WOODLAND FLOOD RISK MANAGEMENT PROJECT
PUBLIC DRAFT ENVIRONMENTAL IMPACT REPORT

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Contents

Tables

Figures

Unless otherwise indicated, figures follow the chapter or section in which they are referenced.

Acronyms and Abbreviations

Term	Description
°C	degrees Celsius
°F	degrees Fahrenheit
2017 Ozone Plan	*Sacramento Regional 2008 8-Hour Ozone Attainment and Reasonable Further Progress Plan*
AB	Assembly Bill
AC	Annual Chance
ACM	asbestos containing materials
ADT	average daily traffic
AEP	Association of Environmental Professionals
AGR	agricultural supply
ANSI	American National Standards Institute
AQAP	Air Quality Attainment Plan
AREAPOLY	area source
B.P.	Before Present
BACT	best available control technologies
basin plan	regional water quality control plan
Basin Plan	Water Quality Control Plan for the California Regional Water Quality Control Board, Central Valley Region
BCC	birds of conservation concern
BFEs	base flood elevations
BMPs	best management practices
BO	Biological Opinion
BSSCP	Bentonite Slurry Spill Contingency Plan
BTUs	British Thermal Units
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAFÉ	Corporate Average Fuel Economy Standards
CAL FIRE	California Department of Forestry and Fire Protection
Cal/OSHA	California Division of Occupational Safety and Health
CalARP	California Accidental Release Prevention
Cal-EPA	California Environmental Protection Agency
Cal-IPC	California Invasive Plant Council
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CARB	California Air Resources Board
Carl Moyer Program	Carl Moyer Memorial Air Quality Standards Attainment Program
CBSC	California Building Standards Code
CCAA	California Clean Air Act
CCAP	*Cache Creek Area Plan*
CCR	California Code of Regulations

Term	Description
CCRMP	*Cache Creek Resources Management Plan*
CCSB	Cache Creek Settling Basin
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
Central Valley Water Board	Central Valley Regional Water Quality Control Board
CEQA	California Environmental Quality Act
CEQA Guide	*Guide to Air Quality Assessment in Sacramento County*
CEQA Handbook	*Handbook for Assessing and Mitigating Air Quality Impacts*
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CH_4	methane
CHP	California Highway Patrol
CHRIS	California Historic Resources Inventory System
City	City of Woodland
CMP	congestion management process
CNDDB	California Natural Diversity Database
CNEL	community noise equivalent level
CNPPA	California Native Plant Protection Act
CNPS	California Native Plant Society
CNRR	California Northern Railroad
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
Construction General Permit	NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities
COP21	21st session of the Conference of Parties
County	Yolo County
County Improvement Standards	*County of Yolo Improvement Standards*
CRHR	California Register of Historical Resources
CRPR	California Rare Plan Rank
CTP	*California Transportation Plan*
CUPA	Certified Uniform Program Agency
CVFMP	Central Valley Flood Management Planning
CVFPB	Central Valley Flood Protection Board
CVFPP	*Central Valley Flood Protection Plan*
CVP	Central Valley Project
CWA	Clean Water Act
dB	decibel
dBA	A-Weighted Decibel
dbh	diameter at breast height
Delta	Sacramento-San Joaquin River Delta
Delta RMP	Delta Regional Monitoring Program

Term	Description
DOC	California Department of Conservation
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
EFH	Essential Fish Habitat
EHD	Environmental Health Division
EIA	Energy Information Administration
EIR	environmental impact report
EIS	environmental impact statement
EISA	Energy Independence and Security Act
EO	Executive Order
ESA	Endangered Species Act
Farmland	Prime Farmland, Unique Farmland, or Farmland of Statewide Importance
Feasibility Report	Lower Cache Creek Flood Risk Reduction Project Feasibility Report
FEMA	Federal Emergency Management Agency
FHSZs	fire hazard severity zones
FHWA	Federal Highway Administration
FIRMs	Flood Insurance Rate Maps
FIS	Flood Insurance Study
FMMP	Farmland Mapping and Monitoring Program
FPPA	Federal Farmland Protection Policy Act
fps	feet per second
FR	*Federal Register*
frac-out	fracture-out event
FRAP	Fire and Resource Assessment Program
Friant Ranch Decision	California Supreme Court's decision in Sierra Club v. County of Fresno (6 Cal. 5th 502)
Friant Ranch Project	Community Plan Update and Friant Ranch Specific Plan
FS	Flood Study Areas
FTA	Federal Transit Administration
g	acceleration of gravity
GC	Government Code
GHG	greenhouse gas
GIS	geographic information system
GSAs	groundwater sustainability agencies
GSPs	groundwater sustainability plans
GWh	gigawatt hours
GWMP	*City of Woodland Groundwater Management Plan*
GWP	global warming potential

Term	Description
HCD	California Department of Housing and Community Development
HCP	Habitat Conservation Plan
HCP/NCCP	*Yolo Habitat Conservation Plan/Natural Community Conservation Plan*
HFCs	hydrofluorocarbons
HI	hazard index
Hot Spots Act	Air Toxics Hot Spots Information and Assessment Act of 1987
HRA	health risk assessment
HSC	Health and Safety Code
Hz	Hertz
I-	Interstate
IEPR	Integrated Energy Policy Report
IPaC	Information for Planning and Conservation
IPCC	Intergovernmental Panel on Climate Change
ISA	International Society of Arboriculture
kg	kilogram
kg/yr	kilograms/year
KOPs	key observation points
kWh	kilowatt hours
LBP	Lead-based paint
LCCFS	Lower Cache Creek Feasibility Study
LDA	light-duty automobile
L_{dn}	day-night sound level
LDT	light-duty truck
L_{eq}	equivalent sound level
LESA	Land Evaluation and Site Assessment
LINEAREA	line/area source
L_{min} and L_{max}	minimum and maximum sound levels
LOS	level of service
LRAs	Local Responsibility Areas
LSAA	lakes and streambed alteration agreement
L_{xx}	percentile-exceeded sound levels
Madrone	Madrone Environmental Consulting
MBTA	Migratory Bird Treaty Act
mg	milligrams
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MLD	most likely descendant
mm	millimeters
mmBTUs	one million BTUs
MOU	memorandum of understanding
MPOs	Metropolitan Planning Organizations
MRO	Mineral Resource Overlay

Term	Description
MRZ	mineral resource zone
MTIP	metropolitan transportation improvement program
MTP/SCS	metropolitan transportation plan/sustainable communities strategy
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NCCP	Natural Community Conservation Plan
NCCPA	Natural Community Conservation Planning Act
NDC	Nationally Determined Contributions
NED	National Economic Development
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
ng/L	nanograms per liter
NHPA	National Historic Preservation Act
NHTSA	National Highway Traffic Safety Administrative
NMFS	National Marine Fisheries Service
NO	nitric oxide
NO_2	nitrogen dioxide
NOI	notice of intent
NOP	Notice of Preparation
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSR	New Source Review
NWPs	nationwide permits
NWS	National Weather Service
O&M	operations and maintenance
OCMP	*Off-Channel Mining Plan*
OEHHA	Office of Environmental Health Hazard Assessment
OES	Office of Emergency Services
OHWM	Ordinary High Water Mark
OPR	Office of Planning and Research
OSHA	Occupational Safety and Health Administration
Parkway Plan	*Cache Creek Parkway Plan*
PFCs	perfluorocarbons
PG&E	Pacific Gas & Electric
Phase I ESA	Phase 1 Environmental Site Assessment
PM	particulate matter
Porter-Cologne Act	Porter-Cologne Water Quality Control Act
ppb	parts per billion
PPV	peak particle velocity
PRC	Public Resources Code

Term	Description
Proposed Project	Woodland Flood Risk Management Project
proposed species	Species that are listed or proposed for listing as threatened or endangered under ESA
proposed transportation impact guidelines	*Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA, Implementing Senate Bill 743*
PWD	Public Works Department
RD	Reclamation District
Reclamation	U.S. Bureau of Reclamation
RECs	recognized environmental conditions
Regional Water Boards	Regional Water Quality Control Boards
RHNA	regional housing needs allocation
RMP	risk management plan
RMS	root-mean-square
ROG	reactive organic gases
RPAs	Reasonable and Prudent Actions
RPS	Renewables Portfolio Standard
RPW	relatively permanent water
RSP	rock slope protection
RTP	regional transportation plan
RWTF	regional water treatment facility
SACOG	Sacramento Area Council of Governments
SAFE	Safer Affordable Fuel-Efficient
SB	Senate Bill
SCS	sustainable communities strategy
SDDER	Storm Damage DWR Emergency Rehabilitation Project
SDFMPs	Storm Drainage Facilities Master Plans
SEIS	Supplemental Environmental Impact Report
SF_6	sulfur hexafluoride
SFNA	Sacramento Federal Nonattainment Area
SGMA	Sustainable Groundwater Management Act
SIP	state implementation plan
SLCP	Short-Lived Climate Pollutant
Small MS4 Permit	*General Permit for Discharges of Storm Water from Small Municipal Separate Storm Sewer Systems Stormwater Discharges from Small Municipal Separate Storm Sewer Systems*
SMAQMD	Sacramento Metropolitan Air Quality Management District
SMARA	Surface Mining and Reclamation Act of 1975
SO_2	sulfur dioxide
SR	State Route
SRA	State Responsibility Area
SRBPP	Sacramento River Bank Protection Project
SRFCP	Sacramento River Flood Control Project
State Water Board	State Water Resources Control Board
STIP	State Transportation Improvement Program

Term	Description
SVAB	Sacramento Valley Air Basin
SVP	Society of Vertebrate Paleontology
SWANCC	Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers
SWP	State Water Project
SWPPP	stormwater pollution prevention plan
SYMVCD	Sacramento-Yolo Mosquito and Vector Control District
TACs	toxic air contaminants
Tanner Act	Toxic Air Contaminant Identification and Control Act
T-BACT	best available control technology for toxics
TDM	transportation demand management
Technical Advisory	*Technical Advisory on Evaluating Transportation Impacts in CEQA*
the Rapanos decision	*Rapanos v. United States* and *Carabell v. U.S. Army Corps of Engineers*
TMDLs	total maximum daily loads
TNW	traditional navigable waters
UC	University of California
ULDC	Urban Levee Design Criteria
ULOP	Urban Level of Flood Protection
ULV	Ultra Low Volume
Under2 MOU	Under2 Coalition is an international coalition of jurisdictions that signed the Global Climate Leadership Memorandum of Understanding
UPRR	United Pacific Railroad
USACE	U.S. Army Corps of Engineers
USC	United States Code
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UWMP	*Urban Water Management Plan*
VCE	Valley Clean Energy
VdB	vibration decibels
VHFHSZs	Very High Fire Severity Zones
VMT	vehicle miles traveled
WBWG	Western Bat Working Group
WDCWA	Woodland–Davis Clean Water Agency
WDRs	waste discharge requirements
WFD	Woodland Fire Department
Williamson Act	California Land Conservation Act of 1965
WPCF	Water Pollution Control Facility
WRDA	Water Resources Development Act
WYs	water years

Term	Description
YCTD	Yolo County Transportation District
YDWN	Yocha Dehe Wintun Nation
YSAQMD	Yolo Solano Air Quality Management District

ES.1 Introduction

This executive summary identifies the purpose of the environmental impact report (EIR), provides an overview of the proposed flood system improvements for the City of Woodland, i.e., the Woodland Flood Risk Management Project (Proposed Project), and identifies the impacts that would result from implementation of the Proposed Project and the recommended mitigation measures. This summary also presents other conclusions required by the California Environmental Quality Act (CEQA) and the State CEQA Guidelines. These discussions provide an overview and are to be used in conjunction with the EIR.

Located in Yolo County, the project area lies mostly north of the city of Woodland and immediately south of the south levee of Lower Cache Creek, and includes the Cache Creek Settling Basin (CCSB). Most of the 10,292-acre project area contains agricultural lands consisting of row crops, orchards, or rural homes. The Proposed Project footprint generally extends from between County Roads 97A and 98 in the west to midway along the southern boundary of the CCSB in the east (Figure ES-1).

ES.2 Project Overview

The Proposed Project would provide flood system improvements to reduce the risks to public health and safety, property, and infrastructure for the City of Woodland (City) from flooding of Lower Cache Creek. The proposed improvements include installation of an approximately 5.5-mile-long earthen levee and a drainage channel along Woodland's northern boundary to redirect overland flood flows to the CCSB and the City's North Drainage canal, installation of an inlet weir in the existing CCSB west levee to allow flood flow conveyance into the CCSB, degradation of 3,000 feet of the CCSB training levee to improve sediment distribution within the CCSB, construction of elevated crossings or closure structures where the proposed levee crosses existing roads or railroad tracks, and installation of culverts at road and railroad crossing for flood flow conveyance to the proposed drainage channel.

ES.3 Project Objectives

The City's primary objective is to implement a project to meet the State of California's Urban Level of Flood Protection criteria and Federal Emergency Management Agency (FEMA) 100-year levee certification criteria for Woodland. The objectives are as follows.

- Provide 200-year flood protection from Cache Creek to the city.
- Obtain FEMA certification for 100-year level of flood protection for the city.
- Develop a project that meets U.S. Army Corps of Engineers (USACE) planning criteria and federal requirements for investment.
- Avoid or reduce risk associated with increases to the 100-year flood depth at existing structures north of the city.

- Maintain the functionality of the CCSB.
- Ensure no net loss of native trees.

ES.4 Project Impacts and Mitigation Measures

ES.4.1 Summary of Project Impacts

Table ES-1 provides a summary of the environmental effects that would result from implementation of the Proposed Project, potential mitigation measures, and the level of significance of the environmental impacts after implementation of the proposed mitigation.

ES.4.2 Significant and Unavoidable Impacts

A significant and unavoidable impact is that which would cause a substantial adverse change in the environment that cannot be avoided or mitigated to a less-than-significant level if the project is implemented. The EIR identifies that implementation of the Proposed Project would result in significant and unavoidable impacts on agricultural resources, traffic and circulation, and aesthetics, as identified in Table ES-1 and presented in Chapter 3, *Impact Analysis*. However, by implementing the Proposed Project, the City would achieve the objectives of the Woodland Flood Risk Management Project (WFRMP) and reduce the risks to public health, safety, property and life that exist due to the potential for flooding in the project area.

Table ES-1. Summary of Impacts and Mitigation Measures

Impact	Level of Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Hydrology			
Impact HYDRO-1: Substantially alter the existing drainage pattern of the site or area in a manner that would result in substantial erosion or siltation onsite or offsite	Less than significant	–	–
Impact HYDRO-2: Substantially alter the existing drainage pattern of the site or area in a manner that would substantially increase the rate or amount of surface runoff resulting in flooding onsite or offsite	Less than significant	–	–
Impact HYDRO-3: Increase siltation in the Cache Creek Settling Basin	Less than significant	–	–
Impact HYDRO-4: Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff	Less than significant	–	–
Impact HYDRO-5: Impede or redirect flood flows resulting in increased inundation levels	Less than significant	–	–
Water Quality			
Impact WQ-1: Violation of water quality standards or waste discharge requirements or substantial degradation of surface water or groundwater quality	Significant	Mitigation Measure WQ-1: Prepare and implement a Bentonite Slurry Spill Contingency Plan	Less than significant
Impact WQ-2: Substantial decrease in groundwater supplies or substantial interference with groundwater recharge such that the project may impede sustainable groundwater management of the basin	Less than significant	–	–
Impact WQ-3: Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan	Less than significant	–	–

Impact	Level of Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Impact WQ-4: In flood hazard zones, risk of release of pollutants as a result of project inundation	Less than significant	–	–
Geology, Soils, Minerals, and Paleontological Resources			
Impact GEO-1: Substantial adverse effects, including the risk of loss, injury, or death involving the risk of surface fault rupture	Less than significant	–	–
Impact GEO-2: Substantial adverse effects, including the risk of loss, injury, or death involving the risk of strong seismic ground shaking and associated ground failure	Less than significant	–	–
Impact GEO-3: Accelerated erosion and sedimentation resulting from construction-related ground disturbance	Less than significant	–	–
Impact GEO-4: Loss of topsoil	Less than significant	–	–
Impact GEO-5: Slope failure during levee wall, drainage channel, and floodwall construction	Less than significant	–	–
Impact GEO-6: Structural damage and injury resulting from development on expansive soils	Less than significant	–	–
Impact GEO-7: Damage to paleontological resources as a result of project construction	Significant	Mitigation Measure GEO-1: Monitor for discovery of paleontological resources, evaluate found resources, and prepare and follow a recovery plan for found resources	Less than significant
Impact GEO-8: Loss of availability of a known mineral resource of regional or local importance as a result of project construction	Less than significant	–	–
Impact GEO-9: Loss of a known mineral resource of regional or local importance as a result of placement of proposed project	Less than significant	–	–
Impact GEO-10: Exposure to hazards associated with subsurface gas	Less than significant	–	–

Impact	Level of Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Biological Resources			
Impact BIO-1: Potential disturbance or mortality of vernal pool branchiopods and their habitat	Significant	Mitigation Measure BIO-1: Install orange construction fencing or other suitable markers between the construction area and adjacent sensitive biological resources Mitigation Measure BIO-2: Conduct environmental awareness training for construction employees Mitigation Measure BIO-3: Conduct periodic biological monitoring Mitigation Measure BIO-4: Assume presence of vernal pool branchiopods or conduct protocol-level surveys and implement avoidance and minimization measures as applicable or vernal pool branchiopods Mitigation Measure BIO-5: Avoid impacts on vernal pool branchiopods and their habitat	Less than significant
Impact BIO-2: Potential disturbance or mortality of valley elderberry longhorn beetle and its habitat	Significant	Mitigation Measure BIO-2: Conduct environmental awareness training for construction employees Mitigation Measure BIO-6: Conduct a focused survey for elderberry shrubs within 50 meters of the project footprint Mitigation Measure BIO-7: Implement avoidance measures to protect valley elderberry longhorn beetle and its habitat outside permanent impact areas Mitigation Measure BIO-8: Provide compensatory mitigation for impacts on valley elderberry longhorn beetle	Less than significant
Impact BIO-3: Potential disturbance or mortality of western pond turtle	Significant	Mitigation Measure BIO-1: Install orange construction fencing or other suitable markers between the construction area and adjacent sensitive biological resources Mitigation Measure BIO-2: Conduct environmental awareness training for construction employees Mitigation Measure BIO-3: Conduct periodic biological monitoring	Less than significant

Impact	Level of Significance before Mitigation	Mitigation Measure	Significance after Mitigation
		Mitigation Measure BIO-9: Conduct preconstruction surveys for western pond turtle and monitor construction activities if turtles are observed	
Impact BIO-4: Potential disturbance or mortality of or loss of habitat for giant garter snake	Significant	Mitigation Measure BIO-1: Install orange construction fencing or other suitable markers between the construction area and adjacent sensitive biological resources Mitigation Measure BIO-2: Conduct environmental awareness training for construction employees Mitigation Measure BIO-10: Restore temporarily disturbed giant garter snake aquatic and upland habitat to pre-project conditions Mitigation Measure BIO-11: Compensate for permanent loss of giant garter snake habitat Mitigation Measure BIO-12: Avoid and minimize construction impacts on giant garter snake Mitigation Measure BIO-13: Avoid and minimize potential impacts from operation and maintenance activities on giant garter snake and its habitat	Less than significant
Impact BIO-5: Potential disturbance or mortality of nesting Swainson's hawk and white-tailed kite and loss of nesting and foraging habitat	Significant	Mitigation Measure BIO-1: Install orange construction fencing or other suitable markers between the construction area and adjacent sensitive biological resources Mitigation Measure BIO-2: Conduct environmental awareness training for construction employees Mitigation Measure BIO-14: Conduct vegetation removal activities outside the breeding season for birds Mitigation Measure BIO-15: Conduct focused surveys for nesting Swainson's hawk prior to construction and implement protective measures during construction Mitigation Measure BIO-16: Compensate for the permanent loss of foraging habitat for Swainson's hawk	Less than significant

Impact	Level of Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Impact BIO-6: Potential disturbance or mortality of nesting special-status and non–special-status birds and removal of suitable breeding habitat	Significant	Mitigation Measure BIO-1: Install orange construction fencing or other suitable markers between the construction area and adjacent sensitive biological resources Mitigation Measure BIO-2: Conduct environmental awareness training for construction employees Mitigation Measure BIO-14: Conduct vegetation removal activities outside the breeding season for birds Mitigation Measure BIO-17: Conduct nesting surveys for special-status and non–special-status birds and implement protective measures during construction Mitigation Measure BIO-18: Avoid and minimize construction and operation and maintenance impacts on western yellow-billed cuckoo and least Bell's vireo and their habitat	Less than significant
Impact BIO-7: Potential injury, mortality or disturbance of tree-roosting bats and removal of roosting habitat	Significant	Mitigation Measure BIO-1: Install orange construction fencing or other suitable markers between the construction area and adjacent sensitive biological resources Mitigation Measure BIO-2: Conduct environmental awareness training for construction employees Mitigation Measure BIO-19: Identify suitable roosting habitat for bats and implement avoidance and protective measures	Less than significant
Impact BIO-8: Potential disruption of wildlife movement corridors	Less than significant	–	–
Impact BIO-9: Potential for construction activities to result in removal of special-status plants	Significant	Mitigation Measure BIO-1: Install orange construction fencing or other suitable markers between the construction area and adjacent sensitive biological resources Mitigation Measure BIO-2: Conduct environmental awareness training for construction employees Mitigation Measure BIO-3: Conduct periodic biological monitoring	Less than significant

Impact	Level of Significance before Mitigation	Mitigation Measure	Significance after Mitigation
		Mitigation Measure BIO-20: Conduct special-status plants surveys Mitigation Measure BIO-21: Avoid or compensate for impacts on special-status plants	
Impact BIO-10: Potential for construction activities to result in indirect impacts on riparian habitat	Significant	Mitigation Measure BIO-1: Install orange construction fencing or other suitable markers between the construction area and adjacent sensitive biological resources Mitigation Measure BIO-2: Conduct environmental awareness training for construction employees Mitigation Measure BIO-3: Conduct periodic biological monitoring	Less than significant
Impact BIO-11: Potential for construction activities to result in loss of valley oak woodland	Significant	Mitigation Measure BIO-1: Install orange construction fencing or other suitable markers between the construction area and adjacent sensitive biological resources Mitigation Measure BIO-2: Conduct environmental awareness training for construction employees Mitigation Measure BIO-3: Conduct periodic biological monitoring Mitigation Measure BIO-22: Conduct a native tree survey prior to construction Mitigation Measure BIO-23: Protect native trees during construction	Less than significant
Impact BIO-12: Potential for construction activities to result in fill of non-wetland waters of the United States/waters of the state	Significant	Mitigation Measure BIO-1: Install orange construction fencing or other suitable markers between the construction area and adjacent sensitive biological resources Mitigation Measure BIO-2: Conduct environmental awareness training for construction employees Mitigation Measure BIO-3: Conduct periodic biological monitoring	Less than significant

Impact	Level of Significance before Mitigation	Mitigation Measure	Significance after Mitigation
		Mitigation Measure BIO-24: Compensate for fill of wetlands and non-wetland waters of the United States/waters of the state	
Impact BIO-13: Potential for construction activities to result in fill of wetlands	Significant	Mitigation Measure BIO-1: Install orange construction fencing or other suitable markers between the construction area and adjacent sensitive biological resources Mitigation Measure BIO-2: Conduct environmental awareness training for construction employees Mitigation Measure BIO-3: Conduct periodic biological monitoring Mitigation Measure BIO-24: Compensate for fill of wetlands and non-wetland waters of the United States/waters of the state	Less than significant
Impact BIO-14: Conflict with provisions of an adopted HCP/NCCP or other approved local, regional, or state habitat conservation plan	Less than significant	–	–
Impact BIO-15: Potential for construction activities to introduce and spread invasive species	Significant	Mitigation Measure BIO-1: Install orange construction fencing or other suitable markers between the construction area and adjacent sensitive biological resources Mitigation Measure BIO-2: Conduct environmental awareness training for construction employees Mitigation Measure BIO-25: Avoid the introduction and spread of invasive plants during construction	Less than significant
Land Use Planning and Agricultural Resources			
Impact LU-1: Physical division of an established community	Less than significant	–	–
Impact LU-2: Conflict with land use plans, policies, and regulations adopted for the purpose of avoiding or mitigating an environmental effect	Less than significant	–	–

Impact	Level of Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Agricultural and Forestry Resources			
Impact AG-1: Conversion of Farmland to nonagricultural use	Significant	Mitigation Measure AG-1: Conserve Farmland (Prime Farmland and Unique Farmland)	Significant and unavoidable
Impact AG-2: Conflict with existing zoning for agricultural use or with a Williamson Act contract	Less than significant	–	–
Impact AG-3: Other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to nonagricultural use	Less than significant	–	–
Air Quality			
Impact AQ-1: Conflict with or obstruct implementation of the applicable air quality plan	Less than significant	–	–
Impact AQ-2: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard	Significant	Mitigation Measure AQ-1: Implement fugitive dust control best management practices	Less than significant
Impact AQ-3: Expose sensitive receptors to substantial pollutant concentrations	Significant	Mitigation Measure AQ-1: Implement fugitive dust control best management practices	Less than significant
Impact AQ-4: Result in other emissions (such as those leading to odors) affecting a substantial number of people	Less than significant	–	–
Greenhouse Gas Emissions			
Impact GHG-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment	Significant	Mitigation Measure GHG-1: Implement measures to reduce GHG emissions from construction Mitigation Measure GHG-2: Implement measures to reduce GHG emissions from operations and maintenance activities	Less than significant

Impact	Level of Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Impact GHG-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases	Significant	Mitigation Measure GHG-1: Implement measures to reduce GHG emissions from construction Mitigation Measure GHG-2: Implement measures to reduce GHG emissions from operations and maintenance activities	Less than significant
Noise and Vibration			
Impact NOI-1: Generation of substantial temporary or permanent increase in ambient noise levels in the project vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies	Less than significant	–	–
Impact NOI-2: Generation of excessive groundborne vibration or groundborne noise levels	Less than significant	–	–
Cultural Resources			
Impact CUL-1: Potential to cause a substantial adverse change in the significance of a historical resource	Significant	Mitigation Measure CUL-1: Evaluation of resources 50 years or older in the event of floodproofing	Less than significant
Impact CUL-2: Change in the significance of an archaeological resource	Significant	Mitigation Measure CUL-2: Implement inadvertent discovery procedures	Less than significant
Impact CUL-3: Disturbance of Native American and historic-period human remains	Significant	Mitigation Measure CUL-3: Implement human remains discovery procedures	Less than significant
Tribal Cultural Resources			
Impact TCR-1: Potential to cause a substantial adverse change in the significance of a tribal cultural resource	Significant	Mitigation Measure TCR-1: Implement measures in Yocha Dehe Cultural Resources Treatment Protocol Mitigation Measure TCR-2: Implement measures in Public Resources Code Section 21084.3 (b)	Less than significant

Impact	Level of Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Traffic and Circulation			
Impact TRA-1: Conflict with a program, plan, ordinance, or policy addressing the circulation system including transit, roadway, bicycle, and pedestrian facilities	Less than significant	–	–
Impact TRA-2: Conflict or be inconsistent with State CEQA Guidelines Section 15064.3, subdivision (b) by temporarily causing substantial additional VMT or induced automobile travel	Significant	Mitigation Measure GHG-1: Implement measures to reduce GHG emissions from construction	Significant and unavoidable
Impact TRA-3: Create major driving or transportation- and circulation-related hazards	Significant	Mitigation Measure TRA-1: Traffic management plan for project construction	Less than significant
Impact TRA-4: Result in inadequate emergency access	Significant	Mitigation Measure TRA-1: Traffic management plan for project construction	Less than significant
Public Services and Utilities			
Impact PSU-1: Relocation or construction of new or expanded water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction of which could cause significant environmental effects	Less than significant	–	–
Impact PSU-2: Have sufficient water supply to serve the Proposed Project and reasonably foreseeable future development during normal, dry, and multiple dry years	Less than significant	–	–
Impact PSU-3: Project-related exceedance of state or local solid waste standards or of the capacity of local infrastructure, or other impediments to attaining solid waste reduction goals	Less than significant	–	–

Impact	Level of Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Energy			
Impact EN-1: Wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation	Less than significant	–	–
Impact EN-2: Conflict with or obstruct a state or local plan for renewable energy or energy efficiency	Significant	Mitigation Measure GHG-1: Implement measures to reduce GHG emissions from construction Mitigation Measure GHG-2: Implement measures to reduce GHG emissions from operations and maintenance activities	Less than significant
Aesthetics			
Impact AES-1: Substantial adverse effect on a scenic vista	Less than significant	–	–
Impact AES-2: Substantially degrade the existing visual character or quality of public views in non-urbanized areas due to construction	Significant	Mitigation Measure AES-1: Install temporary visual barriers between construction zones and residences and maintain construction sites and staging areas in an orderly fashion	Less than significant
Impact AES-3: Substantially degrade the existing visual character or quality of public views in non-urbanized areas due to operations	Significant	None available	Significant and unavoidable
Impact AES-4: Create a new source of substantial light or glare that would adversely affect day or nighttime public views during construction and operations	Less than significant	–	–
Recreation			
Impact REC-1: Increased use of existing recreational facilities, resulting in substantial physical deterioration	Less than significant	–	–
Population and Housing			
Impact POP-1: Creation of substantial population growth	No impact	–	–
Impact POP-2: Substantial displacement of people or housing	Less than significant	–	–

Impact	Level of Significance before Mitigation	Mitigation Measure	Significance after Mitigation
Hazards and Hazardous Materials			
Impact HAZ-1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials	Less than significant	–	–
Impact HAZ-2: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment	Significant	Mitigation Measure HAZ-1: Develop and implement a health and safety plan Mitigation Measure HAZ-2: Perform a phase I environmental site assessment prior to construction activities and remediate if necessary Mitigation Measure HAZ-3: Develop a freight rail management plan	Less than significant
Impact HAZ-3: Place project-related facilities on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment	Significant	Mitigation Measure HAZ-1: Develop and implement a health and safety plan Mitigation Measure HAZ-2: Perform a phase I environmental site assessment prior to construction activities and remediate if necessary Mitigation Measure HAZ-3: Develop a freight rail management plan	Less than significant
Impact HAZ-4: Impair implementation of or physical interference with an adopted emergency response plan or emergency evacuation plan	Significant	Mitigation Measure TR-2: Traffic management plan for project construction	Less than significant

Cumulative Impact	Contribution to Cumulative Effects	Mitigation Measures	Contribution after Mitigation
Agricultural and Forestry Resources	Considerable contribution	Mitigation Measure AG-1: Conserve Farmland (Prime Farmland and Unique Farmland)	Considerable contribution
Air Quality	Considerable contribution	Mitigation Measure AQ-1: Implement fugitive dust control best management practices	No considerable contribution
Greenhouse Gas Emissions	Considerable contribution	Mitigation Measure GHG-1: Implement measures to reduce GHG emissions from construction Mitigation Measure GHG-2: Implement measures to reduce GHG emissions from operations and maintenance activities	No considerable contribution
Cultural Resources, Prehistoric Cultural Resources	Considerable contribution	Mitigation Measure CUL-3: Implement human remains discovery procedures	No considerable contribution
Tribal Cultural Resources	Considerable contribution	Mitigation Measure TCR-1: Implement measures in Yocha Dehe Cultural Resources Treatment Protocol Mitigation Measure TCR-2: Implement measures in Public Resources Code Section 21084.3 (b)	No considerable contribution
Transportation and Circulation Conditions	Considerable contribution	Mitigation Measure TRA-1: Traffic management plan for project construction	No considerable contribution

ES.5 Project Alternatives

The EIR must examine a reasonable range of alternatives to the project that could feasibly attain most of the project objectives and avoid or substantially lessen any of the project's significant environmental impacts (State CEQA Guidelines 15126 [f]). As required by Section 15126.6 of the State CEQA Guidelines, the range of alternatives must always include the "No Project Alternative." The purpose of describing and analyzing a no project alternative is to allow decision-makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project.

This EIR examines the following alternatives.

- *No Project Alternative*. Current conditions and operation and maintenance practices would continue into the foreseeable future. No additional work would be performed to address levee overtopping, seepage, or levee stability along Lower Cache Creek, and the city of Woodland would remain at risk of severe flooding from upstream overtopping.
- *Alternative 2C*. A new levee along the north side of Woodland and a drainage channel that would divert flood flows into the Yolo Bypass would be constructed to protect Woodland from Lower Cache Creek flooding. Alternative 2C would provide a floodway to drain floodwaters directly to the Yolo Bypass instead of impounding them and draining them into the CCSB.

The impacts of these alternatives are briefly summarized and compared to the Proposed Project in Table ES-2 and the impacts for the No Project Alternative and Alternative 2C are discussed in more detail in Chapter 4, *Alternatives Analysis*.

Table ES-2. Comparison of Environmental Impacts of Alternatives to the Proposed Project

Resource Topic	Proposed Project	No Project Alternative	Alternative 2C
Hydrology			
Erosion and Siltation	LTS	S (>)	LTS (=)
Flooding due to Alteration of Existing Drainage	LTS	S (>)	LTS (=)
Flooding due to Impeded/Redirected Flood Flows	LTS	S (>)	LTS (<)
Stormwater Runoff	LTS	NI (<)	LTS (<)
Water Quality			
Water Quality (Surface, Groundwater)	LTS w/mit	S (>)	SU (>)
Groundwater Supply	LTS	LTS (=)	LTS (=)
Geology, Soils, and Paleontological and Mineral Resources			
Geology	LTS	LTS (=)	LTS (=)
Soils	LTS	S (>)	LTS (>)
Paleontological Resources	LTS w/mit	NI (<)	LTS w/mit (>)
Minerals	LTS	NI (<)	LTS (=)
Biological Resources			
Special-Status Wildlife Species	LTS w/mit	LTS (<)	LTS w/mit (>)
Nesting Birds	LTS w/mit	LTS (<)	LTS w/mit (>)
Bats	LTS w/mit	LTS (<)	LTS w/mit (>)
Wildlife Movement Corridors	LTS	LTS (<)	LTS (=/>)
Special-Status Plant Species	LTS w/mit	LTS (<)	LTS w/mit (>)
Sensitive Vegetation Communities	LTS w/mit	LTS (<)	LTS w/mit (>)
Wetlands	LTS w/mit	LTS (<)	LTS w/mit (>)
Conflict with HCP/NCCP	LTS	LTS (<)	LTS (=)
Invasive Species	LTS w/mit	LTS (<)	LTS w/mit (=)
Land Use and Planning			
Divide Community	LTS	LTS (=)	LTS (=)
Conflict with Plan	LTS	S (>)	LTS (=)
Agricultural and Forestry Resources			
Convert Farmland	SU	NI (<)	SU (>)
Conflict with Zoning or Williamson Act	LTS	NI (<)	NI (<)
Air Quality			
Conflict with Plan	LTS	NI (<)	LTS (=)
Increase Criteria Pollutants	LTS w/mit	NI (<)	SU (>)
Expose Sensitive Receptors	LTS w/mit	NI (<)	SU (>)
Other Emissions	LTS	NI (<)	LTS (=)
Greenhouse Gas Emissions			
Generate GHG	LTS w/mit	NI (<)	LTS w/mit (>)
Conflict with Plan	LTS w/mit	NI (<)	LTS w/mit (=)

Resource Topic	Proposed Project	No Project Alternative	Alternative 2C
Noise			
Construction Noise	LTS	NI (<)	LTS (=)
Construction Vibration	LTS	NI (<)	LTS (=)
Cultural Resources			
Historical Resource	LTS w/mit	NI (<)	LTS w/mit (=)
Archaeological Resource	LTS w/mit	NI (<)	LTS w/mit (=)
Native American and Historic-Period Human Remains	LTS w/mit	NI (<)	LTS w/mit (=)
Tribal Cultural Resources			
Change Significance of Tribal Cultural Resource	LTS w/mit	NI (<)	LTS w/mit (=)
Transportation			
Conflict with Plan	LTS	NI (<)	LTS (>)
Additional VMT	SU	NI (<)	SU (>)
Roadway Hazards	LTS w/mit	S (>)	LTS w/mit (=)
Inadequate Emergency Access	LTS w/mit	S (>)	LTS w/mit (=)
Public Services, Utilities, and Service Systems			
Relocation or Construction of Facilities	LTS	LTS (<)	LTS (=)
Water Supply	LTS	LTS (<)	LTS (=)
Solid Waste	LTS	LTS (<)	LTS (=)
Energy			
Consumption of Energy Resources (Construction)	LTS	LTS (<)	LTS (>)
Consumption of Energy Resources (Operation)	LTS	LTS (>)	LTS (=)
Conflict with Plan	LTS w/mit	LTS (<)	LTS w/mit (=)
Aesthetics			
Scenic Vista	LTS	NI (<)	LTS (<)
Visual Character/Quality (Construction)	LTS w/mit	NI (<)	LTS w/mit (<)
Visual Character/Quality (Operation)	SU	NI (<)	SU (<)
Light and Glare	LTS	NI (<)	LTS (<)
Recreation			
Physical Deterioration of Facilities	LTS	LTS (<)	LTS (=)
Population and Housing			
Growth	NI	NI	NI (=)
Displacement	LTS	LTS (>)	LTS (=)
Hazards, Hazardous Materials, and Wildfire			
Routine Transport, Use, or Disposal	LTS	LTS (<)	LTS (=)
Accidental Release	LTS w/mit	LTS (<)	LTS w/mit (=)
Wildfire	NI	NI (=)	NI (=)

Note: shading indicates change in significance level from Proposed Project.

NI = no impact.
LTS = less than significant impact.
LTS w/mit = less than significant impact with mitigation incorporated.
S = significant.
SU = significant and unavoidable impact.

(<) less than Proposed Project.
(=) similar to Proposed Project.
(>) greater than Proposed Project.

ES.6 Areas of Known Controversy

State CEQA Guidelines Section 15123(b) requires that the summary section of an EIR include a description of areas of controversy known to the lead agency, including issues raised by agencies and the public and issues to be resolved, including the choice among alternatives and whether or how to mitigate the significant effects.

The following list specifies the key issues that were identified during the EIR scoping process and the sections of the EIR that address these issues and concerns as they relate to the potential for environmental impact considerations, as required by CEQA.

- Conversion of agricultural land to non-agricultural uses, leading to loss of productive agricultural acreage (for the new levee, drainage channel, and weir and flood bypass, and to obtain borrow material and create habitat). Impacts related to the conversion of agricultural lands are discussed in Section 3.6, *Agricultural and Forestry Resources*.
- Increased flood risk, land and property damage, and duration of flooding on agricultural lands north of the proposed levee and drainage channel. Changes in hydrology and flood risk are discussed in Section 3.1, *Hydrology*, and non-structural measures proposed by the City to benefit properties north of the city are described in Chapter 2, *Project Description.*
- Potential for transport of mercury (methylmercury) to the Sacramento–San Joaquin River Delta from the CCSB. Section 3.2, *Water Quality*, discusses potential for the Proposed Project to affect transport of mercury.
- Road closures or detours during construction that could affect emergency services and public access. Section 3.12, *Transportation*, discusses the potential effects of construction-related traffic and activities on emergency services and public access.
- Land use compatibility concerns including the concern that changed land uses caused by the Proposed Project (establishment of habitat areas, the levee, and drainage channel) would adversely affect the remaining adjacent agricultural lands due to potential access of these areas by the public (possible homeless encampments, off-road vehicles, increased litter, trespass). Section 3.5, *Land Use and Planning*, discusses potential land use compatibility topics. However, CEQA only requires discussion of reasonably foreseeable physical changes. If the Proposed Project is not anticipated to result in a physical change to the environment, it would not be considered to have a significant impact under CEQA (State CEQA Guidelines Sections 15064(f) and 15131). For the Proposed Project, any physical consequences resulting from changed land uses are too speculative to ascertain.
- Installation of replacement habitat as part of the Proposed Project could attract potentially sensitive wildlife species, placing a burden on adjacent agricultural properties to avoid “take” of protected species. Habitat replacement is discussed in Section 3.4, *Biological Resources.* In general, CEQA does not require mitigation for purely economic impacts unless they lead to reasonably foreseeable secondary environmental impacts. Socioeconomic issues are analyzed in the Supplemental EIS being prepared by USACE.

Some letters received during the scoping process expressed disappointment that the properties north of the city would remain in the floodplain after implementation of the Proposed Project. A summary of the concerns expressed in these letters is provided below. Several alternatives were considered, including some that would provide increased flood protection for the properties north of the city, but these alternatives were screened out for various reasons, including cost/benefit considerations. Appendix A, *Technical Memorandum, City of Woodland, Previous Alternatives Analysis Related to the Lower Cache Creek Feasibility Study*, contains an alternatives screening memorandum that provides more information about alternatives considered but not carried forward. However, as part of the Proposed Project, the City has developed a suite of non-structural measures to benefit the properties north of the city. Chapter 2, *Project Description*, describes these measures. However, because these properties are already subject to flooding, and the City does not propose any changes to the Lower Cache Creek levees that would influence the frequency of flood risk from Lower Cache Creek, the Proposed Project would not be the cause of future flooding of these properties. The flood risk would be a continuation of baseline conditions. This EIR analyzes impacts caused by the Proposed Project, which could include an increase in flood depths north of the city; however, this EIR does not analyze impacts associated with *continued* flood risk north of the city. Concerns associated with continued flood risk north of the city included the following.

- Water quality concerns due to pathogens, debris, and silt carried by floodwaters that could damage orchards and other permanent crops or agricultural installations.
- Importation of weed seeds, spores, other pollutants carried by floodwaters that would increase costs for maintenance and operations (cleanup, weed control) of agricultural lands north of the city and potentially affect viability of organic operations that cannot use pesticides.
- Effects on landowner ability to construct a second house or add new agricultural-related processing, storage, store-fronts, or other infrastructure on agricultural properties north of the city (due to increased costs, flood insurance burden).
- Economic effects on agricultural property owners due to devaluation of properties north of the levee because of flood safety issues.
- Reduced potential for property owners to have an opportunity to sell easements for conservation or other development mitigation in areas north of the city.

ES.7 How to Comment on this Draft EIR

The review period for this Draft EIR will be a minimum of 90 days, beginning on March 23, 2020 and ending on June 20, 2020. The Draft EIR is available on the City's website: www.cityofwoodland.org (under "City Projects"). When the current shelter-in-place orders are lifted, hard copies of the Draft EIR will be available at the Woodland Public Library, 250 1st Street, Woodland; at the Woodland Community Center, 2001 East Street, Woodland; at the Yolo Branch Library, 37750 Sacramento Street, Yolo; and at the public counter at the City of Woodland City Hall, 300 First Street, Woodland.

Submit written comments by mail to:

Mr. Tim Busch, Principal Utilities Civil Engineer
City of Woodland
300 First Street
Woodland, CA 95695

Submit written comments by email to: Tim.Busch@cityofwoodland.org.

Emails should include the subject line "Comments on WFRMP Draft EIR."

The City plans to hold a community meeting to give the public an opportunity to provide comments on the Draft EIR in person. However, because of the current public health crisis, the City has not set a date for this meeting at this time. Individuals and agencies on the project mailing list will be notified by letter when this meeting is scheduled, and the date will be posted on the City's website.

ES.8 Final EIR

After the close of the public review period for the Draft EIR, the City will prepare a Final EIR. The Final EIR will consist of the Draft EIR and the Final EIR and will include the comments received during the formal review period of the Draft EIR; responses to the comments received that relate to environmental issues; and any revisions made to the Draft EIR in response to the comments. The Final EIR will also contain copies of the comments received during the public review period.

The Final EIR and accompanying Draft EIR will be available to the Woodland City Council for consideration during their decision-making process to approve or deny the Proposed Project.

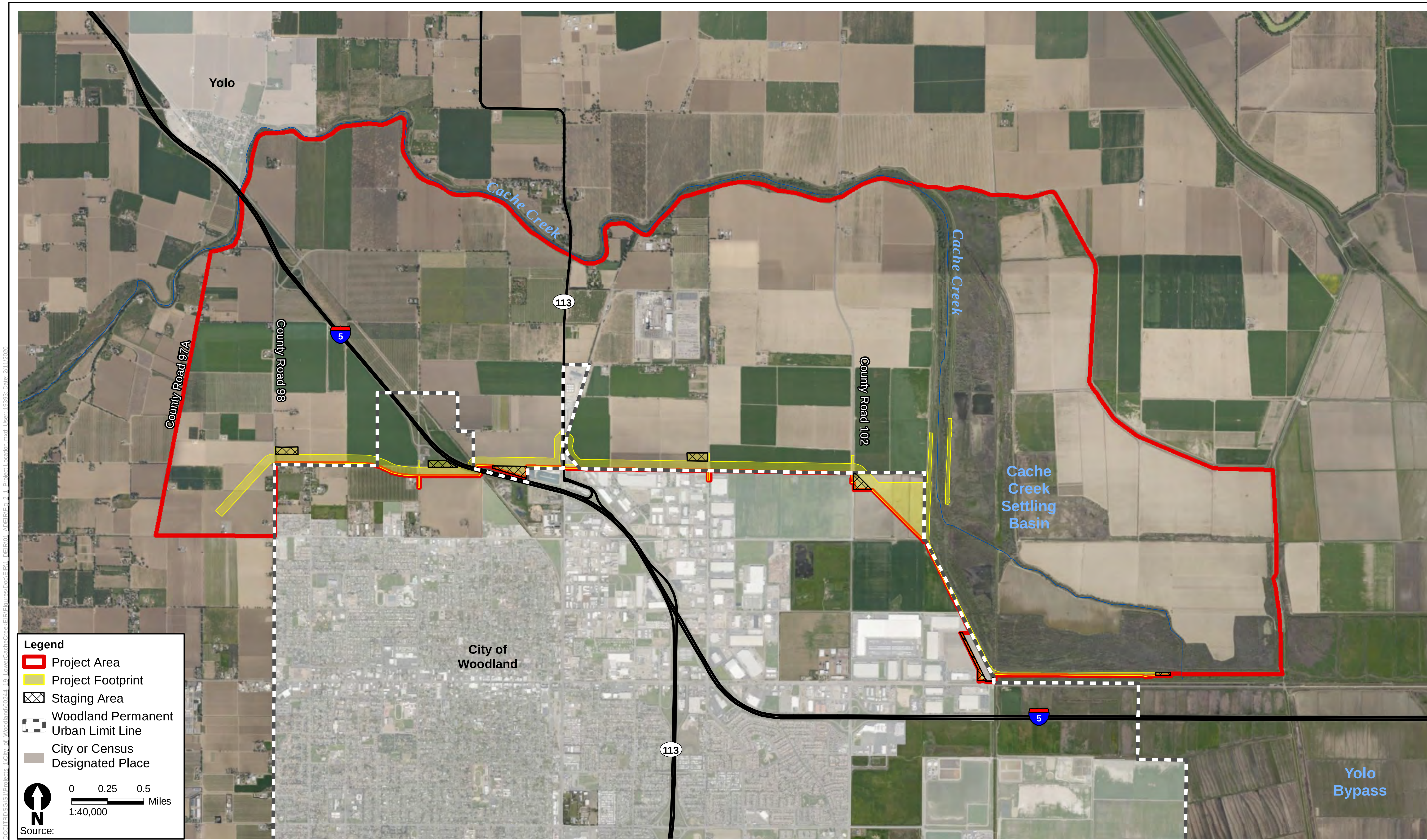


Figure ES-1
Project Location

Chapter 1
Introduction

This Draft Environmental Impact Report (EIR) has been prepared for the Woodland Flood Risk Management Project (Proposed Project) by the City of Woodland (City). The City is the lead agency under the California Environmental Quality Act (CEQA).

The Proposed Project is located in rural unincorporated Yolo County and the City of Woodland (Figure 1-1). The Proposed Project involves flood system improvements to reduce the risks to public health and safety, property, and infrastructure from flooding of Lower Cache Creek in Woodland. These improvements are being proposed in cooperation with the U.S. Army Corps of Engineers (USACE), the Central Valley Flood Protection Board (CVFPB), and the California Department of Water Resources (DWR). The Proposed Project includes additional non-structural measures, proposed by the City and DWR, to benefit properties north of Woodland that would remain in the floodplain.

1.1 Project Background and Overview

Lower Cache Creek downstream from Clear Lake has a history of flooding and has experienced multiple flood events since the mid-1900s, including 20 severe flood events since 1990. Most recently, in February 2019, the Cache Creek levees overtopped, causing road closures around Woodland and resulting in flood-fighting efforts to ensure the levees did not fail. The current level of flood protection from Lower Cache Creek flood events is not adequate and poses risk to public health and safety as well as economic damages to property and infrastructure within Woodland and surrounding areas. The following sections provide brief background information and an overview of the proposal to address these concerns.

1.1.1 Background

USACE last made major improvements to the Lower Cache Creek levees in 1958 as part of the federally authorized Sacramento River Flood Control Project. These levees are also part of the State Plan of Flood Control. At the time USACE built these levees, they were designed and sized in anticipation of future development of an upstream storage facility, Wilson Valley Dam and Reservoir, which would have provided additional flood storage and control of downstream flow levels. The design of the levee improvements was set to a target flow of 30,000 cubic feet per second (cfs) with 3 feet of freeboard, which was intended to account for uncertainties in water surface elevations and to contain wind-driven waves. This design flow corresponded to a storm recurrence interval of approximately 10 years (10 percent or 1 in 10 chance of flooding in any given year). However, the Wilson Valley Dam and Reservoir project was never constructed because of seismic and sediment concerns. Since 1958, the existing levees have conveyed larger flood flows by encroaching into the freeboard, and there has been a number of substantial flood events due to overtopping of the levees. The capacity of the channel has been reduced with time. A study by DWR is underway to determine if this has been caused by subsidence, increased vegetative growth, or other factors. The levee system can no longer pass a design flood event without risk of flood flows overtopping the levees below the design flow of 30,000 cfs.

Cache Creek discharges into the Cache Creek Settling Basin (CCSB), which is also a component of the Sacramento River Flood Control Project and a State Plan of Flood Control facility. Because Cache Creek historically has carried a large sediment load, USACE constructed the settling basin in 1937 to prevent sediment from entering the Yolo Bypass and diminishing its flood conveyance capacity. The CCSB covers approximately 3,600 acres and is bounded by levees with an outlet weir into the Yolo Bypass. The CCSB is designed to convey a flow of 30,000 cfs, the same as the Cache Creek levee system.

Cache Creek has a history of flooding, including in 1958 and 1995, when Cache Creek rose to the top of both levees and overflowed its banks toward the cities of Woodland and Davis. In 1983, a breach in the Cache Creek south levee occurred just upstream of the CCSB, flooding areas in the eastern part of an area now within the city limits of Woodland (industrial area). In 1995, overland flood flows reached within one block of Woodland. In 2019, flood-fighting efforts at multiple locations helped prevent overtopping and failure of the levees.

Since 2008, evaluations of the levee system, including topographic mapping, hydraulic analyses, and field observations, have confirmed that the channel capacity is less than originally designed, and levees begin to overtop at a flow of approximately 26,000 cfs. These conditions combined with ongoing regional subsidence issues suggest that channel capacity will continue to diminish and there is a real threat of potentially substantial flooding in Woodland. Potential costs due to property damage from future Cache Creek flooding are estimated at approximately $12 million annually. Additional losses or adverse effects would include potential for loss of life, contamination from sewage and hazardous materials, and the possible extended closure of portions of Interstate 5, other local roads, and railway access east of the City (Appendix A, *Technical Memorandum, City of Woodland, Previous Alternatives Analysis Related to the Lower Cache Creek Feasibility Study*).

The City's primary objective is to implement a project to meet the State of California's Urban Level of Flood Protection (ULOP) criteria and the Federal Emergency Management Agency 100-year levee certification criteria for the city. The estimated 100-year and 200-year flow rates within the existing combined Cache Creek levee and CCSB flood control system are approximately 56,000 and 65,000 cfs, respectively. At these rates, the current facilities do not meet the flood protection levels required by the State's urban level of protection requirements (200-year protection), nor provide necessary protection to the City to obtain Federal Emergency Management Agency certification to remove the City from the mapped floodplain (100-year protection). Additional project objectives are described in Chapter 2.

1.1.2 Overview of Proposed Project

The City is partnering with DWR, the CVFPB, and USACE through a combination of DWR's Urban Flood Risk Reduction Program and the Lower Cache Creek Flood Risk Reduction Project Feasibility Report (Feasibility Report). USACE evaluated multiple alternatives through the federal National Economic Development (NED) planning process and for the purposes of complying with the National Environmental Policy Act (NEPA). USACE is evaluating Alternative 2A in a supplemental environmental impact statement (SEIS). The Proposed Project for the City's purposes and for complying with CEQA consist of the following improvements, which are the same as Alternative 2A being evaluated by USACE:

- Installation of an approximately 5.5-mile-long earthen levee and a drainage channel along Woodland's northern boundary to redirect overland flood flows to the CCSB and the City's North Drainage canal.
- Installation of an inlet weir in the existing CCSB west levee to allow conveyance of flood flows into the CCSB.
- Degrading the southernmost 3,000 feet of the CCSB training levee to improve the distribution of sediment within the CCSB.
- Construction of elevated crossings or closure structures where the new levee crosses existing roads or railroad tracks, and installation of culverts at road and railroad crossings to facilitate conveyance of flood flows in the proposed drainage channel.

The City, in partnership with DWR, is also proposing a non-structural plan as part of the Proposed Project that would include implementation of additional measures in conjunction with the proposed flood system improvements to assist properties north of the city (north of the new levee and drainage channel). The City would work with individual property owners to identify appropriate site-specific methods and techniques to reduce flood risk and flood damages in this area. These measures may include providing funding to implement measures to raise or flood-proof structures, purchase flowage easements, or provide funding to subsidized flood insurance. The City also would continue to coordinate with Yolo County and DWR to ensure the existing Cache Creek levees continue to be maintained as currently required and recommended in the Lower Cache Creek Feasibility Study if the Proposed Project is implemented. Finally, the Proposed Project would also involve planting trees to provide both visual screening of the new levee embankment and replacement habitat value.

See Chapter 2, *Project Description*, for more information about the Proposed Project.

1.2 Purpose of this Environmental Impact Report

This EIR (State Clearinghouse No. 2015062075) has been prepared according to CEQA (California Public Resources Code Section 21000 et seq.) and the State CEQA Guidelines (California Code of Regulations, Title 14, Chapter 3) to evaluate the potential environmental impacts associated with implementing the Proposed Project (see Chapter 2, *Project Description*).

CEQA requires public agencies to consider the potential adverse environmental impacts, both direct impacts and reasonably foreseeable indirect impacts, of projects under an agency's consideration. A discretionary project that would have a significant adverse impact on the environment cannot be approved without the preparation of an EIR. The Proposed Project is such a project. According to Section 15002 of the State CEQA Guidelines, the basic purposes of CEQA include the following.

- Inform government decision makers and the public about the potential significant environmental effects of proposed activities.
- Identify ways that environmental damage can be avoided or significantly reduced.
- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governing agency finds the changes to be feasible.

- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

CEQA establishes a process for analyzing a project's potential environmental impacts. It is not a permit and does not regulate the project. CEQA also does not require that a proposed project be approved or denied. CEQA's purposes are to ensure that public agencies make a good-faith effort at disclosing the potential environmental impacts of projects to decision makers, the public, and other agencies, and implement actions that will reduce or avoid potential significant impacts (i.e., mitigation measures).

The City Council will review the EIR to understand the Proposed Project's impacts before taking action. The City Council will also consider other information and public comment that arises during deliberations on the Proposed Project before making its decision.

1.2.1 Level of Detail and Scope of this EIR

CEQA identifies various types of EIRs, the most common of which is the project EIR. A project EIR focuses primarily on the changes in the environment that would result from a development project. It examines all phases of the project, including planning, construction, and operation. This EIR provides a project-level analysis that focuses on potential environmental impacts associated with construction and operation and maintenance of the Proposed Project and measures that can minimize or avoid such impacts.

The non-structural plan elements of the Proposed Project would be tailored according to further evaluations of individual site-specific conditions of property owners north of the proposed levee. These elements are analyzed to the extent detail was available at the time that this EIR was prepared. Later environmental review may be required once individual property treatments are identified and details are known.

1.3 Scoping and Public Involvement

1.3.1 Purpose of Scoping

CEQA outlines a scoping process as part of the environmental review of a proposed project. Section 15083 of the State CEQA Guidelines defines early consultation, also called scoping, as the opportunity for reviewing agencies and the public to identify the range of actions, alternatives, mitigation measures, and significant impacts to be analyzed in depth in an EIR. The opportunity to provide input on the issues and alternatives to be evaluated during the environmental process is provided to potentially affected federal, state, and local agencies; Native American tribes; and other interested persons or organizations that may be concerned with the environmental effects of the project.

As described below, the scoping process for this EIR involved the distribution of a Notice of Preparation (NOP) of an EIR, conducting a public scoping meeting, and requesting comments and input from agencies and individuals on the NOP.

1.3.2 Notice of Preparation and Scoping Meeting

An NOP was prepared for the Proposed Project and published for a 30-day public review and comment period beginning June 25, 2015 (Appendix B, *Notice of Preparation and Scoping Comments*). Notification was sent to agencies and interested parties, and comments were accepted through July 24, 2015. At that time, the City noted that a scoping meeting would be scheduled at a future date. Subsequently, the City paused work on the preparation of the EIR and resumed the process in August 2019.

In August 2019, the City mailed letters to agencies and interested parties providing notification of a public scoping meeting inviting their attendance and submittal of written comments on the proposed content and scope of the environmental information for the EIR. The City conducted the public scoping meeting from 6:30 to 8:00 p.m. on September 11, 2019 at Woodland City Hall. The City accepted written comments through September 25, 2019. The scoping meeting was an open-house-style event, with presentation boards and materials at information stations operated by City staff and consultants.

The City received six comment letters on the NOP in 2015 and an additional six letters in 2019. The California Department of Fish and Wildlife is the only commenter that submitted a comment letter in 2015 and again in 2019. The City considered these comments while preparing this EIR.

1.3.3 Coordination and Consultation

The Proposed Project has been planned in coordination and cooperation with other local, state, and federal agencies and organizations. In Chapter 3, *Impact Analysis*, the regulatory setting for each respective resource describes compliance with applicable federal, state, regional, and local laws and regulations, including consultation to date with various agencies. A summary of key coordination efforts follows.

1.3.3.1 Flood Control Advisory Committee

The City Council established the Flood Control Advisory Committee in May 2015 with the charge of assisting in development and implementation of a locally preferred flood control project, including input on the finance plan, and serving as an additional forum for public input, education, and outreach (City of Woodland 2019a).

Since May 2015, the committee has conducted 12 meetings to discuss planning and environmental review (City of Woodland 2015a, 2015b, 2015c, 2015d, 2015e, 2015f, 2016a, 2016b, 2017, 2018, 2019b, 2019c). At those meetings, the committee discussed the following topics.

- The development and evaluation of alternatives.
- Concerns and design preferences of the community (Measure S, 2004).
- Regulatory requirements (Senate Bill 5).
- The status and relationship of other regional flood control efforts (e.g., Lower Sacramento River/Delta North Regional Flood Management Plan, Corridor Management Framework, and the Central Valley Flood Protection Plan).
- Possible federal, state, and local project funding options.

The committee also discussed and clarified for the public the relationships among, and roles of, USACE, DWR, and the City in their partnership to develop a flood control project. Meetings regularly include updates on the status of USACE milestones, such as planning, feasibility study, alternatives evaluation, National NED plan development, and environmental review stages.

In August 2016, the committee identified and approved a modified version of the USACE NED plan, the Proposed Project, which incorporates nonstructural elements as local enhancements to USACE NED plan.

Members of the general public also have participated in these meetings and raised questions or provided comments on the process, alternative selection, and other issues, such as potential impacts on agricultural areas north of the city.

1.3.3.2 Native American Consultation under AB52

In accordance with procedures prescribed in Assembly Bill 52, the City on July 31, 2019 sent notice and maps of the Proposed Project to six tribes and the Native American Heritage Commission. The City contacted the Torres Martinez Desert Cahuilla Indians, the Ione Band of Miwok Indians, the Miwok Maidu United Auburn Indian Community, Cortina Band of Indians, Rumsey Indian Rancheria of Wintun, and the Yocha Dehe Wintun Nation (YDWN). The United Auburn Indian Community responded on August 16, 2019 that the Proposed Project was outside its traditional tribal territory and deferred to YDWN. YDWN responded on August 16, 2019 that the tribe would like to consult on the Proposed Project. No responses from the other tribes have been received to date (November 2019). The City and its consultant corresponded with YDWN and provided GIS files for the Proposed Project. The first formal consultation meeting took place at Woodland City Hall on October 28, 2019.

1.3.3.3 Railway Coordination

The City is undertaking early coordination efforts with the operators of the rail lines that pass through the footprint of the Proposed Project. The City met with a representative of the California Northern Railroad on November 19, 2019 to provide California Northern with an overview of the Proposed Project, to listen to any potential concerns, and to discuss how best to avoid interruptions to California Northern's operations. The City and California Northern plan to meet again once the project is authorized and USACE is initiating the design phase.

1.3.3.4 Other Coordination Efforts

The City has also met with the following organizations to provide information about the Proposed Project, answer questions, and respond to concerns: the Water Resources Association of Yolo County (meeting held on January 14, 2019), the Woodland Chamber of Commerce (meeting held on October 30, 2019), and the Yolo County Farm Bureau (meeting held on November 12, 2019).

1.4 Intended Use of this EIR

This EIR examines the potential impacts of the Proposed Project. The Final EIR will be considered by the City Council prior to taking final action on the Proposed Project. Additionally, other agencies that may use the Final EIR in the future include those listed below.

- Central Valley Regional Water Quality Control Board.

- State Water Resources Control Board.
- California Department of Fish and Wildlife.

Chapter 2, Section 2.4, *Required Approvals*, identifies the specific local and state approvals and permits that would be required.

USACE also prepared a separate EIS and is preparing an SEIS to evaluate the NED plan for the purposes of compliance with NEPA. Other federal agencies, such as the U.S. Fish and Wildlife Service, may use the EIS and SEIS for permitting purposes.

1.5 Document Format

The format of this EIR is outlined below to assist the reader's review of the document.

- **Executive Summary** summarizes the contents and findings contained in this EIR. It also contains a brief description of the project, alternatives, public review procedures, and a summary table listing Proposed Project impacts, mitigation measures that have been recommended to reduce significant impacts, and the level of significance of each impact following mitigation.
- **Chapter 1** is the introduction to the EIR.
- **Chapter 2** contains the project description. It summarizes the proposed Woodland Flood Risk Management Project.
- **Chapter 3** consists of sections containing the environmental analysis for each environmental topic (e.g., hydrology, water quality, biological resources, land use). Each section is organized according to the following framework.
    - Existing Conditions
        - Regulatory Setting
        - Environmental Setting
    - Environmental Impacts
        - Methods of Analysis
        - Thresholds of Significance
        - Impacts and Mitigation Measures
- **Chapter 4** contains discussion of the project alternatives. As allowed by CEQA, most of the impacts of these alternatives are evaluated at a more general level than the analyses contained in Chapter 3.
- **Chapter 5** contains discussions of additional topics required by CEQA, specifically, cumulative impacts, growth-inducing impacts, significant and unavoidable impacts, significant irreversible environmental changes, and mitigation measures with the potential for environmental effects under CEQA.
- **Chapter 6** lists the EIR preparers.

- **Chapter 7** provides details about the cited sources of information and personal communications used for preparation of this EIR.
- **Appendices A through F** contains supporting technical information.
  - Appendix A, *Technical Memorandum, City of Woodland, Previous Alternatives Analysis Related to the Lower Cache Creek Feasibility Study*.
  - Appendix B, *Notice of Preparation and Scoping Comments*.
    - B.1, *Notice of Preparation, June 2015*.
    - B.2, *Scoping Letters Received during 2015 Scoping Period*.
    - B.3, *Notice of Scoping Meeting, August 2019*.
    - B.4, *Scoping Letters Received during 2019 Scoping Period*.
  - Appendix C, *Biological Resources*.
    - C.1, *Special-Status Species with the Potential for Occurrence in the Proposed Project Study Area and the Alternative 2C Footprint*.
    - C.2, *U.S. Fish and Wildlife Service IPac Species List.*
    - C.3, *California Natural Diversity Database Species List.*
    - C.4, *National Marine Fisheries Service Species List.*
  - Appendix D, *California Agricultural Land Evaluation and Site Assessment Model Farmland Conversion Impact Rating*.
  - Appendix E, *Air Quality and Greenhouse Gas Modeling Inputs and Supporting Data*.
  - Appendix F, *Key Observation Points for Aesthetics Analysis*.

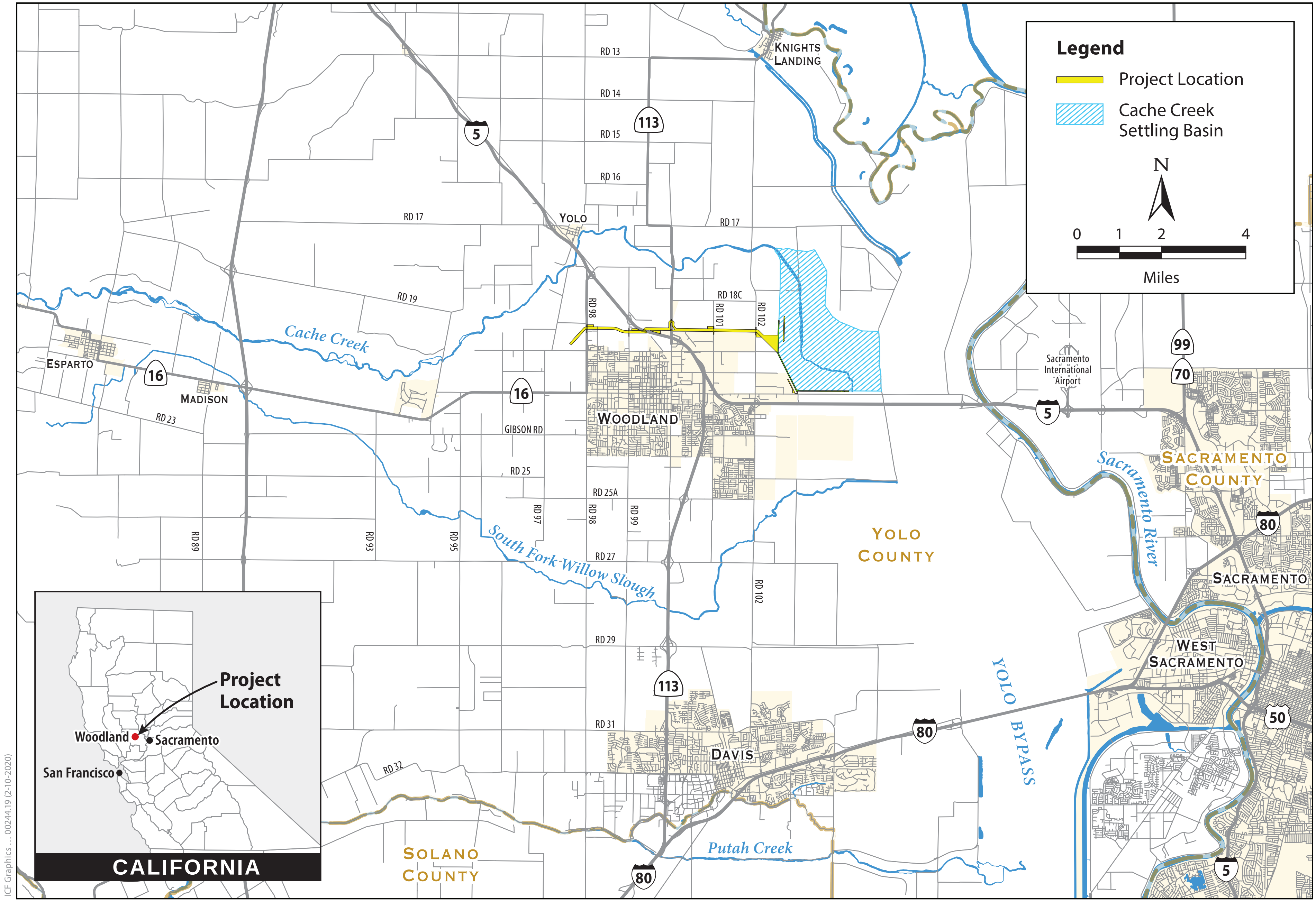


Figure 1-1
Project Vicinity

Chapter 2
Project Description

2.1 Project Setting and Location

The Woodland Flood Risk Management Project (Proposed Project) is located primarily in a rural unincorporated area of Yolo County (see Figure 1-1). The community of Yolo, Cache Creek, and the Lower Cache Creek south levee are located to the north and east. The city of Woodland is located to the south. The Proposed Project generally extends between County Roads 97A and 98 in the west and Cache Creek, Cache Creek Settling Basin (CCSB), and the Yolo Bypass in the east.

The project area consists of the area potentially affected by the Proposed Project (see Figure 2-1). This area contains all lands to the north of the Proposed Project that are between the Lower Cache Creek south levee and the proposed project, as well as the CCSB. Most of the project area contains agricultural lands consisting of row crops, orchards, or rural homes, as well as the CCSB, all of which are located in Yolo County. The project area is approximately 10,292 acres. There are a mix of historic aged buildings with industrial, residential, and agricultural uses. The dominant land use in the project area is agriculture (approximately 9,692 acres are zoned agricultural intensive). Industrial, heavy industrial and commercial uses comprise approximately 150 acres and are primarily located between State Route (SR) 113 and Road 101. The CCSB is approximately 3,600 acres. The City of Woodland has jurisdiction over approximately 57 acres in the project area. There is a public open space, Nelson's Grove, in the project area. Two lines of the California Northern Railroad extend through the project area north to south, and one line of the Sierra Northern Railway extends through the project area east to west.

The project footprint consists of the temporarily and permanently disturbed areas needed to construct, operate, and maintain the Proposed Project (see Figure 2-1). The footprint contains approximately 352 acres and is located in the County of Yolo. There would be approximately 5.5 miles of new levee, approximately 3,000 feet of new cutoff wall, approximately 3,000 feet for an inlet weir, and approximately 3,000 feet of degrading at the existing CCSB training levee within the footprint (see Table 2.1, *Key Project Features*, for additional information). The dominant land use in the Proposed Project footprint is agriculture (approximately 329 acres), with industrial/commercial making up approximately 4 acres and public/roadway right-of-way making up the remaining 20 acres.

2.2 Project Objectives

The City's primary objective is to develop and implement a plan that meets California's Urban Level of Protection and Federal Emergency Management Agency (FEMA) 100-year requirements to reduce the risk of flooding to avoid loss of life, property damage, and economic effects that result from flooding in both the project area and Woodland while also providing measures to address concerns north of the city in the project area. The objectives are as follows:

- *Provide 200-Year Flood Protection.* Comply with recent state legislation and flood protection criteria by providing the urban area with a 200-year level of flood protection from Cache Creek.

- *Obtain FEMA Certification***.** Provide 100-year flood protection to Woodland in order to obtain FEMA certification and remove the city from the mapped floodplain.
- *Develop a project that meets U.S. Army Corps of Engineers (USACE) planning criteria and federal requirements for investment.* The City lacks the financial capability to construct a project without significant state and federal funding. The USACE Civil Works Program is the only viable mechanism through which to secure federal investment.
- *Avoid or reduce risk associated with increases to the 100-year flood depth at existing structures north of the city.*
- *Maintain the functionality of the Cache Creek Settling Basin.* Ensure the efficient and effective functioning of the CCSB to capture sediment from waters flowing out of Cache Creek before the water is discharged into the Yolo Bypass.
- *Ensure no net loss of native trees.* Provide a location that can serve as a replacement planting area for native trees removed during construction.

2.3 Project Overview

Overall, the Proposed Project consists of constructing a new levee north of the city of Woodland and a drainage canal that would divert flows into the CCSB through a degraded reach of the existing CCSB west levee (to be protected by a new concrete weir) in order to protect Woodland from Lower Cache Creek flooding. The Proposed Project also includes strengthening the existing CCSB levees, improving drainage facilities to reduce the duration of flooding north of the new levee, and implementing non-structural flood management measures to reduce potential flood damage north of the new levee. The Proposed Project contains six distinct project reaches (Reach N through Reach S). A graphical overview of the Proposed Project is provided on Figure 2-2, and Table 2-1 summarizes the project features and improvements. The estimated construction footprint of the Proposed Project is shown on Figure 2-1.

Table 2-1. Key Project Features

Feature	Improvement Description	Applicable Reaches	Quantity
New Levee	6-foot-tall levee with seepage berm	S	2.3 miles
	7-foot-tall levee with seepage berm	R	0.6 miles
	11-foot-tall levee with seepage berm	Q (Partial)	1.0 mile
New Levee with rock slope protection	11-foot-tall levee with seepage berm and rock slope protection	Q (Partial)	0.7 miles
	14-foot-tall levee with seepage berm and rock slope protection	P	1.0 mile
Improvement of Existing Cache Creek Settling Basin Levee	Improve existing levee with cutoff wall	N, O	2.3 miles
Drainage Channel	New 150-foot-wide, 5-foot-deep drainage channel that also serves as borrow source for levee fill.	P, Q, R, S	5.6 miles

Feature	Improvement Description	Applicable Reaches	Quantity
Precast Box Culverts	Precast Box Culverts to convey drainage channel flows under State Route (SR) 113, the two adjacent railroad lines, and a private access road.	Q, R	1 Site
Culverts	Culverts in drainage channel under County Roads 98, 99, 101, and 102 and culverts from the detention basin to the CCSB and to the existing drainage channel.	Q, S	6 Sites (3 culverts per site)
Concrete-Lined Undercrossing	Concrete-lined erosion protection in drainage channel where it crosses under Interstate 5	R, S	217,000 square feet
Elevated Roadways	Elevate roadway over levee at County Roads 98, 99, 101, and 102	P, Q, S	4
	Elevate SR 113 and private access road (to allow for sufficient cover over precast box culverts)	Q, R	1 Site
Gated Roadway Closure Structure	Gate at SR 113	Q, R	1
Gated Railroad Closure Structures	Gates for railroad crossings at Interstate 5, west of SR 113, and East of SR 113	Q, R, S	3
Cache Creek Settling Basin Inlet Weir	Concrete inlet weir	CCSB Inlet Weir	3,000 feet
Degraded Training Levee	Degrade 3,000 feet of existing Cache Creek Settling Basin training levee	Training Levee	3,000 feet
Detention Basin and Outlets	New detention basin and outlets	P	1
Improvement of Existing Drainage Ditch	Utilize existing drainage ditch from detention basin to City of Woodland pump station	O	1 mile

2.3.1 Features

2.3.1.1 New Levee

A new levee with a 20-foot-wide crest and a 30-foot-wide landside seepage berm would begin near the intersection of County Road 20 and County Road 98 and extend east to the CCSB. The alignment of the levee would generally follow the northern city limit line west of SR 113 and Churchill Downs Avenue east of SR 113. The height of the new levee would vary from 6 feet near County Road 98 to 14 feet at its intersection with the existing west levee of the CCSB. Rock slope protection is proposed on the waterside slope of the new levee from County Road 101 east to the southern end of the proposed inlet weir near County Road 20. A seepage berm would be constructed on the landside of the new levee as a resiliency measure. A typical cross-section of the new levee is shown on Figure 2-3.

2.3.1.2 Conveyance Improvements

A trapezoidal drainage channel with a design capacity of approximately 350 cubic feet per second (cfs) would be excavated north (waterward) of the new levee in Reaches P through S to capture floodwaters that overtop the Cache Creek levees and convey them to the proposed weir and drainage system. The material excavated from this channel will also provide the necessary fill material for the project. This drainage channel is currently proposed to be approximately 150 feet wide and 5 feet deep, but the width may be revised during subsequent design phases to create a balanced earthwork for the Proposed Project. The drainage channel would be grass-lined except in the section under the Interstate (I-) 5 crossing, where the channel would be concrete-armored.

Floodwaters would pond in an approximately 40-acre detention basin to be constructed at the downstream end of the proposed drainage channel along Reach P. During large flood events, water impounded by the proposed levee, drainage channel, and detention basin would empty into the CCSB via an inlet weir (described below). Water would also drain out of the detention basin via culverts emptying east into the CCSB and south into the City's interior drainage system. The east outlet would provide for gravity drainage into the CCSB and would consist of three 60-inch diameter culverts fitted with flap gates installed under the CCSB inlet weir. This design would allow gravity flow from the detention basin into the CCSB after stages subside below the weir elevation, with reverse flow from the CCSB into the detention basin being prevented by the flap gates. The south outlet would consist of a set of three 60-inch diameter culverts fitted with sluice gates. The culverts would discharge to an existing ditch that terminates at a pump station owned and operated by the City. The sluice gates would control the discharge flow to the pump station until capacity was available to discharge the flows into the existing channel that runs parallel to, and south of, the CCSB south levee and empties into the Yolo Bypass. The design and operation of these systems has not yet been fully developed, and will be optimized during later phases of the project.

2.3.1.3 Modifications to the Cache Creek Settling Basin Levees

Levee Improvements

A 7,400-foot-long portion of the southern CCSB levee (Reach N) would be rehabilitated with construction of a 60-foot-deep cutoff wall through the levee. Additionally, a 5,000-foot-long portion of the southwest CCSB levee (Reach O) would be rehabilitated with construction of a 45-foot-deep cutoff wall through the levee. The cutoff walls would prevent seepage from passing through the CCSB levees. A typical cross-section showing how the cutoff wall would be installed in the CCSB levee is shown on Figure 2-4.

Weir Installation

A 3,000-foot-long section of the west levee of the CCSB would be degraded to an elevation of 43 feet[1] to accommodate a concrete weir with a height of approximately 9 feet above existing adjacent grade. The weir would accept floodwater emanating from Cache Creek west of the CCSB, and would prevent backflow from the CCSB to the west during small, frequent flood events. The existing CCSB outlet weir on the east levee, which passes floodwaters from Cache Creek into the Yolo Bypass, would remain in place.

[1] All elevations are given in the North American Vertical Datum of 1988 (NAVD 88).

Training Levee Degrade

The southernmost 3,000-foot portion of the CCSB training levee would be degraded to improve the distribution of sediment within the basin before construction begins. If excavated materials are suitable to use as fill, the material would be hauled north on the training levee, west towards County Road 102, over the County Road 102 bridge, and south towards the project footprint. The existing outlet weir on the east side of the CCSB would remain unchanged.

2.3.1.4 Closure Structures

A total of four closure structures (gates that are assembled by operations and maintenance personnel prior to flooding) would be constructed where the new levee crosses certain roads and rail lines. Railway closure structures would be located where the new levee crosses the railroad tracks near I-5 (as shown on Figure 2-5) and where the new levee crosses the railroad tracks west of SR 113 and east of SR 113 (as shown on Figure 2-6). A roadway closure structure would be constructed where the new levee crosses SR 113 (also shown on Figure 2-6). Because of the limited distance between the closure structures, short sections of floodwall would be constructed to connect the closure structure at the I-5 crossing to the existing roadway embankment and to connect the closure structures at the SR 113 crossing and the adjacent railroad crossing to the west.

2.3.1.5 Other Road and Railway Improvements

The new levee would require the raising of County Road 98, County Road 99, County Road 101, and County Road 102 where the roads cross the levee. Three 60-inch culverts would be installed where each of these raised crossings intersect with the proposed drainage canal (see the typical levee cross-section with road and culvert detail on Figure 2-3).

Precast box culverts would be installed under SR 113, the two adjacent railroad crossings, and the private access road to the west of SR 113 where they cross over the drainage channel. The total width of the culverts will be approximately 200 feet. In order to install the box culverts beneath the highway and an adjacent private access road, the roadways would need to be elevated approximately 4 feet from current grade. This work would require the closing of SR 113, the rail lines, and the private access road during construction. A roadway detour diverting traffic to County Road 18 and I-5 would be established during construction. For the private road, temporary access would be arranged (potentially utilizing a temporary ramp) to maintain continuous access for the landowner. The duration of the closure is estimated to be 3 months total, for which time it is assumed that the rail lines would remain out of service and no shoofly or other temporary rerouting of rail traffic would be required. Close coordination with the railroad is anticipated in the future in order to develop a plan for this closure.

The existing railroad underpass at I-5 would be used to convey floodwaters under the interstate. To prevent erosion due to high velocities in this area, those portions of the area found to have velocities of more than five feet per second (fps) would be lined with concrete. See Figure 2-5 for a graphical representation of the approximate extents. This area includes the existing slopes of the I-5 roadway embankment, the slopes of the new levee, the proposed channel (both bottom and slopes), and the existing railway.

2.3.2 Operation and Maintenance Activities

The existing Cache Creek levees would continue to undergo regular operations and maintenance. The City of Woodland would be responsible for the operation and maintenance of the new levee once the Proposed Project is completed. DWR would continue to be responsible for maintenance of the existing levee system. Levee and seepage berm operation and maintenance may include hand and mechanical mowing, burning, or application of herbicides. Tree and shrub pruning may be required. Additionally, pesticide control of burrowing rodent activity may be needed. The levee slope and road would occasionally need reconditioning using a bulldozer. Maintenance of the new drainage channel and new detention basin would require the periodic removal of sediments and vegetation once they reach capacity sediment load.

2.3.3 Construction Details

2.3.3.1 Footprint and Right-of-Way Needs

A fee title would be obtained for areas beneath the physical project features (e.g., embankment, seepage berm, drainage channel) and for the area 15 feet beyond the toe of waterside features and 20 feet beyond the toe of landside features. Existing trees and encroachments would be removed to the extent necessary to facilitate construction of the Proposed Project and to support long-term operation and maintenance. It may be the case that some trees and other encroachments are not removed from the rights-of-way. These encroachments will be addressed on a case-by-case basis during final design of the project.

2.3.3.2 Site Preparation

Site preparation would include clearing, grubbing, and stripping activities within the project construction and staging areas. Up to approximately 350 acres are anticipated to be cleared. Clearing and grubbing activities would involve the removal of larger woody vegetation, including trees, rootballs, and other existing debris within the project footprint. These activities would be completed using excavators and bulldozers, and the debris would be transported by haul truck to a permitted disposal site (possibly the Yolo County Central Landfill, which is located approximately 11 miles from the project site). Stripping would involve excavating approximately 6 to 12 inches of topsoil, which consists of organic material from the land surface. The topsoil would be stockpiled at the borrow and staging areas. After levee construction is complete, the topsoil removed from the borrow areas, project footprint, and the maintenance corridor would be placed on the embankment slopes to promote vegetative growth.

2.3.3.3 Cutoff Wall Construction

A cutoff wall consists of a deep trench excavated into the foundation soil of the levee embankment along the levee centerline, which is backfilled with soil-bentonite slurry. The cutoff walls would extend up to approximately 60 feet deep, as measured from the bottom of the new "select levee fill" cap, and would be 3 feet wide. As the trench is excavated, it would be filled with bentonite slurry to keep the sidewalls from caving in. Adjacent to the trench, the excavated material would be mixed with bentonite slurry in appropriate proportions to achieve the required cutoff wall mix design and permeability properties, and then would be backfilled into the excavated trench.

Cutoff wall construction would require the temporary establishment of an onsite slurry batch plant that would occupy approximately 1 to 2 acres. The batch plant would be located in the staging area located near the southwest corner of the CCSB. It is anticipated that the batch plant site would contain tanks for water storage, bulk bag supplies of bentonite and bentonite storage silos, a cyclone mixer, pumps, and two generators that meet air quality requirements. The site would also accommodate slurry tanks to store the blended slurries temporarily until they are pumped to the work sites. Slurry ingredients would be mixed with water at the batch plant and the mixture would be pumped from the tanks through pipes to the cutoff wall construction work sites. Booster pumps would ensure the slurry flows to its destination along the reach without drying or hardening. The batch plant would produce two different slurry mixes, one for trench stabilization and one for the soil backfill mix. Therefore, two slurry pipes or hoses (typically 4-inch or 6-inch high-density polyethylene pipes) would be laid on the ground and extend to all work sites. An additional pipe may be used to supply water to the work sites.

2.3.3.4 Levee and Drainage Channel Construction

A trapezoidal drainage channel is proposed to be located waterward of the proposed levee in Reaches P through S. An existing trapezoidal channel serves the levee system landward of Reaches N and O. Material excavated from the drainage channel would either be used in the construction of the levee and seepage berm embankments, or would be disposed of in a legal manner. Once construction of the drainage channel is completed, except for the concrete-armored section under the I-5 crossing, the channel would be hydroseeded.

Levee foundation preparation would include excavating an inspection trench up to 6 feet deep and 12 feet wide, and be centered under the outer edge of the waterside levee crown. Material excavated for the inspection trench would be stockpiled at the borrow and staging areas.

Most material excavated from the trapezoidal drainage channel would be suitable for levee and seepage berm fill and used in the construction of the levee and seepage berm embankments. If needed, additional embankment fill would be transported from areas an existing permitted stockpile or commercial source within 5 miles of the project site and placed in specified lifts by motor graders (in accordance with accepted levee construction standards for lift thickness and compaction) to achieve the desired levee height and configuration. Each lift would be moisture-conditioned and compacted to the specified minimum density using a suitable compactor.

Stockpiled topsoil would be placed on the levee slopes. An all-weather patrol road along the levee crown and an access road along the landside toe of the levee would be constructed for flood fighting and operation and maintenance purposes. The levee patrol road and access road would be surfaced with aggregate base. Approximately 82,000 tons of aggregate base are estimated to be required for project construction. After all levee construction is complete, the levee slopes and other disturbed areas would be hydroseeded.

Rock slope protection (approximately 40,000 tons) for the new levee waterside slope in reaches P and Q would likely come from Marysville or Yuba City, both about 40 miles north of Woodland. Concrete required for the I-5 undercrossing erosion protection and armoring would be trucked in pre-mixed.

2.3.3.5 Seepage Berm Construction

A seepage berm is a wide embankment structure that consists of soil fill placed landward of the new levee embankment to form a widened prism. Fill would be placed in accordance with U.S. Army Corps of Engineers (USACE) construction standards for lift thickness and compaction to achieve the desired height. Each lift would be moisture-conditioned and compacted to the specified density using appropriate compaction equipment. The seepage berm would measure approximately 5 feet thick and extend up to 30 feet from the landside toe of the levee.

2.3.3.6 Closure Structure Construction

Closure structures would be needed where the proposed levee crosses existing improvements that cannot be raised (i.e., major roads and railroads). The closure structures would consist of permanent components and of temporary components that would be installed only during high-water events. The temporary components would be the property of the City and would be stored by the City in its maintenance yard.

The permanent components of the closure structure would generally consist of the following materials.

- Foundation piles.
- Concrete retaining walls and steel support structure.
- Galvanized metal steel plates to prevent seepage through railroad ballast (at railroad crossings).

Construction of the permanent components of the closure structure are anticipated to be performed within available track curfews (or roadway closures) without physically altering the tracks or roadways. Excavation and construction would be in close proximity to the tracks, but the tracks are not anticipated to be removed, modified, or disturbed as part of the construction effort.

2.3.3.7 CCSB West Levee Degrade/Weir Construction

A 3,000-foot-long portion of the existing CCSB West Levee would be degraded to an elevation of 43 feet to construct a weir. Excavated material would either be stockpiled for use on the project, or would be disposed of legally. Excavated material from the CCSB levees may be used to offset borrow material needs, although this procedure would need to be evaluated by USACE during design.

2.3.3.8 Stormwater Pollution Prevention

Temporary erosion/runoff best management control measures would be implemented during construction to prevent the discharge of pollutants resulting from erosion and sediment migration from the construction, staging, and borrow areas. These temporary control measures may include secondary containment for storage of fuel and oil; and for management of stockpiles and disturbed areas by means of earthen berms, diversion ditches, straw wattles, straw bales, silt fences, gravel filters, mulching, revegetation, and temporary covers. Erosion and stormwater pollution control measures would be consistent with National Pollutant Discharge Elimination System permit requirements and would be included in a Stormwater Pollution Prevention Plan (SWPPP). The specific best management practices (BMPs) that would be incorporated into the SWPPP would be site-specific and would include, at a minimum, the following measures.

- **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.
    - All grindings and asphaltic-concrete waste will be stored within previously disturbed areas absent of habitat and at a minimum of 50 feet from any aquatic habitat, culvert, or drainage feature.
    - No discharge of pollutants from vehicle equipment will be allowed into any storm drains or watercourses.
    - Vehicle and equipment fueling and maintenance operations must be at least 50 feet away from watercourses, except at established commercial gas stations or at an established vehicle maintenance facility.
    - Concrete wastes are to be collected in washouts and water from curing operations will be collected and disposed of properly. Neither will be allowed into watercourses.
- **Minimize soil and vegetation disturbance**. The construction contractor will minimize ground disturbance and the disturbance or 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 graded areas.** Graded areas will be protected from erosion using a combination of silt fences, fiber rolls, etc. along toes of slopes or along edges of designated staging areas, and erosion control netting (such as jute or coir) as appropriate on sloped areas. No erosion control materials that use plastic or synthetic monofilament netting will be used.
- **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.
- **Watercourse and stormwater drain inlet protection**. The construction contractor may install silt fences, drop inlet sediment traps, sandbag barriers, and 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 the application of an erosion control native seed mix. Permanent erosion control measures, such as bio-filtration strips and swales to receive storm water discharges from paved roads or other impervious surfaces, will be incorporated to the maximum extent practicable.

In addition, the contractor would prepare and implement a hazardous materials spill prevention and containment plan to avoid inadvertent spills of hazardous materials including petroleum products, such as lubricants, oils, fuel, and other potentially hazardous chemicals, such as pesticides and herbicides, during construction. BMPs that would be incorporated would include, at minimum, training for construction personnel that outlines methods, materials, and responsibilities for the response to, containment and cleanup of, an accidental hazardous materials spill during construction. At a minimum, the plan would include provisions for immediate response, containment, and cleanup of a spill, including excavation and disposal of contaminated soils and notification responsibilities. Materials (e.g., absorbent pads and mats) needed for potential cleanup activities would be kept onsite as part of implementation of this plan.

After construction is complete, temporary facilities would be demobilized and the site would be stabilized. Site restoration activities for areas disturbed by construction activities, including borrow areas, may include regrading, reseeding, constructing permanent diversion ditches using straw wattles and bales, and applying straw mulch and other measures deemed appropriate.

2.3.3.9 Structure and Road Demolition

Structure and road demolition activities would include removing standing structures within the levee and borrow area footprints. All demolition would be performed in compliance with existing regulations, including asbestos abatement requirements. These activities would require use of equipment with a percussion hammer attachment for breaking up concrete foundations. Debris would be loaded into waste containers and transported by haul truck to a permitted disposal site (possibly the Yolo County Central Landfill).

2.3.3.10 Roadway Raising

The Proposed Project would require the raising of County Roads 98, 99, 101, and 102 where the roads cross the new levee. SR 113 and an adjacent private access road would also be raised where they intersect the new drainage channel to allow for installation of precast box culverts beneath the roadways. All roadway raising design and construction activities would be done in accordance with the roadway standards contained in the *County of Yolo Improvement Standards* (County of Yolo Department of Planning and Public Works 2008).

2.3.4 Staging, Site Access, and Construction-Related Traffic

Staging areas would be located within the right-of-way and easement limits to be obtained for the Proposed Project, as shown on Figure 2-1. The contractor may reach agreements with landowners for additional staging locations outside of these limits. Staging areas may be used by the contractor for storage of equipment and materials, project offices, employee parking, and other uses needed for construction of the project. After project construction is complete, staging areas would be restored to their pre-project conditions.

Personnel, equipment, and imported materials would reach the project site via I-5, SR 113, County Road 102, and County Road 22. Once onsite, haul trucks would use the embankment footprint to transport material between borrow and staging areas and the levee construction area. Staging would occur within the construction footprint and defined staging areas as shown on Figure 2-1.

It is expected that approximately 15 trailer (“low-boy”) truck round trips would be required to transport the contractor’s cutoff wall material batch plant and equipment to the site, and a similar number of round trips would be needed to remove the equipment from the site as the work is completed.

Approximately 50 truckloads would be needed to bring dry bentonite to the site (probably from the Sacramento area). Approximately 4,000 truckloads would be needed to bring aggregate base and asphalt materials from local sources, estimated to be within a 5-mile radius of Woodland.

Earthwork quantities for the Proposed Project are nearly balanced; however, some of the excavated material is expected to be unsuitable for use in levee and berm construction. Accounting for this unsuitable material, along with the waste material from clearing and grubbing and expected demolition and construction debris, it is estimated that approximately 250,000 cubic yards of material will require disposal. A total of approximately 21,000 truck trips have been estimated for this task over the two-year construction window These materials are expected to be disposed of at the Yolo County Central Landfill, which is approximately 11 miles from the project area.

2.3.5 Construction Schedule and Labor Force

Project construction would be completed within the next 6 years. The project is anticipated to be constructed in a single phase of approximately 24 months during the spring, summer, and fall construction windows (non-rain season). Some work could occur in the winter if the site is dry enough to support construction activities. Schedule assumptions used in this EIR are located in Appendix E, *Air Quality and Greenhouse Gas Modeling Inputs and Supporting Data*.

Work, including equipment operation, would generally occur Monday through Saturday during normal working hours as allowed by the noise ordinances of the City and Yolo County. Equipment maintenance could occur before and after working hours and on Sunday.

Construction crew sizes would vary depending on the construction activity, but the maximum crew is anticipated to be composed of approximately 50 workers. Construction workers would probably come from the local labor force in the Woodland and Sacramento areas.

2.3.6 Additional Features Proposed by City of Woodland

2.3.6.1 Non-Structural Measures

The City of Woodland, in conjunction with the California Department of Water Resources (DWR), has developed a non-structural plan that would be implemented in conjunction with the Proposed Project to benefit the properties north of the city. These non-structural measures[2] would rely on local, state, and FEMA funding programs for implementation. The City would work with each individual landowner to develop a suite of measures tailored for each affected parcel. The degree of financial support would vary depending on changes in flood depth for any given affected parcel. The range of potential measures include floodproofing individual structures, financially assisting property owners to purchase flood insurance, purchasing flowage easements, and upgrading flood warning systems and other flood preparedness measures that would be implemented in consultation with Yolo County. The suite of non-structural measures would be implemented over a set period of time, not to exceed 10 years after beginning construction of the Proposed Project. These measures are discussed in greater detail in the *Technical Memorandum: Non-Structural Plan*

[2] "Non-structural measures" are: "… proven methods and techniques implemented for reducing flood risk and flood damages by adapting to the natural characteristics of flooding within the unobstructed floodplain. Because of their adaptive characteristics to flood risk, these measures support the National Flood Insurance Program and generally cause no adverse effects to the floodplain, flood stages, flood velocities, flood duration, or the existing environment" (Association of State Floodplain Managers n.d.).

Elements for Consideration in Conjunction with the Lower Cache Creek Project Technical Memorandum (MBK Engineers 2020).

Floodproofing of Individual Structures

Floodproofing of individual residential homes or commercial, industrial, and agricultural structures can achieve flood damage reduction in areas of shallow, overland flooding (such as the area north of the proposed levee) by either preventing floodwater from entering a structure (dry floodproofing), or designing the structures to not be damaged during flooding (wet floodproofing). Flood protection can be achieved by modifying the structure itself or by creating a berm or floodwall around the structure or small group of structures. Studies would be conducted to document each of the structures in the floodplain directly north of the proposed new levee to evaluate the relationship of each structure to the floodplain and the potential options for floodproofing each one that is not already above the 100-year floodplain.

The City believes that the floodproofing measures most likely to be selected by property owners would be erectable floodwalls, which would be deployed during times of flood threat, or structure raising. Because erectable floodwalls involve the temporary placement and then removal of water filled plastic blocks or bladders and have been determined to have no potential impact under CEQA, they are not analyzed in this EIR. As noted in Chapter 1, additional CEQA analysis may be required for non-structural measures, including individual structure raising, either by the City or the County. Individual structures in the project area that may be raised exist within the jurisdiction of Yolo County. The County would determine if the raising of a structure involved a ministerial action, which would not trigger CEQA, or a discretionary action. If raising of a structure is determined to be a discretionary action, the County would determine if the action qualifies for a categorical exemption under CEQA, or if the activity is to be covered by this EIR. Regardless, for disclosure purposes, the potential environmental effects of structure raises associated with this project are analyzed in this EIR.

Although the number and location of property owners who would opt to raise their homes is not known, the analysis in this EIR assumes three structure raises could occur during the second year of project construction, with two structure raises taking place per year over the course of 5 years after construction is complete. This EIR assumes these structures would be residential homes, approximately 1,800 square feet in size, with slab-on-grade foundations, and that these structures would be raised an average of 3 feet.

The construction process for residential structure raising would begin with disconnecting all utilities and removing any landscaping or fencing/decking elements from around the home. The structure would be unbolted from its existing foundation, raised with jacks, and concrete or masonry piers would be built up from the existing slab. Once the new foundation is complete, the contractor would lower the structure and anchor it to the new foundation. Utilities would be reconnected and other elements that were removed would be replaced. New stairways and decks would be constructed as needed to allow access to the raised structure.

Subsidizing Flood Insurance Costs

A significant area south of Cache Creek and north of Woodland is currently mapped in the FEMA 100-year floodplain, and flood insurance is mandatory for structures with a federally backed mortgage in these areas. For structures that experience an increased flood depth as a result of construction of the Proposed Project, and where floodproofing is not a practical alternative, financial assistance to property owners in the form of offsetting a portion of their annual cost of flood insurance is an option. In cases where floodproofing may be expensive, but feasible, the property owner would be consulted to determine if the best course of action will be floodproofing, subsidized flood insurance, or another option. For most of the area north of the proposed levee and west of SR 113, the Proposed Project would pose no measurable increase in flood depth or duration. For these areas, the City and state propose subsidizing a portion of the flood insurance costs for structures that would not be protected by the Proposed Project.

Flowage Easements

A "flowage easement" is an easement purchased to allow flooding of property. There are approximately 12 large agricultural parcels, none of which contains structures, west of the CCSB and generally east of County Road 101, which would experience an increase in flood depth greater than 1 foot with construction of the Proposed Project. However, the frequency of flooding would not be changed by the Proposed Project. Given the existing topography near the CCSB, the existing flood depths can be significant in this area. For private parcels in this area, flowage easements would be purchased from willing sellers as compensation for the incremental increase in flood depth associated with implementation of the Proposed Project. For the parcels owned by the University of California, Davis, the City and DWR, in consultation with the university, would further investigate the need for flowage easements.

Flood Warning System and Flood Preparedness

Flood warning systems, which rely on a network of stream gages, rain gages, and hydrologic data to forecast the potential extent of flooding for areas of potential flood risk, can help notify residents and identify the amount of time available to implement emergency measures to secure property and take protective actions during significant flood events. The City proposes to work with the Yolo County Office of Emergency Services to confirm the adequacy of the existing flood warning system to reduce the risk of loss of life to the rural residents in the floodplain north of the Proposed Project. Any upgraded flood notification efforts would further improve the effectiveness of other existing and proposed non-structural measures.

2.3.6.2 Oak Woodland Plantings

The City proposes to plant a mixture of valley oaks and interior live oaks on the south slope of the drainage channel to provide a visual screen of the new levee embankment and to provide replacement habitat value for trees removed as part of Proposed Project construction. In order to ensure that the capacity of the drainage channel is maintained, during regular operations and maintenance activities, the limbs of the trees would be removed up to 4 to 5 feet above the ground surface. The final planting mixture may include additional species as determined necessary by analysis of Proposed Project impacts.

The City will replace lost oak woodland by planting valley oak trees at a 3:1 density and acreage ratio (i.e., a minimum of 3 acres planted:1 acre removed) along the south slope of the drainage channel. The City will prepare an oak mitigation planting plan, including the number of trees to be planted, planting locations, and maintenance requirements. Plantings will consist of cuttings taken from local plants or plants grown from local material. Planted species for the replacement plantings will be the same as those removed from the project footprint. All plantings will be fitted with exclusion cages or other suitable protection from herbivory until the plantings are established. Plantings will be irrigated seasonally for up to 3 years or until established.

The City will monitor plantings annually for 3 years post-planting. To be considered successful, 75% of the plants must have survived at the end of the first 3 years. If the survival criteria are not met at the end of the 3-year monitoring period, planting and monitoring will be repeated after causes of tree stress or mortality have been identified and corrected.

2.3.6.3 Recreation Access

Velocity Island Park is a privately owned, 15-acre waterpark facility located north of I-5 and west of the railroad tracks next to SR 113. To access Velocity Island Park, recreationists currently drive approximately 0.25 mile north of the park on SR 113, and then take a paved road approximately 0.25 mile south back to the park. The park is adjacent to the project footprint, and, consequently, the Proposed Project would be constructed over the current access route to the park. Through the project design process, however, the City would ensure that access to the park remains unobstructed during construction and operation of the Proposed Project.

2.4 Required Approvals

In implementing the Proposed Project, the City, in concert with USACE, would seek all necessary permissions, authorizations, concurrences and permits to comply with the following regulatory schemes.

- City of Woodland: compliance with CEQA and issuance of Statement of Overriding Considerations, Findings of Fact, and Notice of Determination.
- City of Woodland: compliance with Clean Water Act and Porter-Cologne Water Quality Control Act and obtaining permits under the National Pollution Discharge Elimination System for water quality from the Central Valley Regional Water Quality Control Board.
- City of Woodland: obtaining an encroachment permit from the Central Valley Flood Protection Board.
- City of Woodland: compliance with California Fish and Game Code for species identified for protection by the California Endangered Species Act.
- City of Woodland: obtaining a Streambed Alteration Agreement from the California Department of Fish and Wildlife pursuant to Fish and Game Code Section 1602.
- City of Woodland: compliance with all Yolo Solano Air Quality Management District rules.
- City of Woodland: compliance with Assembly Bill 52 (and consultation with Native American tribes regarding tribal cultural resources).
- City of Woodland and USACE: compliance with National Historic Preservation Act and consultation with State Historic Preservation Officer as required under Section 106 of the act.
- USACE: compliance with NEPA and issuance of Record of Decision.
- USACE: Section 404 of the Clean Water Act permit and compliance with Section 408 of the Clean Water Act. Water resources projects developed by USACE do not obtain Department of the Army permits through a self-permitting process. Instead, the project documentation (i.e., report) and

environmental compliance work performed by USACE serves as the functional equivalent of self-permitting, ensuring that the same level of review is performed.

- USACE: compliance with federal Endangered Species Act and consultation with the U.S. Fish and Wildlife Service as required under Section 7 of the act.

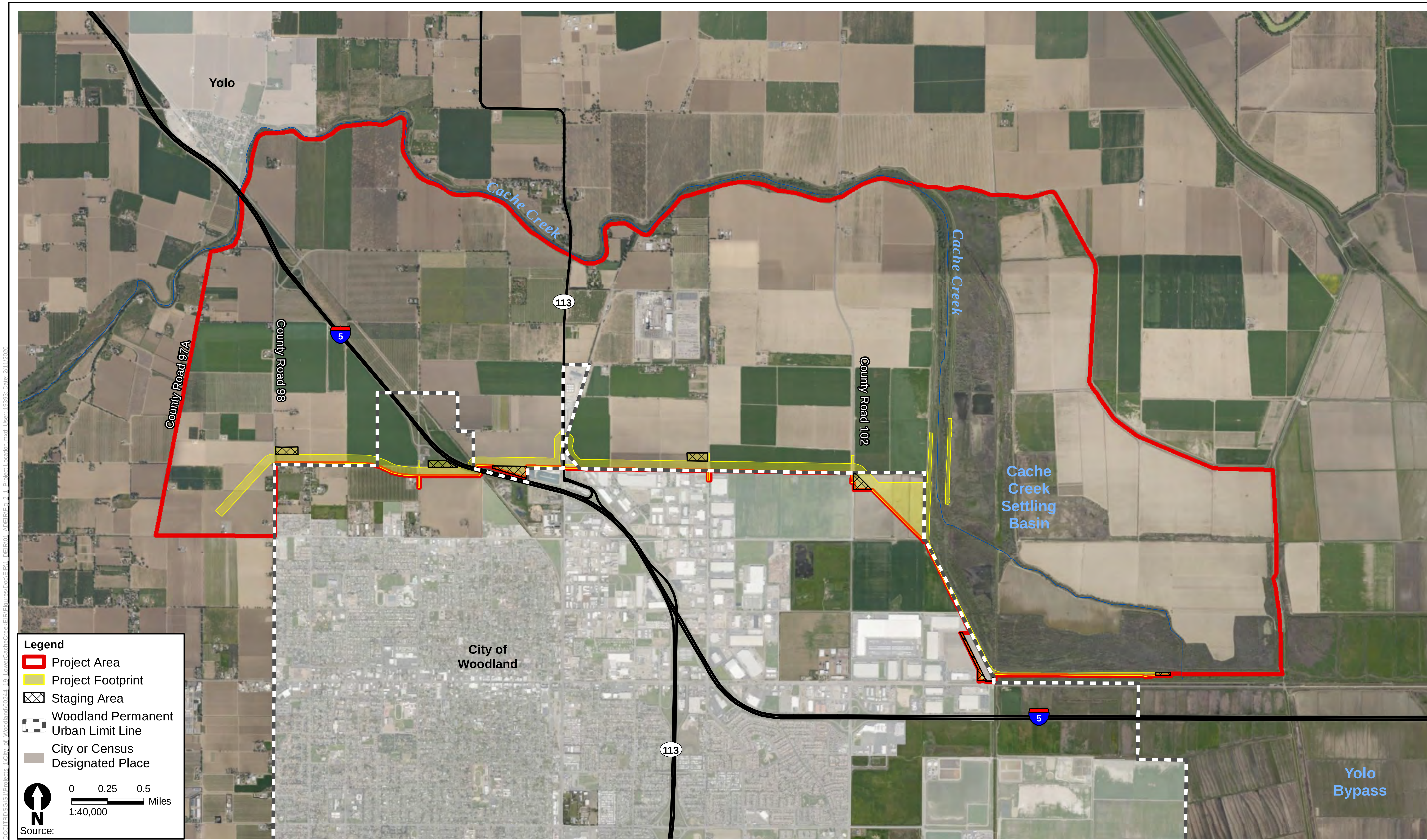
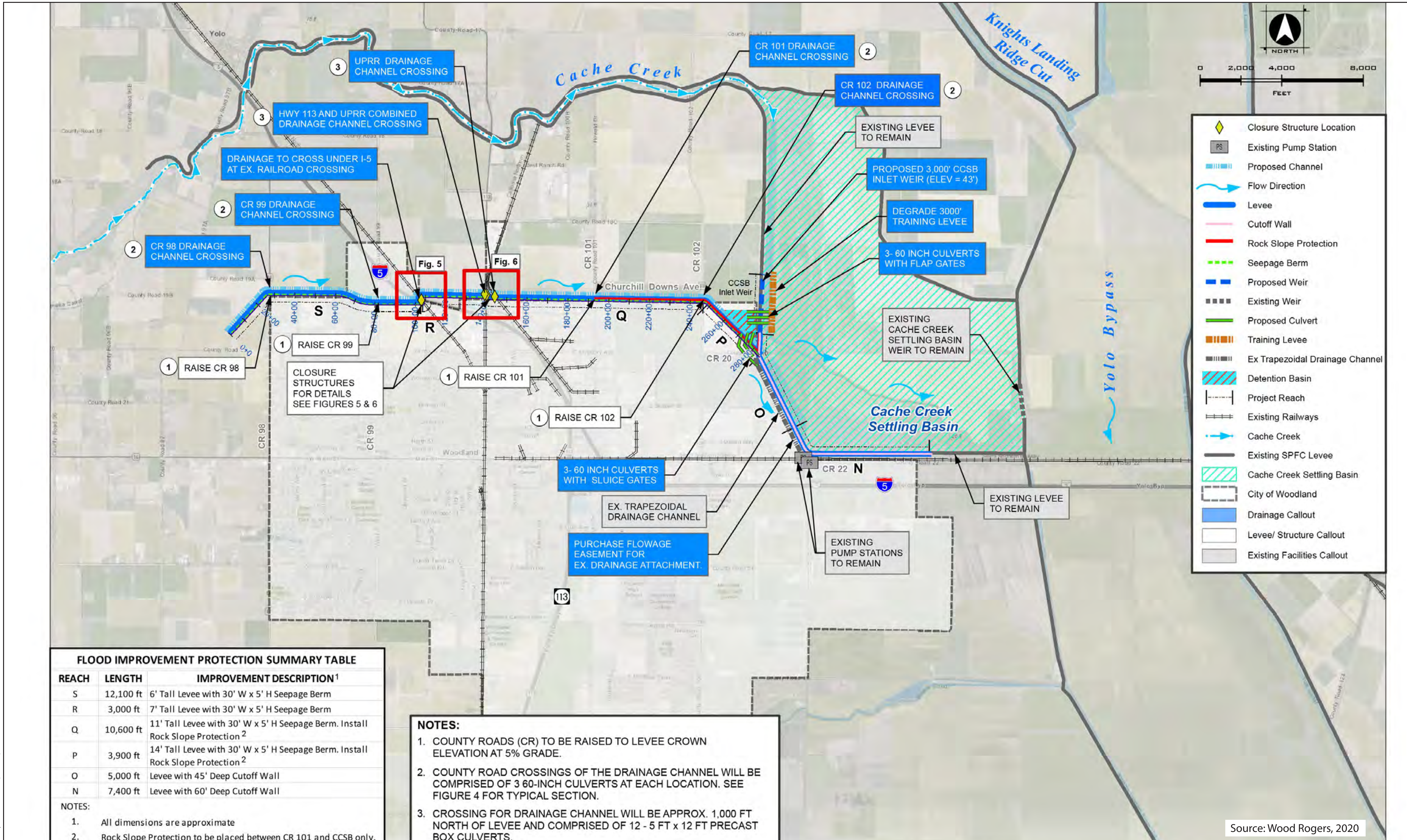


Figure 2-1
Project Location



FLOOD IMPROVEMENT PROTECTION SUMMARY TABLE

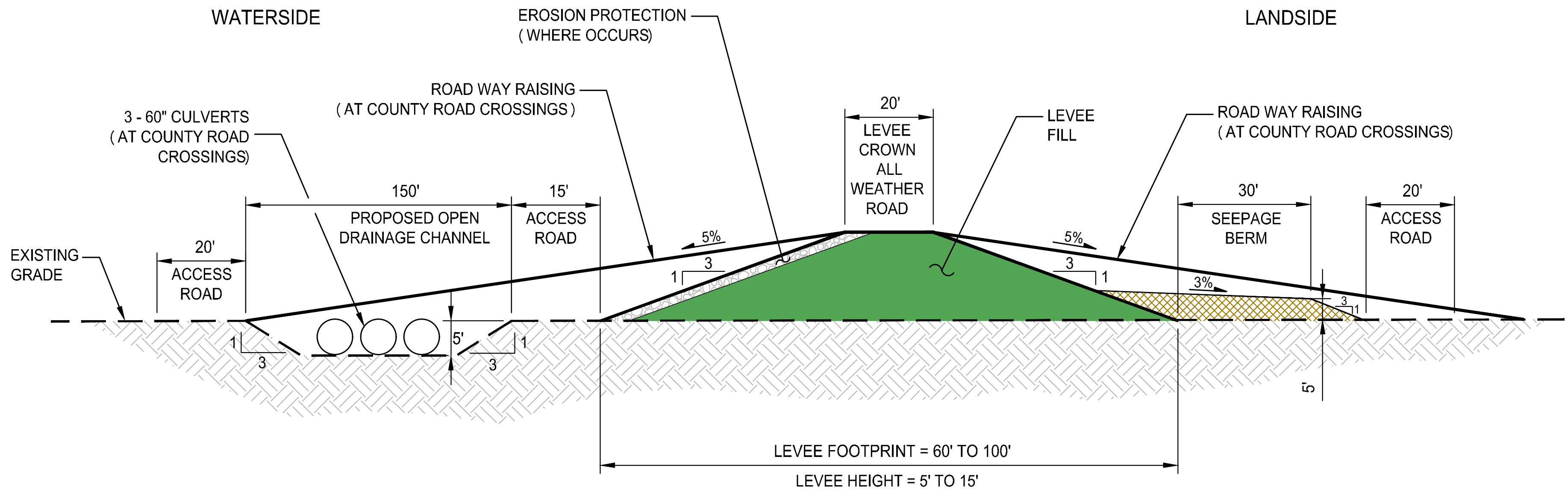
REACH	LENGTH	IMPROVEMENT DESCRIPTION[1]
S	12,100 ft	6' Tall Levee with 30' W x 5' H Seepage Berm
R	3,000 ft	7' Tall Levee with 30' W x 5' H Seepage Berm
Q	10,600 ft	11' Tall Levee with 30' W x 5' H Seepage Berm. Install Rock Slope Protection[2]
P	3,900 ft	14' Tall Levee with 30' W x 5' H Seepage Berm. Install Rock Slope Protection[2]
O	5,000 ft	Levee with 45' Deep Cutoff Wall
N	7,400 ft	Levee with 60' Deep Cutoff Wall

NOTES:
1. All dimensions are approximate
2. Rock Slope Protection to be placed between CR 101 and CCSB only.

NOTES:
1. COUNTY ROADS (CR) TO BE RAISED TO LEVEE CROWN ELEVATION AT 5% GRADE.
2. COUNTY ROAD CROSSINGS OF THE DRAINAGE CHANNEL WILL BE COMPRISED OF 3 60-INCH CULVERTS AT EACH LOCATION. SEE FIGURE 4 FOR TYPICAL SECTION.
3. CROSSING FOR DRAINAGE CHANNEL WILL BE APPROX. 1,000 FT NORTH OF LEVEE AND COMPRISED OF 12 - 5 FT x 12 FT PRECAST BOX CULVERTS.

ICF Graphics ... 00244.19 (2-7-2020)

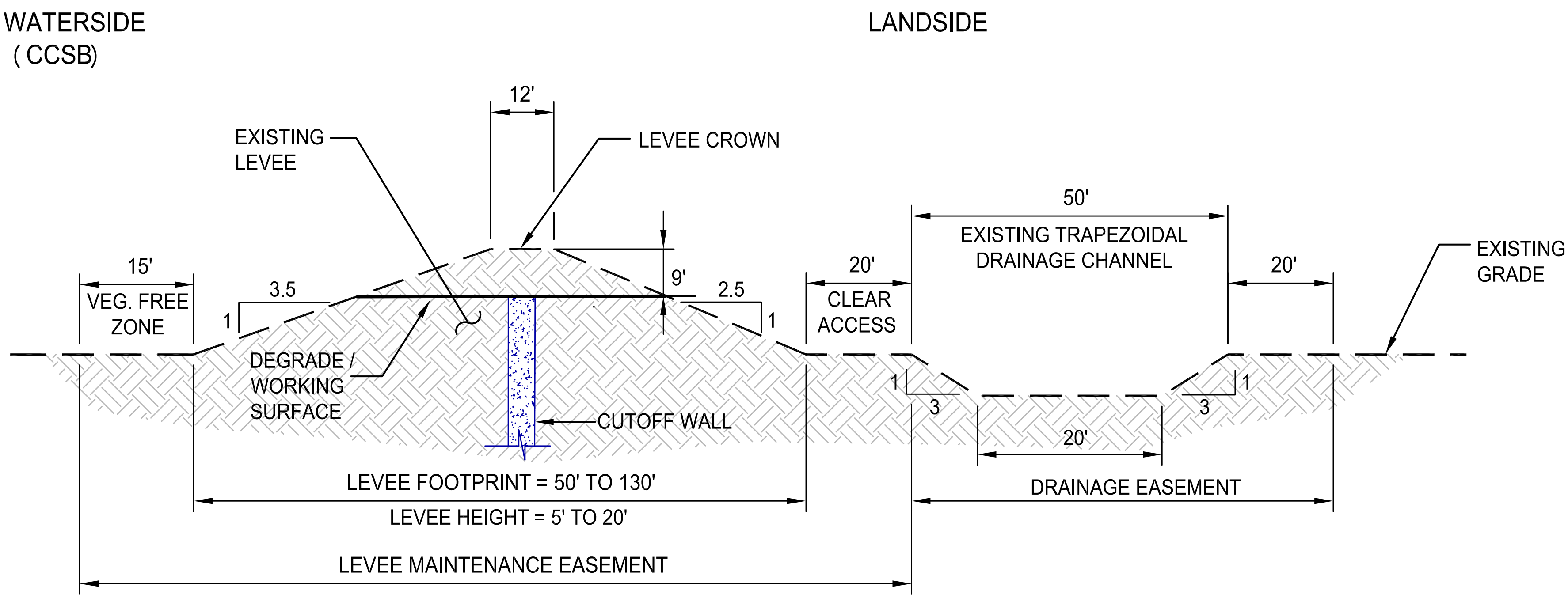
Figure 2-2
Overview of Proposed Project



ICF Graphics ... 00244.19 (2-6-2020)

Source: Wood Rodgers, 2020.

Figure 2-3
Typical Cross-Section of Proposed Levee (Reaches P, Q, R, and S)



Source: U. S. Army Corps of Engineers, Sacramento District.

ICF Graphics ... 00244.19 (10-29-2019)

Figure 2-4
Typical Cross-Section of Cache Creek Settling Basin Cutoff Wall (Reaches N and O)

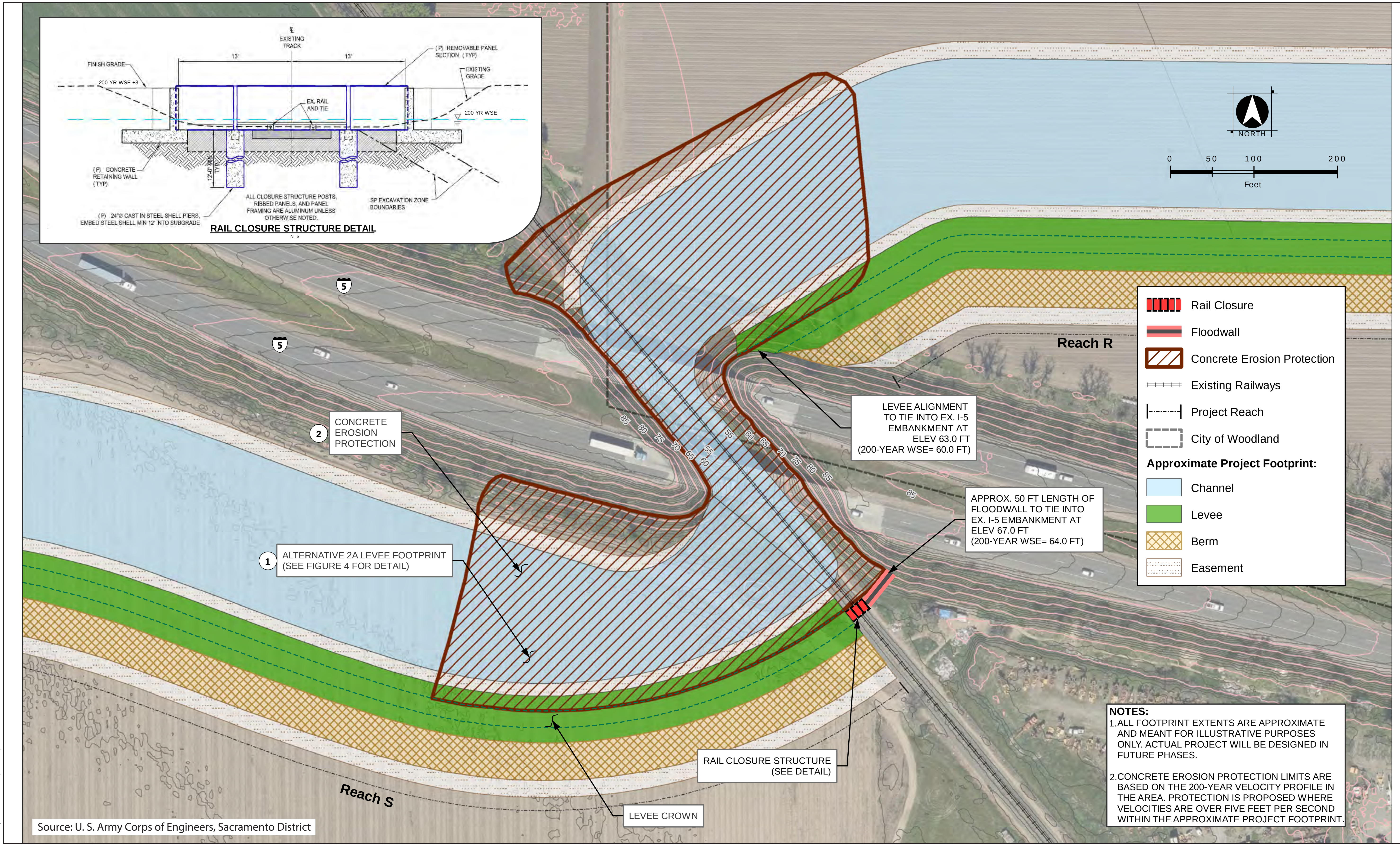


Figure 2-5
I-5 Undercrossing Detail

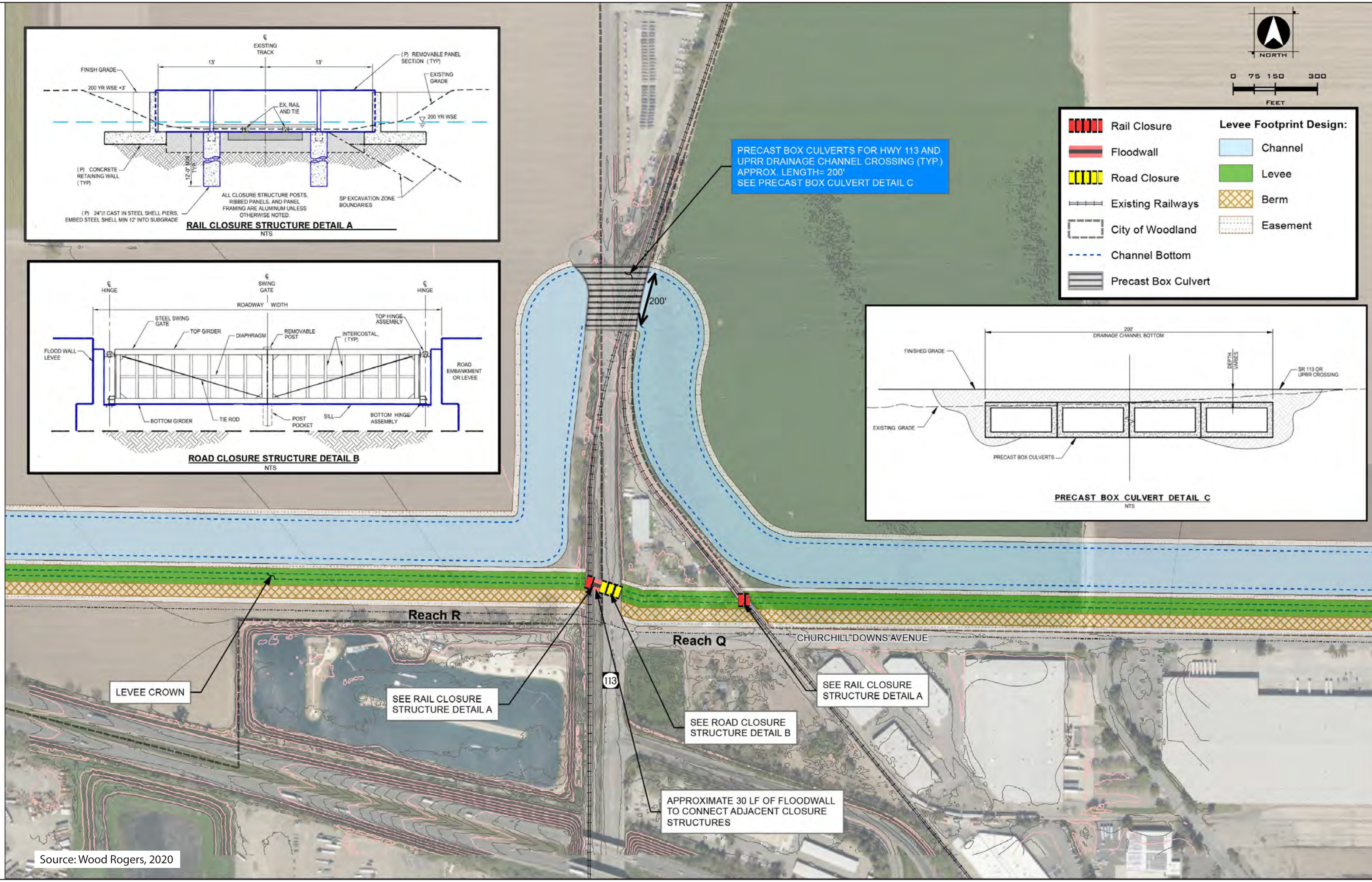


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Figure 2-6
Closure Structure Detail

Chapter 3
Impact Analysis

This chapter describes the existing conditions and evaluates the potential environmental impacts on resources that may be affected by the Proposed Project.

3.0 Introduction

Based on the project description and on preliminary evaluations of the Proposed Project, including review of comments received during the Notice of Preparation (NOP) comment period, the following topics are analyzed in detail in Chapter 3, Sections 3.1 through 3.18, of this EIR.

- 3.1, *Hydrology*
- 3.2, *Water Quality*
- 3.3, *Geology, Soils, and Paleontological and Mineral Resources*
- 3.4, *Biological Resources*
- 3.5, *Land Use and Planning*
- 3.6, *Agricultural and Forestry Resources*
- 3.7, *Air Quality*
- 3.8, *Greenhouse Gas Emissions*
- 3.9, *Noise*
- 3.10, *Cultural Resources*
- 3.11, *Tribal Cultural Resources*
- 3.12, *Transportation*
- 3.13, *Public Services, Utilities, and Service Systems*
- 3.14, *Energy*
- 3.15, *Aesthetics*
- 3.16, *Recreation*
- 3.17, *Population and Housing*
- 3.18, *Hazards, Hazardous Materials, and Wildfire*

The resource sections examine the short-term, permanent, direct, and indirect effects that the Proposed Project would have on the physical environment. For each resource topic, the EIR presents information regarding the existing conditions of each resource, methodology and thresholds used to analyze potential impacts on resources, and the impact analysis and mitigation measures to reduce potentially significant impacts. These topics are discussed further below, including specific terminology used throughout the EIR.

3.0.1 Existing Conditions

The existing conditions typically constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The baseline for CEQA purposes is generally the existing conditions at the time of the release of the NOP (Public Resources Code Section 15125.). However, CEQA, does not mandate "a uniform, inflexible rule for determination of the existing conditions baseline. Rather, an agency enjoys the discretion to decide, in the first instance, exactly how the existing physical conditions without the project can most realistically be measured, subject to review as with all CEQA factual determinations, for support by substantial evidence" (*Communities for a Better Environment v. South Coast Air Quality Management Dist*. [2010] 48 Cal.4th 310, 328). The NOP was released on June 25, 2015 and the scoping meeting was conducted September 11, 2019. Therefore, the baseline for the purposes of the impact analysis is generally conditions in 2019, unless otherwise noted in an impact section.

Some resources, such as hydrology, have baselines that may vary within a period of time (e.g., a year) and over multiple years. In practice, CEQA acknowledges that environmental conditions may vary from year to year and in some cases it is necessary to consider conditions over a range of time periods (*Save Our Peninsula Committee v. County of Monterey*, [2001] 87 Cal.App.4th at p. 125). Thus, a lead agency may use an average of conditions over time as the baseline. The lead agency also may make a determination regarding the available information and data that best depict the environmental setting for a particular resource and that will inform decision-making. For example, a lead agency may elect to use older data that are consistent across geographies and sources, rather than less consistent data. The hydraulic model was developed by calibrating to high water marks from the January 2006 flood event and then verified by comparing to the high water marks from the March 1995 flood event.

The existing conditions described in each resource section consists of the regulatory setting and the environmental setting. The regulatory setting section offers pertinent federal, state, and local policies, regulations, and standards. The environmental setting section describes the existing conditions of the project area or project vicinity.

3.0.2 Environmental Impacts

This section describes the different concepts used to evaluate environmental impacts on each resource within a resource section.

3.0.2.1 Methods and Thresholds

The methods of analysis section describes the technical methodology for impact assessment. If models were used to assess impacts, they are described in this section, as are other technical tools. The methods for analysis may identify specific elements of the Proposed Project that is analyzed using one set of data or tools. The following three elements of the non-structural plan are not physical actions and would not result in a physical impact on the environment:

- Subsidizing flood insurance costs.
- Flowage easements.
- Flood warning system and flood preparedness.

Therefore, these three elements are not addressed in this EIR. All other elements of the Proposed Project are addressed in the EIR.

The thresholds of significance section presents the thresholds used to determine the significance of the impacts on specific resources. The significance conclusions that can be noted in each impact discussion are defined below.

- No impact: This level of significance is used for instances in which there clearly would be no effect. Where it was clear at the outset that there would be no impact on a particular resource topic under a specific threshold, that threshold is dismissed, and an explanation is provided for the dismissal at the end of the thresholds of significance section.
- Less than significant: This level of significance is used for impacts where there would be an impact, but the degree of the impact would not meet or exceed the identified thresholds.
- Less than significant with mitigation: This level of significance is used for impacts that would meet or exceed the identified thresholds but implementing mitigation measures would reduce such impacts to less-than-significant levels.
- Significant and unavoidable: This level of significance is used for significant impacts for which mitigation is unavailable or infeasible to reduce the significant impact to a less-than-significant level.

3.0.2.2 Impacts and Mitigation Measures

The impacts and mitigation measures section describes the effects of the Proposed Project. For each identified significant or potentially significant impact, mitigation measures are identified. As stated above, where mitigation is not available or feasible to reduce the impact to a less-than-significant level, the impact is identified as significant and unavoidable. CEQA requires that each public agency mitigate or avoid the significant impacts of any project it approves or implements (State CEQA Guidelines Section 15126.4). State CEQA Guidelines Section 15370 defines mitigation as follows.

- Avoiding the impact altogether by not taking a certain action or part of an action.
- Minimizing the impact by limiting the degree or magnitude of the action and its implementation.
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- Compensating for the impact by replacing or providing substitute resources or improvements to the environment.

This EIR recommends feasible mitigation measures consistent with State CEQA Guidelines to reduce impacts of the Proposed Project.

3.0.2.3 Other CEQA Topics

Topics required by CEQA in addition to the resource topics addressed in this chapter are addressed in Chapter 4, *Alternatives Analysis*, and Chapter 5, *Other CEQA Considerations*. Chapter 4 examines alternatives to the project, including no project.

Chapter 5 addresses the following additional topics.

- Cumulative impacts.
- Growth-inducing impacts.
- Significant and unavoidable impacts.
- Significant irreversible environmental changes.
- Mitigation measures with the potential for environmental effects under CEQA.

3.1 Hydrology

This section describes the regulatory and environmental setting for hydrology in the study area, analyzes effects on hydrology that would result from implementation of the Proposed Project, and provides mitigation measures to reduce the effects of any potentially significant impacts. The study area for hydrology includes the project area as well as the city of Woodland. Information presented in the discussion and used for the subsequent analysis was drawn primarily from the following sources.

- Cache Creek Settling Basin/Yolo Bypass Project, Contract No. 4600010003, *Amendment to the Cache Creek Settling Basin Trap Efficiency Study for the City of Woodland's Urban Flood Risk Reduction (UFRR) Study and Preliminary Design*, Final Report, January 1, 2016–August 3, 2016 (University of California, Davis 2016)
- *City of Woodland Lower Cache Creek Feasibility Study Alternatives Analysis Report* (Wood Rogers 2016)
- *Lower Cache Creek, Yolo County, CA, City of Woodland and Vicinity, Draft Environmental Impact Statement/Environmental Impact Report for Potential Flood Damage Reduction Project* (U.S. Army Corps of Engineers 2003d)
- *Lower Cache Creek, Yolo County, CA, City of Woodland and Vicinity Draft Feasibility Report for Potential Flood Damage Reduction Project* (U.S. Army Corps of Engineers 2003c)
- *Technical Memorandum: Hydraulic Analysis for Lower Cache Creek Feasibility Study Alternatives* (Draft) (MBK Engineers 2016)
- *Technical Memorandum: Non-structural Plan Elements for Consideration in Conjunction with the Lower Cache Creek Project* (MBK Engineers 2020)
- *Technical Memorandum: Refined Hydraulic Analysis of Alternative 2A* (Wood Rogers 2020)

3.1.1 Existing Conditions

3.1.1.1 Regulatory Setting

This section summarizes key federal, state, and local or regional regulations, laws, and policies relevant to hydrology in the study area.

Federal

National Flood Insurance Program

The National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 were intended to reduce the need for large, publicly funded flood control structures and disaster relief by restricting development on floodplains. The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP) to subsidize flood insurance to communities that comply with FEMA regulations limiting development in floodplains. FEMA issues Flood Insurance Rate Maps (FIRMs) for communities participating in the NFIP. These maps delineate flood hazard zones in the community. These maps are designed for flood insurance purposes only and do not necessarily show all areas subject to flooding. The maps designate lands likely to be inundated during a 100-year storm event and elevations of the base flood. They also depict areas between the limits affected by 100-year and 500-year events and areas of minimal flooding. These maps often are used to establish building pad elevations to protect new development from flooding effects. The locations of FEMA-designated floodplains in the study area are discussed in Section 3.1.1.2, *Environmental Setting*.

Federal Emergency Management Agency Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures

FEMA has published engineering principles and practices for retrofitting flood-prone residential structures (Federal Emergency Management Agency 2012). The document summarizes the regulatory environment that governs such retrofits and describes requirements for general design practices, dry floodproofing, and floodwalls and levees. These include considerations for hazard assessment, sealants and shields, drainage collection systems, pressure relief, and structure elevation; descriptions of types of floodwalls and floodwall construction; and level design criteria and construction.

Requirements for Federal Emergency Management Agency Certification

For guidance on floodplain management and floodplain hazard identification, communities turn to FEMA guidelines, as defined in 44 CFR 59 through 77. In order for a levee to be recognized by FEMA under the NFIP, the community must provide evidence demonstrating that adequate design and operation and maintenance systems are in place to provide reasonable assurance that protection from the base flood (1 percent or 100-year flood) exists. These specific requirements are outlined in 44 CFR 65.10, Mapping of Areas Protected by Levee Systems, and are summarized below.

Levee Height. Riverine levees must provide a minimum freeboard (the height of the top of a levee above a given level of water in a river) of 3 feet above the water-surface level of the base flood. An additional 1 foot above the minimum is required within 100 feet of either side of structures (such as bridges) riverward of the levee or wherever the flow is constricted. An additional 0.5 foot above the minimum at the upstream end of the levee, tapering to not less than the minimum at the downstream end of the levee, also is required.

Closures. All openings must be provided with closure devices that are structural parts of the system during operation and designed according to sound engineering practice.

Embankment Protection. Engineering analyses must be submitted that demonstrate no appreciable erosion of the levee embankment can be expected during the base flood, as a result of either currents or waves, and that anticipated erosion will not result in failure of the levee embankment or foundation directly or indirectly through reduction of the seepage path and subsequent instability.

Embankment and Foundation Stability. Engineering analyses that evaluate levee embankment stability must be submitted to FEMA. The analyses provided must evaluate expected seepage during loading conditions associated with the base flood and shall demonstrate that seepage into or through the levee foundation and embankment will not jeopardize embankment or foundation stability.

Settlement. Engineering analyses must be submitted that assess the potential and magnitude of future losses of levee height as a result of levee settlement and demonstrate that freeboard will be maintained within the minimum standards.

Interior Drainage. An analysis must be submitted that identifies the source(s) of such flooding, the extent of the flooded area, and, if the average depth is greater than 1 foot, the water-surface elevation(s) of the base flood.

Operation Plans. For a levee system to be recognized, a formal plan of operation must be provided to FEMA. All closure devices or mechanical systems for internal drainage, whether manual or automatic, must be operated in accordance with an officially adopted operational manual, a copy of which must be provided to FEMA.

Maintenance Plans. For levee systems to be recognized as providing protection from the base flood, they must be maintained in accordance with an officially adopted maintenance plan. All maintenance activities must be under the jurisdiction of a federal or state agency, an agency created by federal or state law, or an agency of a community participating in the NFIP that must assume ultimate responsibility for maintenance. The plan must document the formal procedure that ensures that the stability, height, and overall integrity of the levee and its associated structures and systems are maintained. At a minimum, maintenance plans must specify the maintenance activities to be performed, the frequency of their performance, and the person by name or title responsible for their performance.

U.S. Army Corps of Engineers Levee Design Criteria

All existing levees included in the study area are Federally authorized and fall within the jurisdiction of the U.S. Army Corps of Engineers (USACE). USACE technical criteria in the following list should be used for construction of new levees as guidance unless noted otherwise.

- *Overtopping of Flood Control Levees and Floodwalls* (Publication ETL 1110-2-299, August 22, 1986).
- *Structural Design of Closure Structures for Local Flood Protection Projects* (Publication EM 1110-2-2705, March 31, 1994).
- *Design of Coastal Revetments, Seawalls, and Bulkheads* (Publication EM 1110-2-1614, June 30, 1995).
- *Design Guidance on Levees* (Publication ETL 1110-2-555, November 30, 1997).
- *Conduits, Culverts, and Pipes* (Publication EM 1110-2-2902, March 31, 1998).
- *Guidelines on Ground Improvement for Structures and Facilities* (Publication ETL 1110-1-185, February 1, 1999).
- *Engineering and Design for Civil Works Projects* (Publication ER 1110-2-1150, August 31, 1999).
- *Design and Construction of Levees* (Publication EM 1110-2-1913, April 30, 2000).
- *Geotechnical Investigations* (Publication EM 1110-1-1804, January 1, 2001).
- *USACE CESPK Levee Task Force, Recommendations for Seepage Design Criteria, Evaluation and Design Practices* (2003a).
- *Slope Stability* (Publication EM 1110-2-1902, October 31, 2003b).
- *Geotechnical Levee Practice* (Publication SOP EDG-03, June 28, 2004).
- *Engineering and Design—Design Guidance for Levee Underseepage* (Publication ETL 1110-2-569, May 1, 2005).

- *Quality Management* (Publication ER 1110-1-12, September 30, 2006).
- *Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures* (Publication ETL 1110-2-571, April 10, 2009(a)).

Sacramento River Flood Control Project Levee Height Requirements

As specified in the *Design Memorandum, Volume I of II for the Sacramento River Flood Control Project, California, Mid-Valley Area, Phase III* (U.S. Army Corps of Engineers 1996:2-12), the following minimum levee height (freeboard) requirement applies to the reach of Cache Creek in the study area:[1] 3 feet.

State

Central Valley Flood Protection Plan

According to California Government Code Sections 65302.9 and 65860.1, every jurisdiction located within the Sacramento–San Joaquin Valley is required to update its general plan and zoning ordinance in a manner consistent with the Central Valley Flood Protection Plan (CVFPP) within 24 months after the CVFPP's adoption on June 29, 2012. In addition, the locations of the state and local flood management facilities, locations of flood hazard zones, and the properties located in these areas must be mapped and consistent with the CVFPP.

The Proposed Project is intended to be consistent with the CVFPP, as the state seeks to continue to work with the City of Woodland to develop and implement projects to achieve an urban level of flood protection for Woodland. This includes designing levees to urban design criteria (see below).

Department of Water Resources Urban Levee Design Criteria

Pursuant to Senate Bill 5 (Government Code (GC) section 65007(l)), the Urban Levee Design Criteria (ULDC) define the urban level of flood protection as the level of protection that is necessary to withstand flooding that has a 1 in 200 chance of occurring in any given year using criteria consistent with, or developed by, the California Department of Water Resources (DWR). While cities and counties located outside of the Sacramento–San Joaquin Valley are not required to make findings related to the urban level of flood protection, the ULDC can help inform engineering and local land use decisions for areas at risk of flooding anywhere in California. The ULDC was developed through a collaborative process with stakeholders from local government (including representatives from the Central Valley, San Francisco Bay Area, and Los Angeles Region), state government, and the federal government.

The ULDC provide criteria and guidance for design, construction, operation, and maintenance of levees and floodwalls in urban and urbanizing areas (California Department of Water Resources 2012), and may be applicable to the Proposed Project.

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[1] The freeboard requirements listed are for the Sacramento River Flood Control Project, specifically the "1957 USACE design" profiles for Sacramento River and many of its tributaries.

Local

The County of Yolo *2030 Countywide General Plan* and the *City of Woodland General Plan 2035* contain goals and policies aimed at reducing the risk of flooding within the county and city, respectively. Additionally, the Woodland Municipal Code contains a policy intended to guide the City's approach to the flood control (Policy 8.12.010). These goals and policies are discussed in Section 3.5, *Land Use and Planning*.

City of Woodland Storm Drainage Facilities Master Plan

The City maintains two Storm Drainage Facilities Master Plans (SDFMPs) for the planning and implementation of improvements to stormwater infrastructure within the City. The South Area SDFMP was recently completed, but only covers the southern third of Woodland and not the project area. The City also has a 2006 North Area SDFMP, which is currently being updated. The 2006 North Area SDFMP is most likely no longer applicable to the project because the proposed levee footprint conflicts with the planned ditch in that study (Busch pers. comm.).

3.1.1.2 Environmental Setting

This section discusses the environmental setting relevant to hydrology in the study area.

Watercourse Description

Cache Creek

Cache Creek originates in the northern coastal range and flows southeasterly to the Yolo Bypass, then to the Sacramento River. Its watershed is approximately 1,139 square miles and includes portions of Colusa, Lake, and Yolo Counties. The Cache Creek watershed consists of two distinct areas—the Clear Lake area (including the tributaries to Clear Lake) and the Cache Creek area (including Cache Creek and its tributaries). (U.S. Army Corps of Engineers 2003c:2-1.)

The Clear Lake area encompasses approximately 528 square miles of the Cache Creek watershed. Downstream of the Clear Lake Dam, Cache Creek flows approximately 46 miles to the Capay Diversion Dam. Two major tributaries, the North Fork of Cache Creek and Bear Creek, enter within this reach. Downstream of the Capay Diversion Dam, Cache Creek flows east to its confluence with the Cache Creek Settling Basin (CCSB) and the Yolo Bypass. (U.S. Army Corps of Engineers 2003c:2-1.)

Cache Creek Settling Basin

The primary function of the CCSB is to remove a significant portion of the sediment load from Cache Creek to avoid its deposition in the Yolo Bypass, thereby preserving the capacity of the bypass for conveying flood flows. The CCSB is surrounded by levees on all sides and is approximately 3,600 acres in aerial extent. Originally constructed by USACE in 1937, its levee heights and locations have been modified to control sediment deposition and enhance basin sediment storage. (U.S. Army Corps of Engineers 2003c:2-9.)

Somewhat recently (between 1991 and 1993), modifications to the CCSB included an additional 50-year storage capacity with an average of 340 acre-feet of sediment accumulation per year (corresponding to an average trapping efficiency of 55 percent, assuming existing levee project conditions). Streamflow from Cache Creek enters the basin's northwest corner and exits into the

Yolo Bypass through two structures in the southeast corner of the basin. These include the high-flow outlet (a 1,740-foot concrete weir), and the low-flow outlet (a gated, double-box culvert). (U.S. Army Corps of Engineers 2003c:2-9.)

The CCSB is designed to safely contain and pass a design flow of 30,000 cubic feet per second (cfs). This flow represents the current design capacity of the original settling basin and the upstream channel/levee system. The CCSB's low-flow outlet structure was designed to pass 400 cfs. Review of gage data for Cache Creek at Yolo (USGS 11452500) indicates that flows exceed 400 cfs most years for several days at a time. (U.S. Army Corps of Engineers 2003c:2-10.)

Yolo Bypass

The Yolo Bypass, located in Yolo and Solano Counties, is one of two flood bypasses in California's Sacramento Valley. Through a system of weirs, the bypass diverts floodwaters from the Sacramento River away from the state's capital city of Sacramento and other nearby riverside communities. The main input to the Yolo bypass is through the Fremont Weir, where water spills over into the bypass if it reaches the 33.5-foot crest. Downstream, the Sacramento Weir, just north of the city of West Sacramento, can also be opened to divert additional waters if needed. The bypass ends a few miles north of Rio Vista in the Liberty Farms area, where it first enters Prospect Slough and then Cache Slough adjacent to the connection of the Sacramento Deep Water Ship Channel. Cache Slough then reconnects with the Sacramento River just north of Rio Vista.

Willow Slough Bypass

The Willow Slough Bypass is a constructed canal north of Davis that alleviates localized flooding on Willow Slough. It drains into the Yolo Bypass. The bypass turns east away from Willow Slough proper immediately north of the intersection of County Roads 101A and 28, just north of Davis and south of Woodland.

Existing Storm Drain System (City of Woodland)

The City's storm drainage system conveys runoff by gravity flow from west to east. The agricultural lands are served by a minimal drainage system, whereas the City is served by piped trunk systems. The trunk systems discharge into what are referred to as the North or the South Canals, which convey the runoff to the City's three pump stations. The pump stations discharge into the Outfall Channel, which conveys runoff to the Yolo Bypass. (U.S. Army Corps of Engineers 2003c:2-10.)

The Environmental Services Division in the City's Public Works Department (PWD) is responsible for stormwater management within the City of Woodland. The city's stormwater system includes 130 miles of drain pipe, 14 miles of drainage channel, 1,600 catch basins, 1,874 drain inlets, nine detention ponds, and nine stormwater pumps in three locations. The City plans on upgrading the drainage system after the project is complete. A 30 to 36 inch diameter gravity main line runs along Pioneer Avenue from the Woodland City Limits to Kentucky Avenue. Several smaller gravity main lines lie between Pioneer Avenue and N. East Street. There are two detention basins near the intersection of Interstate (I-) 5 and State Route (SR) 113.

Onsite ditches transport water to existing roadside ditches within the agricultural areas of the unincorporated communities. These roadside ditches are intended to carry only runoff from the roadway and are not part of the larger flood control system.

Common Flood Frequency Terminology

Because there are numerous ways to describe the statistical frequency of a flood event, Table 3.1-1 provides a reference of equivalent terminology. For a typical 30-year mortgage, with a 1 in 30 chance that a specific flood event will occur in any given year, the probability that a flood of this magnitude will occur (or be exceeded) in any given year would be 3 percent and the period of time between flood events of this magnitude would be 30 years.

Table 3.1-1. Common Flood Frequency Terminology

Chance of Occurring in Any Given Year—The chance that a specific flood event will occur in any given year	**Probability of Exceedance**—The probability that a flood of this magnitude will occur (or be exceeded) in any given year commonly expressed as a percentage	**Average Return Frequency, Years**—The period of time between flood events of this magnitude, averaged over many thousands of years (years)
1 in 2	50%	2
1 in 10	10%	10
1 in 25	4%	25
1 in 30	3%	30
1 in 50	2%	50
1 in 100	1%	100
1 in 200	0.5%	200
1 in 500	0.2%	500

Flood Control

Sacramento River Flood Control Project

The study area levees (including those along lower Cache Creek and the CCSB) are part of the Sacramento River Flood Control Project (SRFCP). The SRFCP was authorized by Congress in 1917. The SRFCP was the major project for flood control on the Sacramento River and its tributaries. It was sponsored by The Reclamation Board of the State of California (today reauthorized as the CVFPB) and was the first federal flood control project constructed outside the Mississippi River Valley (U.S. Army Corps of Engineers 2009b).

The SRFCP includes approximately 980 miles of levees, overflow weirs, pumping plants, and bypass channels that protect communities and agricultural lands in the Sacramento Valley and the Delta. Currently, the SRFCP extends from the Sacramento River's mouth near Collinsville in the Delta to near Chico Landing in the northern Sacramento Valley. Approximately 980 miles of levees were constructed as part of the project, providing flood protection to roughly 800,000 acres of highly productive agricultural lands, the cities of Sacramento and Marysville, and numerous other small communities. Although the SRFCP levees often were constructed of poor foundation materials such as river dredge spoils that would not meet current engineering standards, the levees are relied upon to provide flood protection during major storms to more than 2 million people in approximately 50 communities with an estimated $37 billion in urban and agricultural development.

Levee Maintenance and Ownership

At the regional and local level, the primary agencies responsible for flood control in the study area include the Yolo County Flood Control and Conservation District, Yolo County, and the City of Woodland. The lower Cache Creek levees in the study area and the CCSB levees are operated and maintained by DWR's Flood Maintenance Office.

Flooding

Historic Flooding

Historically, the Lower Cache Creek levee system has passed flows up to 34,000 cfs, a 1 in 20 chance flow (a 20-year recurrence interval), without failures (U.S. Army Corps of Engineers 2003c:2-21). Although the City of Woodland has not experienced flooding,[2] Lower Cache Creek has experienced numerous past flooding events. Since 1900, twenty significant floods have occurred in the Cache Creek watershed. The largest floods include those in 1955, 1956, 1958, 1964, 1965, 1970, 1983, 1995, and 1997. In 1983, a levee failure near County Road 102 caused flooding in what is now the industrial area in the northeast portion of Woodland. (U.S. Army Corps of Engineers 2003d:ES-1.)

The peak flow in Lower Cache Creek (at County Road 94B) during the flood event in January 1995 was approximately 48,000 cfs.[3] An estimated 3,800 cfs flowed over the south bank of Cache Creek while a scant amount of water overtopped the north bank upstream of the levee system. This total flow represents a 1 in 40 chance event (a 40-year recurrence interval). (U.S. Army Corps of Engineers 2003d:ES-2.)

Present-Day Flood Concerns

Flooding in Cache Creek is principally the result of runoff from high-intensity rainstorms during the winter and spring.

Flooding from Cache Creek is anticipated to occur on a once-in-20-year to once-in-30-year recurrence interval due to the limited capacity of Lower Cache Creek. Furthermore, the CCSB, located at the downstream end of Cache Creek, consists of levees that do not meet current USACE Levee Design Criteria or DWR Urban Levee Design Criteria. (Wood Rogers 2016:1.)

As a result, Woodland is subject to flooding from the right bank of Cache Creek from larger storm events. Flood flows from Cache Creek flow south and east towards Woodland. The presence of the I-5 embankment and the CCSB levees exacerbates the flooding experienced by the city by directing the out-of-bank flows southward and into the urban areas.

Typical flood hazards in the study area consist of shallow sheet flooding from surface water runoff from large rainstorms with depths generally less than two feet. However, in larger storm events, there are significant areas within the study area on the north and east sides that are also affected by flooding from Lower Cache Creek and/or the Yolo Bypass. (City of Woodland 2017:SE 8-16 and SE 8-17.)

[2] According to the April 2001 FEMA Flood Insurance Study, the city of Woodland has no recorded history of flooding; however, in 1958, 1983, and 1995, Cache Creek rose to the top of both levees and overflowed its banks toward Woodland (U.S. Army Corps of Engineers 2003d:ES-1).

[3] The corresponding flow further downstream on Yolo was 36,400 cfs (see Table 3.1-3).

In brief, the primary flood hazard in the study area is Cache Creek. However, the lands to the east of Woodland could potentially be subject to deep flooding from overflows from either the Willow Slough Bypass or the Yolo Bypass, depending on the magnitude of the flood event or associated levee failure (and the associated volume of discharge). The deep flooding could occur as a result of water ponding against levees of the Yolo Bypass and the Willow Slough Bypass. The proposed document that outlines the method of assessment for operation and maintenance of Reclamation District (RD) 2035 states that lands to the east of Woodland would be subject to 6.5 to 16 feet of inundation if the bypass levee fails (U.S. Army Corps of Engineers 2003c:2-22). Flooding from these sources (i.e., Willow Slough Bypass or the Yolo Bypass) are considered less likely to occur than the flood hazard that Cache Creek presents.

Federal Emergency Management Agency Mapping Efforts

Based on the FEMA FIRMs, the locations of the designated floodplains in the study area are shown on Figure 3.1-1 and are summarized below.

- Most of the area north of the city and the northeast and eastern portions of the city are designated as Zone AE (inundated by 100-year flooding; base flood elevations [BFEs] have not been determined).
- The southwest portion of the city is designated as (Unshaded) Zone X (areas to be determined to be outside the 0.2 percent annual chance floodplain).
- Some areas of the city and a few pockets of the area north of the city are designated as Zone AO (subject to inundation by 1 percent annual-chance shallow flooding (usually sheet flow on sloping terrain) with average depths of between 1 and 3 feet.).

The current FEMA Flood Insurance Study (FIS) for Yolo County (dated May 16, 2012) maps areas within the 1 percent annual chance floodplain. The FIS uses a flow of 63,680 cfs for Cache Creek at County Road 94B for the 1 percent Annual Chance (AC) event. The FIS finds that the existing Cache Creek levees are not in compliance with the National Flood Insurance Program requirement of protection against the 1 percent annual chance flood. (MBK Engineers 2019:2.)

DWR subsequently published floodplain maps showing areas that would be inundated by a 200-year flood event. The areas of the City of Woodland within the 200-year and the 100-year floodplain of Cache Creek are approximately the same. As described in the City of Woodland's General Plan, 45 percent of the City's Planning Area[4] is located in the Cache Creek and/or Yolo Bypass 200-year floodplains and subject to a 0.5 percent probability of flooding in any given year. (City of Woodland 2017:SE 8-17.)

Channel Capacity and Site-Specific Flood Stage Information

Channel Capacity

The lower Cache Creek levees were constructed to contain a flow of 30,000 cfs with adequate freeboard, based on the USACE 1957 design water surface elevation for the flood control system. Currently, a flow of 30,000 cfs is estimated to have an annual exceedance probability of 10 percent (a 10-year recurrence interval) (MBK Engineers 2019b:1).

[4] The Planning Area for the City of Woodland is the same as the Urban Limit Line.

The flood event on February 27, 2019 had an approximate flow of 26,400 cfs and resulted in overtopping of the left bank levee downstream of the town of Yolo and overtopping of the right bank upstream of the town of Yolo. Based on this event, the Cache Creek capacity near the town of Yolo is actually approximately 26,400 cfs (as opposed to the 30,000 cfs). The reduced capacity in the area may be a function of local subsidence in the region, as well as sedimentation and vegetation within the channel and the CCSB (MBK Engineers 2019:5-6). DWR is investigating the cause of the reduced capacity and is expected to prepare a report on what should be done to restore the capacity.

Flood Stages

The National Weather Service (NWS) is the agency responsible for determining flood stages for waterways across the county. Current NWS flood stage thresholds for Cache Creek at Yolo are as shown in Table 3.1-2.

Table 3.1-2. National Weather Service Flood Stage Thresholds for Cache Creek at Yolo

Flood Stage (feet)	Stage Type	Description
75.0	Action Stage	Yolo County and the California Department of Water Resources begin patrolling levee sections.
81.0	Flood Stage	Overflow is expected on the non-leveed south bank, upstream from the start of the south-side levee. Water begins to move southeast toward the city of Woodland.
84.1	Major Flood Stage	Overtopping of levees and flooding.

Source: National Weather Service 2019.

Peak discharges and river stages during historical high flow events for lower Cache Creek at Yolo are shown in Table 3.1-3.

Table 3.1-3. Peak Discharge and River Stage during Historical High Flow Events, Cache Creek at Yolo

Water Year	Peak Discharge (cubic feet per second)	Stage (feet)	Date
2019	26,393	84.90	Feb 27, 2019
2006	26,908	83.28	Dec 31, 2005
1998	34,600	84.39	Feb 3, 1998
1995	36,400	85.37	Mar 9, 1995
1983	33,000	83.75	Jan 27, 1983
1965	37,800	–	Jan 6, 1965
1958	41,400	85.35	Feb 25, 1958
1940	38,700	85.30	Feb 28, 1940

Source: National Oceanic and Atmospheric Administration California and Nevada River Forecast Center 2019.

3.1.2 Environmental Impacts

This section describes the environmental impacts associated with hydrology that would result from implementation of the Proposed Project. It describes the methods used to determine the effects of the Proposed Project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts are provided.

3.1.2.1 Methods for Analysis

This evaluation of hydrologic conditions is based on professional standards and information cited throughout the section. The impacts were identified and evaluated based on the environmental characteristics of the study area and the magnitude, intensity, and duration of activities related to the construction and operation of this project.

Analysis methods were primarily based on modeling results. Specifically, hydraulic modeling and sediment transport simulation results were used to compare existing conditions to the Proposed Project.

Hydraulic Modeling

In 2012, Wood Rogers developed an existing conditions hydraulic model for the City of Woodland using the software planform TUFLOW. The model represents existing conditions for Cache Creek and the adjacent overland floodplain. Wood Rogers' 2020 technical memorandum titled *Refined Hydraulic Analysis for Alternative 2A* documents the hydraulic analysis of the Proposed Project (Wood Rogers 2020).

Wood Rodgers' model is a coupled one-dimensional and two-dimensional hydraulic model that included Cache Creek, the CCSB, and the adjacent floodplain. The model was developed using TUFLOW and used a range of hydrologic flows, including the 100- and 200-year events based on hydrologic input developed by USACE.

The hydraulic model for the Proposed Project includes the following features.

- Construction of a new levee that begins near the northwest city boundary and extends to the CCSB.
- Construction of a 150-foot-wide channel directly north of the new levee.
- Degradation of a 3,000-foot-long section of the west levee of the CCSB to an elevation of 45 feet (NAVD 88)[5] to provide an inlet weir.
- Degradation of the southern 3,000-foot portion of the training levee in the CCSB.
- Construction of a detention basin near the CCSB.
- Three 60-inch culverts with flap gates from the detention basin to the CCSB.
- Three 60-inch culverts at the County Road 102, 101, 99, and 98 channel crossings.
- Twelve 5'x12' box culverts at the channel crossings at SR 113 and the railroad tracks located 1,000 feet north of the levee.

[5] Elevations above mean sea level are provided using the North American Vertical Datum of 1988 (NAVD 88) throughout the *Hydrology* section.

Existing Conditions

Figure 3.1-2 shows the depths under existing conditions for the 100-year flood. Figure 3.1-3 shows the depths under existing conditions for the 200-year flood. As shown in Figures 3.1-2 and 3.1-3, most depths under existing conditions for the 100-year flood and the 200-year flood are between 0 to 3 feet but increase locally towards the CCSB (ranging between 5.1 and 10 feet). Other lower-lying areas experience even greater flood depths (greater than 10 feet). The localized inundation areas expand in aerial coverage under the 200-year event.

Under the 100-year flood, the velocities of the flows in most of the overbank areas and in the floodplain range on average from 1 to 3 feet per second (fps). There are some localized areas of velocities between 5 and 10 fps near roadways and intersections (such as I-5) and along the CCSB levees (Figure 3.1-4). Existing velocities for the 200-year flood are similar to those of the 100-year flood (Wood Rogers 2020:Figure 9). As such, velocity values associated with the 200-year flood are not discussed further herein.

Proposed Conditions

Water Surface Elevation

Figure 3.1-5 shows the differences in water surface elevations with the inclusion of Proposed Project elements (i.e., the changes that occur to water surface elevations between existing and proposed conditions) for the 100-year flood. Figure 3.1-6 shows the differences in water surface elevations with the inclusion of Proposed Project elements for the 200-year flood.

As shown in the figures, flooding is no longer present south of the proposed levee (i.e., the city limits) under both the 100-year and 200-year flood events; however, there are localized areas where flood depths increase north of the proposed levee. In general, water surface elevation increases (for the 100-year flood) range from 0.1 to 6.0 feet. The larger increases occur on the east end of the project area near the CCSB on UC Davis-owned agricultural lands that do not contain any structures and in the detention basin. There is also an area to the east and west of County Road 102 (south of Cache Creek) where water under the 100-year event would be present (approximately 0.1 to 2.0 feet), where no water is present under existing conditions. There are no structures located in this area.

A variety of structures (to the immediate west and east of I-5, and immediate north and south of County Road 18C) would experience increases in water surface elevations ranging from 0.1 to 2.0 feet under the 100-year floods (Figure 3.1-5). To the west of I-5 (where increases in water surface elevations between 1.0 and 2.0 feet would occur), there are two structures—an ARCO am/pm store and a Denny's restaurant. To the east of I-5 (where increases in depth between 0.1 and 1.0 feet would occur), there are three structures—all residential structures.

To the south of County Road 18C, there are three structures—all residential structures—that would experience increases in water surface elevation between 0.1 and 1.0 feet for the 100-year flood.

To the north of County Road18C, there are four structures—all residential structures—that would experience increases in water surface elevation between 0.1 and 1.0 feet for the 100-year flood.

All the remaining structures in the project area (as shown on Figure 3.1-5) would experience no change from existing conditions (i.e., no current flooding or water surface elevations that remain the same) or a decrease in water surface elevation. This decrease (where structures are present) falls into the -0.1 to 0.1 range.[6]

Additional information about water surface elevation changes is presented in Section 3.1.2, *Environmental Impacts*.

Velocity

The modeled velocities for the 100-year event for the Proposed Project are shown in Figure 3.1-7. Average velocities within the greater floodplain would generally increase on the order of 0 to 2.0 fps for the 100-year flood (Figure 3.1-4 and Figure 3.1-7). Higher velocity values (greater than 2.0 fps) would occur within the project footprint, near roadways and intersections (such as I-5), and along the CCSB levees.

There are some localized areas where velocity would decrease relative to existing conditions. These areas are north of the proposed levee in the area south of County Road 18C and within the CCSB. In these locations, many of the existing conditions velocities associated with the 100-year flood event are currently 2 to 5 fps. The relative decrease with the implementation of the Proposed Project as shown on Figure 3.1.-7 would generally be between 1.0 and 2.0 fps, although there are some smaller localized areas where velocity decreases would be grater (e.g., within the CCSB).

Similar to water surface elevations, there is also an area to the east and west of County Road 102 (south of Cache Creek) where water for the 100-year event would be present (approximately 0.1 to 2.0 feet), where no water is present under existing conditions. Modeled velocities in this area would be on the order of 0.1 to 1.0 fps.

Additional information about decreases in velocity is presented in Section 3.1.2, *Environmental Impacts*.

Flood Duration

Figure 3.1-8 illustrates the flood duration modeling results for the 100-year event. Under both existing and proposed conditions in the hydraulic model, Cache Creek levees are assumed to overtop at hour 46, and flood stage peaks near SR 113 approximately 4 hours after levee overtopping (hour 50 of the modeled period). Upstream of SR 113, the ground surface elevation is 49.7 feet. At this location, flood stage peaks at approximately 55.5 feet and, under existing conditions, remains relatively even, decreasing only to approximately 53.75 feet through the end of the modeled period (175 hours). Under proposed conditions, flood stage decreases rapidly after initial inundation and floodwaters have left the area almost completely by the end of the modeled period (flood stage is at 49.72 feet at hour 175).

Downstream of SR 113, the ground surface elevation is 47.1 feet. The difference in flood stage between existing and proposed conditions is less pronounced at this location, but the duration is shorter under proposed conditions. Under existing conditions, flood stage peaks at approximately 49.5 feet and is still at approximately 47.75 feet by the end of the modeled period. Under proposed conditions, floodwaters have left the area almost completely by the end of the modeled period (flood stage is at 47.15 feet at hour 175).

[6] For this analysis, an increase in flood depth of 0.1 feet is considered negligible and within the margin of error for the modeling results. As such, it is not considered an "increase" herein.

Note, however, that there are some areas north of County Road 18C and east of County Road 102 that may experience an increase in flood stage (temporarily), and there are isolated locations that will experience flooding that currently do not show flooding in the scenario modeled under existing conditions, but do not contain any structures. Additionally, there may be locations in the same vicinity that currently drain after about a day that will be flooded for a longer duration (Milligan pers. comm.).

Nonetheless, with implementation of the Proposed Project, flood duration would generally decrease significantly when compared to existing conditions. Inclusion of various improvements, such as the armoring of the freeway underpass and rail embankment under I-5, installation of box culverts under SR 113, and improvement of gravity drainage)would reduce the duration and extent of flooding immediately north of the proposed new levee and would help to reduce residual flood risk.

Sediment Transport Modeling

The University of California, (UC) Davis completed sediment transport simulations for existing conditions and the Proposed Project for the 10-, 50-, 100-, and 200-year events (University of California, Davis 2016). The purpose of the study was to utilize sediment transport modeling for design storms in order to evaluate the relative sediment capture performance and relative flood inundation for the current (baseline) condition and the Proposed Project. Trap efficiencies[7] for the full domain of the model are based on the total bed and suspended load entering the system at the upstream boundary at County Road 94B and the total load exiting the system at the CCSB overflow weir. Trap efficiencies for the CCSB are based on the total load entering the CCSB at County Road 102 for existing conditions or County Road 102 and the proposed inlet weir for the Proposed Project and exiting the system at the overflow weir. Results of the simulations are shown in Table 3.1-4.

Table 3.1-4. Trap Efficiencies (Quantified as Percent of Load Entering the Yolo Bypass) of 10-, 50-, 100-, and 200-Year Flow Events for the Current Condition and the Proposed Project Based on the Entire Simulation Domain and the Cache Creek Settling Basin

	Full Domain		Cache Creek Settling Basin	
Flow Event	Existing Conditions	Proposed Project	Existing Conditions	Proposed Project
10-Year	80	83	31	41
50-Year	86	86	56	58
100-Year	88	90	57	63
200-Year	93	92	66	71

Source: University of California, Davis 2016.

In all cases, whether considering existing conditions or those under the Proposed Project (in the full domain or the CCSB), sediment trapping efficiency increases with event magnitude. In addition, the Proposed Project meets or exceeds the current trapping efficiency whether calculated for the full domain or the CCSB in all event magnitudes, with the exception of the 200-year event calculated in the full domain. Currently, 7.3 percent of the total sediment load enters the Yolo Bypass. Under the Proposed Project, it is predicted that 7.5 percent of the total load will enter the Yolo Bypass, which not does not represent a significant increase.

[7] Trap efficiency is defined as the ratio of deposited sediment to the total sediment inflow for a given period within a settling basin or reservoir during its economic lifetime.

3.1.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the Proposed Project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
  - result in substantial erosion or siltation onsite or offsite;
  - substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite;
  - create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or
  - impede or redirect flood flows.

3.1.2.3 Impacts and Mitigation Measures

Impact HYDRO-1: Substantially alter the existing drainage pattern of the site or area in a manner that would result in substantial erosion or siltation onsite or offsite (less than significant)

The Proposed Project proposes placement of a new levee, with some improvements made to existing levees on the CCSB. All elements of the Proposed Project are offset from Cache Creek and will not change the geometry or geomorphic characteristics of the streambed or streambanks. Therefore, the project would have no effect on the frequency or direction of flood flows in Cache Creek.

Changes in velocity could result in localized increases in erosion or siltation. The potential for increased velocity was evaluated by comparing with-project and existing conditions within the project area (Figure 3.1-4 and Figure 3.1-7). Average velocities would not change in the majority of floodplain north of the city. Some localized changes in velocity would occur, generally increases on the order of 0 to 2.0 fps, under the 100-year flood event. Higher velocity values (greater than 2.0 fps) would occur within the project footprint, near roadways and intersections (such as I-5), and along the CCSB levees. The design of the proposed project elements (which include armoring the drainage channel with concrete at the I-5 undercrossing, rock slope protection on the new levee in Reach P and part of Reach Q, and constructing the inlet weir out of concrete) would ensure that the locations within the project footprint experiencing increased velocities are protected from erosion.

Project components, such as the concrete inlet weir, the armored portion of the drainage channel at the I-5 undercrossing, and other hard features (e.g., closure structures), would only create minimal new impervious surfaces with limited footprints. This would not result in a significant reduction in the amount of natural soil surfaces available for infiltration of rainfall and runoff, thereby generating little, if any, additional runoff and associated erosion and siltation during storm events.

There are some localized areas where velocity would decrease relative to existing conditions. These areas occur above the proposed levee south of County Road 18C and within the CCSB. In these locations, many of the existing conditions velocities associated with the 100-year flood event are currently 2 to 5 fps. The relative decrease with the implementation of the Proposed Project as shown on Figure 3.1.-7 would generally be between 1.0 and 2.0 fps, although there are some smaller localized area where velocity decreased would be greater (e.g., within the CCSB).

There is also an area to the east and west of County Road 102 (south of Cache Creek) where water under the 100-year event would be present (approximately 0.1 to 2.0 feet), where no water is present under existing conditions. Modeled velocities in this area would be on the order of 0.1 to 1.0 fps.

The City of Woodland, in conjunction with DWR, has developed a non-structural plan that would be implemented in conjunction with the Proposed Project to benefit the properties north of the city. These non-structural measures (which include floodproofing of individual structures, subsidizing flood insurance costs, purchasing flowage easements, and confirming the adequacy of the existing flood warning system) would rely on local, state, and FEMA funding programs for implementation. By definition, these non-structural measures are

> … proven methods and techniques implemented for reducing flood risk and flood damages by adapting to the natural characteristics of flooding within the unobstructed floodplain. Because of their adaptive characteristics to flood risk, these measures support the National Flood Insurance Program and generally cause no adverse effects to the floodplain, flood stages, flood velocities, flood duration, or the existing environment (The Association of State Floodplain Managers n.d.).

As such, these non-structural measures would not significantly alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite.

This impact would be less than significant.

Impact HYDRO-2: Substantially alter the existing drainage pattern of the site or area in a manner that would substantially increase the rate or amount of surface runoff resulting in flooding onsite or offsite (less than significant)

Similar to Impact HYDRO-2, project components would only create minimal new impervious surfaces with limited footprints. This would not result in a significant reduction in the amount of natural soil surfaces available for infiltration of rainfall and runoff, thereby generating little, if any, additional runoff and associated flooding during storm events.

This impact would be less than significant.

Impact HYDRO-3: Increase siltation in the Cache Creek Settling Basin (less than significant)

The primary function of the CCSB is to remove a significant portion of the sediment load from Cache Creek to avoid its deposition in the Yolo Bypass, thereby preserving the capacity of the bypass for conveying flood flows. UC Davis completed sediment transport simulations for existing conditions and the Proposed Project for the 10-, 50-, 100-, and 200-year events (University of California, Davis 2016) (see discussion in Section 3.1.2.1, *Methods for Analysis, Sediment Transport Modeling*). The UC Davis results show that, in all cases, whether considering existing conditions or those under the Proposed Project (in the full domain or the CCSB), sediment trapping efficiency increases with event magnitude. In addition, the Proposed Project meets or exceeds the current trapping efficiency whether calculated for the full domain or the CCSB in all event magnitudes, with the exception of the 200-year event calculated in the full domain. Currently, 7.3 percent of the total sediment load enters the Yolo Bypass. Under the Proposed Project, it is predicted that 7.5 percent of the total load will enter the Yolo Bypass (under the 200-year event), which not does not represent a significant increase.

The removal of the training levee could alter the distribution of sedimentation within the CCSB; however, design and incorporation of the project elements (including inlet weirs and culverts with flap gates) would incorporate strategies for not disrupting the overall function of the settling basin.

In brief, the Proposed Project would not increase siltation or decrease the existing capacity of the CCSB.

This impact would be less than significant.

Impact HYDRO-4: Create or contribute runoff water that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff (less than significant)

Within the city limits of Woodland, south of the proposed levee, runoff naturally flows to the south away from the city. Therefore, the construction of a levee north of the city would not affect the existing pattern of flow. North of the project area, increased inundation at certain locales as described in Section 3.1.2.1, *Methods for Analysis, Hydraulic Modeling*, would occur locally. Remedial measures such as culverts, a drainage canal, and a weir would convey water east to the CCSB, but in some areas east of SR 113, flood inundation depths and durations would be greater than under existing conditions. Floodwaters that do not pass over the inlet weir into the CCSB would be collected in the proposed 15-acre detention basin. The detention basin would be drained with an east outlet into the CCSB and a south outlet into the City's interior drainage system.

Water entering the City's interior drainage system through the south outlet would be drained via pumps. Currently there are two pumping stations located on E. Main Street with a capacity of 500 cfs. Only floodwater that could not pass over the CCSB inlet weir, or could not flow into the CCSB through the culverts underneath the inlet weir, would be diverted to the pump station after stormwater had already been pumped out of the City (following the first few days after a storm event).

In addition, the non-structural measures are not anticipated to create or contribute runoff water that would exceed the capacity of the existing (or planned) stormwater drainage systems, nor provide substantial additional sources of polluted runoff due to the fact that they would not affect the capacity of existing or planned storm water drainage systems.

In brief, the Proposed Project would not create or contribute runoff water that would exceed the capacity of the existing (or planned) stormwater drainage systems, nor provide substantial additional sources of polluted runoff.

This impact is considered less than significant. No mitigation is required.

Impact HYDRO-5: Impede or redirect flood flows resulting in increased inundation levels (less than significant)

The frequency of flooding in the area north of the city would not change relative to existing conditions, because the study area is already prone to flood risk, and the Proposed Project would not alter the geometry of Cache Creek (i.e., alter the pre-existing flooding regime). However, project implementation could result in increased inundation depths associated with impeding or redirecting flood flows.

The potential for increased inundation was evaluated by comparing with-project and existing conditions within the project area. Figure 3.1-5 shows the differences in water surface elevations with the inclusion of the Proposed Project elements for the 100-year flood. Figure 3.1-6 shows the differences in water surface elevations with the inclusion of the Proposed Project elements for the 200-year flood. As shown in the figures, flooding is no longer present south of the proposed levee (i.e., the city limits), thus meeting the overall project objectives of providing 200-year flood protection and obtaining FEMA certification for the City.

Although the proposed project would not cause flooding at any structures that are not already subject to flooding, modeled water surface elevations do increase in portions of the existing floodplain north of the proposed levee. In general, water surface elevations increase in areas where there are structures (for the 100-year flood) range from 0.1 to 2.0 feet. The deepest increases (up to 6.0 feet) would occur on the east end of the project area near the CCSB on UC Davis-owned agricultural lands that do not contain any structures and in the detention basin.

Structures subject to flooding under existing conditions that would be affected by this modeled increase in water surface elevation are described in Section 3.1.2.1. *Methods for Analysis, Hydraulic Modeling*. Where water surface elevation increases would affect such structures, the maximum increase is modeled to be 2.0 feet. The remaining structures within the project area (as shown on Figure 3.1-5) would experience no change from existing conditions or a decrease in water surface elevation.

As described in Chapter 2, *Project Description*, for each affected parcel, the City would work with individual landowners to develop a suite of non-structural measures tailored for each parcel to reduce flood damages and losses. These measures could include floodproofing of individual structures, subsidizing flood insurance costs, purchasing flowage easements, or confirming the adequacy of the existing flood warning system. This impact would be less than significant.

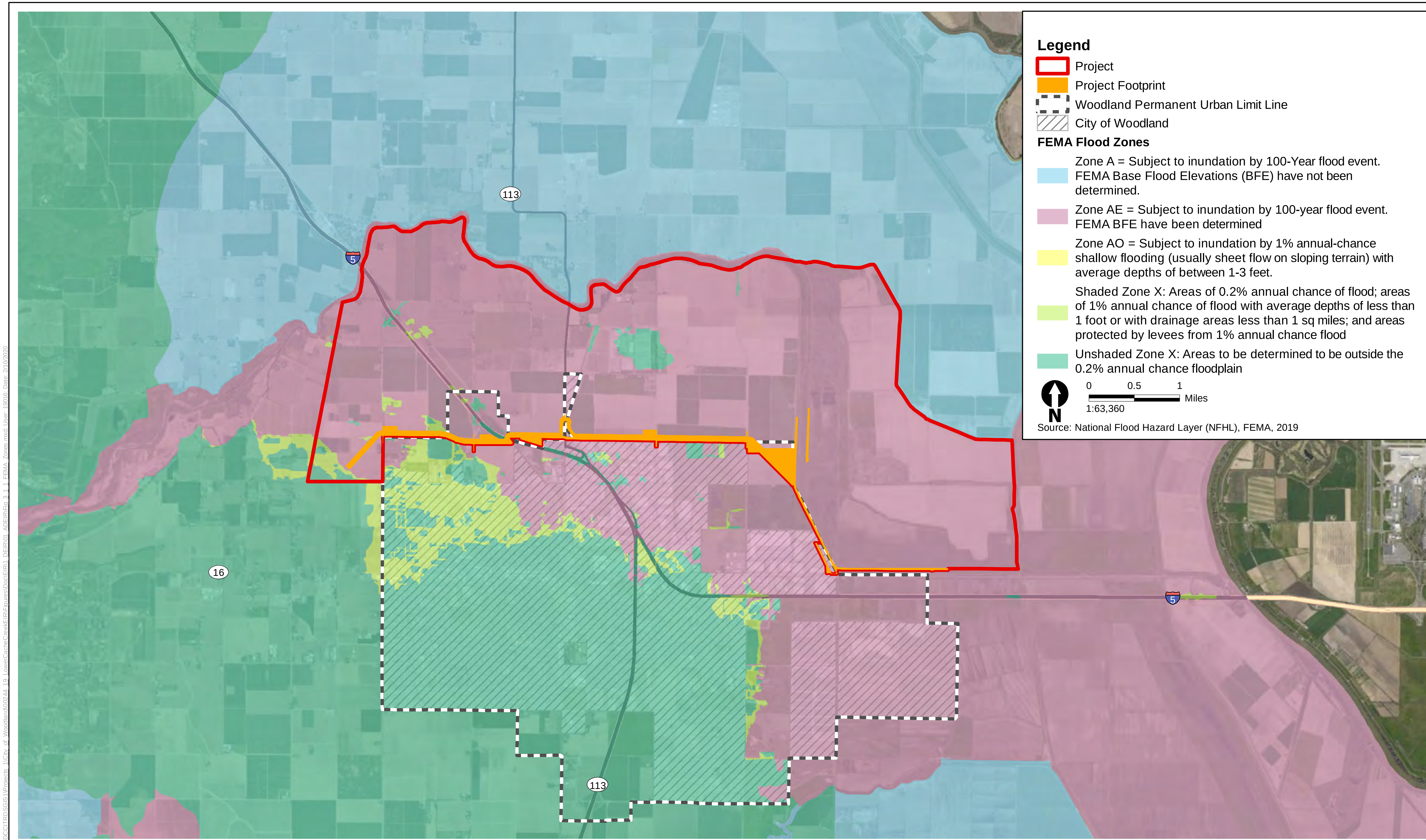
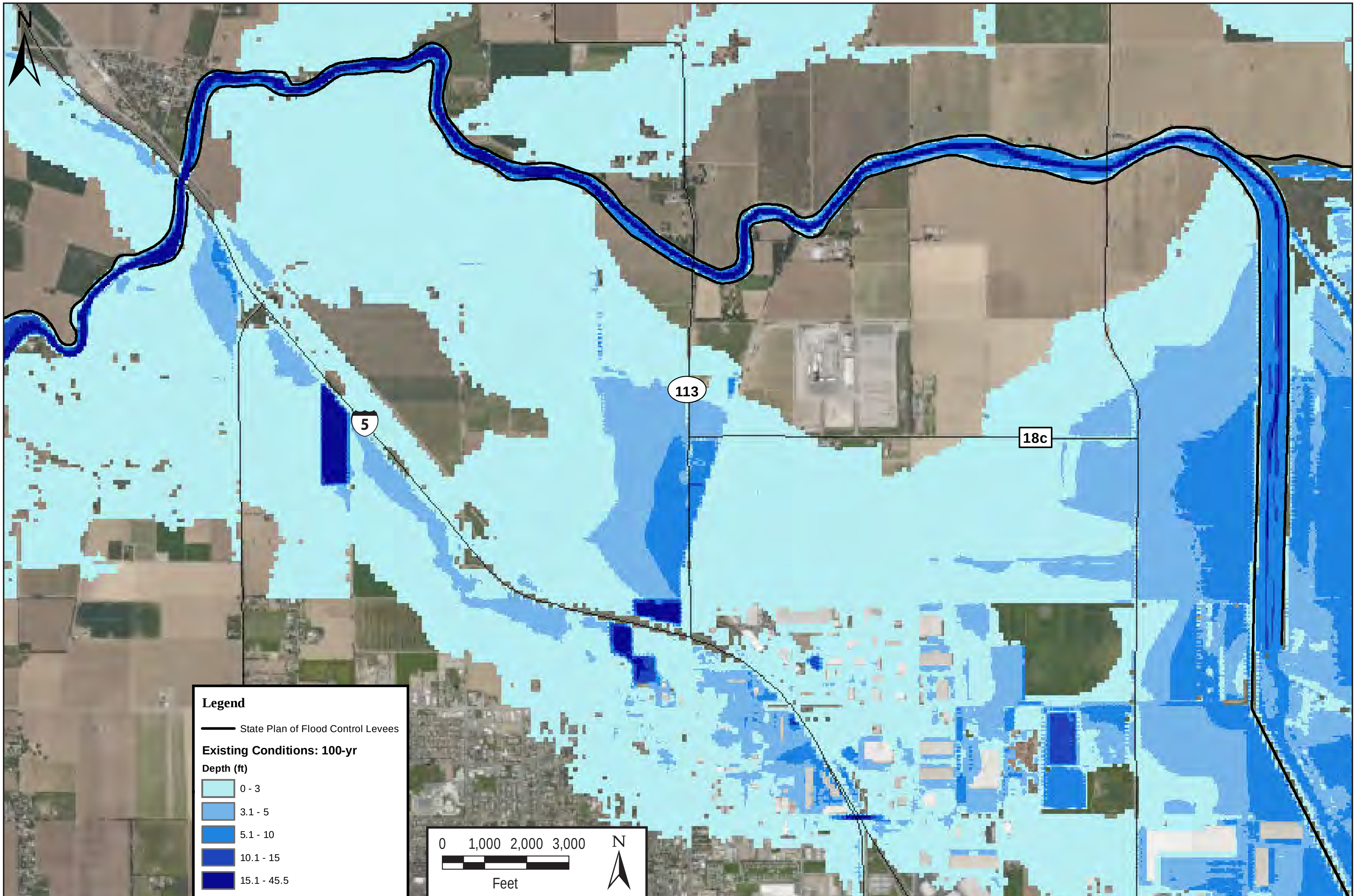


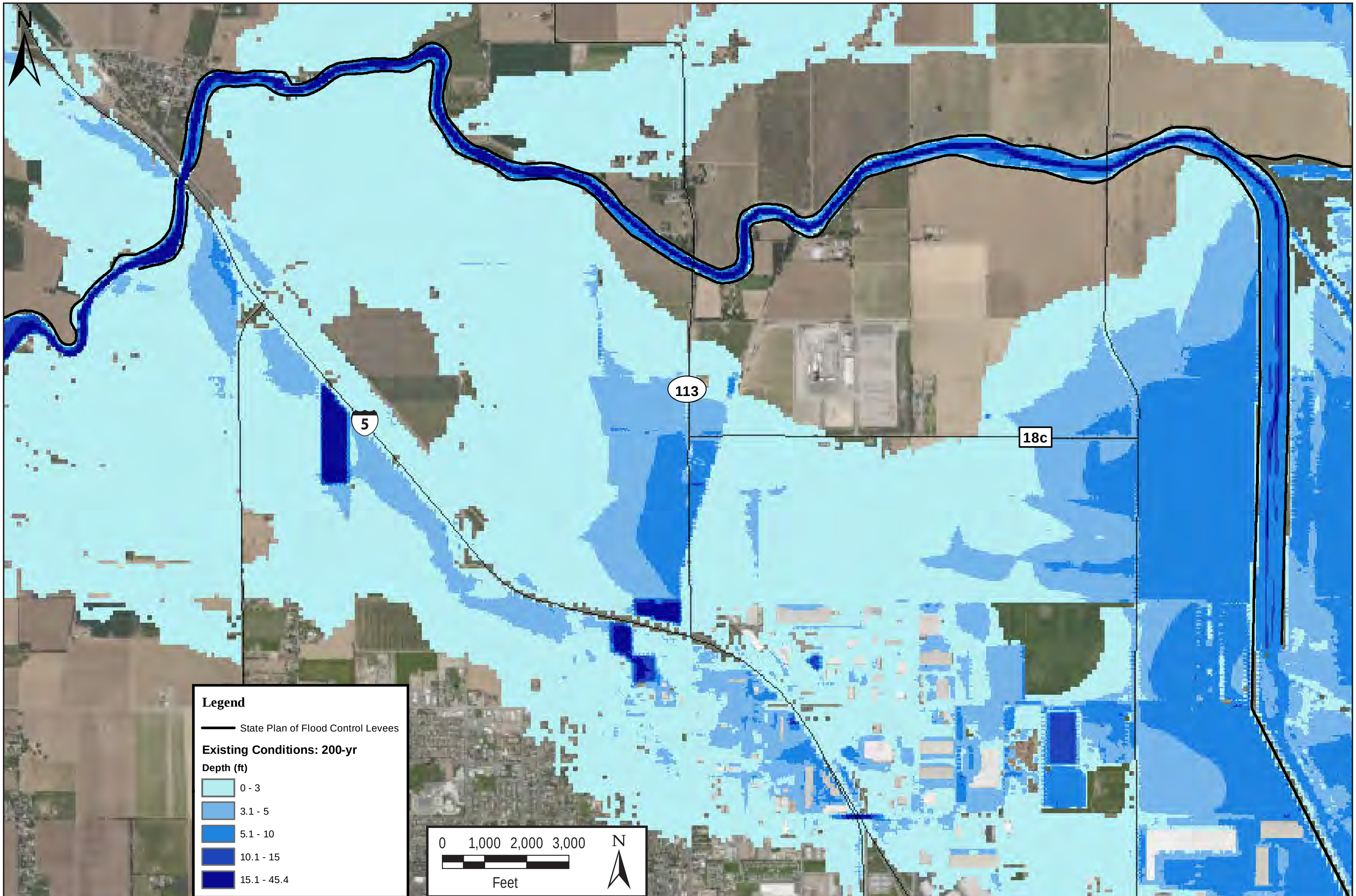
Figure 3.1-1
FEMA Flood Zones



Source: MBK Engineers.

ICF Graphics ... 00244.19 (11-22-2019)

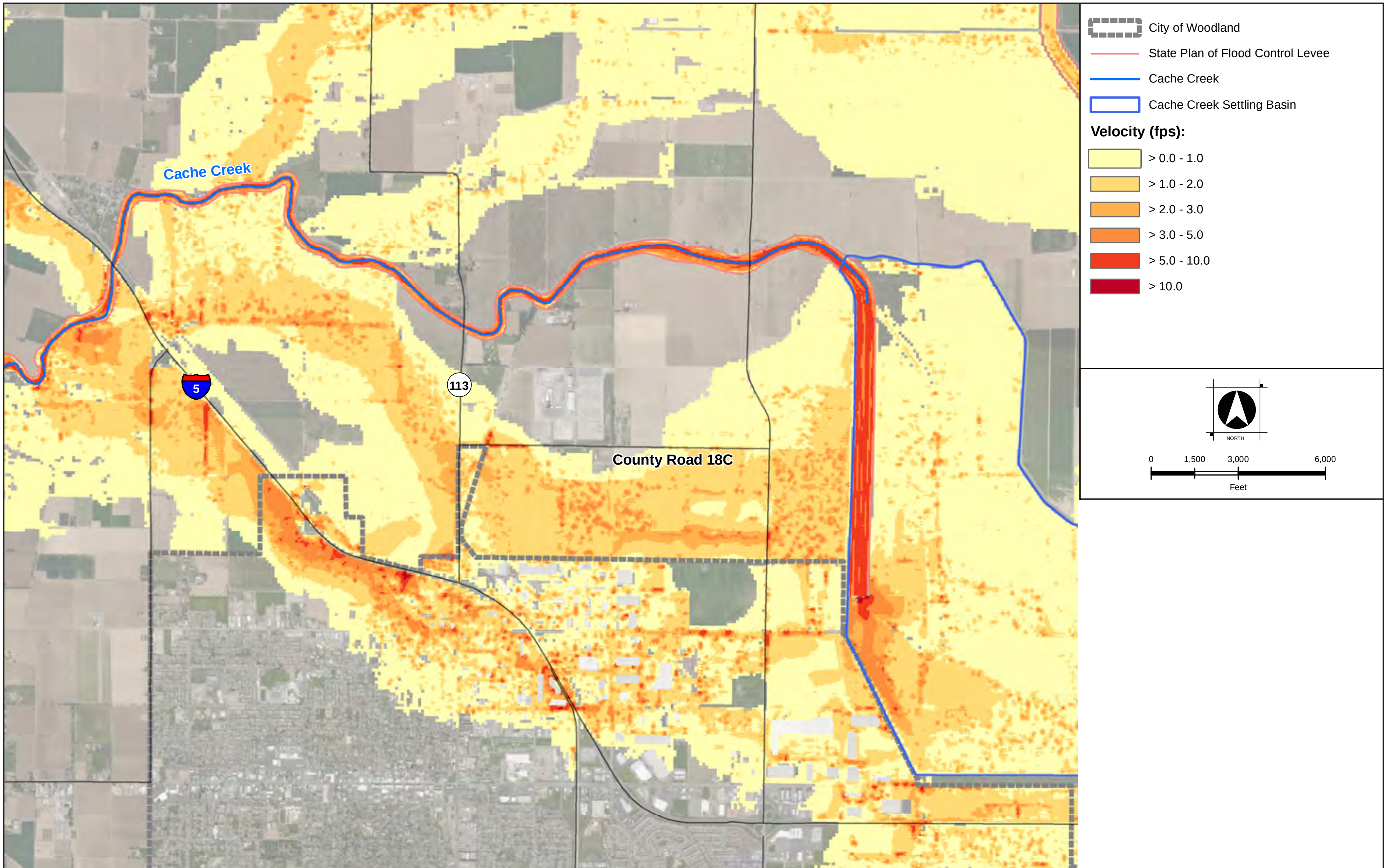
Figure 3.1-2
Existing Conditions: 100-Year Flood Event



Source: MBK Engineers.

ICF Graphics ... 00244.19 (11-22-2019)

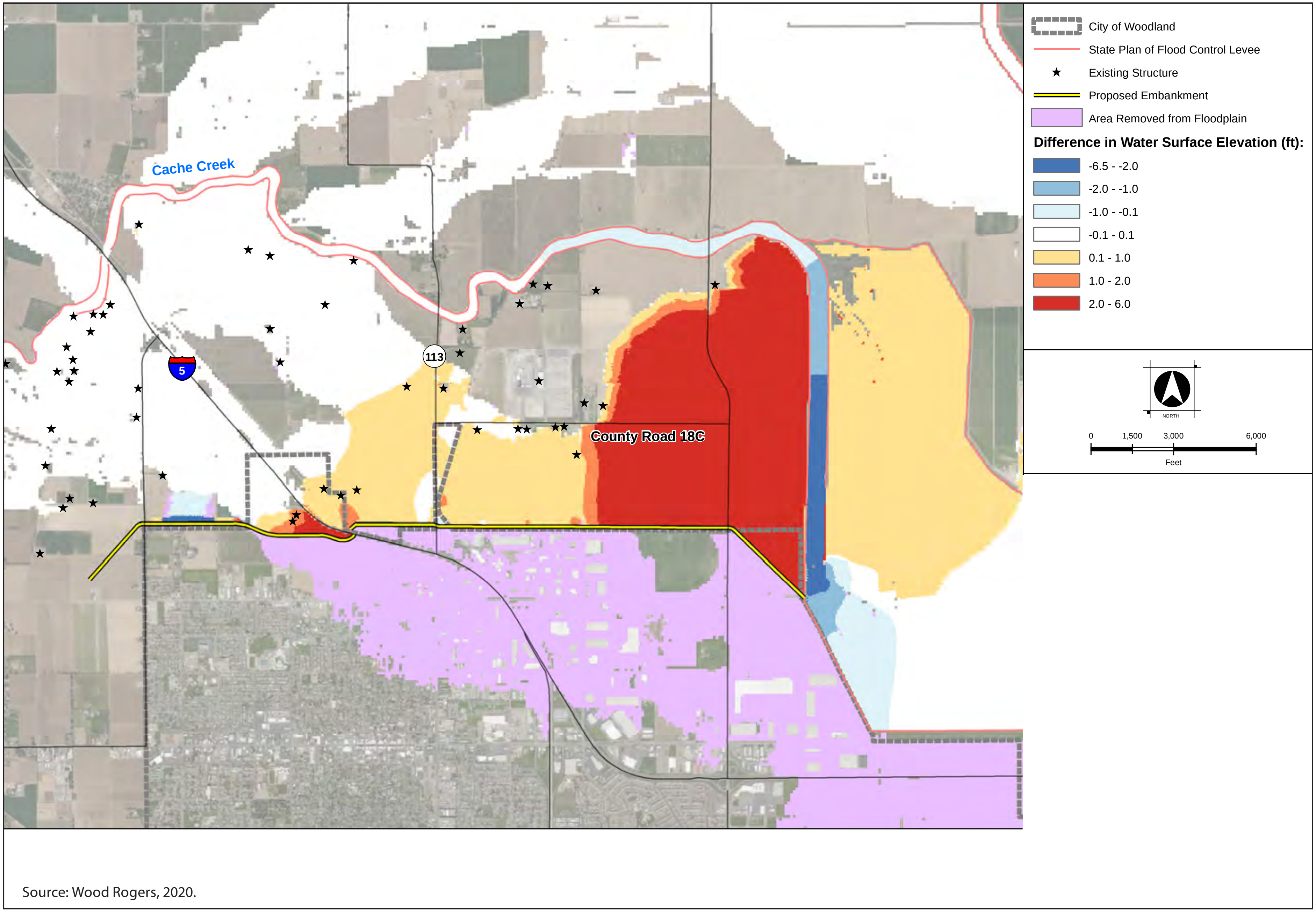
Figure 3.1-3
Existing Conditions: 200-Year Flood Event



Source: Wood Rogers, 2020.

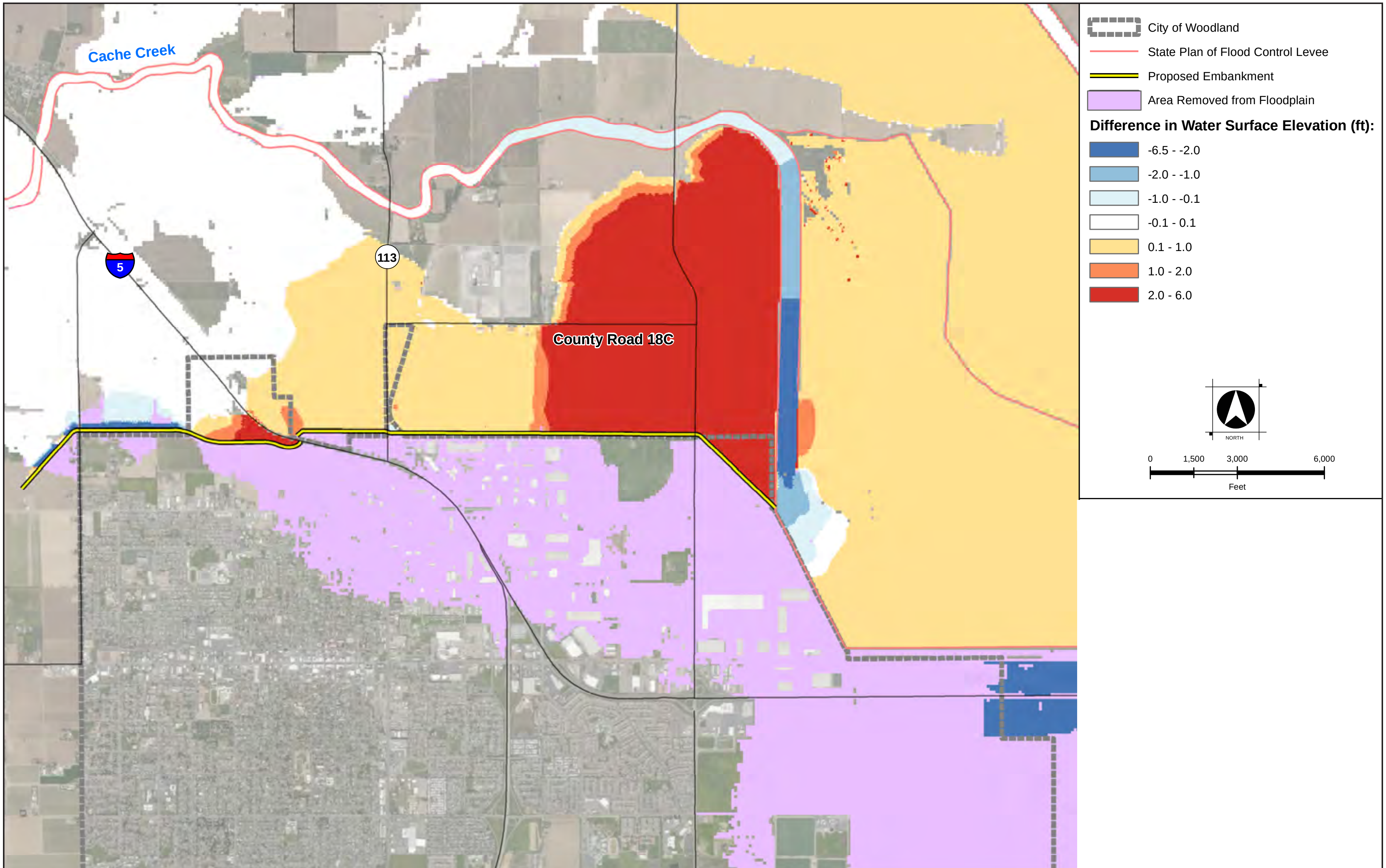
ICF Graphics ... 00244.19 (2-24-2020)

Figure 3.1-4
Existing Conditions: Velocities under the 100-Year Flood Event



ICF Graphics ... 00244.19 (2-24-2020)

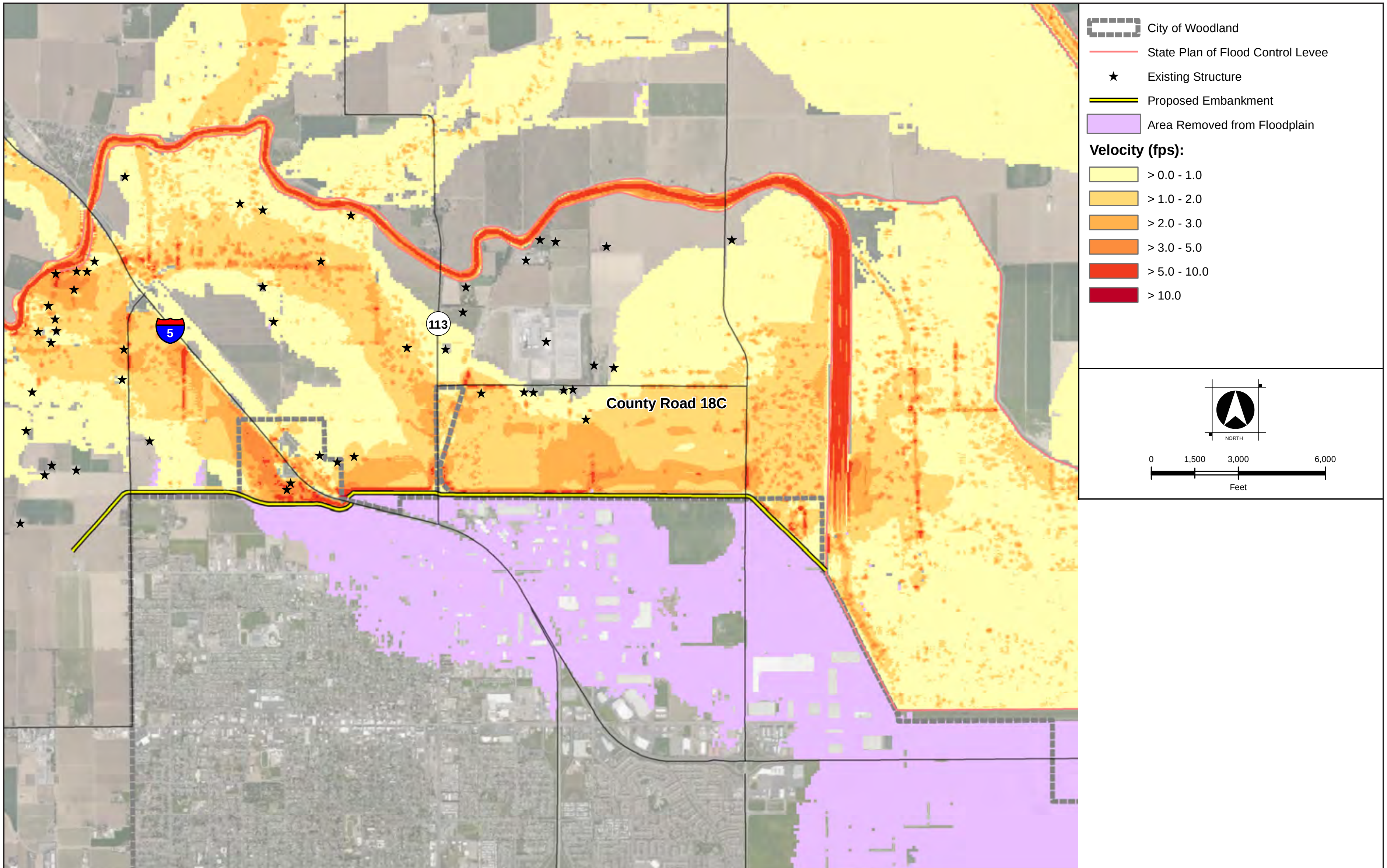
Figure 3.1-5
With Proposed Project: Difference in Flood Surface Elevation under the 100-Year Flood Event



ICF Graphics ... 00244.19 (2-24-2020)

Source: Wood Rogers, 2020.

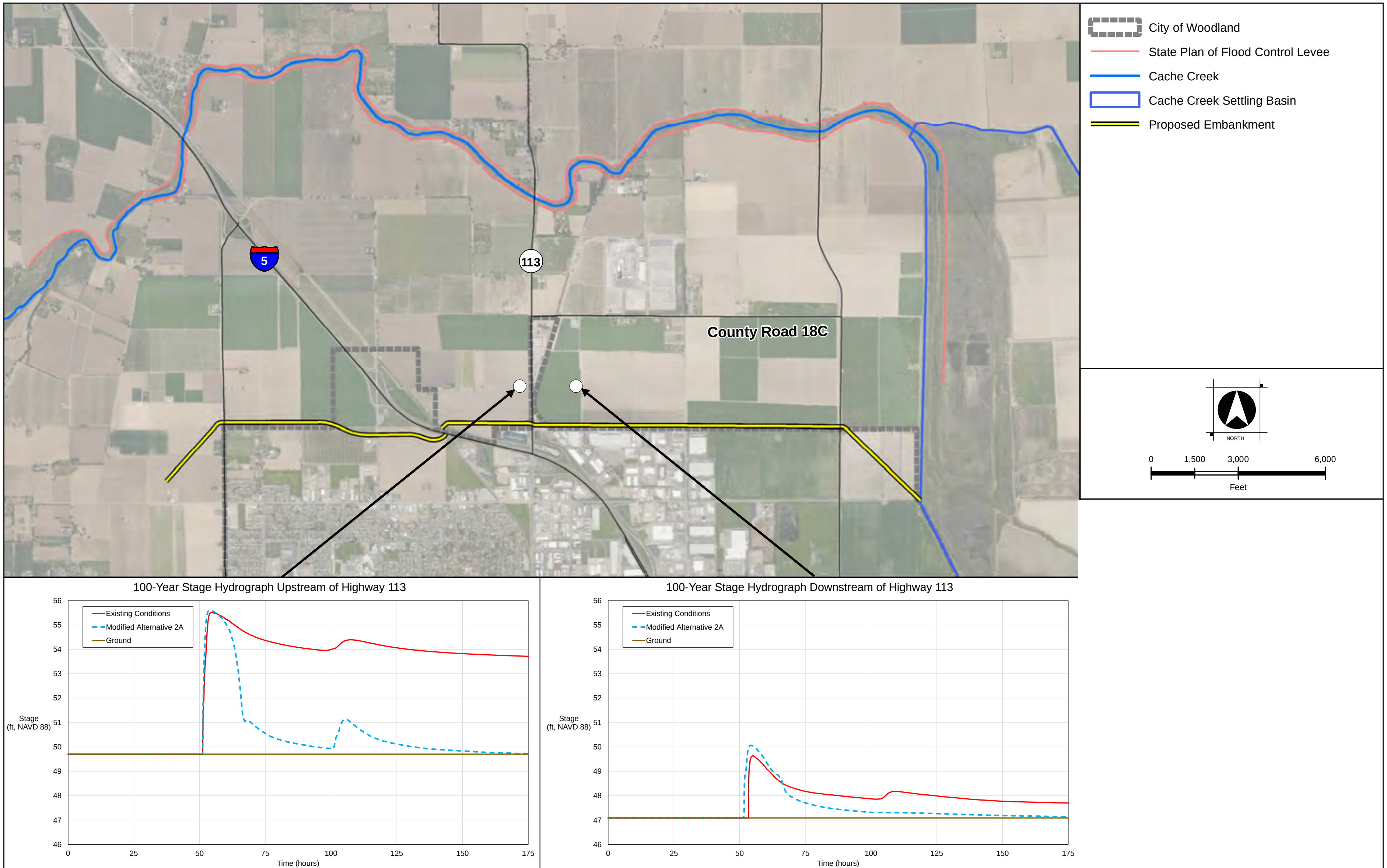
Figure 3.1-6
With Proposed Project: Difference in Flood Surface Elevation under the 200-Year Flood Event



Source: Wood Rogers, 2020.

ICF Graphics ... 00244.19 (2-24-2020)

Figure 3.1-7
With Proposed Project: Velocities under the 100-Year Flood Event



Source: Wood Rogers, 2020.

ICF Graphics ... 00244.19 (2-24-2020)

Figure 3.1-8
Flood Duration, 100-Year Flood Event

3.2 Water Quality

This section describes the regulatory and environmental setting for water quality in the project area (as defined in Chapter 2, *Project Description*, and shown in Figure 2-1), analyzes effects on water quality that would result from implementation of the Proposed Project, and provides mitigation measures to reduce the effects of any potentially significant impacts. Information presented in the discussion and used for the subsequent analysis was drawn primarily from the following sources.

- Cache Creek Settling Basin / Yolo Bypass Project, Contract No. 4600010003, *Amendment to the Cache Creek Settling Basin Trap Efficiency Study for the City of Woodland's Urban Flood Risk Reduction (UFRR) Study and Preliminary Design*, Final Report, January 1, 2016 – August 3, 2016 (UC Davis 2016).
- *Report of Findings: Mercury Control Studies for the Cache Creek Settling Basin, Yolo County, California* (California Department of Water Resources 2015).
- *Lower Cache Creek, Yolo County, CA, City of Woodland and Vicinity, Draft Environmental Impact Statement/Environmental Impact Report for Potential Flood Damage Reduction Project* (U.S. Army Corps of Engineers 2003)

3.2.1 Existing Conditions

3.2.1.1 Regulatory Setting

This section summarizes key federal, state, and local or regional regulations, laws, and policies relevant to water quality in the project area under existing conditions.

Federal

Clean Water Act

The federal Clean Water Act (CWA) (33 United States Code Section 1251 et seq.) establishes the institutional structure for the U.S. Environmental Protection Agency (USEPA) to regulate point and nonpoint discharges of pollutants into the waters of the United States, establish water quality standards, and implement pollution control programs, such as setting wastewater standards for industry. The CWA authorizes USEPA to delegate many permitting, administrative, and enforcement aspects of the law to state governments. In California, the State Water Resources Control Board (State Water Board) has been designated by USEPA to develop and enforce water quality objectives and implementation plans. The State Water Board has delegated the specific responsibilities for the development and enforcement actions to the regional water quality control boards (Regional Water Boards). Cache Creek is located within Region 5, the jurisdictional area of the Central Valley Regional Water Quality Control Board (Central Valley Water Board).

Section 303: Impaired Waters

CWA Section 303(d) requires states to identify waters that are not attaining water quality standards (303(d) list) and include a priority ranking of such waters. The priority ranking considers the severity of the pollution and the uses to be made of such waters. The State Water Board and Regional Water Boards address water quality impairments that are caused by multiple dischargers and other sources of pollution by developing total maximum daily loads (TMDLs), which set water quality objectives or targets and allocate allowable loads for sources of pollution. A TMDL represents the maximum load (usually expressed as a rate, e.g., grams methylmercury per year) of a pollutant that a water body can assimilate and not result in impairments. A TMDL describes the reductions needed to meet water quality objectives and allocates those reductions among the sources in the watershed. To meet federal and state requirements, TMDLs must include the following elements: description of the problem; numerical water quality target; analysis of current loads; load reductions needed to eliminate impairments and plan/program of implementation to achieve the needed load reductions; and monitoring to document program progress. As described in Section 3.2.1.2, *Environmental Setting*, Lower Cache Creek (Clear Lake Dam to Cache Creek Settling Basin [CCSB]) is included on the 303(d) list for mercury, boron, and unknown toxicity impairments.

Section 401: Water Quality Certification

Under CWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. The Proposed Project would require a Section 401 Water Quality Certification for construction activities from the Central Valley Water Board.

Section 402: Permits for Discharge to Surface Waters

CWA Section 402 regulates discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program, which is administered by the Regional Water Boards. An NPDES permit sets specific discharge limits for point sources discharging pollutants into waters of the United States and establishes monitoring and reporting requirements, as well as special conditions. Typically, NPDES permits are issued for a 5-year period by the Regional Water Boards.

Dischargers whose projects disturb at least 1 acre of soil or whose projects disturb less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acres, are required to obtain coverage under the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) (Order 2009-0009-DWQ as amended by 2010-0014-DWQ and 2012-0006-DWQ). Construction activity subject to this permit includes clearing, grading and ground disturbances such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility.

The Construction General Permit requires the development of a site-specific Storm Water Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer. The SWPPP must identify an effective combination of soil erosion and sediment controls, as well as non-stormwater best management practices (BMPs). The Construction General Permit requires that the SWPPP define a program of regular inspections of the BMPs and, in some cases, sampling of water quality parameters. The Central Valley Water Board administers the NPDES stormwater permit program in Yolo County.

As described in Chapter 2, the Proposed Project would require a SWPPP and the development of BMPs to manage stormwater runoff.

Section 404: Permits for Fill Placement in Waters and Wetlands

Section 404 of the CWA requires that a permit be obtained from the U.S. Army Corps of Engineers (USACE) for the discharge of dredged or fill material into navigable waters of the United States, their tributaries, and associated wetlands. Activities regulated by Section 404 permits include dredging, bridge construction, flood control actions, and some fishing operations. The Proposed Project would require a Section 404 permit for construction activities. However, water resources projects developed by USACE do not obtain Department of the Army permits through a self-permitting process. Instead, the project documentation (i.e., report) and environmental compliance work performed by USACE serves as the functional equivalent of self-permitting, ensuring that the same level of review is performed. A Section 404(b)(1) analysis will be completed as part of each site-specific environmental compliance effort and included in the site-specific NEPA analysis report.

State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) (California Water Code Sections 13000 et seq.) establishes the basis for water quality regulation within California. The State Water Board administers the CWA through the Porter-Cologne Act, pursuant to which the State Water Board oversees nine Regional Water Boards that regulate the quality of waters within their regions. Pursuant to the Porter-Cologne Act, each of the nine Regional Water Boards must adopt a regional water quality control plan (also referred to as a "basin plan"), which must identify beneficial uses for the waters within the region, water quality objectives to protect those beneficial uses, and a program of implementation to achieve the water quality objectives. The Proposed Project is within the jurisdictional area of the Central Valley Water Board, which establishes water quality standards for receiving waters through the *Water Quality Control Plan for the California Regional Water Quality Control Board, Central Valley Region* (Basin Plan [Central Valley Regional Water Quality Control Board 2018]). The Basin Plan includes numerical and narrative criteria for several key water quality constituents, including dissolved oxygen, water temperature, trace metals, turbidity, suspended material, pesticides and other constituents.

In California, discharges of waste that are not NPDES "discharges of pollutants" require the issuance of waste discharge requirements (WDRs) unless otherwise waived. Discharges of waste that are not subject to NPDES permits typically include runoff from nonpoint sources, such as agricultural and timber harvest activities and associated waste discharges, to land or to groundwater. WDRs prescribe requirements, such as limitations on temperature, toxicity, or pollutant levels, as to the nature of any discharge (Water Code Section 13260[a]). WDRs may also specify conditions where no discharge will be permitted and may also include monitoring and reporting requirements.

The Porter-Cologne Act requires that a "report of waste discharge" be compiled for any discharge of waste that could affect the quality of the waters of the state with the appropriate Regional Water Board. Upon receipt of a report of waste discharge, the Regional Water Board may then issue WDRs designed to ensure compliance with applicable water quality objectives and other requirements of the basin plan. Because the project would place fill material into wetlands and drainages, some of which may be waters of the state but not waters of the United States, an application for WDRs from the Central Valley Water Board could be needed.

Sacramento-San Joaquin Delta Methylmercury TMDL

In 2010, the Central Valley Water Board adopted amendments to the Basin Plan to establish a TMDL for methylmercury for the Sacramento-San Joaquin River Delta (Delta) to address mercury and methylmercury impairments in the Delta. For the Sacramento–San Joaquin Delta and Yolo Bypass waterways listed in Appendix 43 of the Basin Plan, per the methylmercury objective, average methylmercury concentrations should not exceed 0.08 and 0.24 milligrams (mg) methylmercury/kilogram (kg) wet weight of muscle tissue of trophic level 3 and 4 fish, respectively (150–500 millimeters [mm] total length), and should not exceed 0.03 mg methylmercury/kg, wet weight, in whole fish less than 50 mm in length. Furthermore, the TMDL establishes an implementation goal of 0.24 mg/kg in largemouth bass muscle at a standard size of 350 mm as a means of ensuring that all of the fish tissue objectives are met. In some places in the Delta, methylmercury objectives are exceeded. For example, in a sport fish monitoring/sampling survey conducted at six locations in the Delta by the Delta Regional Monitoring Program (Delta RMP) from August 2016 to April 2017, average methylmercury concentrations in largemouth bass (length-adjusted [350 mm]) ranged from 0.15 mg/kg wet weight (at Little Potato Slough) to 0.61 mg/kg at the Sacramento River at Freeport (Davis et al. 2018).

Based on the existing annual methylmercury loads to different Delta subareas (e.g., Central Delta, West Delta, Yolo Bypass), the Central Valley Water Board has identified loading capacities[1] for each subarea, as well as subarea-specific percent reductions needed to comply with methylmercury TMDL numeric targets (equal to the water quality objectives for this TMDL). Reductions were determined by comparing the existing average methylmercury concentrations in water for each Delta subarea to the proposed methylmercury implementation goal for ambient water (0.06 nanograms/liter [ng/L]). The reduction needed in each subarea is a percentage of the ambient concentration. The Delta methylmercury TMDL requires a 78 percent reduction of methylmercury in the Yolo Bypass (U.S. Environmental Protection Agency 2015).

The TMDL includes a control program, the Delta Mercury Control Program, to reduce inorganic (total) mercury and methylmercury in the Delta. The Delta Mercury Control Program is designed to protect people eating one meal/week (32 grams/day) of trophic levels 3 and 4 Delta fish, plus some non-Delta (commercial market) fish. The implementation plan for the Delta Mercury Control Program consists of two phases. In phase 1, entities responsible for reducing methylmercury in the Delta and Yolo Bypass are required to participate in studies to develop and evaluate ways to manage methylmercury, including controlling sediment-bound mercury in the Delta and Yolo Bypass that may become methylated in agricultural, wetland, and open-water habitats. The Delta Mercury Control Program establishes inorganic mercury load reductions from upstream mercury-contaminated watersheds, establishes a mercury exposure reduction program to protect humans consuming Delta fish, and establishes a schedule and guiding principles for developing a mercury offset program and phase 1 pilot offset projects. The Delta Mercury Control Program also contains requirements of the Department of Water Resources (DWR), the Central Valley Flood Protection Board, and USACE, in conjunction with any landowners and other interested stakeholders, for evaluating the CCSB trap efficiency, and evaluating potential feasible alternatives for mercury reduction from the CCSB, including a plan for improvements to CCSB to reduce mercury loads from the basin. Following the completion of phase 1 (expected in October 2020), phase 2 will commence.

[1] The loading capacity is the maximum amount of a contaminant (in this case, methylmercury) or stressor that can be assimilated by a waterbody without exceeding TMDL numeric targets.

As part of this phase, dischargers will implement methylmercury control programs and continue inorganic mercury reduction programs. Compliance monitoring and implementation of upstream control programs are also included in phase 2 (Central Valley Regional Water Quality Control Board 2010a, 2011a).

Cache Creek, Bear Creek, and Harley Gulch Mercury TMDL

A TMDL for mercury in Cache Creek, Bear Creek, and Harley Gulch was approved by USEPA in 2007. The TMDL encompasses the 81-mile reach of Cache Creek between Clear Lake Dam and the outflow of the CCSB. The TMDL is set to achieve the following fish tissue methylmercury water quality objectives: methylmercury concentration not to exceed 0.12 and 0.23 mg kg wet weight of muscle tissue in trophic levels 3 and 4 fish, respectively, for Cache and Bear Creeks, and not to exceed 0.05 mg methylmercury/kg wet weight in whole for trophic level 2 and 3 fish. The TMDL is also set to ensure that the applicable numeric total mercury water column criterion in the California Toxics Rule of 50 ng/L is not exceeded (Central Valley Regional Water Quality Control Board 2004; U.S. Environmental Protection Agency 2007).

Sustainable Groundwater Management Act

The Sustainable Groundwater Management Act (SGMA [Water Code Section 10720 et seq.]), effective January 1, 2015, requires that "groundwater resources be managed sustainably for long-term reliability and multiple economic, social, and environmental benefits for current and future beneficial uses" and that sustainable groundwater management "is best achieved locally through the development, implementation, and updating of plans and programs based on the best available science." SGMA tasks local agencies in basins designated as high and medium priority to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge in order to avoid undesirable results. SGMA requires local agencies in high- and medium-priority basins to form groundwater sustainability agencies (GSAs) to manage basins sustainably and requires those GSAs to adopt groundwater sustainability plans (GSPs). A basin's GSP describes how the GSA will ensure the basin is operated within its sustainable yield, including projects, programs, and enforcement actions that will be taken to achieve sustainability. SGMA requires that critically overdrafted high- and medium-priority basins adopt GSPs by January 31, 2020 and all other high- or medium-priority basins adopt GSPs by January 31, 2022 (Water Code Section 10720.7). SGMA authorizes GSAs to regulate, limit, and suspend groundwater extractions in order to achieve basin-wide sustainability. Each GSP must also include measurable objectives, as well as milestones in increments of 5 years, to achieve the sustainability goal in the basin within 20 years of the implementation of the GSP (Water Code Section 10727.2). Under a GSA's SGMA authority, GSAs can and should manage groundwater subbasins to prevent over-pumping and groundwater quality degradation from migrating contaminants. The Yolo groundwater subbasin has been designated as a high-priority groundwater subbasin (for further information regarding the physical conditions of the Yolo subbasin see the *Groundwater* subsection in Section 3.2.1.2, *Environmental Setting*).

The Yolo Subbasin Groundwater Agency formed in 2017 for the purpose of action as the GSA for the Yolo subbasin. The Yolo Subbasin Groundwater Agency consists of local agencies, specifically the Cities of Woodland, Davis, Winters and West Sacramento, local Reclamation Districts, Dunnigan Water District, Madison Community Services District, and Esparto Community Services District (Yolo Subbasin Groundwater Agency 2019). The Yolo Subbasin Groundwater Sustainability Plan is scheduled to be completed by January 1, 2022 to meet the state's deadline (YoloGroundwater.org n.d.).

Local

Yolo County General Plan

The *Conservation and Open Space Element* of the *2030 Countywide General Plan* contains goals and policies related to water quality. The following goal and policies from the general plan may apply to the Proposed Project (County of Yolo 2009).

Goal CO-5: Water Resources. Ensure an abundant, safe, and sustainable water supply to support the needs of existing and future generations.

Policy CO-5.6. Improve and protect water quality for municipal, agricultural, and environmental uses.

Policy CO-5.23. Support efforts to meet applicable water quality standards for all surface and groundwater resources.

Yolo County Stormwater Management Program

Title 10, Chapter 9 of the Yolo County Code contains the required stormwater management regulations pursuant to the CWA, and "provides for the regulation and reduction of pollutants discharged into waters of the United States by extending NPDES requirements to stormwater and urban runoff discharge into the County storm drain system." The provisions of Title 10, Chapter 9 provide the County with the legal authority necessary to implement and comply with the Yolo County Stormwater Management Program. This program is composed of six elements or "minimum control measures," specifically public education/outreach; public involvement/participation; illicit discharge; construction activities; new development and redevelopment; and municipal operations. These elements are intended to reduce the discharge of pollutants to the stormwater drainage system that serves Yolo County. The stormwater management program identifies how Yolo County will comply with the provisions of the WDRs for the *General Permit for Discharges of Storm Water from Small Municipal Separate Storm Sewer Systems Stormwater Discharges from Small Municipal Separate Storm Sewer Systems* (Small MS4 Permit) issued by the State Water Board. The Small MS4 Permit requires Yolo County to develop, implement and enforce a program to ensure controls are in place that will reduce pollutants in stormwater draining from construction sites. Implementation of the Proposed Project would be required to comply with the Yolo County Stormwater Management Program prior to and during construction.

City of Woodland General Plan

The *Sustainability, Conservation and Open Space Element* of the *City of Woodland General Plan 2035* contains goals and policies related to surface water and groundwater resources in the Woodland area (City of Woodland 2017). The following goal and policies from the general plan may apply to the proposed project.

Goal 7.A. Protect Water Supply and Quality. Protect and enhance the natural quantity and qualities of surface water and groundwater resources in the Woodland area.

Policy 7.A.3 Watershed Protection. Support local and regional efforts to protect the Sacramento River, Cache Creek, Putah Creek, and Willow Slough watersheds.

Policy 7.A.4 Best Management Practices. Continue to require the use of feasible and practical best management practices (BMPs) and promote Low Impact Development to protect receiving waters from the adverse effects of construction activities and urban and agricultural runoff.

3.2.1.2 Environmental Setting

This section discusses the environmental setting relevant to water quality in the project area (as defined in Chapter 2 and shown in Figure 2-1). Specifically, the physical properties of the two primary receiving waters either within or immediately adjacent to the project area, Cache Creek and the Cache Creek Settling Basin, which could be affected during construction or operation and maintenance of the Proposed Project are discussed. It also discusses the groundwater resources located under the City of Woodland and Yolo County. A description of the climate setting is provided in Section 3.1, *Hydrology.*

Surface Water

Cache Creek

The Cache Creek watershed drains a 0.7-million-acre area with a variety of land uses. Cache Creek originates at Clear Lake in the Coastal Ranges and flows easterly to the Sacramento Valley through Colusa, Lake, and Yolo Counties. The watershed is separated into two basins—the upper and lower basins. At the downstream end of the lower basin, Cache Creek flows into the CCSB and the Yolo Bypass, which subsequently drains into the Delta. Lower Cache Creek from the outlet of Clear Lake to the CCSB is approximately 80 miles in total length. Approximately 6.5 miles of Lower Cache Creek are located immediately north of the project area behind the existing levee. Although Cache Creek is a tributary of the Yolo Bypass, flow in the creek only reaches the bypass during extremely wet years because of upstream damming and diversion (Yolo County 2009). Irrigation return flows enter the creek above the town of Yolo and provide some discharge from the lower basin to the Yolo Bypass during the dry season (Central Valley Regional Water Quality Control Board 2004). Land uses in the watershed have the potential to contribute to water quality problems such as fecal coliform from septic systems and cattle; boron, mercury and other minerals from geothermal springs and abandoned mines; fertilizers, pesticides, and herbicides from agriculture activities; and sediment from erosion.

Surface water quality monitoring data collected from 1999 through 2016 for Lower Cache Creek as part of the Cache Creek Resources Management Plan (CCRMP) water quality monitoring program concluded that there were no significant trends with regard to water quality impairment or improvement for the water quality constituents surveyed. Under the CCRMP monitoring program, water quality data was collected from four monitoring locations along the mainstem of Cache Creek—Capay Bridge (County Road 85); upstream of where Gordon Slough enters Cache Creek; Stevens Bridge (County Road 94B); and Interstate (I-) 5 Bridge (County Road 97B)—and one off-creek location in Gordon Slough. Of these four monitoring locations, only the I-5 bridge location is within the project area. Constituents/water quality parameters tested included: pH, total dissolved solids, temperature, turbidity, total and fecal coliform, mercury, total petroleum hydrocarbons, dissolved oxygen, nitrogen, phosphorus, herbicides, and pesticides, suspended and floating matter, odor, and color. The analysis indicated that most of the contaminants surveyed (more than 85 percent) have never been detected at any of the four water quality monitoring locations. For those contaminants that were detected, limited spatial or temporal trends were noted, including an increase in fecal coliform, boron, and orthophosphate. In addition, the analysis noted that mercury and total Kieldahl nitrogen[2] concentrations showed variability over time (e.g., total and dissolved mercury concentrations spiked in water years 2004 and 2015), and that that variability could not be attributed to changes in hydrology or land use (Tompkins et al. 2017).

Lower Cache Creek (Clear Lake Dam to CCSB) is on the 303(d) list for mercury, boron, and toxicity impairments. Although elevated sources of mercury in Cache Creek are attributed to resource extraction from abandoned mines, sources of boron and toxicity are listed as "unknown" by the State Water Board (State Water Resources Control Board 2017). Boron is a naturally occurring in the Clear Lake and Cache Creek watershed. Sodium borate deposits were mined in the watershed during the 1800s and natural hot and cold springs release water with high boron concentrations (Yolo County Flood Control and Water Conservation District 2007). The Yolo County Flood Control and Water Conservation District monitors boron at seven locations throughout the watershed, and concentrations typically range from 0.7 milligrams per liter (mg/L) during the spring to 2.2 mg/L during the winter, and the average concentration during the irrigation season is less than 1.0 mg/L (U.S. Fish and Wildlife Service and Yolo Habitat Conservancy 2018). Based upon data for 1999 through 2016 from the CCRMP water quality monitoring program, since water year 2009, there has been an overall increase in the average boron concentration in Lower Cache Creek, with the highest average concentration (1.82 mg/L) occurring at the Stevens Bridge monitoring location (Tompkins et al. 2017). The primary beneficial use negatively affected by boron is agricultural supply (AGR). The expected completion date for a TMDL for boron for Lower Cache Creek is 2021. Existing designated beneficial uses for Lower Cache Creek (Clear Lake Dam to CCSB) are provided in Table 3.2-1.

Table 3.2-1. Designated Beneficial Uses for Lower Cache Creek and Yolo Bypass

									MIGR		SPWN		
	MUN	AGR	PROC	IND	REC-1	REC-2	WARM	COLD	WARM	COLD	WARM	COLD	WILD
Lower Cache Creek	E	E	E	E	E	E	E	P	–	–	E	E	E
Yolo Bypass	–	E	–	–	E[a]	E	E	P	E	E	E	–	E

Source: Central Valley Regional Water Quality Control Board 2018.

MUN = Municipal and Domestic Supply; AGR = Agricultural Supply; PROC = Industrial Process Supply; IND = Industrial Service Supply; REC-1 = Water Contact Recreation; REC-2 = Non-Contact Water Recreation; WARM = Warm Freshwater Habitat; COLD = Cold Freshwater Habitat; MIGR = Migration of Aquatic Organisms; SPWN = Spawning, Reproduction, and/or Early Development; WILD = Wildlife Habitat.

E = existing beneficial use; P = potential beneficial use.

[a] Does not include "Canoeing and Rafting."

Mercury is a statewide water quality issue and is being addressed through various state and federal water quality efforts. Mercury contamination originates from past mining activities, geothermal springs, erosion of naturally occurring mercury-containing soils, and atmospheric deposition near Clear Lake and at tributaries to Cache Creek (U.S. Fish and Wildlife Service and Yolo Habitat Conservancy 2018). The Cache Creek watershed is approximately 2 percent of the landmass of the Central Valley but exports more than half of the mercury (Central Valley Regional Water Quality Control Board 2011b). Studies have measured high concentrations of inorganic mercury in the

[2] Total Kieldahl nitrogen is a measure of nitrogen in ammonia, as well as organic and reduced nitrogen in water. Total Kieldahl nitrogen does not include nitrogen in nitrates and nitrites (U.S. Environmental Protection Agency 2013).

sediment and water of Cache Creek and have identified bioaccumulation of methylmercury in aquatic and terrestrial species in the watershed (Donovan et al. 2016). Mercury adsorbs or binds to particulate matter in water and tends to settle and accumulate in sediment and in this way is transported from Cache Creek, particularly during high flows, downstream through the CCSB and into the Yolo Bypass. The remainder of the mercury is exported to the Yolo Bypass and the downstream Bay-Delta estuary (Central Valley Regional Water Quality Control Board 2011b).

Cache Creek Settling Basin

CCSB covers approximately 3,600 acres and is bound by levees on all sides (California Department of Water Resources 2015). CCSB is wholly within the project area. Water from the CCSB flows through either a 400 cubic feet per second (cfs) low-flow culvert under moderate flow conditions, or the overflow concrete outlet weir during high-flow events. Those waters are discharged into the Yolo Bypass, which flow directly into the Sacramento River. Managed by DWR, CCSB's fundamental purpose is to trap sediment carried by Cache Creek to preserve the floodway capacity of the Yolo Bypass. The CCSB was constructed in 1937 and modified in 1993 to upgrade the capacity and extend its life by providing an additional 50 years of sediment storage capacity (California Department of Water Resources 2015). In the 2007 *Cache Creek Settling Basin Enlargement—Operation & Maintenance Manual*, USACE proposed raising the height of the outlet weir from its current height of 12 feet (crest elevation of 32.5 feet) to 18 feet (crest elevation of 38.5 feet) at year 25 of the life of the basin (2018) or if the trap efficiency of the basin drops below 30 percent, and proposed removing 400-foot sections of the interior training levee every 5 years, starting with a section 1100 feet upstream from the current terminus of the training channel (U.S. Army Corps of Engineers 2007). Because the trap efficiency remained greater than 30 percent in 2018, the proposed CCSB modifications were not implemented in 2018.

Recent U.S. Geological Survey (USGS) studies looking water years (WYs) 2010 to 2014 indicate CCSB trap efficiency (5-year annual average) for total mercury is approximately 59 percent, which is generally consistent with historical estimates of approximately 61 percent. Total mercury loads calculated by USGS flowing into and out of CCSB for WYs 2010 to 2014 averaged 32 kilograms/year (kg/yr) and 13 kg/yr, respectively (California Department of Water Resources 2015). For WYs 1984 to 2003, the Central Valley Water Board reported 20-year average annual inflow and outflow total mercury loads of 224 kg/yr and 125 kg/yr, respectively (Central Valley Regional Water Quality Control Board 2004). DWR has noted that below-average rainfall and streamflow during WYs 2010 to 2014 and variation in gravimetric total mercury concentration on suspended particulates may be factors contributing to the differences between the calculated average inflow and outflow total mercury loads reported by the Central Valley Water Board versus USGS. Suspended sediment concentrations in the CCSB generally correlate well with concentrations of particulate total mercury (California Department of Water Resources 2015).

The CCSB is a net-producer of methylmercury during low-flow conditions, and results from USGS sampling studies have indicated that there is a significant increase in methylmercury sediment concentrations from west to east, in the direction of flow within the CCSB. In addition, methylmercury concentrations in the CCSB are closely correlated with habitat, specifically wetland habitat with elevated organic carbon, non-agricultural floodplains, and riparian zones. Historical estimates for methylmercury loads into and out of the CCSB differ somewhat, as shown in Table 3.2-2. DWR has noted that the higher methylmercury loads calculated for WYs 2010 to 2014 than during previously studied periods (WYs 2000 to 2003) are likely due to the dryer conditions during WYs 2010 to 2014, and to the accumulation of denser vegetation in the non-agricultural floodplain and riparian zones of the CCSB for this same time frame (California Department of Water Resources 2015).

Table 3.2-2. Historical Estimates of Average Annual Methylmercury Loads Into and Out of Cache Creek Settling Basin

Period	Methylmercury Load In (grams/year)	Methylmercury Load Out (grams/year)
1984–2003[a, b]	Estimate not provided	270
1996–2000[b]	72	86
2000–2003[c]	Estimate not provided	137
2010–2014[d]	408	183

[a] Annual average methylmercury load out of Cache Creek Settling Basin for this 20-year period was calculated using concentration data from water years 1996 to 2000.
[b] Source: Central Valley Regional Water Quality Control Board 2004.
[c] Source: Central Valley Regional Water Quality Control Board 2010b.
[d] Source: California Department of Water Resources 2015.

In freshwater environments, sulfate-reducing bacteria convert inorganic mercury to methylmercury, and this process is enhanced by multiple environmental variables in water and sediment, including temperature, pH, oxygen, sulfate, and the presence of organic matter (U.S. Geological Survey 2014). Iron-reducing bacteria have also been implicated in mercury methylation (Yu et al. 2012). Total mercury concentrations in sediment positively correlate with methylmercury levels in sediment and water (Central Valley Regional Water Quality Control Board 2010a). Positive correlations also exist between methylmercury in water and fish tissue. Methylmercury is the form of mercury that enters the food web in aquatic environments and bioaccumulates in fish and shellfish through prey consumption and absorption from water. Consumption of contaminated fish is the major pathway for human exposure to mercury (via methylmercury from fish tissue) (U.S. Environmental Protection Agency 2017). Elevated mercury concentrations have been observed in invertebrates and fish species sampled from Cache Creek.

Yolo Bypass

The Yolo Bypass is a 59,300-acre floodplain area of the Sacramento River and conveys floodwaters from the Sacramento, American, and Feather Rivers and their tributary watersheds. The Yolo Bypass is downstream of the project area and Cache Creek. Surface water in Yolo County and Woodland generally drains to the Yolo Bypass on the eastern edge of the county. Much of the Yolo Bypass is farmed, while some of the land has been dedicated as a managed wetland and wildlife area. Various water bodies that flow into the Yolo Bypass have been identified as impaired by multiple constituents of concern, and the source waters define existing water quality in the bypass. These constituents of concern include pesticides, salinity, toxicity, boron and mercury. Table 3.2-1 identifies existing designated beneficial uses for the Yolo Bypass.

Mercury is a major contaminant in sediments in the Yolo Bypass. The source of much of this mercury is due to erosion and runoff from historical mercury mines in upstream watersheds during rainfall events, as evidenced by notably lower mercury loading during drought years (Domagalski et al. 2004). Mercury in bypass sediments is metabolized by sediment microbes, particularly sulfate- and iron-reducing bacteria, to methylmercury. Because all areas of the Yolo Bypass are currently subject to periodic flooding, methylation of mercury in the soils throughout the bypass is a major ongoing issue of concern (U.S. Bureau of Reclamation, and California Department of Water Resources 2019).

When flooded, the Yolo Bypass is a major source of methylmercury to the Delta (Central Valley Regional Water Quality Control Board 2011b).

Groundwater

Yolo County is in the Sacramento Valley groundwater basin, Yolo subbasin (5-021.67) (California Department of Water Resources 2016a). The Yolo groundwater subbasin is in the southern portion of the Sacramento Valley basin and includes the majority of Yolo County. The northern, eastern and southern boundaries are predominately defined by the Colusa, Sacramento and Solano County lines, respectively (California Department of Water Resources 2016b). The project area overlies the Yolo groundwater subbasin.

As previously described, the Yolo groundwater subbasin has been designated as a high- priority groundwater subbasin. Groundwater levels near Cache Creek exhibit seasonal trends of depression in the irrigation season and recovery in the rainy season. Notable overdraft areas in the subbasin include the Yolo-Woodland area on both sides of Cache Creek, areas between the towns Yolo and Zamora, and areas northeast of the City of Davis (California Department of Water Resources n.d.). These areas coincide with places where subsidence or deteriorating groundwater quality have been measured. The 21-year record from 1996 to 2016 shows that although drought periods (e.g., 2007 to 2009 and 2012 to 2015) create a noticeable decline in groundwater levels in excess of annual seasonal variation, groundwater levels generally rebound within 1 to 2 years of a wet year (Tompkins et al. 2017). Groundwater recharge occurs through rainfall percolation (considered a minor source), applied irrigation water, and water flowing from Cache and Putah Creeks, as well as the Sacramento River (City of Woodland 2016). Two main aquifers are present: an intermediate, unconfined aquifer at depths of approximately 200 to 700 feet; and a deep confined aquifer at depths of approximately 700 to 2,700 feet. Wells in Woodland pump from the intermediate aquifer at depths of 200 to 600 feet below the ground surface (City of Woodland 2016). The Cities of Woodland and Davis have recently converted from groundwater to Sacramento River water as the primary source of drinking water through the Woodland-Davis Clean Water Agency; groundwater is used to meet any remaining unmet demand (City of Woodland 2016; Woodland-Davis Clean Water Agency 2019). Historically, groundwater elevations in the region have ranged from approximately -20 feet to -50 feet mean sea level (City of Woodland 2011).

Groundwater quality in the Yolo groundwater subbasin is characterized by the presence of calcium magnesium, sodium magnesium, or magnesium bicarbonate. The groundwater quality is generally good for agricultural and municipal uses, though it is considered "hard" to "very hard" overall. Elevated concentrations of selenium, nitrate, and boron have been detected in groundwater along Cache Creek and the CCSB area (Yolo County 2009), generally adjacent and within the project area. Mercury is detected in the groundwater but is typically at background concentrations.

3.2.2 Environmental Impacts

This section describes the environmental impacts on water quality that would result from implementation of the Proposed Project. It describes the methods used to determine the effects of the Proposed Project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts are provided.

3.2.2.1 Methods for Analysis

The evaluation of potential water quality impacts is based on review of existing water quality information for the Lower Cache Creek; groundwater quality in the project area (Yolo groundwater subbasin); USGS and DWR studies identifying mercury and sediment trap efficiencies for CCSB under existing conditions (California Department of Water Resources 2015); and a technical report prepared for the Proposed Project, which identifies modeled sediment trap efficiencies for CCSB for multiple flow events (UC Davis 2016) with the Proposed Project and under existing conditions, as identified in Section 3.2.1. Potential impacts resulting from implementation of the Proposed Project were analyzed by comparing existing conditions with conditions during construction and operation of the Proposed Project.

As described in Section 3.1.2.1, *Methods for Analysis, Sediment Transport Modeling*, CCSB sediment trap efficiencies were modeled for existing conditions and the Proposed Project for 10-, 50-, 100-, and 200-year flow events of Lower Cache Creek near the City of Woodland (UC Davis 2016). Trap efficiencies for the CCSB were based on total load (bed and suspended load) entering the CCSB at County Road 102, and exiting the basin at the CCSB overflow weir for existing conditions. Trap efficiencies for the CCSB for the Proposed Project were based on total load entering the CCSB at County Road 102 and the proposed inlet weir west of the CCSB, and exiting the basin at the CCSB overflow weir. Modeling results from this study indicate that sediment trap efficiencies increase with flow event magnitude for both existing conditions and the Proposed Project, and that sediment trap efficiencies are higher under the Proposed Project than under existing conditions (see Section 3.1, Table 3.1-4). Trap efficiencies increase under the Proposed Project relative to existing conditions from 31 percent to 41 percent for the 10-year flow event, for example, and from 66 percent to 71 percent for the 200-year flow event. The authors of this study noted that the increase in trap efficiency of the CCSB with flow event magnitude may be due to the increase in larger grain size particles transported by such flows into the settling basin, and while these larger particles are transported in channel, they are deposited when flows overtop the channel levees or reach the CCSB. In addition, modeling results indicate that sediment loads to the Yolo Bypass under the Proposed Project for the 10-, 50-, 100-, and 200-year flow events are 88, 96, 84, and 103 percent of loads, respectively, under existing conditions.

Impacts on water quality that could result from construction activities were qualitatively evaluated based on construction designs and practices, construction-related materials and equipment, location of construction activities, and magnitude and duration of construction activities. Operation and maintenance effects on water quality were evaluated qualitatively based on the potential of the Proposed Project to significantly alter surface runoff patterns, increase the quantity of runoff, or generate additional sources of water pollutants (e.g., fuel, oil).

Impacts on groundwater recharge were qualitatively assessed by comparing existing sources of recharge to recharge potential following implementation of the Proposed Project.

3.2.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the Proposed Project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water or groundwater quality.

- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.
- In flood hazard, tsunami, or seiche zones, risk of release of pollutants as a result of project inundation.

Because the project area is located in the Sacramento Valley outside of the areas of the state at risk for tsunamis (as mapped by the California Department of Conservation), it would not be subject to tsunamis. Accordingly, the potential for water quality impacts from tsunamis is not discussed further in this analysis. In addition, the project area is protected from exposure to seiches by levees on both the east and west sides of the Yolo Bypass, which lies between the project area and the Sacramento River, as well as levees on the west side of the Sacramento River. These levees were designed and engineered to withstand seismic activity, including the potential for seiches (City of Woodland 2016). Therefore, the potential for water quality impacts from seiches is not discussed further in this analysis.

3.2.2.3 Impacts and Mitigation Measures

Impact WQ-1: Violation of water quality standards or waste discharge requirements or substantial degradation of surface water or groundwater quality (less than significant with mitigation)

Construction-related earth-disturbing activities, including clearing, grubbing and other site preparation activities, as well as degrading a portion of the CCSB west levee and training levee, would create the potential for increased erosion, runoff, and sedimentation. The increased erosion, runoff, and sedimentation could affect surface water quality in Lower Cache Creek and the CCSB, as well as the Yolo Bypass, which could be affected by CCSB outflow. During site excavation, grading, fill placement, and other construction activities, areas of bare soil would be subject to erosion during rainfall events. Although most construction activities would not occur during the rainy season and most ground-disturbing construction activities would not be near Lower Cache Creek, ground-disturbing activities within the CCSB could result in sediment-laden runoff with the first-flush storm event. In addition, construction activities associated with southern CCSB levee improvements could result in erosion and sediment runoff to the nearby existing drainage canal along the south side of the CCSB, which directs stormwater to Yolo Bypass and onto the Sacramento River. The use of bentonite slurry for the proposed cutoff wall on the existing southern CCSB levee could create the potential for accidental slurry spills and the subsequent introduction of bentonite in runoff to the existing drainage canal and into the Yolo Bypass.

Although construction of the Proposed Project would require fairly extensive excavation, the depth of excavation would not be great enough to directly impact groundwater quality given that the two main aquifers in the vicinity are at approximate depths of at least 200 feet.

In addition, topsoil stockpiled at borrow areas and staging areas, within and adjacent to the project footprint as depicted in Figure 2-1 and described in Chapter 2, Table 2-1, *Key Project Features,* and Section 2.3.3.4, *Levee and Drainage Channel Construction*, may be subject to erosion and subsequent sedimentation. The extent and magnitude of the impacts would be dependent on soil erosion potential, type of construction practice (e.g., excavation of the drainage channel versus installation of foundation piles for closure structures), extent of disturbed area, timing of precipitation events, and topography and proximity to existing drainage channels and surface water.

Heavy construction equipment (e.g., excavators, dump trucks, cement mixers) and activities involving the use of this equipment would have the potential to leak hazardous materials (e.g., engine oil, fuel, hydraulic fluid, concrete) or result in spills of fuel or related petroleum contaminants used in fueling and operation of construction equipment, potentially affecting surface water or groundwater quality. Improper storage, use or accidental spills of fuel, oil, and other construction-related hazardous materials such as concrete and bentonite, or pesticides or herbicides (used as part of operation and maintenance of levees) could also impact water quality if spills entered surface water or groundwater. These potential leaks or spills, if not contained, could impact groundwater and surface water quality.

Operation and maintenance activities such as maintenance of the levee road or slope maintenance, which would occur on an as-needed basis, could result in increases in erosion. However, given the temporary and periodic nature of this work, water quality impacts would not be expected.

As described in Chapter 2, Section 2.3.3.8, *Stormwater Pollution Prevention*, erosion and stormwater pollution control measures would be implemented during construction as part of a SWPPP, consistent with NPDES permit requirements to prevent the discharge of pollutants resulting from erosion and sediment migration from the construction, staging, and borrow areas. Once construction is complete, temporary facilities would be demobilized and construction sites would be stabilized. Restoration activities for areas disturbed by construction activities, including borrow areas, may include regrading, reseeding, constructing permanent diversion ditches using straw wattles and bales, and straw mulch and other measures deemed appropriate.

Hazardous materials spills during construction would be considered a significant impact. To minimize water quality impacts related to accidental spills during construction, the contractor would prepare and implement a hazardous materials spill prevention and containment plan, as described in Chapter 2. In addition, implementation of Mitigation Measure WQ-1 would minimize or avoid the potential for impacting water quality due to accidental spills or releases of bentonite during construction of the proposed cutoff wall on the existing southern CCSB levee. Further, the lead agency would ensure compliance with appropriate federal and state regulations, Yolo County general plan policies, and local ordinances. Therefore, this impact would be less than significant.

For the reasons discussed for Impact WQ-3, mercury/methylmercury loads out of the CCSB into the Yolo Bypass are not expected to increase. Therefore, the Proposed Project would not substantially degrade surface water.

Mitigation Measure WQ-1: Prepare and implement a Bentonite Slurry Spill Contingency Plan

Before cutoff wall construction begins and prior to establishing the onsite slurry batch plant, the lead agency will ensure the contractor will prepare and implement a Bentonite Slurry Spill Contingency Plan (BSSCP). If the contactor prepares the plan, it will be subject to approval by USACE and the lead agency before use of bentonite can begin. The BSSCP will include measures intended to minimize the potential for a fracture-out event (frac-out) associated with excavation 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 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).
- The Central Valley Water Board will be notified immediately of any spills and will be consulted regarding clean-up procedures. A Brady barrel will be on site and used if a frac-out occurs. Containment materials, such as straw bales, also will be on site prior to and during all operations, and a vacuum truck will be on retainer and available to be operational on site within 2 hours' notice. The site supervisor will take any necessary follow-up response actions. 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 a streambed, will be taken that potentially would 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.

Impact WQ-2: Substantial decrease in groundwater supplies or substantial interference with groundwater recharge such that the project may impede sustainable groundwater management of the basin (less than significant)

Implementation of the Proposed Project would not require the use of groundwater and, thus, would not substantially decrease groundwater supplies.

Construction of the Proposed Project would introduce new impervious surfaces to the project area, which could reduce rainwater infiltration and subsequent groundwater recharge. However, it is not expected that these surfaces would result in a substantial reduction in groundwater recharge given that the overall footprint of new impervious areas (i.e., concrete armoring of the railroad I-5 underpass; that elements associated with the closure structures, and the CCSB inlet weir) would be minimal; the major groundwater recharge areas for the subbasin in the vicinity of the Proposed Project are the Sacramento River and other nearby active stream channels in Yolo County; and that infiltration of precipitation is a relatively minor source of groundwater recharge in the area. Therefore, this impact would be less than significant.

Impact WQ-3: Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan (less than significant)

As described for Impact WQ-2, the Proposed Project would have a less-than-significant effect on groundwater in the subbasin. Consequently, the Proposed Project would not conflict with or obstruct implementation of a sustainable groundwater management plan.

Construction-related ground disturbances within the CCSB, as part of activities related to degradation of the training levee and the inlet weir, could contribute to erosion and the potential consequent reintroduction of mercury- and methylmercury-laden sediment to water in the CCSB. However, given the relatively limited temporal and spatial extent of construction proposed in this area and given that erosion control measures would be implemented as part of a SWPPP to limit or avoid the introduction of sediment to surface water, any potential water quality effect is expected to be localized and negligible, and would not increase overall mercury levels above existing conditions. Operation and maintenance activities, including removal of sediments from the proposed drainage channel and pesticide use (discussed under Impact WQ-1), would not have impacts on water quality such that a conflict with or obstruction of implementation of the Basin Plan results.

Implementation of the Proposed Project would not introduce mercury or methylmercury to Lower Cache Creek, i.e., the Proposed Project would not be a new source of mercury or methylmercury in the project area. In a flood event under existing conditions or Proposed Project conditions, all creek flow exceeding the capacity of the Cache Creek levee system (30,000 cfs or less in some areas [see Section 3.1.1 in Section 3.1, *Hydrology*]) may result in failure or overtopping of creek levees and overflow onto adjacent land because there would be no difference in the frequency or occurrence of potential flooding between existing conditions and Proposed Project conditions. This overflow results in some sediment transport from Cache Creek onto the floodplain, and therefore potentially mercury, deposition onto surrounding farmland under both existing conditions and Proposed Project conditions. Cache Creek sediment would also be conveyed directly to the CCSB, as would also occur under existing conditions. However, in 100- and 200-year flood events under the Proposed Project, flood flows would overtop the proposed inlet weir and move into the CCSB, thereby introducing additional sediment to the CCSB. Additional sediment loading to the CCSB could result in a reduction in the CCSB trap efficiency, which could ultimately result in greater loads of mercury entering the Yolo Bypass from the CCSB. However, as discussed in Section 3.2.2.1, *Methods for Analysis*, the UC Davis sediment trap efficiency study determined that CCSB sediment trap efficiency not only increased with flow event magnitude under the Proposed Project, but that sediment trap efficiency would be greater under the Proposed Project relative to existing conditions. Although mercury can exist in the water column, mercury is generally bound to suspended particulate matter and sediment. Therefore, it is reasonable to assume that there would not be a substantial increase in mercury entering the Yolo Bypass from the CCSB during flood events under the Proposed Project because the sediment trap efficiency would greater. Although the modeling results for a 200-year flood event under the Proposed Project indicated that approximately 7.5 percent of the total sediment load would enter the Yolo Bypass, this is a 0.2 percent increase relative to the modeled current condition sediment load and is not considered substantial. Under all other modeled flood events, results indicated that the sediment load to Yolo Bypass under the Proposed Project would be reduced relative to the modeled existing conditions.

As discussed in Section 3.1, the duration of flooding in the project area upstream and downstream of State Route (SR) 113 would be shorter under the Proposed Project relative to existing conditions for 100-year flood events. However, relative to existing conditions, there would be areas (north of County Road 18C and east of County Road 102) that would be flooded for longer, and there may be locations that currently do not flood that would experience flooding. In mercury-contaminated watersheds, methylmercury production has been shown to be driven by flood events that infrequently inundate areas adjacent to stream channels (Balogh et al. 2006 in Singer et al. 2016). In addition, generally, the potential for methylmercury production would be expected to increase with flood inundation duration (Singer et al. 2016). Therefore, it is reasonable to assume that under the Proposed Project, in those inundated areas that could be flooded longer than under existing conditions in a flood event, the potential for mercury methylation would be higher relative to existing conditions, particularly in areas where modeled floodwater velocities are substantially reduced relative to existing conditions (see Section 3.1). Reductions in floodflow velocity in areas could result in localized increases in deposition of fine sediment, including mercury-laden sediment from Cache Creek. If there were an increase in methylmercury production on the floodplain during inundation in flood events, some proportion of this could then drain back into Lower Cache Creek on the falling limb of the hydrograph, which would contribute to the existing methylmercury load in the creek. However, variables other than flood duration would influence the potential for mercury methylation on the floodplain, as discussed in Section 3.2.1, and, therefore, to what extent there may be an increase in methylmercury production in infrequent, large flood events (e.g., 100-year events) in areas north of the proposed levee that may be inundated longer is not known. Further, under the Proposed Project in a 100-year flood event, a relatively large area south of the CCSB southern levee extending to the west levee of Yolo Bypass would be removed from the floodplain, which would otherwise be inundated under existing conditions (see Figure 3.2-1). Thus, implementation of the Proposed Project would essentially remove the potential for methylmercury production in this area in a 100-year flood event by protecting it from inundation. Accordingly, it is unlikely that there would be an overall increase in methylmercury production in the study area under the Proposed Project relative to existing conditions.

Therefore, the Proposed Project would not affect beneficial uses and, thus, would not conflict with or obstruct implementation of the Basin Plan. Accordingly, this impact would be less than significant.

Impact WQ-4: In flood hazard zones, risk of release of pollutants as a result of project inundation (less than significant)

Much of the project area is currently in a flood hazard zone (see Figure 3.1-1). Implementation of the structural flood risk reduction features of the Proposed Project would increase the 100-year flood depth at existing structures north of the City of Woodland and the proposed levee east of SR 113, as described in Section 3.1, *Hydrology*. In flood events in general, particularly major events, surface water and groundwater quality can be impacted. In the project area, flooding could upset and spread stored hazardous materials from inundated vehicles, homes, industrial facilities, agricultural operations, businesses, and equipment, and result in the flushing of existing pesticides and other soil contaminants into surface water and groundwater. Overland flow of flood waters would also result in erosion, turbidity and sedimentation. In addition, sewage facilities could fail, resulting in floodwaters contaminated by human and animal waste and potentially pathogens. However, the Proposed Project would increase flood protection for Woodland relative to existing conditions. For the area immediately west of SR 113, flood depth would decrease relative to existing conditions. This increase in flood protection for Woodland and the area immediately west of SR 113 would eliminate the risk of pollutants that could potentially be released in a flood event. In other words, any existing stored hazardous materials, sewage facilities, or other facilities, which are in great concentration in the city and this area, would no longer be at risk of upset during a flood. The small number of businesses and homes located in the remaining flood hazard area and the potential risk of upset associated with them would be negligible when compared with the elimination of risk within the city and the other area. Furthermore, non-structural measures that would be implemented under the Proposed Project would include floodproofing structures, including homes, as well as agricultural, commercial, and industrial structures. These measures would reduce the risk of the release of stored hazardous chemicals, for example, into floodwaters. This impact would be less than significant.

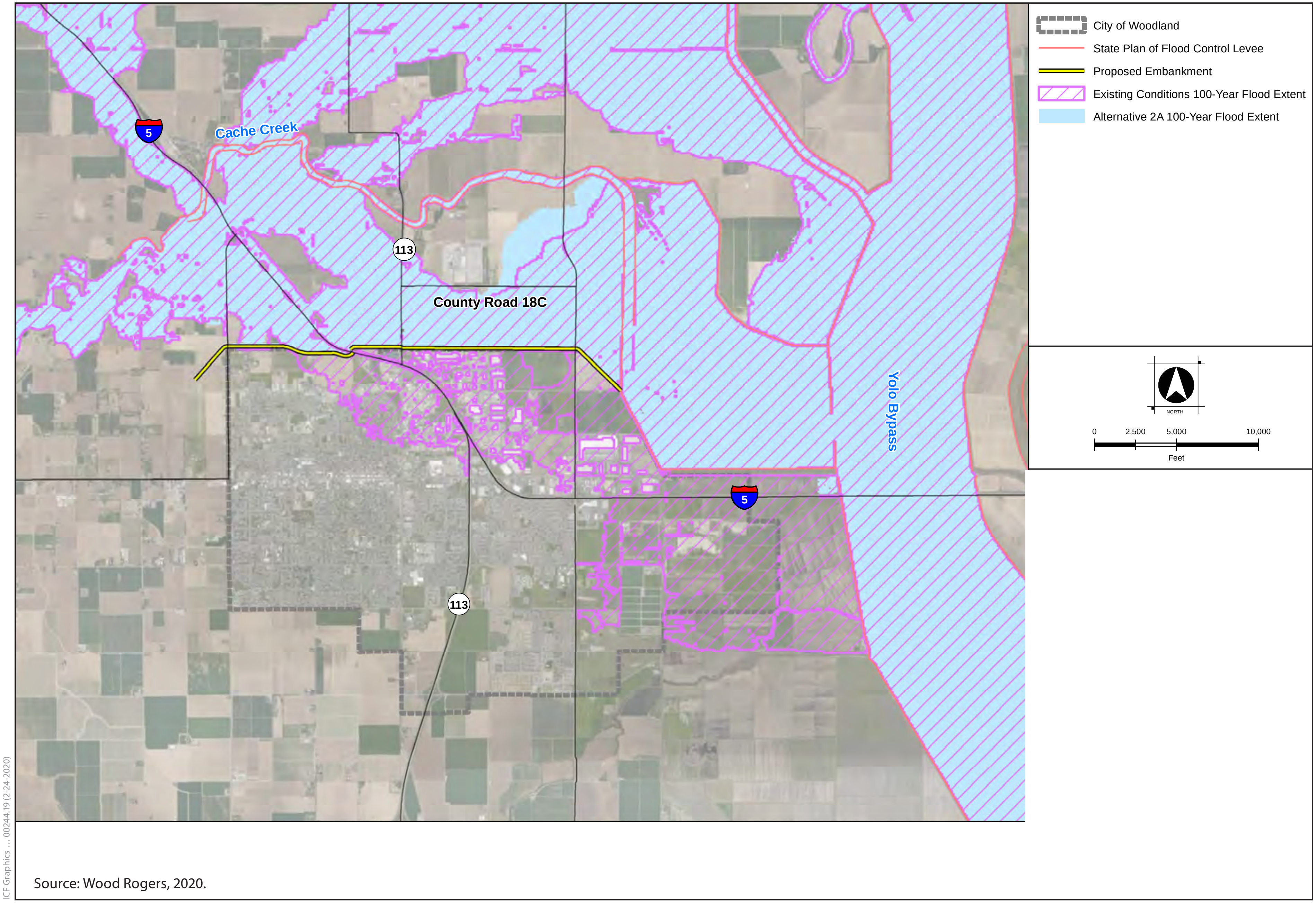


Figure 3.2-1
100-Year Flood Extent Map

3.3 Geology, Soils, and Paleontological and Mineral Resources

This section describes the regulatory and environmental setting for geology, soils, and paleontological and mineral resources in the project area, analyzes effects related to these resources that would result from implementation of the Proposed Project, and provides mitigation measures to reduce the effects of any potentially significant impacts. Information presented in the discussion and used for the subsequent analysis was drawn primarily from the following sources.

- *Preliminary Borrow Site Investigation Data Report, Phase 2, Lower Cache Creek Feasibility Study* (AECOM 2016).
- *Mineral Land Classification: Portland Cement Concrete-Grade Aggregate in the Sacramento-Fairfield Production-Consumption Region* (Dupras 1988).
- *Custom Soil Resource Report for Yolo County* (Natural Resources Conservation Service 2019).
- Quaternary fault and fold database for the United States (U.S. Geological Survey 2006).
- Advanced records search for fossils recovered from the Riverbank and Modesto Formations (University of California Museum of Paleontology 2019a, 2019b).
- Geologic Map of the Sacramento Quadrangle, California, 1:250,000 (Wagner et al. 1981).

3.3.1 Existing Conditions

3.3.1.1 Regulatory Setting

This section summarizes key federal, state, and local or regional regulations, laws, and policies relevant to geology, soils, and paleontological and mineral resources in the project area.

Geology and Soils

Federal

Clean Water Act Section 402 (National Pollutant Discharge Elimination System Program)

The Clean Water Act (CWA) is discussed in detail in Section 3.2, *Water Quality*. However, because CWA Section 402 is directly relevant to grading activities, additional information is provided here.

CWA Section 402 mandates that certain types of construction activities comply with the requirements of the U.S. Environmental Protection Agency's (USEPA's) National Pollutant Discharge Elimination System (NPDES) program. USEPA has delegated to the State Water Board the authority for the NPDES program in California, where it is implemented by the state's nine Regional Water Quality Control Boards. Construction activity disturbing 1 acre or more must obtain coverage under the state's General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order 2009-0009-DWQ, as amended by 2010-0014-DWQ and 2012-006-DWQ). USEPA has delegated responsibility for CWA implementation to the State Water Quality Control Board (State Water Board) (*Construction Activities Storm Water Construction General Permit*

[Order 2009-0009-DWQ, as amended by 2010-0014-DWQ and 2012-006-DWQ] in Section 3.1.1.1, *Regulatory Setting, Federal*).

U.S. Army Corps of Engineers Levee Design Criteria

All levees included in the project area are federally authorized and fall within the jurisdiction of the U.S. Army Corps of Engineers (USACE). USACE technical criteria (as described in Section 3.1, *Hydrology*) would be used for construction of new levees as guidance unless noted otherwise. These criteria apply to levee stability, standards for design, guidelines for geotechnical investigations, quality management, and vegetation planting and management.

Federal Emergency Management Agency Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures

The Federal Emergency Management Agency (FEMA) has published engineering principles and practices for retrofitting flood-prone residential structures (Federal Emergency Management Agency 2012). The document summarizes the regulatory environment that governs such retrofits and describes requirements for general design practices, dry floodproofing, and floodwalls and levees. These include considerations for hazard assessment, sealants and shields, drainage collection systems, pressure relief, and structure elevation; descriptions of types of floodwalls and floodwall construction; and level design criteria and construction.

State

Alquist-Priolo Act

California's Alquist-Priolo Act (Public Resources Code [PRC] Section 2621 et seq.), originally enacted in 1972 as the Alquist-Priolo Special Studies Zones Act and renamed in 1994, is intended to reduce risks to life and property from surface fault rupture during earthquakes. The Alquist-Priolo Act prohibits the location of most types of structures intended for human occupancy[1] across the traces of active faults and strictly regulates construction in the corridors along active faults (earthquake fault zones). It also defines criteria for identifying active faults, giving legal weight to terms such as "active," and establishes a process for reviewing building proposals in and adjacent to earthquake fault zones.

Under the Alquist-Priolo Act, faults are zoned, and construction along or across them is strictly regulated if they are "sufficiently active" and "well defined." A fault is considered sufficiently active if one or more of its segments or strands shows evidence of surface displacement during Holocene time (defined for purposes of the act as referring to approximately the last 11,000 years). A fault is considered well defined if its trace can be identified clearly by a trained geologist at the ground surface, or in the shallow subsurface using standard professional techniques, criteria, and judgment (Bryant and Hart 2007).

Seismic Hazards Mapping Act of 1990

Like the Alquist-Priolo Act, the Seismic Hazards Mapping Act of 1990 (PRC Sections 2690–2699.6) is intended to reduce damage resulting from earthquakes. While the Alquist-Priolo Act addresses

[1] With reference to the Alquist-Priolo Act, a "structure for human occupancy" is defined as one "used or intended for supporting or sheltering any use or occupancy, which is expected to have a human occupancy rate of more than 2,000 person-hours per year" (California Code of Regulations, Title 14, Div. 2, Section 3601[e]).

surface fault rupture, the Seismic Hazards Mapping Act addresses other earthquake-related hazards, including strong ground shaking, liquefaction, and seismically induced landslides. Its provisions are similar in concept to those of the Alquist-Priolo Act—the state is charged with identifying and mapping areas at risk of strong ground shaking, liquefaction, landslides, and other corollary hazards; and cities and counties are required to regulate development within mapped seismic hazard zones.

Under the Seismic Hazards Mapping Act, permit review is the primary mechanism for local regulation of development. Specifically, cities and counties are prohibited from issuing development permits for sites within seismic hazard zones until appropriate site-specific geologic and/or geotechnical investigations have been carried out and measures to reduce potential damage have been incorporated into the development plans. Geotechnical investigations conducted within Seismic Hazard Zones must incorporate standards specified by California Geological Survey Special Publication 117a, Guidelines for Evaluating and Mitigating Seismic Hazards (California Geological Survey 2019).

Central Valley Flood Protection Plan

The Central Valley Flood Protection Board (CVFPB), which administers the Central Valley Flood Protection Plan (CVFPP) (described in Section 3.1), is responsible for regulating construction in the floodplain. The CVFPP would need to issue an encroachment permit for the project and comply with the requirements of USACE.

Construction Activities Storm Water Construction General Permit (Order 2009-0009-DWQ, as amended by 2010-0014-DWQ and 2012-006-DWQ)

Dischargers whose projects disturb 1 or more acres of soil, or whose projects disturb less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acres, are required to obtain coverage under the General Permit Order 2009-0009-DWQ, as amended by 2010-0014-DWQ and 2012-006-DWQ. Construction activity subject to this permit includes clearing, grading, and disturbances to the ground such as stockpiling or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. As described in Chapter 2, *Project Description*, the Proposed Project would require a stormwater pollution prevention plan (SWPPP) and the development of best management practices (BMPs) to manage stormwater runoff.

California Building Standards Code

The State of California's minimum standards for structural design and construction are given in the California Building Standards Code (CBSC) (24 California Code of Regulations [CCR]). The CBSC is based on the International Building Code, which is used widely throughout United States (generally adopted on a state-by-state or district-by-district basis) and has been modified for California conditions with numerous, more detailed or more stringent regulations. The current CBSC as of January 1, 2020 is the 2019 California Building Standards Code.

The CBSC requires that "classification of the soil at each building site will be determined when required by the building official" and that "the classification will be based on observation and any necessary test of the materials disclosed by borings or excavations." In addition, the CBSC states that "the soil classification and design-bearing capacity will be shown on the (building) plans, unless the foundation conforms to specified requirements." The CBSC provides standards for various aspects of construction, including (i.e., not limited to) excavation, grading, and earthwork construction; fills and embankments; expansive soils; foundation investigations; and liquefaction potential and soil strength loss. In accordance with California law, certain aspects of the Proposed Project would be required to comply with all provisions of the CBSC. The CBSC requires extensive geotechnical analysis and engineering for grading, foundations, retaining walls, and other structures, including criteria for seismic design.

Local agencies must ensure that development in their jurisdictions comply with guidelines contained in the CBSC. Cities and counties can, however, adopt building standards beyond those provided in the code.

Department of Water Resources Urban Levee Design Criteria

Pursuant to SB 5 (Government Code (GC) §65007(l)), the Urban Levee Design Criteria (ULDC) define the urban level of flood protection as the level of protection that is necessary to withstand flooding that has a 1-in-200 chance of occurring in any given year using criteria consistent with, or developed by, the California Department of Water Resources (DWR).

The ULDC provide criteria and guidance for design, construction, operation, and maintenance of levees and floodwalls in urban and urbanizing areas (California Department of Water Resources 2012). The ULDC are described in more detail in Section 3.1.

Local

Yolo County

Yolo County General Plan

The *Health and Safety Element* of the Yolo County *2030 Countywide General Plan* (Yolo County 2009a:HS-11–HS-12) contains goals, policies, and actions related to geologic, soils, and seismic hazards.

> **Goal HS-1 Geologic Hazards:** protect the public and reduce damage to property from earthquakes and other geologic hazards.
>
> > **Policy HS-1.2:** All development and construction proposals shall be reviewed by the County to ensure conformance to applicable building standards.
> >
> > **Policy HS-1.3:** Require environmental documents prepared in connection with CEQA to address seismic safety issues and to provide adequate mitigation for existing and potential hazards identified.

County Design and Improvement Standards Manual

County of Yolo Improvement Standards (County Improvement Standards) (2008:2-1) states that all improvements other than minor work require submittal of complete plans for a range of applications, including earthwork and erosion control, to the Department of Planning and Public Works for approval.

County Improvement Standards (2008:2-2) also requires that engineering works requiring County approval or permits must submit a geotechnical investigation with initial plan submittals. The geotechnical investigation must describe subsurface condition, soil bearing capacity, groundwater levels, soil drainage characteristics, and soil erodibility characteristics; and it must contain recommendations for earth grading and compaction, road structural design, boring logs, soil corrosivity, and groundwater, as required to meet project needs and conditions. Additional information may be required by the Chief Building Official.

In addition, County Improvement Standards (2008:11-1–11-19) provides requirements for controlling erosion and sediment release. These include construction site BMPs, specifications for an erosion and sediment control plan, preservation of existing vegetation, hydroseeding, and use of a range of sediment control techniques, as well as post-construction best practices such as protecting slopes and channels.

County Drainage Manual

The *Yolo County Drainage Manual* (2010) provides storm drainage criteria and standards, including considerations for levee construction (Vol 1, 17) and BMPs for source control (Vol 2, 7-17), runoff reduction (Vol 2, 19-27), and treatment (Vol 2, 28-48).

County Code of Ordinances

Yolo County Code (Sec. 7-1.02 [a]) states that Yolo County has adopted the 2013 edition of the CBSC, Volume 1 and 2, incorporating the 2012 edition of the International Building Code.

City of Woodland

City of Woodland General Plan

The *Safety Element* of the *City of Woodland General Plan 2035* contains goals and policies related to geologic, soils, and seismic hazards (City of Woodland 2017a:SE 8-58).

Goal 8.A Seismic and Geologic Hazards: Minimize the loss of life, injury, and property damage due to seismic and geologic hazards.

Policy 8.A.2 Geologic-Seismic Analysis: Require the preparation of a soils engineering and geologic-seismic analysis prior to permitting development in areas prone to geological or seismic hazards (i.e., groundshaking, liquefaction, expansive soils).

Policy 8.A.3 Expansive Soils: Evaluate and avoid siting of structures across soil materials of substantially different expansive properties. Require appropriate design specification including special slabs where foundations are in areas of expansive soils.

Engineering Standards: Design Standards, Standard Details, and Construction Specifications

City of Woodland Engineering Standards (2016) describes requirements for design and construction. It describes storm drainage system and design, including levees (1-47–1-71); grading and erosion control design (1-145–1-148); and general construction requirements (3-3–3-11), among other engineering standards.

Storm Drainage Facilities Master Plan

The City maintains two Storm Drainage Facilities Master Plans (SDFMPs) for the planning and implementation of improvements to stormwater infrastructure within the City. Please see Section 3.1.1.1, *Regulatory Setting*, in Section 3.1, *Hydrology*, for more information on the SDFMPs.

Municipal Code

The City of Woodland has adopted the 2019 edition of the CBSC, which incorporates and amends the 2015 edition of the International Building Code (15.04.010). Amendments to the CBSC are described in 15.04.030.

Mineral Resources

Federal

No federal regulations related to mineral resources apply to the project because there are no federally owned lands in the project area.

State

California Surface Mining and Reclamation Act of 1975

The principal legislation addressing mineral resources in California is the Surface Mining and Reclamation Act of 1975 (SMARA) (PRC Sections 2710–2719), which was enacted in response to land use conflicts between urban growth and essential mineral production.

SMARA provides for the evaluation of an area's mineral resources using a system of mineral resource zone (MRZ) classifications that reflect the known or inferred presence and significance of a given mineral resource. The MRZ classifications are based on available geologic information, including geologic mapping and other information on surface exposures, drilling records, and mine data, and on socioeconomic factors such as market conditions and urban development patterns. The MRZ classifications are defined as follows.

- MRZ-1—areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.
- MRZ-2—areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood for their presence exists.
- MRZ-3—areas containing mineral deposits, the significance of which cannot be evaluated from available data.
- MRZ-4—areas where available information is inadequate for assignment into any other MRZ.

Although the State of California is responsible for identifying areas containing mineral resources, the county or city is responsible for SMARA implementation and enforcement by providing annual mining inspection reports and coordinating with the California Geological Survey.

Local

Yolo County

2030 Countywide General Plan

The Yolo County *2030 Countywide General Plan* Conservation and Open Space Element (Yolo County 2009b:CO-46–CO-49) contains goals, policies, and actions related to mineral resource protection.

> **Goal CO-2 Mineral Resources:** Protect mineral and natural gas resources to allow for their continued use in the economy.

Policy CO-3.1: Encourage the production and conservation of mineral resources, balanced by the consideration of important social values, including recreation, water, wildlife, agriculture, aesthetics, flood control, and other environmental factors.

Cache Creek Area Plan

Yolo County has several plans and policies in places related to Cache Creek and mining. These include *Cache Creek Area Plan*, *Off-Channel Mining Plan*, and the *Cache Creek Resource Management Plan*. A very small area of the project area overlaps with the Cache Creek Area Plan; however, because the Proposed Project is a flooding infrastructure project and does not include any mining activities, these plans and policies are not discussed further.

Yolo County Code

Yolo County Code (Sec. 10-3) implements the Cache Creek Area Plan. It is known as the Cache Creek Area Plan In-Channel Maintenance Mining Ordinance of Yolo County. It is enacted pursuant to SMARA of 1975 and Chapter 9 of Division 2 of the Public Resources Code, commencing with Section 2710.

Sec. 8-2.903(d) defines the Sand and Gravel and Gravel Reserve Overlay zones. These zones correspond to State-designated MRZ-2 containing critical mineral deposits needed for economic use. No MRZ-2 or mineral overlay zones occur in the project area.

City of Woodland

General Plan, Sustainability, Conservation, and Open Space Element

The City of Woodland Sustainability, Conservation, and Open Space Element contains goals and policies related to mineral resources (City of Woodland 2017b:CO 7-45).

Goal 7.D Protect Mineral Resources: Cooperate with regional agencies to protect significant mineral resources in the Planning Area that may be identified in the future.

Policy 7.D.1 Natural Gas: Encourage the County to consider compatibility with land uses planned in the City's General Plan when considering applications for natural gas wells within the Planning Area.

Policy 7.D.2 Plan After Discovery: If previously unknown important mineral resources are discovered in the Planning Area, work with Yolo County and appropriate state agencies to determine a course of action to protect and sustainably manage the resources, consistent with land uses planned in the City's General Plan.

Paleontological Resources

Federal

No federal regulations related to mineral resources apply to the project because there are no federally owned lands in the project area.

State

California Environmental Quality Act and California Environmental Quality Act Guidelines for Protection of Paleontological Resources

CEQA does not define what constitutes a unique paleontological resource or site. Section 21083.2 defines "unique archaeological resources" as "any archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria.

- Contains information needed to answer important scientific research questions and show that there is a demonstrable public interest in that information.
- Exhibits a special and particular quality, such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.

This definition is equally applicable to recognizing a unique paleontological resource or site.

California Public Resources Code (Cal. Public Res. Code Section 5097.5)

This section of the Public Resources Code protects artifacts at paleontological sites, including fossilized footprints, which are situated on public lands, except with the permission of the public agency with jurisdiction over the lands. "Public lands" is defined as lands owned by the state, any city, county, district, authority, or public corporation.[2] Disturbing paleontological resources on public lands under this section of the Public Resources Code is a misdemeanor.

Local

Yolo County

2030 Countywide General Plan

The Yolo County *2030 Countywide General Plan* Conservation and Open Space Element contains goals and policies related to paleontological resources (Yolo County 2009b:CO-55–CO-60).

Goal CO-4 Cultural Resources: Preserve and protect cultural resources within the County.

Policy CO-4.1: Identify and safeguard important cultural resources.[3]

Yolo County Code

Yolo County Code (Section 10-3.404[a-b]) specifies that, if paleontological resources are encountered during excavation, then all work within 75 feet must immediately stop and the County Administrator or designee chosen by the Administrator must be notified immediately. Damaging effects must be avoided whenever possible. In the case that avoidance is not feasible, the importance of the site must be evaluated by a qualified professional. If avoidance of an important resource is not feasible, a mitigation plan must be prepared and implemented. The plan must explain the

[2] Lands within the existing rail right-of-way (ROW) and acquired for rail ROW fall within the definition of public lands used for this section of the Public Resources Code.

[3] The Conservation and Open Space Element includes paleontological resources under cultural resources.

importance of the resource, describe the proposed approach to mitigate destruction or damage to the site, and demonstrate how the proposed mitigation would serve the public interest.

City of Woodland

General Plan 2035

The City of Woodland *General Plan 2035* Sustainability, Conservation, and Open Space Element contains goals and policies related to paleontological resources (City of Woodland 2017:CO 7-45).

Goal 7.E Preserve Prehistoric, Cultural, and Archaeological Resources: Preserve and protect areas and sites of prehistoric, cultural, and archaeological significance.

Policy 7.E.1 Potentially Significant Sites: Ensure that development avoids potential impacts to sites determined to be archeologically, paleontologically, or culturally significant.

Policy 7.E.2 Discovery of Resources: If cultural, archaeological, or paleontological resources are discovered during construction, ensure their evaluation and protection, as appropriate, in accordance with applicable Federal and State laws and regulations.

3.3.1.2 Environmental Setting

This section discusses the environmental setting relevant to geology, soils, and paleontological and mineral resources in the project area.

Geographic Location and Regional Geomorphic Setting

The project area falls within the north–central portion of the Great Valley Geomorphic Province (California Geological Survey 2002:2). The Great Valley is an alluvial plain in the central part of California, approximately 50 miles wide and 400 miles long. The northern portion of the Great Valley encompasses the Sacramento Valley, drained by the Sacramento River. Sediments have been deposited in this trough almost continuously since the Jurassic period about 160 million years ago.

Most of what is now California was formed by accretion and deformation of marine sediments and volcanic rocks carried from the west on an oceanic crustal plate and scraped off as the plate was subducted under the western edge of the North American continental plate. Rocks formed and altered by these processes range in age from about 205 million to 65 million years and are known as the Franciscan Complex. These rocks form the basement below the sequence of sedimentary deposits that underlie the project area.

Geologic Setting and Site Geology

The Cache Creek watershed drains 1,150 square miles on the eastern slope of the northern portion of the Coast Ranges in Lake County, Colusa County, and Yolo County (Central Valley Regional Water Quality Control Board 2002:III-17). The project area is in the eastern portion of the watershed where the creek drains into Yolo Bypass.

The geologic units underlying the project area are Quaternary alluvium and Quaternary Modesto-Riverbank Formation, which in turn consists of Modesto Formation and Riverbank Formation (Wagner et al. 1981; California Department of Water Resources 2014:41-43). These geologic units are described below from oldest to youngest.

Riverbank Formation: The Riverbank Formation is Pleistocene in age (0.13 million years ago to 0.45 million years ago) (California Department of Water Resources 2014:41-42). It is exposed throughout the Sacramento Valley and extends discontinuously from Redding to Merced (Marchand and Allwardt 1981:35-36). The Riverbank Formation consists primarily of arkosic sediments, characterized by well sorted sand and silts with pebbly lenses. Its origin is the Sierra Nevada. The Riverbank Formation ranges in thickness from less than 1 foot to more than 200 feet, depending on location (California Department of Water Resources 2014:42).

Modesto Formation: The Modesto Formation is Pleistocene in age (0.14 to 0.42 million years ago) (California Department of Water Resources 2014:42-43). The Modesto Formation is widespread throughout the Sacramento Valley, extending from Redding to Merced (Marchand and Allwardt 1981:51-53). The Modesto Formation consists of primarily arkosic sediments, characterized by oxidized and weathered well-sorted sand and gravel that transitions to fine sand and silt. The origin of the materials is primarily the Sierra Nevada. Locally derived material, such as andesite or metamorphic rock, also appears in the Modesto Formation. The Modesto Formation ranges in thickness from 10 to 200 feet, depending on location (California Department of Water Resources 2014:43).

Holocene Alluvium: This surficial alluvium overlies the Riverbank and Modesto Formations (California Department of Water Resources 2014:44). The alluvium consists of unweathered gravel, sand, and silt that has been transported and deposited by modern waterways that drain the Coast Ranges, Klamath Mountains, Cascade Range, and Sierra Nevada. Holocene alluvium is generally thin (Marchand and Allwardt 1981:61) but can range up to more than 30 feet thick, depending on location (California Department of Water Resources 2014:44).

Seismic Setting

Several faults are in the project vicinity. The Dunnigan Hills fault is approximately 5 miles northwest of the project area and is considered active due to activity during the Holocene epoch (last 10,000 years) (California Geological Survey 2010; U.S. Geological Survey 2006; Yolo County 2009a:HS-5–HS-7). The Hunting Creek fault is in the northwestern portion of Yolo County approximately 23 miles west of the project area, and is both considered active and subject to surface fault rupture (California Geological Survey 2010; U.S. Geological Survey 2006; Yolo County 2009a:HS-5–HS-7). Other faults in the region, including the Capay fault, Sweitzer fault, and East Valley fault, are considered inactive. Major faults in the San Francisco Bay Region and in the Sierra Nevada foothills could also affect the project area.

Primary Seismic Hazards

Primary seismic hazards are surface fault rupture and ground shaking.

Surface Fault Rupture

Surface fault rupture is an offset of the ground surface when a fault rupture extends to the ground surface. Structures that are built atop a fault are at risk of being damaged, potentially seriously, in case of surface fault rupture. The purpose of the Alquist-Priolo Act is to regulate development near active faults to mitigate the hazard of surface rupture. Faults in an Alquist-Priolo Earthquake Fault Zone are typically active faults. As defined under the Alquist-Priolo Act, an "active fault"[4] is one that

[4] Two types of active faults are recognized—active faults along which historic (last 200 years) displacement has occurred, and active faults exhibiting Holocene fault displacement (during past 11,700 years) without historic record.

has had surface displacement within the Holocene epoch (the last 11,000 years); a "late Quaternary" fault is a fault that has undergone displacement during the past 700,000 years; a "Quaternary" fault (age undifferentiated) is one that has had surface displacement at some point during Quaternary time (the last 1.6 million years); and a "pre-Quaternary" fault is one that has had surface displacement before the Quaternary period.

The project area is not identified as being located in an Alquist-Priolo Earthquake Fault Zone (Bryant and Hart 2007; California Geological Survey 2015). No known faults cross the project area (California Geological Survey 2010; U.S. Geological Survey 2006), so risk of surface fault rupture is minimal.

Seismic Ground Shaking

Severe ground shaking can damage structures, including levees, potentially leading to levee breach. The intensity of potential ground shaking at a particular location depends on distance from the earthquake, magnitude of the earthquake, duration of the earthquake, underlying sediments, and engineering characteristics of potentially affected structures. As a rule, the greater the energy released from the fault rupture (the earthquake magnitude) and the closer the fault rupture (epicenter) to the site, the greater the intensity of ground shaking. Geologic and soil units comprising unconsolidated, clay-free sands and silts can reach unstable conditions during ground shaking, which can result in extensive damage to structures built on such soils. When various earthquake scenarios are considered, ground-shaking intensities will reflect both the effects of strong ground accelerations and the consequences of ground failure.

Earthquake magnitude is generally expressed in the Richter Magnitude Scale or as moment magnitude. The scale used in the Richter Magnitude Scale is logarithmic so that each successively higher Richter magnitude reflects an increase in the energy of an earthquake of about 31.5 times. Moment magnitude is the estimation of an earthquake magnitude by using seismic moment, which is a measure of an earthquake size utilizing rock rigidity, amount of slip, and area of rupture. Earthquake energy is most intense at the fault epicenter; the farther an area from an earthquake epicenter, the less likely that ground shaking will occur there.

Ground shaking is described using two methods: ground acceleration as a fraction of the acceleration of gravity, expressed in units of "g," and the Modified Mercalli scale, which is a more descriptive method involving 12 levels of intensity denoted by Roman numerals. Modified Mercalli intensities range from I (shaking that is not felt) to XII (total damage).

Active faults in the project area as well as major regional faults in the San Francisco Bay Region and in the Sierra Nevada foothills could result in ground shaking. The probabilistic peak horizontal ground acceleration values for the project area are 0.25g (where g equals the acceleration of gravity) based on a probabilistic seismic hazard map that depicts the peak horizontal ground acceleration values exceeded at a 10 percent probability in 50 years (California Geological Survey 2019). As a point of comparison, probabilistic peak horizontal ground acceleration values for the San Francisco Bay Area range from 0.4g to more than 0.8g. Therefore, the ground-shaking hazard in the project area is low to moderate. Further supporting this estimate of a low to moderate hazard, a map showing earthquake shaking potential in California (Branum et al. 2016) shows that the project area has a moderately low risk of seismic groundshaking.

Secondary Seismic Hazards

Secondary seismic hazards include seismically induced liquefaction, lateral spreading and slope failure, landslide, and settlement. The project area has not been mapped for secondary hazards in accordance with the Seismic Hazards Mapping Act (California Geological Survey 2015). However, as stated above under *Primary Seismic Hazards*, the project area is potentially subject to seismic ground shaking from both local and major regional faults. This ground shaking could lead to secondary seismic hazards.

Liquefaction

Liquefaction is a phenomenon in which saturated granular sediments, such as sand and silt, temporarily lose their shear strength during periods of earthquake-induced strong ground shaking. The susceptibility of a site to liquefaction is a function of the depth, density, and water content of the granular sediments and the magnitude of earthquakes likely to affect the site. Saturated, unconsolidated silts, sands, silty sands, and gravels within 50 feet of the ground surface are most susceptible to liquefaction (California Geological Survey 2019). When a soil liquefies, it loses its ability to support structures and buried utilities. When the liquefaction event is over, settlement occurs, potentially resulting in differential settlement (see *Settlement* below).

As previously stated, the project area has not been mapped for liquefaction hazard. However, because the project area is subject to seismic activity, liquefaction could be a risk. The project area is underlain by shallow standing groundwater (City of Woodland 2017a:SE 8-10), so near-surface soils are most likely saturated in various locales. In addition, as discussed below under *Local Soils*, some of the soils underlying the project area are composed of sand (Natural Resources Conservation Service 2019). However, most of the soils underlying the project area are characterized by silt, clay, or loam (Table 3.3-1). Therefore, while some areas could be subject to liquefaction (City of Woodland 2017:SE 8-10), liquefaction is unlikely to be widespread.

Lateral Spreading and Slope Failure

Lateral spreading is the horizontal movement of relatively flat-lying sediment toward an open or "free" face such as a body of water, channel, or excavation (U.S. Geological Survey n.d.). Lateral spreading is one consequence of liquefaction. Because the project area includes free faces along waterbodies or channels as well as some soils that are potentially susceptible to liquefaction, some risk of lateral spreading exists alongside the proposed channel.

Landslide

In the south and eastern portions of Yolo County, where the project area is located, topography is relatively flat (Yolo County 2009a:HS-24). There is no risk of landslide.

Settlement

Settlement can result after seismic ground shaking, when sediments are consolidated as a result of shaking, particularly after liquefaction. Differential settlement" is when parts of a structure settle more or less deeply than other parts of the structure. Soils in the project area generally do not contain sand, and risk of seismic ground shaking and liquefaction is low to moderate, so risk of settlement and differential settlement in the project area is low.

Subsidence

Land subsidence is the lowering of land-surface elevation through the compression of subsurface sediments. Subsidence could damage or reduce the integrity of highways, levees, and irrigation canals. The primary hazards associated with subsidence include increased pressure on levees, increases in relative flood water depths and area, damage to underground utilities, and changes in gradients of storm water and sewage drainage systems, especially when flows are gravity driven.

Lower Cache Creek has experienced some land subsidence due to overdraft of the shallow groundwater layer (Yolo County 2009b:HS-8). Precise monitoring of subsidence has been conducted by the DWR through the 2017 GPS Survey of the Sacramento Valley Subsidence Network. Initiated in 2008, the 9-year comparative study found that Yolo County experienced between -0.3 and -1.1 feet of elevation change at several monitoring stations (California Department of Water Resources 2018:18).

Local Soils

Soils in the Project Area

Soils present in the project area are shown in Table 3.3-1. Soils include clay, clay loam, silty clay loam, silt loam, and sandy loam.

As Table 3.3-1 shows, soils in the project area are generally moderately susceptible to wind and water erosion, with ratings for water and wind erosion falling in the low end or middle of the respective scales. An issue of concern in the project area is the shrink-swell potential of several of the soil types. Soils with a moderate to high shrink-swell potential, also known as expansive soils, expand and contract with changes in moisture content and, therefore, do not provide a suitable substrate for construction without modification. As Table 3.3-1 shows, some soils in the project area are highly to very highly expansive when wetted and dried.

The Borrow Site Investigation Report (AECOM 2016:2) found that approximately 95 percent of the soils present in the project area can likely be used to construct the proposed embankment with proper engineering during design.

Table 3.3-1. Soil Types in the Project Area

Soil Map Symbol	Soil Name	Expansiveness[a]	Whole Soil Erodibility (K factor, whole soil)[b]	Wind Erodibility Group[c]
BrA	Brentwood silty clay loam, 0 to 2% slopes	High (7.5)	.37	6
Ca	Capay silty clay	High (8.9)	.28	4
Lg	Laugenour very fine sandy loam	Low (1.0)	.43	3
Lm	Loamy alluvial land	Low (0.9)	.15	5
Ma	Made land	No rating	No rating	No rating
Mb	Maria silt loam	Moderate (4.0)	.43	6
Md	Maria silt loam, deep	Moderate (4.8)	.43	6
Mo	Merritt silty clay loam, deep, drained	High (5.2)	.37	6
Ra	Reiff very fine sandy loam	Low (1.1)	.43	3
Sn	Soboba gravelly sandy loam	Low (0.2)	.10	5
Sp	Sycamore silt loam, drained	Low (2.6)	.43	6
St	Sycamore silty clay loam, drained	Moderate (4.0)	.37	6
Tc	Tyndall very fine sandy loam, drained	Low (1.5)	.43	3
Wb	Willows clay	Very high (13.2)	.17	4
Ya	Yolo silt loam	Moderate (3.2)	.43	6
Yb	Yolo silty clay loam	Moderate (3.4)	.43	6

Sources: SCS and Agricultural Experiment Station 1972; Natural Resources Conservation Service 2019.

[a] Low (0–3), Moderate (3–6), High (5–9), Very high (0=30).

[b] Ranges from 0.02 to 0.69; the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

[c] The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible.

Increased Risk of Erosion Following Wildfire

In July 2018, the Mendocino Complex Fire became the largest wildfire complex in California history, spanning 459,123 acres. The Ranch Fire itself burned 410,203 acres between July and September 2018. Wildfire frequency and intensity has been increasing over the last few decades due to climate change, drought, and forest pathogen outbreaks. Wildfires can change soils nutrient content, organic carbon content and the ability to hold and repel water. Wildfire-induced soil changes likely result in water quality impacts throughout the watershed. Rain events can readily transport exposed soil sediments to freshwater aquatic systems (Cawley et al. 2018:1315).

The absence of vegetative cover leaves soils vulnerable to erosion. Erodible soils resulting from the Mendocino Complex Fire entered the local watersheds starting the winter of 2018–2019 (U.S. Bureau of Land Management n.d.). Sediments likely entered Clear Lake, as the wildfire was only a few miles away, 2.5 miles at the nearest. It is possible newly deposited sediments from Clear Lake and the watershed entered into Cache Creek. These sediments would be trapped in the Cache Creek Settling Basin (CCSB), preventing any soils and potentially harmful contaminants from entering the Sacramento River and affecting water quality.

Paleontological Resources

As stated under *Geologic Setting and Site Geology*, geologic units in the project area at and near ground surface include the Modesto-Riverbank Formation, composed of the Riverbank Formation and Modesto Formation, and Quaternary levee and channel deposits. The Riverbank and Modesto Formations have yielded vertebrate fossils. Quaternary levee and channel deposits are likely also to contain and may have yielded vertebrate fossils.

Riverbank Formation: Vertebrate fossils documented from the Riverbank Formation include extinct mammals (mastodon, bison, wolf, coyote, horse, camel, and giant ground sloth), birds, reptiles (snake, turtle, and tortoise), and bony fish (University of California Museum of Paleontology 2019a; Hilton et al. 2000:7). This unit has high sensitivity for paleontological resources.[5]

Modesto Formation: Vertebrate fossils documented from the Modesto Formation include extinct mammals (giant ground sloth, mastodon, bison, and camel) and reptiles (University of California Museum of Paleontology 2019b). This unit has high sensitivity for paleontological resources.

Quaternary levee and channel deposits: Depending on age, Quaternary levee and channel deposits can also contain vertebrate fossils. Alluvium along and near Cache Creek dates from Mesozoic to Holocene age (Yolo County Community Development Agency 1995:3.2-4) and, therefore, has potential to contain vertebrate fossils. Records of three vertebrate fossils are reported from Woodland and Cache Creek in University of California Museum of Paleontology for Pleistocene and Pliocene sediments, all species of *Equus* or horse (University of California Museum of Paleontology 2019c). These fossils were likely recovered from Quaternary levee and channel deposits. This unit has high sensitivity for paleontological resources.

Mineral Resources

Yolo County contains two types of natural resources: natural gas and mined aggregate (Yolo County 2009b:CO-43).

Areas near Cache Creek contain sources of significant high-grade aggregate (Yolo County 2009b:CO-12, 1996:1). Mining within Cache Creek began at the beginning of the Twentieth Century, when sand and gravel were mined and shipped to San Francisco by rail for use in reconstruction after the city's 1906 earthquake (Yolo County 1996:1). With the post-World War II economic boom of the 1950s, the scale and intensity of aggregate mining began to increase to respond to the demand for materials to construct airports, schools, hospitals, highways, dams, and residential suburbs. The production of sand and gravel in Cache Creek has continued since that time, in response to economic growth of the Sacramento metropolitan region and California in general.

There are six off-channel mining operations (Teichert Schwarzgruber, Syar Industries, Teichert Woodland, Teichert Esparto, Granite Capay, and Cemex) that are permitted along Cache Creek (Miller 2018). The Teichert (Woodland) facility is near the project area.

East of the 95B Bridge at Teichert (Woodland) above Interstate (I-) 5, Yolo County reclaimed its old gravel extraction site previously used for county projects. The area was reclaimed as required in the original mining and reclamation plan. Teichert Materials has requested approval of a new 30-year Mining Permit and Reclamation Plan, currently undergoing environmental review (Teichert Aggregates 2019).

[5] Paleontological sensitivity was determined following methods outlined in 3.3.2.1, *Methods for Analysis*.

MRZs have been identified throughout California to indicate likelihood that mineral resources are present (Division of Mines and Geology DMG n.d.). The Cache Creek Resources Management Plan (Yolo County 2002) has identified several thousand acres for mineral extraction along Lower Cache Creek between the Capay Dam and the City of Yolo. The specific areas amenable to mineral extraction are identified in Special Report 156 (Dupras 1988). The project area lies within MRZ-3 (Dupras 1988:Plate 8 and Plate 9). MRZ-3 indicates that the area contains mineral deposits "that may qualify as mineral resources" (Yolo County 2009b:CO-45). Further exploration within these areas could yield further information that would result in reclassification to MRZ-2, areas where geologic units indicate the presence of mineral resources. However, the project does not currently lie within an MRZ-2 (Dupras 1988:Plate 8 and Plate 9), an area where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood for their presence exists (Yolo County 2009b:CO-45).

In addition, the project area does not lie within a Mineral Resource Overlay (MRO) zone as defined in the Yolo County General Plan Land Use and Community Character Element (Yolo County 2009z:LU-8). The MRO zone applies to State-designated MRZ-2 (Yolo County 2009c:LU-16).

The Woodland area falls within the Sacramento–Fairfield aggregate study area (California Geological Survey 2018a). The area has a reserve of 109 million tons in permitted facilities, equating to a reserve for projected demand over 21 to 30 years, or 37 percent of the projected demand over the next 50 years (California Geological Survey 2018b:5).

Natural gas fields are present along the Yolo Bypass and the Sacramento River, in the unincorporated area of Dunnigan Hills, at the foot of Capay Hills, and in the Clarksburg area. The eastern portion of the project area overlies a known natural gas field (Yolo County 2009b:CO-44). Depth to natural gas fields is typically thousands of feet (U.S. Energy Information Administration 2019).

3.3.2 Environmental Impacts

This section describes the environmental impacts associated with geology, soils, and paleontological and mineral resources that would result from implementation of the Proposed Project. It describes the methods used to determine the effects of the Proposed Project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts are provided.

3.3.2.1 Methods for Analysis

This evaluation of geology, soils, and paleontological, and mineral resources is based on professional standards and information cited throughout this section. The key effects were identified and evaluated based on the environmental characteristics of the project area and the magnitude, intensity, and duration of activities related to the construction and operation of this project.

The following assumptions were made regarding project effects on geology, seismicity, soils, and minerals in the project area.

- Fill or borrow material would be obtained from primarily from the project area, and additional fill or borrow material would be obtained from a quarry or other authorized (i.e., permitted) location.

- The City of Woodland would conform to the latest levee construction standards from USACE, CBSC standards, city and county standards for levee construction and stormwater drainage, and NPDES requirements.
- There are no active faults, potentially active faults, or Alquist-Priolo Earthquake Fault Zones located in or adjacent to the project area.
- No aggregate recovery sites (specifically, off-channel mining operations) are in or adjacent to the construction footprint.
- For mineral resources, it is important to note the difference between the terms "aggregate" and "borrow" as used in this report.
  - The term "aggregate" refers to sand and gravel or crushed stone that meets standard specifications for use in Portland cement concrete or asphalt concrete (Willets 2012:25).
  - The term "borrow" refers to the materials suitable for use in levee construction. The materials would conform to ASTM D 2487 standards as well as moisture content (ASTM D2216); shrinkage, plasticity, and liquid limits (Atterberg limits) (ASTM D4318) and grain size (ASTM D422 and D1411) (AECOM 2016:1-2). All borrow materials would be obtained from the project area.

Geology, Soils, and Seismicity

The evaluation of geologic, soils, and seismic hazards is based on professional standards and qualitative interpretation of geologic, soils, and seismic hazards and discussed throughout this document.

Paleontological Resources

The fossil-yielding potential of geologic units in a particular area depends on the geologic age and origin of the units, as well as on the processes they have undergone, both geologic and anthropogenic.[6] The methods used to analyze potential impacts on paleontological resources and to develop mitigation for the identified impacts involved the following steps.

- Identify the geologic units in the project area.
- Identify the geologic units that would be affected by the project, based on proposed maximum depth of excavation—either at ground surface or below ground surface, defined as at least 5 feet below ground surface.
- Evaluate the potential of the identified geologic units to contain significant fossils (their "paleontological sensitivity").
- Identify and evaluate impacts on paleontologically sensitive geologic units as a result of construction and operation activities that involve ground disturbance.
- Evaluate impact significance.
- According to the identified degree of sensitivity, formulate and implement measures to mitigate potential impacts.

[6] "Anthropogenic" means caused by human activity.

To identify the geologic units in the project area, the *Geologic Map of the Sacramento Quadrangle, California, 1:250,000* (Wagner et al. 1981) was consulted. To evaluate the paleontological sensitivity of the geologic units, first the University of California Museum of Paleontology database was searched for records of fossils in geologic units present in the project area (University of California Museum of Paleontology 2019a, 2019b, 2019c).

The paleontological sensitivity of the units was assessed using the Impact Mitigation Guidelines Revisions Committee of the Society of Vertebrate Paleontology's (SVP's) *Standard Guidelines* (Society of Vertebrate Paleontology 2010). The *Standard Guidelines* includes procedures for the investigation, collection, preservation, and cataloguing of fossil-bearing sites. The *Standard Guidelines* is widely accepted among paleontologists and is followed by most investigators. The *Standard Guidelines* identifies the two key phases of paleontological resource protection as (1) assessment and (2) implementation. Assessment involves identifying the potential for a project area or area to contain significant nonrenewable paleontological resources that could be damaged or destroyed by project excavation or construction. Implementation involves formulating and applying measures to reduce such adverse effects. The SVP defines the level of potential as one of four sensitivity categories for sedimentary rocks: High, Undetermined, Low, and No Potential (Society of Vertebrate Paleontology 2010:1-2).

- **High Potential.** Assigned to geologic units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered; and sedimentary rock units suitable for the preservation of fossils ("e.g., middle Holocene and older, fine-grained fluvial sandstones…fine-grained marine sandstones, etc."). Paleontological potential consists of the potential for yielding abundant fossils, a few significant fossils, or "recovered evidence for new and significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data."
- **Undetermined Potential.** Assigned to geologic units "for which little information is available concerning their paleontological content, geologic age, and depositional environment." In cases where no subsurface data already exist, paleontological potential can sometimes be assessed by subsurface site investigations.
- **Low Potential.** Field surveys or paleontological research may allow determination that a geologic unit has low potential for yielding significant fossils, e.g., basalt flows. Mitigation is generally not required to protect fossils.
- **No Potential.** Some geologic units have no potential to contain significant paleontological resources, such as high-grade metamorphic rocks (such as gneisses and schists) and plutonic igneous rocks (such as granites and diorites). Mitigation is not required.

Based on data from the University of California Museum of Paleontology database (2019a, 2019b, 2019c), each geologic unit in the project area was assigned a paleontological sensitivity according to SVP's *Standard Guidelines* as discussed in Section 3.3.1.2, under *Paleontological Resources*.

To identify and evaluate impacts on paleontologically sensitive geologic units as a result of project construction, depth of excavation in the project area was compared against geologic unit depth as reported in the literature (see *Geologic Setting and Site Geology*). If excavation would extend into a previously undisturbed geologic unit that has High or Undetermined Potential sensitivity for paleontological resources, a significant impact would result.

Mineral Resources

The project lies within the Sacramento–Fairfield aggregate study area, where approximately 109 million tons of aggregate in permitted facilities and the demand over the next 50 years is 295 million tons. The project would require approximately 82,000 tons of aggregate base and 40,000 tons of rock slope protection (riprap). If project construction requires mineral materials that would exhaust regional or local supply, the impact would be significant. In addition, the MRZs in the project area were identified by referring to the literature (Dupras 1988:Plate 8 and Plate 9). If the project would be constructed in an MRZ known to contain mineral resources (MRZ-2), a significant impact would result. If the project would be constructed in a zone where mineral resources might exist (MRZ-3) or where there is too little data to make the determination (MRZ-4), the impact would be less than significant. If the project would lie in a zone where adequate data indicate that no significant mineral deposits are present or that little likelihood exists for their presence (MRZ-1), there would be no impact.

3.3.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the Proposed Project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Potential substantial adverse effects, including the risk of loss, injury, or death involving: (1) rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault; (2) strong seismic ground shaking; (3) seismic-related ground failure, including liquefaction; or (4) landslides.
- Substantial soil erosion or the loss of topsoil.
- Placement of project-related facilities on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse.
- Placement of project-related facilities on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property.
- Placement of project facilities on soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater.
- Direct or indirect destruction of a unique paleontological resource or site or unique geologic feature.
- Loss of availability of a known mineral resource that would be of value to the region and residents of the state.
- Loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

As discussed in Section 3.3.1.2, *Environmental Setting,* under *Landslide*, the topography in the project area is relatively flat. There is no risk of landslide. Therefore, the thresholds pertaining to landslide risk do not apply to the Proposed Project, and this topic is not discussed further. In addition, as discussed in Section 3.3.1.2, *Subsidence,* the project area has experience slight subsidence due to groundwater overdraft; however, the Proposed Project would not change existing groundwater extraction rates or recharge rates, and this topic is not discussed further.

The Proposed Project does not include septic tanks or alternative wastewater disposal systems. Therefore, the threshold pertaining to placement of project facilities on soils incapable of adequately supporting the use of such systems does not apply to the Proposed Project, and this topic is not discussed further.

3.3.2.3 Impacts and Mitigation Measures

Impact GEO-1: Substantial adverse effects, including the risk of loss, injury, or death involving the risk of surface fault rupture (less than significant)

As discussed above under *Seismic Setting*, while the project area is located near active faults (Dunnigan Hills and Hunting Creek), the project area is not identified as being located in an Alquist-Priolo Earthquake Fault Zone, and no active faults have been mapped in the project area. In a seismically active area, unidentified faults can exist. While it is possible that an unidentified fault underlies the project area, it is unlikely because this is an area of low seismicity. Furthermore, the Proposed Project does not include any new buildings or features that would bring people to an area of potential risk thereby increasing their exposure to surface fault rupture. Therefore, there is little risk of surface fault rupture in the project area and the proposed project would not likely result in substantial adverse effects, including the risk of loss, injury, or death involving surface fault rupture. The impact is less than significant.

Impact GEO-2: Substantial adverse effects, including the risk of loss, injury, or death involving the risk of strong seismic ground shaking and associated ground failure (less than significant)

Although the risk of strong ground shaking in the project area is relatively low for California (as discussed under *Primary Seismic Hazards*), a large earthquake on a nearby fault could cause ground shaking in the project area that could result in levee deformation, liquefaction, or secondary ground failure, such as lateral spreading or differential settlement, which could in turn result in structural loss, injury, and death.

Project implementation would introduce a new levee, drainage channel, concrete box culverts, and weir to the project area, as well as new floodproofing features for existing structures in the project area. All of these project features would be subject to damage from seismic ground shaking.

The risk associated with deformation of the new levee would occur if a failure or overtopping event had already occurred on the Lower Cache Creek levee and water in the floodplain was in contact with the new levee. The potential for levee failure from ground shaking would depend on the degree of the levee saturation during an earthquake. High water levels and a high level of saturation would likely occur only during a major flood event. The probability that a large regional earthquake would occur during a major flood event is relatively low, but such coincidence is possible. However, USACE Levee Design Criteria (as described in Section 3.1) would ensure that the new embankment would be constructed using the most up-to date methods, which would decrease the risk of impacts associated with ground shaking and related ground failures. In addition, DWR Urban Levee Design Criteria (as described in Section 3.1) require that if seismic damage is expected after all 200-year flood rehabilitation measures are in place, a post-earthquake remediation plan would be required for quickly restoring the levee system to a 10-year level of protection. If seismic damage to the levee system would be so significant and widespread that this would be infeasible within a few months, seismic strengthening may be required for 200-year certification. Further, the project would comply with the City's engineering standards. These include storm drainage system and design and levee requirements. Through compliance with standards, impacts on levees would be less than significant.

Project implementation would introduce new concrete box culverts with a total width of approximately 200 feet. Seismic ground shaking and associated ground failure could, if the box culverts were not constructed to specifications, result in damage to or collapse of the culverts. However, construction would conform to requirements of the relevant owner/operator. Through compliance with standards, impacts on box culverts would be less than significant.

Project implementation would also introduce floodproofing for existing buildings. Any structural modifications would comply with the CBSC and general design practices and dry floodproofing described in FEMA's *Engineering Principles and Practices* document (Federal Emergency Management Agency 2012). Through compliance with standards, impacts on floodproofing structures would be less than significant.

Furthermore, the Proposed Project does not include any new buildings or features that would bring people to an area of potential risk thereby increasing their exposure to strong seismic ground shaking and associated ground failure.

Because of the relatively small likelihood of a large regional earthquake occurring when water levels are high in the floodplain, and because the expected magnitude of ground shaking from any such large regional earthquakes is relatively low in the project area, the potential for failure of or damage to the new levee and adjacent drainage channel would be less than significant.

Further, the project proposes improvements to existing levees, including degrading the CCSB training levee. These changes would not change the ability of the levees to withstand seismic activity. Because these changes would not introduce new structures that could be at risk of failure as a result of seismic ground shaking, the impact is less than significant.

Impact GEO-3: Accelerated erosion and sedimentation resulting from construction-related ground disturbance (less than significant)

The grading, trenching, stripping, clearing for a temporary slurry batch plant, and other earthwork that would be conducted during project construction, would result in substantial ground and vegetation disturbance. Ground disturbances would increase the hazard of erosion and could temporarily increase erosion and sedimentation rates above existing levels.

Site-specific measures that would control erosion would be described in more detail in the SWPPP, which is included in the project design, described in further detail in Chapter 2, Section 2.3.3.8, *Stormwater Pollution Prevention*. The SWPPP is a requirement of the NPDES General Permit. The SWPPP would include temporary control measures to prevent sediment migration from the construction, staging, and if needed, borrow areas. These measures may include earthen berms, diversion ditches, straw wattles, straw bales, silt fences, gravel filters, mulching, revegetation, and temporary covers as appropriate. In addition, most ground-disturbing activities would take place during the typical construction season, when conditions are generally dry, further reducing the potential for construction-related erosion.

With implementation of the SWPPP, erosion and sediment-related effects would be less than significant.

Impact GEO-4: Loss of topsoil (less than significant)

As discussed in Chapter 2, site preparation would include excavating approximately 6 to 12 inches of topsoil, which consists of organic material, from the land surface where the levee and drainage channel would be constructed and borrow materials would be excavated. As described in Chapter 2, Section 2.3.3.2, *Site Preparation*, the topsoil would be stripped from the soil before underlying soil is excavated and stockpiled at the borrow/staging areas. After levee construction is complete, the topsoil removed from the borrow areas, project footprint, and the maintenance corridor would be placed on the embankment slopes to promote vegetative growth. Subsequently, the levee slopes and other disturbed areas would be hydroseeded. Because the topsoil would be reused onsite, loss of topsoil is not anticipated. Floodproofing existing structures would not remove substantial topsoil. Dry floodproofing activities, such as installing shields or raising the structure, would not remove topsoil. The impact would be less than significant.

Impact GEO-5: Slope failure during levee wall, drainage channel, culvert installation, and floodwall construction (less than significant)

Construction of levees, the drainage canal, concrete box culverts, and floodwalls could result in result in slope failure before walls are compacted. Soils and sediments, especially those consisting of loose alluvium, would be particularly prone to failure and movement. However, the City of Woodland would ensure that geotechnical design recommendations are included in the design of project facilities and construction specifications to minimize the potential effects from slope failure. In addition, the City would comply with USACE requirements for levee construction, levee specifications in FEMA's *Engineering Principles and Practices* document, and the City's engineering standards. These include storm drainage system and design and levee requirements. The City would also ensure that the design specifications are properly executed and that all California Division of Occupational Safety and Health regulations are followed during construction.

Adherence to these and other applicable design specifications and standards would ensure that the hazard of slope failure would be controlled to a safe level. The impact would be less than significant.

Impact GEO-6: Structural damage and injury resulting from development on expansive soils (less than significant)

According to the Yolo County General Plan (Yolo County 2009a:HS-10) and the Natural Resources Conservation Service (2019), soils with moderate to high shrink-swell potential (soil expansiveness) occur in the project area, including the project footprint. If these soils occur in the project footprint, including underlying the new levee or box culverts, they could lead to levee instability, surface cracking, or damage or collapse of culverts.

In order to comply with USACE and DWR requirements (as described in Section 3.1), design specifications for the new levee would consider the characteristics of the materials proposed for levee construction. During final design, if expansive or weak soils are documented onsite for borrow materials or for the land on which the levee would be constructed, modifications to the levee specifications would be made. In addition, materials used to construct the new levee, whether local or imported, would be required to meet strict material specifications (AECOM 2016:1-2). Also, materials used to cap the levees would be required to have a low plasticity so that the material does not crack over time. The Proposed Project would further comply with the City's engineering standards, including storm drainage system and design and levee requirements.

If the new concrete box culverts were not constructed correctly, movement as a result of construction on expansive soils could damage the culverts, up to resulting in collapse. However, construction would conform to requirements of the relevant owner/operator. Through compliance with standards, impacts on box culverts would be less than significant.

In addition, floodproofing existing structures could involve structural modifications. Any structural changes would comply with CBSC and general design practices and dry floodproofing described in FEMA's *Engineering Principles and Practices* document (Federal Emergency Management Agency 2012). I The effect of expansive soils would, therefore, be less than significant.

Impact GEO-7: Damage to paleontological resources as a result of project construction (less than significant with mitigation)

As discussed in Section 3.3.1.2 under *Paleontological Resources*, one geologic unit in the project area, the Riverbank-Modesto Formation, is known to have yielded vertebrate fossils. This geologic unit is considered to have high paleontological sensitivity. The other geologic unit in the project area, Quaternary levee and channel deposits, is likely to contain and may have yielded vertebrate fossils. This geologic unit is considered to have high paleontological sensitivity. Because both units are exposed at or near ground surface, excavation for the drainage channel to a depth of 5 feet, the inspection channel to a depth of 6 feet, and the cutoff wall to a depth of 60 feet could encounter vertebrate fossils. Because of the potential to destroy fossils that exist in these sediments, the impact would be significant. Implementation of Mitigation Measure GEO-1 would reduce this impact to a less-than-significant level by providing oversight by a qualified paleontologist, training construction personnel, and having measures in place to mitigate unearthing of paleontological resources.

Mitigation Measure GEO-1: Monitor for discovery of paleontological resources, evaluate found resources, and prepare and follow a recovery plan for found resources

Given the potential for paleontological resources to be present in construction areas at ground surface and at excavation depths in sensitive geologic units in the project area, the following measures will be undertaken to avoid any potentially significant effect from the improvements on paleontological resources. Before the start of any drilling or pile-driving activities, the City of Woodland will retain a qualified paleontologist, as defined by the Society of Vertebrate Paleontology (SVP), who is experienced in teaching non-specialists. The qualified paleontologist will train all construction personnel who are involved with earthmoving activities, including the site superintendent, regarding the possibility of encountering fossils, the appearance and types of fossils that are likely to be seen during construction, and proper notification procedures should fossils be encountered. Procedures to be conveyed to workers include halting construction within 50 feet of any potential fossil find and notifying a qualified paleontologist, who will evaluate the significance.

The qualified paleontologist will also make periodic visits during earthmoving in high sensitivity sites to verify that workers are following the established procedures.

If paleontological resources are discovered during earthmoving activities, the construction crew will immediately cease work near the find and notify the City of Woodland. Construction work in the affected areas will remain stopped or be diverted to allow recovery of fossil remains in a timely manner. The City of Woodland will retain a qualified paleontologist to evaluate the resource and prepare a recovery plan in accordance with SVP guidelines (Society of Vertebrate Paleontology 2010:30-11). The recovery plan may include a field survey, construction monitoring, sampling and data recovery procedures, museum storage coordination for any specimen recovered, and a report of findings. Recommendations in the recovery plan that are determined by the City of Woodland to be necessary and feasible will be implemented before construction activities can resume at the site where the paleontological resources were discovered. The City of Woodland will be responsible for ensuring that the monitor's recommendations regarding treatment and reporting are implemented.

Impact GEO-8: Loss of availability of a known mineral resource of regional or local importance as a result of project construction (less than significant)

As discussed in Section 3.3.2.1, under *Mineral Resources*, project construction would require approximately 82,000 tons of aggregate and 40,000 tons of rock slope protection for levee roads and the top of the levee surface, in addition to important mineral resources like bentonite for the slurry cutoff wall. Aggregate is an important building material, and its availability can affect a region's potential for development. The project area is located in a region with a permitted aggregate supply, including large aggregate of the size used for rock slope protection that is less than its expected need over the next 50 years (109 million tons of permitted facilities for aggregate versus 295 million tons of projected need for aggregate). The amount of aggregate needed for this project is approximately 0.0003 percent of the projected demand over the next 50 years. The amount of aggregate needed for the project is therefore not expected to substantially affect the availability of this resource. In addition, bentonite is not a locally mined mineral resource This impact would be less than significant.

Impact GEO-9: Loss of a known mineral resource of regional or local importance as a result of placement of proposed project (less than significant)

The placement of a new structure can preclude the mining of a local mineral or fossil fuel, making that resource unavailable if the land uses are incompatible. As discussed in Section 3.3.1.2 under *Mineral Resources*, the project footprint does not lie within a state-designated MRZ-2 (Dupras 1988:Plate 8 and Plate 9) or within the county-designated mineral resource overlay (Yolo County 2009c:LU-8), although it does lie within a state-designated MRZ-3. Structural modification associated with floodproofing existing structures would not involve placement of new structures. Accordingly, the new structures, including the new levee and drainage channel, would not be placed in an area known to have aggregate mineral resources. In addition, the footprint of the project features is small. However, because the potential exists for aggregate mineral resources to be identified in this zone in the future, the impact would be less than significant.

In addition, the new project structures would be located partially above known fossil fuel reserves. However, because fossil fuel production comes from a regional source over a large area, placement of the new project structures would not reduce availability of this resource. The impact would be less than significant.

Impact GEO-10: Exposure to hazards associated with subsurface gas (less than significant)

The project would be constructed in the eastern portion of the project area over fossil fuel reserves, where excavation would extend up to 60 feet below ground surface. This depth of excavation would not extend to the depth of the fossil fuel reserves. Therefore, the risk of encountering fossil fuel reserves is low. The impact would be less than significant.

3.4 Biological Resources

This section describes the regulatory and environmental setting for biological resources in the study area, analyzes effects on biological resources that would result from implementation of the Proposed Project, and provides mitigation measures to reduce the effects of any potentially significant impacts. The study area for biological resources is the project footprint, as identified on Figure 2-1, plus a 300-foot buffer. The 300-foot buffer encompasses species-specific buffers for special-status species such as the valley elderberry longhorn beetle habitat (165 feet from the project footprint) and giant garter snake upland habitat (200 feet from giant garter snake aquatic habitat). These species-specific buffers are based on the biology of the species (U.S. Fish and Wildlife Service 2017a; U.S. Fish and Wildlife Service 2017b). The project footprint is where the temporary and permanent disturbances would take place as a result of constructing and operating the Proposed Project. These disturbances could result in direct impacts on biological resources. The 300-foot buffer includes all areas that could be indirectly affected by project construction, as well as areas that would not experience any potential impacts.

3.4.1 Existing Conditions

3.4.1.1 Regulatory Setting

This section summarizes key federal, state, and local or regional regulations, laws, and policies relevant to biological resources in the project area.

Federal

Endangered Species Act

The federal Endangered Species Act (ESA) of 1973 and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems on which they depend. The U.S. Fish and Wildlife Service (USFWS) (with jurisdiction over plants, wildlife, and resident fish) and the National Marine Fisheries Service (NMFS) (with jurisdiction over anadromous fish and marine fish and mammals) oversee ESA. Section 7 of ESA mandates that all federal agencies consult with USFWS and NMFS if they determine that a proposed project may affect a listed species or its habitat. Section 7 requirements do not apply to nonfederal actions. At present, a federal permit is expected to be required for the Proposed Project and would allow consultation under Section 7 between the U.S. Army Corps of Engineers (USACE), which is the federal lead agency for the Proposed Project, and the USFWS. This consultation would be for potential effects on federally listed species. Potential habitat for the federally listed palmate-bracted bird's-beak, valley elderberry longhorn beetle, and giant garter snake occurs within the study area.

Section 9 of the ESA prohibits the take of any fish or wildlife species listed as endangered, including the destruction of habitat that prevents the species' recovery. "Take" is defined as the action of or attempt to hunt, harm, harass, pursue, shoot, wound, capture, kill, trap, or collect a species. Section 9 prohibitions also apply to threatened species unless a special rule has been defined with respect to take at the time of listing.

Clean Water Act

The federal Clean Water Act (CWA) was enacted as an amendment to the federal Water Pollution Control Act of 1972, which outlined the basic structure for regulating discharges of pollutants to waters of the United States. The CWA serves as the primary federal law protecting the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands.

The following sections provide additional details on specific sections of the CWA as they relate to vegetation and wetlands.

Permits for Fill Placement in Non-Wetland Waters and Wetlands (Section 404)

CWA Section 404 regulates the discharge of dredged and fill materials into waters of the United States. "Waters of the United States" refers to oceans, bays, rivers, streams, lakes, ponds, and wetlands, including any or all of the following.

- Areas within the ordinary high water mark of a stream, including non-perennial streams with a defined bed and bank and any stream channel that conveys natural runoff, even if it has been realigned.
- Seasonal and perennial wetlands.

As of December 23, 2019, the USACE will regulate waters of the United States based on pre-2015 rules regarding the CWA, which are based on two primary rulings—the U.S. Supreme Court decision on January 9, 2001 in *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers* (SWANCC) [121 S.CT. 675, 2001] and a federal ruling on two consolidated cases (June 19, 2006; *Rapanos v. United States* and *Carabell v. U.S. Army Corps of Engineers*), referred to as the Rapanos decision.

SWANCC affected USACE jurisdiction in isolated waters. Based on SWANCC, USACE does not have jurisdiction over and does not regulate isolated wetlands (i.e., wetlands that have no hydrologic connection with waters of the United States).

The Rapanos decision affects whether some waters or wetlands are considered jurisdictional under the CWA. In these cases, the U.S. Supreme Court reviewed the USACE definition of waters of the United States and whether or not it extended out to tributaries of traditional navigable waters (TNW) or wetlands adjacent to those tributaries. The decision provided two standards for determining jurisdiction of water bodies that are not TNWs: (1) if the non-TNW is a relatively permanent water (RPW) or is a wetland directly connected to a RPW, or (2) if the water body has "significant nexus" to a TNW. The significant nexus definition is based on the purpose of the CWA ("restore and maintain the chemical, physical, and biological integrity of the Nation's waters"). Guidance issued by the U.S. Environmental Protection Agency (USEPA) and USACE on the Rapanos decision requires application of the two standards to support a jurisdictional determination for a waterbody.

Applicants must obtain a permit from USACE for all discharges of dredged or fill material into waters of the United States, including adjacent wetlands, before proceeding with a proposed activity. USACE may issue either an individual permit evaluated on a case-by-case basis or a general permit evaluated at a program level for a series of related activities. General permits are preauthorized and are issued to cover multiple instances of similar activities expected to cause only minimal adverse environmental effects. The nationwide permits (NWPs) are a type of general permit issued to cover particular fill activities. Each NWP specifies particular conditions that must be met for the NWP to apply to a particular project.

Compliance with CWA Section 404 requires compliance with several other environmental laws and regulations. Water resources projects developed by USACE do not obtain Department of the Army permits through a self-permitting process. Instead, the project documentation (i.e., report) and environmental compliance work performed by USACE serves as the functional equivalent of self-permitting, ensuring that the same level of review is performed.

Permits for Stormwater Discharge (Section 402)

CWA Section 402 regulates construction-related stormwater discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program, administered by USEPA. In California, the State Water Resources Control Board (State Water Board) is authorized by USEPA to oversee the NPDES program through the Regional Water Quality Control Boards (Regional Water Boards) (see the related discussion below under *Porter-Cologne Water Quality Control Act*). The project area is under the jurisdiction of the Central Valley Regional Water Quality Control Board (Central Valley Water Board).

NPDES permits are required for projects that disturb more than 1 acre of land. The NPDES permitting process requires the applicant to file a public notice of intent (NOI) to discharge stormwater and to prepare and implement a stormwater pollution prevention plan (SWPPP). The SWPPP includes a site map and a description of proposed construction activities. In addition, it describes the best management practices (BMPs) that would be implemented to prevent soil erosion and discharge of other construction-related pollutants (e.g., petroleum products, solvents, paints, cement) that could contaminate nearby water resources. Permittees are required to conduct annual monitoring and reporting to ensure that BMPs are correctly implemented and effective in controlling the discharge of stormwater-related pollutants. Because the Proposed Project would disturb more than 1 acre of land, an NPDES permit and SWPPP would be required for construction activities.

Water Quality Certification (Section 401)

Under CWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where the discharge would originate. Therefore, all projects that have a federal component and may affect state water quality (including projects that require federal agency approval, such as issuance of a Section 404 permit) must also comply with CWA Section 401. A Section 401 Water Quality Certification from the Central Valley Water Board would be required for construction activities in waters of the United States in the project area.

For each of the above sections of the CWA, the project applicant would obtain and comply with the applicable federal and state permits, and all conditions that are attached to those permits would be implemented as part of the Proposed Project. The permit conditions would be clearly identified in the construction plans and specifications and monitored during and after construction to ensure compliance. Because the Proposed Project would require a Section 404 permit and has potential to discharge pollutants into waters of the United States, a Section 401 permit would be required.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) domestically implements a series of international treaties that provide for migratory bird protection. The MBTA authorizes the Secretary of the Interior to regulate the taking of migratory birds. The act further provides that it is unlawful, except as permitted by regulations, "to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird…" (United States Code [USC], Title 16, Section 703). This prohibition includes both direct and indirect acts, although harassment and habitat modification are not included unless they result in direct loss of birds, nests, or eggs. The current list of species protected by the MBTA can be found in the November 1, 2013 *Federal Register* (Code of Federal Regulations [CFR], Title 50, Section10.13). This list comprises several hundred species, including essentially all native birds. Permits for take of nongame migratory birds can be issued only for specific activities, such as scientific collecting, rehabilitation, propagation, education, taxidermy, and protection of human health and safety and of personal property. USFWS publishes a list of birds of conservation concern (BCC) to identify migratory nongame birds that are likely to become candidates for listing under ESA without additional conservation actions. The BCC list is intended to stimulate coordinated and collaborative conservation efforts among federal, state, tribal, and private parties.

State

California Endangered Species Act

The California Endangered Species Act (CESA) (California Fish and Game Code Section 2050 et seq.) establishes state policy to conserve, protect, restore, and enhance threatened or endangered species and their habitats. CESA mandates that state agencies should not approve projects that jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. There are no state agency consultation procedures under CESA. For projects that would affect a species that is federally and state-listed, compliance with the ESA satisfies CESA if the California Department of Fish and Wildlife (CDFW) determines that the federal incidental take authorization is consistent with the CESA under California Fish and Game Code Section 2080.1. Potential habitat for the federally and state-listed palmate-bracted bird's-beak, valley elderberry longhorn beetle, and giant garter snake occurs in the project area. For projects that would result in take of a species that is only state listed, project proponents must apply for a take permit under Section 2081(b). The state-listed Swainson's hawk is present in the project area.

California Fish and Game Code

Several sections of the California Fish and Game Code apply to the Proposed Project and are described below: 1602, 3503, 3503.5, 3511, and 3513.

Section 1602: Streambed Alteration Agreements

Under California Fish and Game Code 1602, public agencies are required to notify CDFW before undertaking any project that would divert, obstruct, or change the natural flow, bed, channel, or bank of any river, stream, or lake. Preliminary notification and project review generally occur during the environmental process. When an existing fish or wildlife resource may be substantially adversely affected, CDFW is required to propose reasonable project changes to protect the resources. These modifications are formalized in a lakes and streambed alteration agreement (LSAA) that becomes part of the plans, specifications, and bid documents for a project. Because the

Proposed Project would alter the natural flow, bed, and bank of Cache Creek Settling Basin (CCSB) in the project footprint, an LSAA would be required.

Sections 3503 and 3503.5: Birds and Raptors

Section 3503 of the California Fish and Game Code prohibits the killing of birds and the destruction of bird nests. Section 3503.5 prohibits the killing of raptor species and the destruction of raptor nests. Trees and shrubs in and adjacent to the study area provide suitable nesting habitat for birds and raptors.

Section 3511, 3515, 4700, and 5050: Fully Protected Species

The California Fish and Game Code provides protection from take for a variety of species, referred to as "fully protected species." Section 5050 lists fully protected amphibians and reptiles; Section 3515 lists fully protected fish; Section 3511 lists protected birds, including the white-tailed kite, for which there is potential nesting and foraging habitat in the study area; and Section 4700 lists protected mammals. The California Fish and Game Code defines "take" as "an action hunt, pursue, catch, capture, or kill or an attempt to hunt, pursue, catch, capture, or kill." Except for take related to scientific research, all take of fully protected species is prohibited.

Section 3513: Migratory Birds

California Fish and Game Code 3513 prohibits the take or possession of any migratory non-game bird as designated in the MBTA or any part of such migratory non-game bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the MBTA. The study area provides habitat for numerous special-status and non–special-status birds.

California Native Plant Protection Act

The California Native Plant Protection Act (CNPPA) of 1977 prohibits importation of rare and endangered plants into California, "take" of rare and endangered plants, and sale of rare and endangered plants. CESA defers to CNPPA, which ensures that state-listed plant species are protected when state agencies are involved in projects subject to CEQA. In this case, plants listed as rare under CNPPA are protected under CEQA, not under CESA. Because the Proposed Project has potential to adversely affect rare and endangered plants, surveys for these plants and mitigation for any effects are required and are discussed in this document.

Porter-Cologne Water Quality Control Act

California Water Code Section 13260 requires "any person discharging waste, or proposing to discharge waste, in any region that could affect the waters of the state to file a report of discharge (an application for waste discharge requirements)." Under the Porter-Cologne Act definition, waters of the state are "any surface water or groundwater, including saline waters, within the boundaries of the state." Although all waters of the United States that are within the borders of California are also waters of the state, the reverse is not true. Therefore, California retains authority to regulate discharges of waste into any waters of the state, regardless of whether the USACE has concurrent jurisdiction under CWA Section 404. If USACE determines that a wetland or non-wetland water is not subject to regulation under Section 404, CWA Section 401 water quality certification is not required for that feature. However, the Regional Water Board may impose waste discharge requirements (WDRs) if fill material is placed into waters of the state. Because the Proposed Project would place fill material into wetlands and drainages, some of which may be waters of the state but not waters of the United States, an application for waste discharge requirements from the Central Valley Water Board could be required.

Oak Woodlands Conservation Act

Senate Bill (SB) 1334, the Oak Woodlands Conservation Act was enacted by the Legislature in 2004 to add Section 21083.4 to the Public Resources Code (CEQA) regarding oak woodlands conservation. Section 21083.4(b) requires that a county shall make a determination whether a project within its jurisdiction may result in conversion of oak woodlands that will have a significant effect on the environment. If a county determines that there may be a significant effect on oak woodlands, the county must require one or more of four oak woodlands mitigation alternatives to mitigate the significant effect of the conversion of woodlands. These alternatives are: conserving oak woodlands through conservation easements; planting an appropriate number of trees and maintaining them; contributing funds to the Oak Woodlands Conservation Fund; or other mitigation measures developed by the county. Yolo County protects oak woodlands under its General Plan policies and the Yolo County Natural Communities Conservation Plan (NCCP), both of which are discussed below under the *Local* regulatory setting.

Natural Community Conservation Planning Act

The Natural Community Conservation Planning Act (NCCPA) of 1991 was intended to provide an alternative and/or a collaborative approach to ESA and CESA. It was designed to represent a new approach to conservation. Instead of focusing on individual species (e.g., ESA and CESA), the NCCPA focuses on protecting intact ecosystems across an entire region or landscape. Natural Community Conservation Plans (NCCPs) have become increasingly common in the development of regional plans that combine the HCP and NCCP processes. The Yolo Habitat Conservancy has prepared an HCP/NCCP for Yolo County, which is discussed below under the *Local* regulatory setting.

Local

Yolo County

Yolo County General Plan

The following goal and policies of the Yolo County *2030 Countywide General Plan* (Yolo County 2009) relate to biological resources in the project area.

> **GOAL CO-2 Biological Resources.** Protect and enhance biological resources through the conservation, maintenance, and restoration of key habitat areas and corresponding connections that represent the diverse geography, topography, biological communities, and ecological integrity of the landscape.
>
> > **Policy CO-2.1** Consider and maintain the ecological function of landscapes, connecting features, watersheds, and wildlife movement corridors.
> >
> > **Policy CO-2.3** Preserve and enhance those biological communities that contribute to the county's rich biodiversity including blue oak and mixed oak woodlands, native grassland prairies, wetlands, riparian areas, aquatic habitat, agricultural lands, heritage valley oak trees, remnant valley oak groves, and roadside tree rows.
> >
> > **Policy CO-2.4** Coordinate with other regional efforts (e.g., Yolo County HCP/NCCP) to sustain or recover special-status species populations by preserving and enhancing habitats for special-status species.

Policy CO-2.9 Protect riparian areas to maintain and balance wildlife values.

Policy CO-2.14 Ensure no net loss of oak woodlands, alkali sinks, rare soils, vernal pools or geological substrates that support rare endemic species, with the following exception. The limited loss of blue oak woodland and grasslands may be acceptable, where the fragmentation of large forests exceeding 10 acres is avoided, and where losses are mitigated.

Policy CO-2.22 Prohibit development within a minimum of 100 feet from the top of banks for all lakes, perennial ponds, rivers, creeks, sloughs, and perennial streams. A larger setback is preferred. The setback will allow for fire and flood protection, a natural riparian corridor (or wetland vegetation), a planned recreational trail where applicable, and vegetated landscape for stormwater to pass through before it enters the water body. Recreational trails and other features established in the setback should be unpaved and located along the outside of the riparian corridors whenever possible to minimize intrusions and maintain the integrity of the riparian habitat. Exceptions to this action include irrigation pumps, roads and bridges, levees, docks, public boat ramps, and similar uses, so long as these uses are sited and operated in a manner that minimizes impacts to aquatic and riparian features.

Policy CO-2.23 Support efforts to coordinate the removal of non-native, invasive vegetation within watersheds and replacement with native plants.

Policy CO-2.31 Protect wetland ecosystems by minimizing erosion and pollution from grading, especially during grading and construction projects.

Policy CO-2.37 Where applicable in riparian areas, ensure that required state and federal permits/approvals are secured prior to development of approved projects.

Policy CO-2.38 Avoid adverse impacts to wildlife movement corridors and nursery sites (e.g., nest sites, dens, spawning areas, breeding ponds). Preserve the functional value of movement corridors to ensure that essential habitat areas do not become isolated from one another due to the placement of either temporary or permanent barriers within the corridors. Encourage avoidance of nursery sites (e.g., nest sites, dens, spawning areas, breeding ponds) during periods when the sites are actively used and that nursery sites which are used repeatedly over time are preserved to the greatest feasible extent or fully mitigated if they cannot be avoided.

Policy CO-2.39 Require new or retrofitted bridges, and new or expanded roads to incorporate design and construction measures to maintain the functional value of wildlife movement corridors.

Policy CO-2.41 Require that impacts to species listed under the State or federal Endangered Species Acts, or species identified as special-status by the resource agencies, be avoided to the greatest feasible extent. If avoidance is not possible, fully mitigate impacts consistent with applicable local, State, and Federal requirements.

Policy CO-2.42 Projects that would impact Swainson's hawk foraging habitat shall participate in the Agreement Regarding Mitigation for Impacts to Swainson's Hawk Foraging Habitat in Yolo County entered into by the CDFG and the Yolo County HIP/NCCP Joint Powers Agency, or satisfy other subsequent adopted mitigation requirements consistent with applicable local, State, and federal requirements.

Yolo Habitat Conservation Plan/Natural Community Conservation Plan

The *Yolo Habitat Conservation Plan/Natural Community Conservation Plan* (HCP/NCCP) is a countywide plan to conserve the natural open space and agricultural landscapes that provide habitat for many special-status species in the county (Yolo Habitat Conservancy 2018). The Yolo HCP/NCCP describes the measures required to conserve important biological resources, provide ESA and CESA take authorization and associated mitigation for infrastructure (e.g., roads and bridges) and development activities (e.g., agricultural facilities, housing, and commercial buildings) identified for construction over the next 50 years in Yolo County. Implementation of the Yolo HCP/NCCP was initiated in January 2019. The HCP/NCCP addresses covered species and natural communities that have the potential to occur within the project footprint. Project impacts on special-status species and their habitat are evaluated in this EIR with consideration of measures in the HCP/NCCP (Yolo Habitat Conservancy 2018: Section 6.3.4, *Covered Species Biological Goals and Objectives*).

City of Woodland

City of Woodland General Plan

The following policies from the *Sustainability, Conservation, and Open Space Element* of the *City of Woodland 2035 General Plan* (City of Woodland 2017) relate to biological resources in the project area.

> **Policy 7.B.1 Habitat Conservation Plan/Natural Community Conservation Plan.** Continue to participate in the planning process for the countywide Habitat Conservation Plan/Natural Community Conservation Plan. Once adopted, fully implement the Plan to mitigate the impacts of growth projected under the General Plan on plant and wildlife habitats in the Woodland area.
>
> **Policy 7.B.2 Sensitive Habitat Types.** Support and cooperate with efforts of other local, State, and Federal agencies and private entities engaged in the preservation and protection of sensitive habitat types from incompatible land uses and development. Sensitive habitat types include alkali sink, freshwater wetlands, freshwater marsh, riparian forest, drainages, riverine habitat, and lakes.
>
> **Policy 7.B.3 Special-Status Species.** Support preservation of the habitats of Federally- or State-listed rare, threatened, endangered, and/or other special status species. Encourage Federal and State agencies, as well as other resource conservation organizations, to acquire and manage endangered species' habitats.
>
> **Policy 7.B.4 Fish and Wildlife.** Support the management efforts of the California Department of Fish and Wildlife to maintain and enhance the productivity of important wildlife species by protecting identified critical habitat for these species from incompatible suburban, rural residential, or recreational development.
>
> **Policy 7.B.9 Tree Canopy.** Manage, enhance, and improve the city's tree canopy as a valuable ecological resource.

City of Woodland Tree Plan

For development projects, the City of Woodland City Code requires preparation of an arborist report and replacement of removed street trees, heritage oaks, specimen trees, and landmark trees. The Proposed Project, however, is for flood control and would not be considered a development project; therefore, the City of Woodland tree plan would not apply.

3.4.1.2 Environmental Setting

This section discusses the environmental setting relevant to biological resources in the study area, which includes the temporary construction footprint, staging areas, and permanent levee for the Proposed Project, as well as a 300-foot buffer around all temporary and permanent impact areas associated with the construction and operation of the levee and the activities in the CCSB.

The study area is located north of the City of Woodland, and primarily runs through agricultural fields that are occasionally interspersed with rural residential lots and valley oak (*Quercus lobata*) woodland windrows. Ruderal and disturbed areas occur along the edges of fields and roadways. The eastern portion of the study area runs along the western levee of the CCSB and the training levee within the CCSB. Much of the portion of the study area that falls within the CCSB is composed of seasonal marshes. A broad corridor of sandbar willow (*Salix exigua*) riparian scrub occurs along the irrigation canal to the south of the CCSB.

The study area is flat but slopes very gently down to the east. Elevations range from approximately 25 feet above mean sea level in the east to 75 feet in the west.

According to the Natural Resources Conservation Service (NRCS) Soil Survey Database (Natural Resources Conservation Service 2019), 19 soil mapping units occur within the study area. The soils in the western portion of the study area are largely silt loams and silty clay loams. The central and eastern portion is somewhat more complex, where a variety of loams are interspersed with clays and saline-alkali soils. Several soil types in the eastern end of the study area represent habitat for plant species that are only found on saline and alkaline soils.

Land Cover Types

The information pertaining to land cover types in the project area was derived using a combination of methods. Field surveys of different portions of the study area were conducted by a Madrone Environmental Consulting (Madrone) biologist on June 6 and 19, August 29, and September 30, 2019. Access was not available for private properties, so data was largely collected from roadways. However, the biologist also walked much of the western CCSB levee and was provided access to drive the CCSB training levee. LiDAR mapping was used to confirm creek and wetland boundaries. Land cover within inaccessible parts of the study area were mapped using aerial photograph interpretation. ICF biologists conducted a reconnaissance survey to review land cover types and species habitat on November 20, 2019.

Land cover types in the study area are depicted in Figure 3.4-1 and fall into four overall categories: natural communities, aquatic communities (potential waters of the United States and waters of the state), agricultural lands, and developed/disturbed areas. The approximate acreages of the land cover types in the study area and the project footprint are listed in Table 3.4-1, and a description of each type is provided below.

Table 3.4-1. Acreages of Land Cover Types in the Study Area and Project Footprint

	Approximate Acreage in the Study Area	Approximate Acreage in the Project Footprint
Natural Communities		
Cottonwood willow riparian woodland[a]	51	0
Sandbar willow riparian scrub[a]	1	0
Tamarisk riparian scrub[a]	2	0
Valley oak woodland[a]	9	2
Nonnative annual grassland/ruderal	109	53
Aquatic Communities		
Intermittent Stream (Cache Creek) [a]	16	0
Cache Creek Settling Basin[a]	29	5
Pond[a]	4	0.3
Alkaline seasonal wetland[a]	13	7
Seasonal marsh[a]	72	4
Seasonal wetland[a]	2	1
Irrigation Canal[a]	16	1
Roadside ditch	<0.1	<0.1
Agricultural Lands		
High-intensity agriculture/fallow	596	236
Orchard	26	8
Irrigation ditch	2	0.2
Developed/Disturbed Areas		
Developed	117	12
Total	1,065	330

[a] These are sensitive land cover types, including sensitive natural communities by CDFW (California Department of Fish and Wildlife 2019), waters of the State, and waters of the United States. Impacts on these land cover types could be regulated.

Natural Communities

Cottonwood Willow Riparian Woodland

Cottonwood willow riparian woodland occurs along the edges of Cache Creek outside of the project footprint, but within the study area. This community is dominated by Fremont's cottonwood (*Populus fremontii*) and red willow (*Salix laevigata*). Other common plant species in this community are black willow (*Salix gooddingii*), box elder (*Acer negundo*), Northern California black walnut (*Juglans hindsii*), giant reed (*Arundo donax*), prickly cocklebur (*Xanthium strumarium*), curly dock (*Rumex crispus*), and annual grasses and forbs typical of the nonnative annual grasslands. This community would be classified as Fremont cottonwood forest (*Populus fremontii* Forest Alliance) (Sawyer et al. 2009) and is considered a Sensitive Natural Community by CDFW (California Department of Fish and Wildlife 2019).

Sandbar Willow Riparian Scrub

Sandbar willow riparian scrub occurs along the irrigation canal adjacent to the southern portion of the study area. In addition to sandbar willow, dominant plant species in this community include box elder, Oregon ash (*Fraxinus latifolia*), poison hemlock (*Conium maculatum*), and teasel (*Dipsacus fullonum*). This community would be classified as sandbar willow thicket (*Salix exigua* Shrubland Alliance) (Sawyer et al. 2009) and might qualify as a wetland.

Tamarisk Riparian Scrub

Tamarisk riparian scrub is dominated by tamarisk (*Tamarix* species) and occurs in two areas on the east side of the CCSB levee; one area is proposed as a haul road, and the other is a small area adjacent to the proposed training levee degraded area. The herbaceous layer in this community is similar to that of the surrounding seasonal marshes (detailed below). This community would be classified as tamarisk thicket (*Tamarix* sp. Semi-Natural Shrubland Stand) (Sawyer et al. 2009) and might qualify as a wetland.

Valley Oak Woodland

Valley oak woodlands largely occur as narrow strips within fields within the project footprint. In some areas, this community is simply mature valley oak trees with a nonnative annual grassland understory, while in other areas, there is a dense shrub layer and very little herbaceous vegetation. Common shrubs observed in the valley oak woodland within the study area include California rose (*Rosa californica*), olive (*Olea europaea*), and Himalayan blackberry (*Rubus armeniacus*). This community would be classified as valley oak woodland (*Quercus lobata* Woodland Alliance) (Sawyer et al. 2009) and is considered a Sensitive Natural Community by CDFW (California Department of Fish and Wildlife 2019).

Nonnative Annual Grassland/Ruderal

The nonnative annual grasslands within the study area largely occur as small, disjunct patches in between agricultural fields or developed areas. One linear strip of nonnative annual grassland occurs within the southeast ends of the project footprint. Dominant plant species in the grassland communities include wild oat (*Avena fatua*), perennial ryegrass (*Festuca perennis*), soft brome (*Bromus hordeaceus*), ripgut brome (*B. diandrus*), medusahead grass (*Elymus caput-medusae*), rattail fescue (*Festuca myuros*), filaree (*Erodium botrys*), rose clover (*Trifolium hirtum*), winter vetch (*Vicia villosa*), and turkey mullein (*Croton setiger*). Depending on the specific dominants in any give patch, this community could be classified as wild oak grassland (*Avena* [*barbata, fatua*] Semi-Natural Herbaceous Stand) or annual brome grassland (*Bromus* [*diandrus, hordeaceus*]—*Brachypodium distachyon* Semi-Natural Herbaceous Stand) (Sawyer et al. 2009).

The existing Cache Creek levee supports annual grass species, such as perennial ryegrass, rattail fescue, and wild oat. Despite the similarity of vegetation, this area is distinguished from the nonnative annual grasslands present throughout the remainder of the study area due to the degree of maintenance that the levees receive. The levees are highly compacted and regularly burned, and as a result, the vegetation is relatively sparse, and no burrows were observed within the levee. Due to the level of maintenance, the levees appear to represent lower quality habitat than other nonnative annual grasslands for a variety of regionally occurring special-status species.

Ruderal vegetation is mapped in areas that occur largely in the unmaintained areas adjacent to agricultural fields or roadways. Dominant plant species in the ruderal areas are primarily nonnative forbs and annual grasses, including Russian thistle (*Salsola tragus*), bristly ox-tongue (*Helminthotheca echioides*), velvetleaf (*Abutilon theophrasti*), cheese weed (*Malva neglecta*), toothpick weed (*Ammi visnaga*), panicled willow-herb (*Epilobium brachycarpum*), black mustard (*Brassica nigra*), prickly wild lettuce (*Lactuca serriola*), and grass species typical of the nonnative annual grasslands.

Aquatic Communities

Intermittent Stream (Cache Creek)

Cache Creek occurs outside of the project footprint adjacent to the training levee degrade. Cache Creek connects to the Sacramento River only in wet years. During the summer and fall, discharge rapidly decreases downstream of Capay Dam and, during most years, the creek is dry before reaching the CCSB. Cache Creek is intermittent due to damming and diversion for agricultural purposes; however, a section of the creek below the dam consists of porous alluvium, and surface flow is lost to groundwater. Thus, regardless of the dam system, surface flow in the lowermost sections of Cache Creek would likely be limited during most years (Stillwater Sciences 2009). Intermittent stream would be considered a non-wetland water of the United States/water of the state.

Cache Creek Settling Basin

The portions of the Proposed Project mapped as CCSB are areas that are within the Ordinary High Water Mark (OHWM) of the CCSB but are almost entirely unvegetated; these areas would be considered non-wetland waters of the United States/waters of the state. The substrate in these areas is primarily riprap.

Pond

Several small ponds occur in the study area, two of which are in the Proposed Project levee alignment, and one of which is in the CCSB at the south end of the training levee in the Proposed Project alignment. None of these features was accessible to visually survey; however, none of them appears to be perennial, and they all appear to be largely unvegetated on the bottom. They likely support a mix of hydrophytic and upland weedy vegetation along the banks. These features could be considered non-wetland waters of the United States/waters of the state.

Irrigation Canal

The irrigation canals that borders the CCSB to the west within the study area are perennially inundated, and support a matrix of open water and emergent vegetation, including cattails (*Typha* species), tules (*Schoenoplectus acutus*), rice cutgrass (*Leersia oryzoides*), and northern water plantain (*Alisma triviale*). The banks are densely vegetated with a variety of hydrophytes, including broad-leaved pepperweed, curly dock (*Rumex crispus*), tubered bulrush (*Bolboschoenus glaucus*), bristly ox-tongue, perennial ryegrass, saltgrass, annual rabbitsfoot grass (*Polypogon monspeliensis*), bird's-foot trefoil (*Lotus corniculatus*), and tall nutsedge (*Cyperus eragrostis*). Some of the canals that appear to be less regularly maintained, have become almost entirely vegetated by cattails and tules, and now function primarily as wetlands. This community would be classified as cattail marsh (*Typha* [*angustifolia, domingensis, latifolia*] Herbaceous Alliance) (Sawyer et al. 2009). Irrigation canals are unlikely to qualify as waters of the United States but might be considered waters of the state.

Alkaline Seasonal Wetland

Several alkaline seasonal wetlands occur within agricultural fields within the study area north of Beamer Road. Plant species observed in these features include saltgrass (*Distichlis spicata*), alkali weed (*Cressa truxillensis*), alkali mallow (*Malvella leprosa*), tubered bulrush, common tarweed (*Centromadia pungens* ssp*. pungens*), Mediterranean barley (*Hordeum marinum*), annual rabbitsfoot grass, broad-leaf pepperweed (*Lepidium latifolium*), and perennial ryegrass. These features would be classified as alkali weed–salt grass sinks (*Cressa truxillensis–Distichlis spicata* Herbaceous Alliance) (Sawyer et al. 2009). This alliance is considered a Sensitive Natural Community by CDFW (California Department of Fish and Wildlife 2019), and these features could be considered waters of the United States/waters of the state.

Seasonal Marsh

Seasonal marshes occur on either side of the levee within the training levee degrade portion of the Proposed Project. These features are dominated by smartweed (*Persicaria* species), barnyard grass (*Echinochloa crus-galli*), prickly cocklebur, swamp pricklegrass (*Crypsis schoenoides*), western golden rod (*Euthamia occidentalis*), and annual sunflower (*Helianthus annuus*). Other species also occurring in these features include Bermuda grass (*Cynodon dactylon*), saltgrass, sweetclover (*Melilotus* species), alkali mallow, alkali weed, tall nutsedge, and smartweed (*Persicaria* species). These features would be classified as smartweed-cocklebur patches (*Persicaria lapathifolia—Xanthium strumarium* Provisional Herbaceous Alliance) (Sawyer et al. 2009) and could be considered waters of the United States/waters of the state.

Seasonal Wetland

One seasonal wetland occurs at the southeast corner of the CCSB in the study area. This feature has a mix of seasonal marsh and seasonal wetland species along the upper fringes, including tubered bulrush, water plantain (*Alisma lanceolatum*), burhead (*Echinodorus berteroi*), hyssop loosestrife (*Lythrum hyssopifolium*), slender popcorn flower (*Plagiobothrys stipitatus*), bird's foot trefoil, and broad-leaved pepperweed. This community does not precisely fit into any classified alliance but could be considered a water of the United States/water of the state.

Roadside Ditch

Two roadside ditches occur within the study area. The roadside ditches were constructed to convey stormwater runoff from the adjacent roadways; as such, they support only ephemeral flow. These features are largely unvegetated or support sparse upland grasses and forbs.

Agricultural Lands

High-Intensity Agriculture/Fallow

Most of the study area comprises high-intensity agricultural crops. Crops observed during the field surveys included alfalfa (*Medicago sativa*), tomatoes (*Solanum lycopersicum*), squashes (*Cucurbita* species), sunflowers (*Helianthus* species), wheat (*Triticum aestivum*), fava beans (*Vicia faba*), and tree crops (orchards, discussed below). In addition, a number of fields had been freshly disked or freshly planted. None of the fields within the project footprint appeared to be planted in rice (*Oryza sativa*) during the field survey.

Some of the agricultural fields within the alignments were fallow at the time of the survey. It is not clear if these fields are only being fallowed for a single year, or if they are not in regular cultivation. The western-most fallow field was a virtual monoculture of poison hemlock and supported a large colony of nesting red-winged blackbirds (*Agelaius phoeniceus*). The eastern fallow field was dominated by plant species typical of a nonnative annual grassland but with significant cover of tall weedy forbs, such as black mustard and prickly lettuce.

Orchard

Orchards occur along the Proposed Project levee alignment west of Interstate (I-) 5. The orchards within the study area support almost exclusively the tree crop being grown; no herbaceous vegetation was observed in the understory of any of the orchards. Tree crops observed included pistachio (*Pistacia vera*) and English walnut (*Juglans regia*).

Irrigation Ditch

Irrigation ditches occur in the study area. The irrigation ditches are narrower than the irrigation canals and are dry for a portion of the year. They also appear to be more regularly maintained. As a result, these features are largely unvegetated within the channel but support similar species on their banks as the irrigation canals previously discussed.

Developed/Disturbed Areas

Developed

Areas mapped as developed are areas of predominantly impermeable surfaces (pavement, buildings, etc.), regularly maintained dirt roadways, or areas of maintained landscaping adjacent to residential or commercial/industrial development. These areas generally do not support special-status species habitat, apart from foraging perches for raptors or possibly, but unlikely, nesting in landscape trees.

Disturbed

Disturbed areas regularly experience disturbance of the soil surface, either due to construction in the area, agricultural staging, or other purposes. These areas are unvegetated for most or all of the year.

Sensitive Natural Communities

Sensitive natural communities are designated as such because of their high level of species diversity, high productivity, unusual nature, limited distribution, or declining status. Local, state, and federal agencies consider these habitats important. The California Natural Diversity Database (CNDDB) maintains a current list of rare, natural communities throughout the state. One sensitive natural community recognized by the CNDDB, valley oak woodland, has been reported in the 7.5-minute U.S. Geological Survey (USGS) quadrangles that overlap the study area (California Department of Fish and Wildlife 2019). The alkaline seasonal wetland community is also considered sensitive. No vernal pools were observed in the study area during the 2019 field surveys or review of aerial photographs.

Waters of the United States and Waters of the State

Although a delineation of aquatic resources has not been conducted throughout the study area, the following land cover types could meet the criteria for waters of the United States and/or waters of the State: riparian woodland and riparian scrub communities, intermittent stream, CCSB, pond, irrigation canal, alkaline seasonal wetland, seasonal marsh, and seasonal wetland.

Wildlife Corridors

The California Essential Habitat Connectivity Project is a peer-reviewed statewide assessment of important habitat linkages (Spencer et al. 2010). The assessment's goal was to identify large remaining blocks of intact habitat or natural landscape at a coarse spatial scale, and model linkages between them that are important to maintain as corridors for wildlife. There are no designated wildlife corridors within or adjacent to the project footprint.

Special-Status Species

Prior to conducting the site visits for the Proposed Project, biologists from Madrone prepared a list of special-status species with potential to occur within the study area by conducting a query of the following databases (Appendix C, *Biological Resources*).

- CNDDB (California Department of Fish and Wildlife 2019) query of the study area and all areas within 5 miles of the study area.
- USFWS Information for Planning and Conservation (IPaC) (U.S. Fish and Wildlife Service 2019) query for the study area.
- National Marine Fisheries Service (National Marine Fisheries Service 2019a) online species list query of the Gray's Bend and Woodland USGS topo quadrangles (completed by ICF biologist).
- California Native Plant Society (CNPS) Rare and Endangered Plant Inventory (California Native Plant Society 2019) query of the Gray's Bend and Woodland USGS topo quadrangles, and the 10 surrounding quadrangles.
- Western Bat Working Group (WBWG) Species Matrix (Western Bat Working Group 2017).

In addition, any special-status species that are known to occur in the region but that were not identified in any of the above database searches were analyzed by ICF biologists for their potential to occur within the study area. Comprehensive, protocol-level surveys of special-status species could not be conducted due to lack of property access. Any special-status species or their habitat documented during the surveys are incidental observations and should not be construed to indicate these species absence in other areas.

For the purposes of this document, special-status species is defined as those species that meet the following criteria.

- Species that are listed or proposed for listing as threatened or endangered under ESA (Code of Federal Regulations, Title 50, Section 17.12 [listed plants] and various notices in the *Federal Register* (proposed species).
- Species that are candidates for possible future listing as threatened or endangered under the ESA (81 Federal Register 87246 December 2, 2016).

- Species listed or proposed for listing by the State of California as threatened or endangered under the CESA (California Code of Regulations, Title 14, Section 670.5).
- Species that meet the definitions of rare or endangered under CEQA (State CEQA Guidelines Section 15380).
- Plants listed as rare under the CNPPA (California Fish and Game Code Section 1900 et seq.).
- Plants considered by CDFW and CNPS to be "rare, threatened, or endangered in California" (Rare Plant Ranks 1B and 2; California Department of Fish and Wildlife 2019; California Native Plant Society 2019).
- Plants identified by CDFW and CNPS about which more information is needed to determine their status, and plants of limited distribution (Rare Plant Ranks 3 and 4, California Department of Fish and Wildlife 2019; California Native Plant Society 2019), which may be included as special-status species on the basis of local significance or recent biological information.

Special-Status Plants

Based on the searches of the CNDDB, the CNPS rare plant inventory, and the USFWS website (California Department of Fish and Wildlife 2019; California Native Plant Society 2019; U.S. Fish and Wildlife Service 2019), 15 special-status plant species were identified as occurring within the vicinity of the study area (Appendix C). Three of these 15 species either have habitat or microhabitat requirements (e.g., valley grasslands, subalkaline flats, vernal pools, meadows, seeps, chenopod scrub, salt marsh, wet riverbanks, chaparral, lower montane coniferous forest, and adobe soils) that are not present in the study area or the study area is out of the species' range. The natural communities in the study area contain potential habitat for 12 species, but 8 of those have very marginal potential habitat and a low potential to occur in the study area. Only the following 4 species have potential habitat and recorded occurrences in or adjacent to the study area (California Department of Fish and Wildlife 2019).

- Brittlescale (*Atriplex depressa*), California Rare Plan Rank (CRPR) 1B.2.
- Palmate-bracted bird's-beak (*Chloropyron palmatum*), federal and state Endangered, CRPR 1B.1.
- San Joaquin spearscale (*Extriplex joaquiniana*), CRPR 1B.2.
- California alkali grass (*Puccinellia simplex*), CRPR 1B.2.

Accessible parts of the study area were surveyed in June, August, September, and November of 2019. No special-status plants were observed during these surveys, but a complete survey of the potential habitat in the study area during the appropriate identification period for all the species has not yet been conducted. Therefore, the presence or absence of special-status plants in the study area cannot be confirmed.

Special-Status Wildlife

Based on the searches of the CNDDB and the USFWS website (California Department of Fish and Wildlife 2019; U.S. Fish and Wildlife Service 2019), 23 special-status wildlife species have the potential to occur in the study area (Appendix C). Of these 23 species, 13 special-status wildlife species were determined to have a moderate or high potential to occur in the study area given their known range, reports of occurrence, or the presence of suitable habitat. These species consist of vernal pool fairy shrimp, vernal pool tadpole shrimp, valley elderberry longhorn beetle, western pond turtle, giant garter snake, tricolored blackbird, burrowing owl, Swainson's hawk, western yellow-billed cuckoo, Modesto song sparrow, pallid bat, silver-haired bat, and hoary bat. The remaining 10 species were determined to have low or no potential to occur. Five additional species were added as having at least moderate potential to occur in the study area based on species habitat requirements and professional judgment (northern harrier, white-tailed kite, loggerhead shrike, least Bell's vireo, and western red bat). Appendix C, Table C.2 contains the species' regulatory status, distribution, habitat requirements, and a rationale for their potential to occur in the study area.

In addition to special-status species, non–special-status migratory birds and raptors could nest in or adjacent to the project footprint, and their occupied nests and eggs are protected by California Fish and Game Code Sections 3503 and 3503.5 and the federal MBTA.

Special-Status Fish

The NMFS online fish species list (2019a) indicates that Central Valley spring-run Chinook salmon, Sacramento River winter-run Chinook salmon, and Central Valley steelhead occur in Cache Creek, adjacent to the project area shown in Figure 2-1. The closest critical habitat is for Central Valley steelhead and spring-run Chinook salmon, which is designated in Tule Canal, which runs parallel to the Sacramento River. Sacramento winter-run critical habitat is in the Sacramento River. Critical habitat will not be affected by the Proposed Project. Essential Fish Habitat (EFH) for Pacific Salmon is designated in Cache Creek (National Marine Fisheries Service 2019b). Groundfish EFH is identified but is not in the study area (National Marine Fisheries Service 2019c).

Historically, Chinook salmon, steelhead, and Pacific lamprey were observed spawning as far up as Capay Dam in Cache Creek (Moyle et al. 2015). Early records suggest that steelhead may have spawned in tributary streams to Clear Lake (Moyle 2002; Lindley et al. 2006) and that fall salmon runs opportunistically entered Cache Creek to spawn, as hydrologic conditions allowed (Yoshiyama et al. 1998). During dry years, Cache Creek did not reach the Sacramento River, so spawning would not occur (Yoshiyama et al. 1998).

Currently, barriers inhibit fall-run Chinook salmon, Pacific lamprey, and steelhead from migrating up Cache Creek. Anecdotal evidence suggests that in wet years, when flows in Yolo Bypass and Cache Creek are high, some salmon may reach the spawning gravels of Lower Cache Creek from the Delta. In recent decades, little indication of salmon on Cache Creek has been found, even during wet years. In November 2000, however, a crew of University of California, Davis scientists collecting fish Yolo County Flood Control & Water Conservation District for mercury analysis found distinct evidence of salmon spawning in the creek (Stillwater Sciences 2009).

In dry years, no passable connection exists for salmon and steelhead between the Delta and mouth of Cache Creek. Cache Creek does support a variety of other fish species and above Capay Dam provides habitat for native fish. Because the water is typically warm and alkaline, the predominant fish species are members of the minnow family such as pikeminnow, hitch, and California roach, as well as Sacramento sucker, catfish, and largemouth and smallmouth bass (Sacramento River Watershed Program 2019).

Stillwater Sciences (2009) performed fish surveys of Cache Creek from the CCSB to Upper Cache Creek Regional Park. The three most downstream sites are located in the study area. For the three sites, a total of 23 bluegill (*Lepomis macrochirus*), 2 green sunfish (*Lepomis cyanellus*), 1 largemouth bass (*Micropterus salmoides*), 1 smallmouth bass (*Micropterus dolomieui*), 8 inland silversides (*Menidia beryllina*), 3 western mosquito fish (*Gambusia affinis*), 1 Sacramento pikeminnow (*Ptychocheilus grandis*) and 15 Sacramento suckers (*Catostomus occidentalis*) were captured.

Sacramento pikeminnow and sucker were the only native fish species captured; all other fish are nonnative species.

Invasive Species

Invasive plants displace native species, change ecosystem processes, alter plant community structure, and lower wildlife habitat quality. Invasive plant species are dominant in agricultural, ruderal, and disturbed/graded areas, but also occur in natural and aquatic communities in the study area. Because botanical surveys have not been conducted throughout the study area, a complete list of the invasive plant species present has not been compiled. Table 3.4-2 contains a list of invasive plants and their California Invasive Plant Council (Cal-IPC) ratings that are known to occur in Yolo County (Calflora 2020; California Invasive Plant Council 2020).

A study conducted for the *Cache Creek Resources Management Plan* in 2016 mapped patches of invasive plant species (Cache Creek Conservancy 2016). The study divided the area into reaches of Cache Creek. The reach closest to the study area is the Jesus Maria Reach. Invasive species in this reach included patches of arundo (*Arundo donax*), thistles (*Carduus pycnocephalus, Cirsium vulgare*), yellow star thistle (*Centaurea solstitialis*), tree tobacco (*Nicotiana glauca*), perennial pepperweed (*Polygonum latifolium*), and tamarisk (*Tamarix ramosissima*).

Table 3.4-2. Invasive Plant Species in Yolo County

Scientific Name Common Name	Cal-IPC Rating	Plant Type
Acacia dealbata Silver wattle	M	Tree, shrub
Acroptilon repens Russian knapweed	M	Perennial herb
Aegilops triuncialis Goatgrass	H	Annual grass
Agrostis avenacea Pacific bentgrass	L	Perennial grass
Agrostis stolonifera Redtop	L	Perennial grass
Ailanthus altissima Tree of heaven	M	Tree
Alhagi maurorum *Camel thorn*	M	Shrub
Alopecurus pratensis Meadow foxtail	W	Perennial grass
Arctotheca calendula Cape weed	M	Annual, Perennial herb
Arundo donax Giant reed	H	Perennial grass
Asparagus asparagoides African asparagus fern	M	Vine

Scientific Name Common Name	Cal-IPC Rating	Plant Type
Avena barbata Slim oat	M	Annual, Perennial grass
Avena fatua Wildoats	M	Annual grass
Bassia hyssopifolia [*Kochia scoparia*] Fivehorn smotherweed	L	Annual herb
Bellardia trixago Mediterranean lineseed	L	Annual herb
Brachypodium distachyon Purple false brome	M	Annual, Perennial grass
Brassica nigra Black mustard	M	Annual herb
Brassica rapa Common mustard	L	Annual herb
Brassica tournefortii Mustard	H	Annual herb
Briza maxima Rattlesnake grass	L	Annual grass
Bromus diandrus Ripgut brome	M	Annual grass
Bromus hordeaceus Soft chess	L	Annual grass
Bromus japonicus Hairy chess	L	Annual grass
Bromus madritensis ssp. *rubens* Foxtail brome	H	Annual grass
Bromus tectorum Downy chess	H	Annual grass
Buddleja davidii Butterfly bush	W	Tree, Shrub
Carduus pycnocephalus Italian thistle	M	Annual herb
Carduus tenuiflorus Slender flowered thistle	L	Annual herb
Carpobrotus edulis Iceplant	H	Annual herb
Carthamus lanatus Woolly distaff thistle	H	Annual herb
Cenchrus longispinus Mat sandbur	W	Annual grass

Scientific Name Common Name	Cal-IPC Rating	Plant Type
Centaurea calcitrapa Purple star thistle	M	Annual, Perennial herb
Centaurea diffusa Diffuse knapweed	M	Perennial herb
Centaurea melitensis Tocalote	M	Annual herb
Centaurea solstitialis Yellow starthistle	H	Annual herb
Chondrilla juncea Skeleton weed	M	Perennial herb
Cirsium vulgare Bullthistle	M	Perennial herb
Conium maculatum Poison hemlock	M	Perennial herb
Cortaderia jubata Andean pampas grass	H	Perennial grass
Cortaderia selloana Pampas grass	H	Perennial grass
Cotula coronopifolia Brass buttons	L	Perennial herb
Cynara cardunculus Cardoon	M	Perennial herb
Cynodon dactylon Bermuda grass	M	Perennial grass
Cynosurus echinatus Dogtail grass	M	Annual grass
Dactylis glomerata Orchardgrass	L	Perennial grass
Dipsacus fullonum Wild teasel	M	Perennial herb
Dittrichia graveolens Stinkwort	M	Annual herb
Egeria densa Brazilian water weed	H	Perennial herb
Ehrharta calycina Perennial veldt grass	H	Perennial grass
Ehrharta erecta Upright veldt grass	M	Perennial grass
Eichhornia crassipes Water hyacinth	H	Perennial herb

Scientific Name Common Name	Cal-IPC Rating	Plant Type
Elaeagnus angustifolia Russian olive	M	Tree, shrub
Elymus caput-medusae Medusa head	H	Annual grass
Erodium cicutarium Coastal heron's bill	L	Annual herb
Eucalyptus camaldulensis Red gum	L	Tree
Eucalyptus globulus Blue gum	L	Tree
Euphorbia oblongata Eggleaf spurge	L	Perennial herb
Festuca arundinacea Reed fescue	M	Perennial grass
Festuca myuros Rattail sixweeks grass	M	Annual grass
Festuca perennis Italian rye grass	M	Annual, Perennial grass
Ficus carica Common fig	M	Tree
Foeniculum vulgare Fennel	M	Perennial herb
Genista monosperma Bridal broom	M	Shrub
Geranium dissectum Wild geranium	L	Annual herb
Hedera helix English ivy	H	Vine, Shrub
Helianthus tuberosus Jerusalem artichoke	W	Perennial herb
Heminthotheca echioides Bristly ox-tongue	L	Annual, Perennial herb
Hirschfeldia incana Mustard	M	Perennial herb
Holcus lanatus Common velvetgrass	M	Perennial grass
Hordeum marinum ssp. *gussoneanum*	M	Annual grass
Hordeum murinum Foxtail barley	M	Annual grass
Hypericum perforatum Klamathweed	L	Perennial herb

Scientific Name Common Name	Cal-IPC Rating	Plant Type
Hypochaeris glabra Smooth cats ear	L	Annual herb
Hypochaeris radicata Hairy cats ear	M	Perennial herb
Ipomoea indica Oceanblue morning glory	W	Perennial herb
Iris pseudacorus Horticultural iris	L	Perennial herb
Lepidium appelianum Hairy whitetop	L	Perennial herb
Lepidium chalepense Lens-podded hoary cress	M	Annual, Perennial herb
Lepidium draba Whitetop	M	Perennial herb
Lepidium latifolium Perennial pepperweed	H	Perennial herb
Limonium duriusculum European sea lavender	M	Perennial herb
Linaria dalmatica ssp. *dalmatica* Dalmatian toadflax	M	Perennial herb
Lobularia maritima Sweet alyssum	L	Perennial herb
Ludwigia hexapetala Six petal water primrose	H	Perennial herb
Ludwigia peploides Marsh purslane	H	Perennial herb
Lythrum hyssopifolia Hyssop loosestrife	M	Annual, Perennial herb
Lythrum salicaria Purple loosestrife	H	Perennial herb
Marrubium vulgare White horehound	L	Perennial herb
Medicago polymorpha California burclover	L	Annual herb
Mentha pulegium Pennyroyal	M	Perennial herb
Myriophyllum spicatum Water milfoil	H	Perennial herb
Nicotiana glauca Tree tobacco	M	Tree, Shrub

Scientific Name Common Name	Cal-IPC Rating	Plant Type
Olea europaea Olive	L	Tree, Shrub
Onopordum acanthium Scotch cottonthistle	W	Perennial herb
Oxalis pes-caprae Bermuda buttercup	M	Perennial herb
Paspalum urvillei Vasey's grass	W	Perennial grass
Pennisetum clandestinum Kikuyu grass	L	Perennial grass
Pennisetum setaceum Fountaingrass	M	Perennial grass
Phalaris aquatica Harding grass	M	Perennial grass
Phoenix canariensis Canary Island date palm	L	Tree
Phytolacca americana Pokeweed	L	Perennial herb
Plantago lanceolata Ribwort	L	Perennial herb
Poa pratensis Kentucky blue grass	L	Perennial grass
Polypogon monspeliensis Annual beard grass	L	Annual grass
Potamogeton crispus Crispate leaved pondweed	M	Perennial herb (aquatic)
Prunus cerasifera Cherry plum	L	Tree
Pyrus calleryana Callery pear	W	Tree
Raphanus sativus Jointed charlock	L	Annual, Biennial herb
Ricinus communis Castor bean	L	Shrub
Robinia pseudoacacia Black locust	L	Tree
Rubus armeniacus Himalayan blackberry	H	Shrub
Rumex acetosella Sheep sorrel	M	Perennial herb

Scientific Name Common Name	Cal-IPC Rating	Plant Type
Rumex crispus Curly dock	L	Perennial herb
Saccharum ravennae Ravennagrass	M	Perennial grass
Salpichroa origanifolia Lily of the valley vine	W	Perennial herb
Salsola tragus Russian thistle	L	Annual herb
Schinus molle Peruvian pepper tree	L	Tree
Sesbania punicea Rattlebox	H	Shrub
Silybum marianum Milk thistle	L	Annual, Perennial herb
Sinapis arvensis Charlock	L	Annual herb
Sisymbrium irio London rocket	L	Annual herb
Spartium junceum Spanish broom	H	Shrub
Stipa brachychaeta Puna needle grass	W	Perennial grass
Tamarix aphylla Athel	L	Tree
Tamarix ramosissima Tamarisk	H	Tree, Shrub
Torilis arvensis Field hedge parsley	M	Annual herb
Triadica sebifera Chinese tallowtree	M	Tree
Tribulus terrestis Puncture vine	L	Annual herb
Trifolium hirtum Rose clover	L	Annual herb
Verbascum thapsus Woolly mullein	L	Perennial herb
Verbena bonariensis Purple top vervain	H	Annual, Biennial herb

Scientific Name Common Name	Cal-IPC Rating	Plant Type
Washingtonia robusta Mexican fan palm	M	Tree

Source: Calflora 2020; California Invasive Plant Council 2019.

Cal-IPC (California Invasive Plant Council) Inventory Categories:

High (H)—Severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Widely distributed ecologically.

Moderate (M)—Substantial and apparent ecological impacts on physical processes, plant and animal communities, and vegetation structure. Reproductive biology and other attributes are conducive to moderate to high rates of dispersal, although generally dependent on ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited (L)—Species are invasive but ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Watch (W)—These species have been assessed as posing a high risk of becoming invasive in the future in California.

3.4.2 Environmental Impacts

This section describes the environmental impacts associated with biological resources that would result from implementation of the Proposed Project. It describes the methods used to determine the effects of the Proposed Project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts are provided.

3.4.2.1 Methods for Analysis

This evaluation of biological resources is based on professional standards and information cited throughout the section. The key effects were identified and evaluated based on the environmental characteristics of the study area, including the project footprint, and the magnitude, intensity, and duration of activities related to the construction and operation of this project.

Direct impacts are those effects that are directly caused by project construction and operation (even if it takes time for the resulting effect to develop). Indirect impacts are those effects of a project that occur either later in time or at a distance from the project footprint but are reasonably foreseeable, such as alteration of hydrology offsite due to project structures (e.g., levee construction and levee degrading). Direct and indirect impacts can be either permanent or temporary. Impacts on habitat are generally considered temporary when the habitat is restored to preconstruction conditions within 1 year.

Permanent direct effects on biological resources were quantified using the estimated amount of land cover that would be converted as a result of construction of new facilities and the operation of the Proposed Project, which would be from levee and drainage channel maintenance. Temporary effects on biological resources were quantified using the estimated amount of land cover that would be temporarily disturbed during project construction but would be restored to pre-project conditions within 1 year of disturbance. The Proposed Project components that would result in permanent and temporary impacts are depicted in Figure 3.4-1.

Impacts on biological resources identified within the study area were determined using geographic information system (GIS) software. The project footprint and associated temporary impact areas were overlaid on the land cover data to quantify the permanent and temporary impacts associated with the construction and operation of the Proposed Project. Impacts on valley elderberry longhorn beetle were calculated within 165 feet of the project footprint because that is the buffer of potential effect on the species habitat (elderberry shrubs) (U.S. Fish and Wildlife Service 2017a). Impacts on giant garter snake upland habitat were calculated within 200-feet of giant garter snake aquatic habitat based on the definition of upland habitat for the species (U.S. Fish and Wildlife Service 2017b).

Effect Assumptions

The following assumptions were made regarding project effects on biological resources.

- All project construction activities, including equipment staging and access associated with construction and operation of the levee and activities in the CCSB, would take place only within the project footprint, as depicted in Figure 3.4-1.
    - Construction would generally take place during spring, summer, and fall construction windows (non-rain season).
    - There would be effects on levee and seepage berm vegetation related to the routine operation or maintenance activities under the Proposed Project, including the use of mowing, burning, herbicides, pesticides, trimming, and occasional use of a bulldozer on the levee slope and road. Sediment and vegetation would also be periodically removed in the new channel and detention basin.
    - Application of herbicides would not be used in the CCSB or the associated CCSB Proposed Project components.
    - Discharge of fill into waters of the United States associated with the Proposed Project would require a CWA Section 404 permit from the USACE Sacramento District, and CWA Section 401 certification from the Central Valley Regional Water Board. Before construction begins, the City of Woodland would have an aquatic resources delineation completed and verified by the USACE and obtain all necessary permits pertaining to affected waters of the United States and waters of the state. The permitting process would also require compensation for construction-related effects.
    - Grading would require a CWA Section 402 permit and preparation of a SWPPP as described in Chapter 2, *Project Description,* Section 2.3.3.8, *Stormwater Pollution Prevention.*
    - Grading or other construction activities within the bed, bank, or channel of Cache Creek or the CCSB would require the project applicant to enter into an LSAA with CDFW.
    - Losses of nonnative annual grassland/ruderal or agricultural land cover types, including orchard, would not be considered adverse effects from a botanical standpoint because these habitats are not considered sensitive natural community types. However, the loss of annual grassland/ruderal or agricultural land cover types in the project footprint could be adverse for wildlife. Similarly, these losses could adversely affect farmlands, which is discussed in Section 3.6, *Agricultural and Forestry Resources*.
    - Oak woodland plantings would occur on the south slope of the drainage channel as described in Chapter 2, Section 2.3.6.2, *Oak Woodland Plantings*. This would require the City

to replace lost oak woodland by planting valley oak trees at a 3:1 ratio and would serve as habitat for various species (e.g., birds).

- Floodproofing individual structures could occur under the Proposed Project; however, it is unknown the exact location, timing, and duration of construction of floodproofing efforts. It is anticipated that the flood proofing actions would be constructed in the project area (Figure 2-1). As described in Chapter 2, floodproofing individual structures would only result in construction, due to potentially raising a structure. Raising an existing structure would occur on parcels already disturbed by existing rural residences or existing agricultural or agricultural industrial structures. These structures and the areas around these structures are currently used, and as such, there is a low likelihood that sensitive plant species and wildlife species are present. Therefore, impacts associated with raising structures are not discussed further in this section.

Effect Mechanisms

The following types of activities that would be part of the Proposed Project could cause varying degrees of direct and indirect effects on biological resources.

- Vegetation removal at the onset of construction (clearing and grubbing).
- Topsoil excavation (stripping) and stockpiling during construction, and placement on levee slopes after construction.
- Grading and fill placement during construction.
- Temporary stockpiling and sidecasting of soil, construction materials, and other construction wastes.
- Soil compaction, dust, and water runoff from the construction site into adjacent areas.
- Increased vehicle traffic.
- Short-term construction-related noise (from equipment) and visual disturbance.
- Runoff of herbicides, fertilizers, diesel fuel, gasoline, oil, raw concrete, or other toxic materials used for construction, operations, and maintenance into sensitive biological resource areas (e.g., riparian habitat).
- Introduction or spread of invasive plant species into adjacent open space areas.
- Damage through toxicity associated with herbicides and rodenticides.

3.4.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the Proposed Project would be considered to have a significant effect if it would result in any of the conditions listed below.

- A substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.
- A substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

- A substantial adverse effect on state- or federally protected wetlands (e.g., marshes, vernal pools, coastal wetlands) through direct removal, filling, hydrological interruption, or other means.
- Substantial interference with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impedance of the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

For fisheries resources, no special-status or native fish species would be impacted by the Proposed Project because they are not present in the project area. The Proposed Project would continue to move excess flows through lower Cache Creek and into the CCSB, the same as the current condition. Therefore, there would be no change in the movement of any native resident or migratory fish, and fisheries resources will not be discussed further in this analysis.

Table 3.4-3 provides a summary of the location within this document of the various species impact analyses, as well as proposed mitigation measure numbers and titles.

Table 3.4-3. Summary of Impacts and Mitigation Measures

Thresholds of Significance	Impact Number	Species or Habitat Evaluated	Proposed Mitigation Measures
Substantial adverse effect on listed, candidate, sensitive, or special-status species	BIO-1	Vernal pool branchiopods and habitat	MM-BIO-1: Install orange construction fencing between the construction area and adjacent sensitive biological resources MM-BIO-2: Conduct environmental awareness training for construction employees MM-BIO-3: Conduct periodic biological monitoring MM-BIO-4: Avoid and minimize impacts on vernal pool branchiopods and their habitat MM-BIO-5: Avoid impacts on vernal pool branchiopods and their habitat
	BIO-2	Valley elderberry longhorn beetle and habitat	MM-BIO-2: see above. MM-BIO-6: Conduct a focused survey for elderberry shrubs within 50 meters of the project footprint MM-BIO-7: Implement avoidance measures to protect valley elderberry longhorn beetle and its habitat outside permanent impact areas MM-BIO-8: Provide compensatory mitigation for impacts on valley elderberry longhorn beetle
	BIO-3	Western pond turtle	MM-BIO-1 through 3: see above. MM-BIO-9: Conduct preconstruction surveys for western pond turtle and monitor construction activities if turtles are observed
	BIO-4	Giant garter snake and habitat	MM-BIO-2: see above. MM-BIO-10: Restore temporarily disturbed giant garter snake Aquatic and Upland habitat to pre-project conditions MM-BIO-11: Compensate for permanent loss of giant garter snake habitat MM-BIO-12: Avoid and minimize construction impacts on giant garter snake MM-BIO-13: Avoid and minimize potential impacts from operation and maintenance activities on giant garter snake and its habitat

Thresholds of Significance	Impact Number	Species or Habitat Evaluated	Proposed Mitigation Measures
	BIO-5	Swainson's Hawk and white-tailed kite	MM-BIO-1 through 3: see above. MM-BIO-14: Conduct vegetation removal activities outside the breeding season for birds MM-BIO-15: conduct focused surveys for nesting Swainson's hawk prior to construction and implement protective measures during construction MM-BIO-16: compensate for the permanent loss of foraging habitat for Swainson's hawk
	BIO-6	Special-Status and Non–Special-Status Birds	MM-BIO-1 through 3: see above. MM-BIO-14: see above. MM-BIO-17: Conduct nesting surveys for special-status and non–special-status birds and implement protective measures during construction MM-BIO-18: Avoid and minimize construction and operation and maintenance impacts on western yellow-billed cuckoo and least Bell's vireo and their habitat
	BIO-7	Tree-Roosting Bats	MM-BIO-1 through 3: see above. MM-BIO-19: Identify suitable roosting habitat for bats and implement avoidance and protective measures
	BIO-9	special-status plants	MM-BIO-1 through 3: see above. MM-BIO-20: Conduct special-status plants surveys MM-BIO-21: Avoid or compensate for impacts on special-status plants
Interference with the movement of native resident or migratory fish or wildlife species or established native resident or migratory wildlife corridors or use of native wildlife nursery sites	BIO-8	Species identified in BIO-1 through BIO-7	None.
Substantial adverse effect on riparian habitat or other sensitive natural community	BIO-10	Riparian habitat	MM-BIO-1 through 3: see above.

Thresholds of Significance	Impact Number	Species or Habitat Evaluated	Proposed Mitigation Measures
	BIO-11	Valley Oak Woodland	MM-BIO-1 through 3: see above. MM-BIO-22: Conduct a native tree survey prior to construction MM-BIO-23: Protect native trees during construction
	BIO-12	non-wetland waters of the United States/ waters of the state	MM-BIO-1 through 3: see above. MM-BIO-24: Compensate for fill of wetlands and non-wetland waters of the United States/waters of the state
Substantial adverse effect on state or federally protected wetlands	BIO-13	Wetlands	MM-BIO-1 through 3: see above. MM-BIO-24: Compensate for fill of wetlands and non-wetland waters of the United States/waters of the state
Conflict with local policies or ordinances protecting biological resources	BIO-11 BIO-14	Valley Oak Woodland	See measures under BIO-11.
Conflict with adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan	BIO-14	Species identified in BIO-1 through 13	None.
Potential for activities to introduce and spread invasive species	BIO-15	None	MM-BIO-1 and -2: see above. MM-BIO-25: Avoid the introduction and spread of invasive plants during construction

3.4.2.3 Impacts and Mitigation Measures

Table 3.4-4 identifies the temporary and permanent acres for each special-status species and their habitat that would result due to construction and operation of the Proposed Project. This table is used throughout the impact analysis of Impacts BIO-1 through BIO-7 and BIO-14 in order to analyze impacts on the respective special-status species.

Table 3.4-4. Impacts on Special-Status Species Wildlife Habitat for the Proposed Project

Special-Status Species	Habitat	Permanent/ Temporary (acres)
Vernal pool fairy shrimp and vernal pool tadpole shrimp	Seasonal wetland	0/0
Valley elderberry longhorn beetle	Elderberry shrubs	2[a]
Western pond turtle aquatic habitat	Ponds, irrigation ditches, irrigation canals, perennial marshes and the Cache Creek Settling Basin	20.2/0.2
Giant garter snake aquatic habitat	Major irrigation ditches, canals, and perennial marshes	1.04/0.01
Giant garter snake upland habitat	Ruderal within 200 feet of aquatic habitat	8.78/41.33
Swainson's hawk and white-tailed kite nesting habitat, and other birds nesting and foraging habitat	Riparian woodland, oak woodland, and other trees	10.1/0.2
Tricolored blackbird nesting and roosting habitat	Irrigation ditches, canals, ponds, and perennial marshes.	20.2/0.2
Western yellow-billed cuckoo and least Bell's vireo nesting habitat	Riparian woodland and riparian scrub (of sufficient density and patch size)	0/0
Swainson's hawk, white-tailed kite, northern harrier, tricolored blackbird and burrowing owl foraging habitat	Field and row crops, fallow fields, ruderal, and nonnative annual grassland	277.3/33.6
Bat roosting habitat	Riparian woodland, oak woodland, and orchard	10.1/0.2

[a] For valley elderberry longhorn beetle, the impact is the number of elderberry shrubs estimated to be removed, rather than the number of acres. Additional shrubs may be found during protocol-level surveys of the construction project footprint and 165-foot buffer.

Table 3.4-5 identifies the temporary and permanent acres for each land cover type that would result due to construction and operation of the Proposed Project. This table is used throughout the impact analysis of Impacts BIO-11 through BIO-14 in order to analyze impacts on the respective land cover types.

Table 3.4-5. Permanent and Temporary Impacts on Land Cover Types in the Project Footprint[a]

Land Cover Type	Permanent Impact Area (acres)	Temporary Impact Area (acres)
Sandbar willow riparian scrub[a]	0	0
Tamarisk riparian scrub[a]	0	0
Valley oak woodland[a]	1.8	0.2
Nonnative annual grassland/ruderal	48.7	5.9
Cache Creek Settling Basin[a]	5.2	0
Pond[a]	0.2	0.2
Irrigation canal[a]	1.2	0
Alkaline seasonal wetland[a]	9.6	0
Seasonal marsh[a]	3.8	0
Seasonal wetland[a]	<0.1	0
Roadside ditch	<0.1	<0.1
High-intensity agriculture/fallow	228.6	27.7
Orchard	8.3	0
Irrigation ditch	0.2	<0.1
Developed/disturbed areas	10.6	0.4
Total	318.1	34.4

[a] These are sensitive land cover types and waters of the United States/waters of the state. Impacts on these land cover types could be regulated.

Impact BIO-1: Potential disturbance or mortality of vernal pool branchiopods and their habitat (less than significant with mitigation)

There is no habitat for vernal pool fairy shrimp or vernal pool tadpole shrimp within the footprint of the Proposed Project; therefore, there would be no direct loss of habitat (Table 3.4-4). However, there is a depressional seasonal wetland adjacent to the project footprint that may provide suitable habitat for both species. The seasonal wetland is located at the southwest corner of the CCSB, adjacent to a dirt levee maintenance road that would be used for construction access and to the levee, where soil would be excavated and concrete slurry would be placed. Dust from construction vehicles and equipment, increased sedimentation, and spills could result in the mortality of individual branchiopods or their cysts, as well as the degradation of habitat, if this depressional seasonal wetland provides suitable habitat for either species. The Proposed Project would eliminate seepage from the CCSB, which may lead to alternations in the rate, extent, and duration of inundation of the seasonal wetland. The Proposed Project would have a significant impact on vernal pool branchiopods as a result of habitat modification and the potential for direct mortality. Implementation of Mitigation Measures BIO-1 through BIO-5 would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-1: Install orange construction fencing or other suitable markers between the construction area and adjacent sensitive biological resources

The City and/or their contractor will clearly delineate the construction limits by installing survey tape, pin flags, orange construction fencing, or other materials between the construction area and adjacent sensitive biological resource areas and will prohibit any construction-related traffic outside of these boundaries. Sensitive biological resources that occur adjacent to the construction area that could be directly affected by the Proposed Project include sensitive natural communities; special-status wildlife habitats for vernal pool branchiopods, valley elderberry longhorn beetle, western pond turtle, giant garter snake, nest sites of Swainson's hawk, migratory birds, roosting bats, and native oak trees to be avoided.

Barriers around sensitive areas will be installed as one of the first orders of work and prior to equipment staging. Before construction begins, the construction contractor will work with the project engineer and a resource specialist to identify the locations for the barrier tape, pin flags, or fencing and will place stakes around the sensitive resource sites to indicate these locations. The protected areas will be designated as environmentally sensitive areas and clearly identified on the construction plans and described in the specifications. If orange construction fencing is used to delineate construction limits, the fencing will be placed with at least a 1-foot gap between the ground and the bottom of the fencing to minimize the potential for snakes and other ground-dwelling animals from being caught in the fencing. The exception to this condition is where construction barrier fencing overlaps with erosion control fencing and must be secured to prevent sediment runoff. Survey tape, pin flags, or barrier fencing will be installed before construction activities are initiated, maintained throughout the construction period, and removed after completion of construction.

Mitigation Measure BIO-2: Conduct environmental awareness training for construction employees

The City will retain a qualified biologist to conduct environmental awareness training for construction crews before project implementation and prior to the start of each phase of construction. The awareness training will be provided to all construction personnel and will brief them on the need to avoid effects on sensitive biological resources (e.g., native oak trees, sensitive natural communities, and special-status species habitats in and adjacent to the construction area). The education program will include a brief review of the special-status species with the potential to occur in the construction area (including their life history and habitat requirements, and photographs of the species). The training will identify the portions of the construction area in which the species may occur, as well as their legal status and protection. The program also will cover the restrictions and guidelines that must be followed by all construction personnel to reduce or avoid effects on these species during project implementation. This will include the steps to be taken if a sensitive species is found within the construction area (i.e., notifying the crew foreman, who will call a designated biologist). In addition, construction employees will be educated about the importance of controlling and preventing the spread of invasive plant infestations. An environmental awareness handout that describes and illustrates sensitive resources to be avoided during project construction and identifies all relevant permit conditions will be provided to each crew member. The crew foreman will be responsible for ensuring that crew members adhere to the guidelines and restrictions. Education programs will be conducted for appropriate new personnel as they are brought on the job during the construction period.

All construction personnel will adhere to the following site restrictions and requirements to avoid or minimize construction effects on special-status species and their habitats.

- A reduced speed limit in the project footprint in unpaved areas will be enforced to reduce dust and excessive soil disturbance.

- Construction access, staging, storage, and parking areas will be located outside of any designated environmentally sensitive areas. Access routes and the number and size of staging and work areas will be limited to the minimum necessary to construct the Proposed Project.
- Routes and boundaries of roadwork will be clearly marked prior to initiating construction or grading.
- All construction pipes, culverts, or similar structures with a diameter of 4 inches or greater that are stored at a construction site for one or more overnight periods should be thoroughly inspected for wildlife before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a federally listed species is discovered inside a pipe, that section of pipe should not be moved until the USFWS has been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved once to remove it from the path of construction activity, until the animal has escaped.
- To the maximum extent practicable, any borrow material will be certified to be nontoxic and weed free.
- At the end of each day all food and food-related trash items will be enclosed in sealed trash containers and properly disposed of offsite.
- A spill response plan will be prepared. Hazardous materials such as fuels, oils, solvents, etc. will be stored in sealable containers in a designated location that is at least 50 feet from hydrologic features.

Mitigation Measure BIO-3: Conduct periodic biological monitoring

The City will retain a qualified biological monitor for the Proposed Project who will visit the site a minimum of once per week to ensure that fencing around environmentally sensitive areas is intact and that activities are being conducted in accordance with the agreed upon project schedule and agency conditions of approval. The monitor will provide the City with a monitoring log for each site visit.

Certain activities will require a biological monitor to be present for the duration of the activity or during the initial disturbance of an area to ensure that impacts on special-status species are avoided.

Mitigation Measure BIO-4: Assume presence of vernal pool branchiopods or conduct protocol-level surveys and implement avoidance and minimization measures as applicable or vernal pool branchiopods

The City will either assume presence of vernal pool branchiopods in the study area or employ a qualified biologist to conduct protocol-level surveys for the species. If surveys are conducted, the USFWS-approved biologist will use protocols identified in Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of ESA for the Listed Vernal Pool Branchiopods (U.S. Fish and Wildlife Service 1996). If protocol surveys determine absence of vernal pool branchiopods from the study area, and if USFWS confirms the results, or if USFWS concurs with a finding of no effect, then the Proposed Project will be determined to have no impact on vernal pool branchiopods and no further mitigation is required. If presence of vernal pool branchiopods is inferred by the City or confirmed during surveys, the City will implement

Mitigation Measure BIO-5 to avoid and minimize impacts on vernal pool fairy shrimp and vernal pool tadpole shrimp.

Mitigation Measure BIO-5: Avoid impacts on vernal pool branchiopods and their habitat

The City and its contractors will implement the following measures to avoid and minimize impacts on vernal pool branchiopods.

- Vernal pool branchiopod habitat will be fenced with silt fence and signage as far from the feature as possible. A qualified biologist will survey and approve the placement of the fencing prior to commencement of construction.
- Herbicide and pesticide spraying in association with maintenance activities within 250 feet of vernal pool branchiopod habitat will not be performed on windy days. Only herbicides or pesticides specifically labeled for use near aquatic resources will be utilized within 50 feet of vernal pool branchiopod habitat.

Impact BIO-2: Potential disturbance or mortality of valley elderberry longhorn beetle and its habitat (less than significant with mitigation)

Elderberry shrubs within 165 feet of ground disturbing activities have the potential to be negatively affected (U.S. Fish and Wildlife Service 2017a). Two elderberry shrubs that represent potential habitat for valley elderberry longhorn beetle have been documented within the project footprint (Table 3.4-4). However, additional shrubs may be found during protocol-level surveys of the construction project footprint and 165-foot buffer. Removal or disturbance of elderberry shrubs could result in the mortality or disturbance of valley elderberry longhorn beetle. Noise and dust generated during construction also may directly affect adult valley elderberry longhorn beetle or exposed larvae or eggs (Talley and Holyoak 2009:10). Soil disturbance adjacent to shrubs may affect the roots and subsequent health of elderberry shrubs. Shrubs located farther from the construction area and those sheltered by surrounding vegetation are expected to have fewer construction-related effects than shrubs that are closer to the construction area and in more open areas. Impacts on valley elderberry longhorn beetle may also result from operation and maintenance activities, such as the trimming of elderberry shrubs and the application of herbicides and pesticides for levee vegetation control. The removal or disturbance of six elderberry shrubs would be considered a significant impact on valley elderberry longhorn beetle. Implementation of Mitigation Measure BIO-2 and Mitigation Measure BIO-6 through BIO-8 would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-2: Conduct environmental awareness training for construction employees

See Impact BIO-1 above for full text of mitigation measure.

Mitigation Measure BIO-6: Conduct a focused survey for elderberry shrubs within 50 meters of the project footprint

A biologist with demonstrated experience identifying elderberry shrubs will conduct a pre-construction survey for elderberry shrubs, host plant for the valley elderberry longhorn beetle, within 50 meters (165 feet) of the construction limits no less than 30 days before ground disturbance or vegetation removal. The biologist will mark all elderberry shrubs with brightcolored flagging and record geospatial information using a handheld GPS or mobile device (i.e., smartphone or tablet).

Mitigation Measure BIO-7: Implement avoidance measures to protect valley elderberry longhorn beetle and its habitat outside permanent impact areas

Contractors will comply with the following avoidance and minimization measures from the USFWS' *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* (U.S. Fish and Wildlife Service 2017a).

- All areas to be avoided during construction activities will be fenced, flagged, or both as close to construction limits as feasible.
- Activities that may damage or kill an elderberry shrub (e.g., trenching, paving) may need an avoidance area of at least 20 feet from the drip line, depending on the type of activity.
- To the extent feasible, all activities that could occur within 165 feet of an elderberry shrub will be conducted outside the flight season of the valley elderberry longhorn beetle (March–July).
- Trimming of elderberry shrubs will occur between November and February and will avoid the removal of any branches or stems that are 1 inch or more in diameter.
- Herbicides will not be used within the drip line of elderberry shrubs. All chemicals will be applied using a backpack sprayer or similar direct application method.
- Mechanical weed removal within the drip line of elderberry shrubs will be limited to the season when adults are not active (August–February) and will avoid damaging elderberry shrubs.

Mitigation Measure BIO-8: Provide compensatory mitigation for impacts on valley elderberry longhorn beetle

The City will provide compensatory mitigation for impacts on valley elderberry longhorn beetle habitat, including through transplantation and replacement of elderberry shrubs and maintenance of replacement shrubs, consistent with the USFWS' *Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle* (U.S. Fish and Wildlife Service 2017a), as follows.

- Suitable riparian habitat will be replaced at a 3:1 ratio (acres of mitigation to acres of impact).
- Suitable nonriparian habitat will be replaced at a ratio of 1:1.
- Individual elderberry shrubs in riparian areas will be replaced through a purchase of two credits at a USFWS-approved bank for each shrub that is trimmed or removed, regardless of the presence of beetle exit holes.
- Individual elderberry shrubs in nonriparian areas will be replaced through a purchase of one credit at a USFWS-approved bank for each shrub trimmed if beetle exit holes have been found in any shrub in or within 165 feet of the area to be disturbed.

- If an elderberry shrub is to be completely removed by the activity, the entire shrub will be transplanted to a USFWS-approved location in addition to the specified credit purchase, and the transplanted shrub will be monitored for 10 years.
- For transplanted elderberry plants, a survival rate of at least 60 percent of the elderberry plants and 60 percent of the associated native plants must be maintained throughout the 10-year monitoring period. If survival rates drop below 60 percent during the monitoring period, failed plantings will be replaced and maintained until the 60 percent survival rate is achieved.

Impact BIO-3: Potential disturbance or mortality of western pond turtle (less than significant with mitigation)

Aquatic and upland (overwintering, nesting) habitat for western pond turtle may be removed or temporarily disturbed by construction activities (Table 3.4-4). Western pond turtles may be killed, injured, or disturbed by activities that remove suitable aquatic or upland habitat. Construction activities (such as grading and movement of heavy equipment) could result in the destruction of pond turtle nests containing eggs or young individuals if affected areas are being used for egg deposition. Declines in populations of western pond turtles throughout the species range have been documented (Jennings and Hayes 1994). Loss of individuals in the project footprint could diminish the local population and lower reproductive potential, which could contribute to the further decline of this species. The loss of upland nesting sites or eggs also would decrease the local population. This impact would be significant, but implementation of Mitigation Measures BIO-1 through BIO-3 and Mitigation Measure BIO-9 would reduce this impact to a less-than-significant level.

Mitigation Measures BIO-1 through BIO-3

See Impact BIO-1 above for full text of mitigation measures.

Mitigation Measure BIO-9: Conduct preconstruction surveys for western pond turtle and monitor construction activities if turtles are observed

One week before and within 24 hours of beginning work in suitable aquatic habitat (ponds, irrigation ditches and canals, perennial marshes, and the CCSB), a qualified biologist (one who is familiar with different species of turtles) will conduct surveys for western pond turtle. The surveys should be timed to coincide with the time of day when turtles are most likely to be active (during the cooler part of the day between 8:00 a.m. and 12:00 p.m. during spring and summer). Prior to conducting the surveys, the biologist should locate the microhabitats for turtle basking (logs, rocks, brush thickets) and determine a location to quietly observe turtles. Each survey should include a 30-minute wait time after arriving onsite to allow startled turtles to return to open basking areas. The survey should consist of a minimum 15-minute observation time per area where turtles could be observed. If western pond turtles are observed during either survey, a biological monitor should be present during construction activities in the aquatic habitat where the turtle was observed. The biological monitor also will be mindful of suitable nesting and overwintering areas in proximity to suitable aquatic habitat and periodically inspect these areas for nests and turtles.

Impact BIO-4: Potential disturbance or mortality of or loss of habitat for giant garter snake (less than significant with mitigation)

Construction of the Proposed Project would result in temporary and permanent losses of suitable aquatic and upland habitat for giant garter snake (Table 3.4-4). Impacts on aquatic habitat would primarily occur along the west side of the CCSB levee from the construction of the detention basin. Permanent loss of suitable upland habitat would result from the construction of the new detention basin and construction of the new levee that would tie into the existing levee. Although the new levee would continue to provide basking habitat for giant garter snake, the new levee would be regularly maintained and might not include the refugia habitat, in the form of rodent burrows and soil cracks that the existing ruderal habitat provides. Temporary impacts on suitable upland habitat would occur from construction of the CCSB levee and associated staging areas.

Construction activities in and adjacent to suitable habitat could result in the injury, mortality, or disturbance of giant garter snakes. Giant garter snakes could be injured or crushed by construction equipment working in or near suitable aquatic and upland habitat. Snakes could also be killed by construction vehicles traveling though the study area. Fuel or oil spills from construction equipment into aquatic habitat could also cause illness or mortality of giant garter snakes. Noise and vibrations from construction equipment, and presence of human activity during construction activities may also disturb giant garter snakes within the project footprint.

Operation and maintenance activities, including mechanical vegetation management, burning, or application of herbicides on the levee and seepage berm may result in the killing of giant garter snake. Equipment required for maintenance activities such as occasional reconditioning of the levee slope and road, periodic removal of sediment and vegetation from the new drainage canal and detention basin, and vehicle patrols of the levees and detention basin may crush or injure giant garter snake.

The loss of habitat and potential injury or mortality of giant garter snakes are considered significant impacts because the giant garter snake is a sensitive species. Implementation of Mitigation Measures BIO-1 and BIO-2 and Mitigation Measures BIO-10 through BIO-13 would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-1 and BIO-2

See Impact BIO-1 above for full text of mitigation measures.

Mitigation Measure BIO-10: Restore temporarily disturbed giant garter snake aquatic and upland habitat to pre-project conditions

Upon completion of the Proposed Project, the City will restore temporarily disturbed suitable aquatic and upland habitat for 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 CDFW and USFWS prior to the start of construction.

Mitigation Measure BIO-11: Compensate for permanent loss of giant garter snake habitat

The City will compensate for the permanent loss of suitable aquatic habitat and upland habitat for giant garter snake at a ratio of 3:1 by purchasing preservation credits equal at a USFWS and CDFW approved conservation bank. The habitat at the conservation bank will be protected in perpetuity for giant garter snake. Prior to the start of construction, the City will provide funding to the conservation bank for giant garter snake habitat preservation credits. 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. The City will provide the USFWS and CDFW with copies of the credit sale agreement and fund transfer.

Mitigation Measure BIO-12: Avoid and minimize construction impacts on giant garter snake

The City and its contractors will implement the following measures to avoid and minimize impacts on giant garter snake and its habitat during construction.

- All construction activity within 200 feet of giant garter snake aquatic habitat will be conducted during the snake's active period (between May 1 and October 1). During this timeframe, potential for injury and mortality are lessened because snakes are actively moving and avoiding danger. Giant garter snakes are more vulnerable to danger during their inactive period because they are occupying underground burrows or crevices and are more susceptible to direct effects, especially during excavation.
- To reduce the likelihood of snakes entering the construction area, the City and its contractors will install exclusion fencing along the edge of the construction area that is within 200 feet of suitable habitat. The exclusion fencing will be installed during the active period for giant garter snakes (May 1 to October 1) to reduce the potential for injury and mortality during this activity. The exclusion fencing will consist of 3-foot-tall silt fencing buried 4 to 6 inches below ground level. One-way escape routes will be installed in the silt fence, or gaps will be left in the fencing during initial clearing and grubbing, to allow snakes to escape from the project footprint. Sandbags will be placed along the gaps to protect water quality and the gaps will be replaced with fencing once initial ground clearing is complete. The fencing requirements will be included in the construction specifications and a USFWS- and DFW-approved biological monitor will be onsite to direct and monitor exclusion fence installation. 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. Barrier and/or exclusion fences will be inspected daily by a qualified biological monitor during ground-disturbing activities and weekly after ground-disturbing activities are complete or until the fences are removed, as approved by the biological monitor. The biological monitor will be responsible for ensuring that the contractor maintains the protective fencing around giant garter snake habitat throughout construction. The biological monitor will prepare monitoring logs that include a description of construction activities; areas surveyed and monitored; communication with construction personnel, the City, and wildlife agencies; noncompliance issues and resolutions; and a list of all wildlife species observed during monitoring activities.
- A USFWS- and CDFW-approved biologist will conduct a preconstruction survey in suitable habitat no more than 24 hours before construction. Prior to construction activities each morning, construction personnel will inspect exclusion and orange barrier fencing to ensure they are both in good working order. If any snakes are observed in the construction area during this inspection or at any other time during construction, the USFWS- and CDFW-approved biologist will be contacted to survey the site for snakes. If a giant garter snake is found within the construction area, 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.

- Any dewatered habitat will be sufficiently dry (no standing water) 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. Giant garter snake habitat within or adjacent to the project footprint 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 potential giant garter snake aquatic habitat will be confined to designated haul routes to minimize habitat disturbance.
- 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.

Mitigation Measure BIO-13: Avoid and minimize potential impacts from operation and maintenance activities on giant garter snake and its habitat

The City and its contractors will implement the following measures to avoid and minimize impacts from operation and maintenance activities on giant garter snake and its habitat.

- Only herbicides or pesticides specifically labeled for use near aquatic resources will be utilized within 50 feet of giant garter snake aquatic habitat.
- Vehicles will maintain a 10-mile-per-hour speed limit within potential giant garter snake upland habitat, except on county roads and state and federal highways.

Impact BIO-5: Potential disturbance or mortality of nesting Swainson's hawk and white-tailed kite and loss of nesting and foraging habitat (less than significant with mitigation)

Construction is anticipated to occur during the breeding season of Swainson's hawk and White-tailed kite (March through August) within the study area. Construction activities and removal of suitable nest trees could result in the loss or disturbance of Swainson's hawk during the nesting season. Removal of nests or suitable nesting habitat and construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Removal of active nest trees or anticipated disturbance that could result in nest abandonment would require an incidental take permit from CDFW. Impacts on potential nesting habitat (riparian forest trees and other trees) and foraging habitat (row/field crops and ruderal grassland) for Swainson's hawk are shown in Table 3.4-4. Because the availability of foraging habitat has been closely tied to the breeding success of this species, projects that would significantly modify suitable Swainson's hawk foraging habitat are considered to have potential to significantly affect this species (California Department of Fish and Game 1994). Loss of Swainson's hawk eggs or nests, any activities resulting in nest abandonment, and loss of nesting and foraging habitat would be considered a significant impact. Because white-tailed kite is fully protected, removal of trees with active nests and activities that may result in loss of white-tailed kites are prohibited. As described in Section 3.4.2.1, *Methods, Effect Assumptions*, above, the City would replace lost oak woodland at a 3:1

ratio. In addition, implementation of Mitigation Measures BIO-1 and BIO-2 and Mitigation Measures BIO-14 through BIO-16, would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-1 and BIO-2

See Impact BIO-1 above for full text of mitigation measures.

Mitigation Measure BIO-14: Conduct vegetation removal activities outside the breeding season for birds

To the maximum extent feasible, the City will schedule vegetation (trees, shrubs, ruderal areas) removal/trimming during the nonbreeding season for birds (September 1–January 31). If vegetation removal cannot be removed in accordance with this timeframe, preconstruction surveys for nesting birds and additional protective measures will be implemented (see Mitigation Measures BIO-5b and BIO-6a). The City will not remove trees with active Swainson's hawk or other active raptor nests. Because white-tailed kite is fully protected, removal of trees with active nests and activities that may result in loss of white-tailed kites are prohibited.

Mitigation Measure BIO-15: Conduct focused surveys for nesting Swainson's hawk prior to construction and implement protective measures during construction

The City will retain a qualified biologist to conduct preconstruction surveys for active nests within the project footprint and in a buffer area up to 0.25 mile around the project footprint, consistent with guidelines provided by the Swainson's Hawk Technical Advisory Committee (2000), between March 15 and August 30 and within 15 days prior to the beginning of the construction activity. If active nests are found during preconstruction surveys, a 1,320-foot initial temporary nest disturbance buffer will be established. If project related activities within the temporary nest disturbance buffer are determined to be necessary during the nesting season, then the qualified biologist will monitor the nest and will, along with the City, determine the best course of action necessary to avoid nest abandonment or take of individuals through informal consultation with CDFW. Work may be allowed to proceed within the temporary nest disturbance buffer if Swainson's hawk or white-tailed kite are not exhibiting agitated behavior, such as defensive flights at intruders, getting up from a brooding position, or flying off the nest. The designated onsite biologist/monitor shall be onsite daily while construction-related activities are taking place within the 1,320-foot buffer and shall have the authority to stop work if raptors are exhibiting agitated behavior. Prior to pruning or removal of a potential Swainson's hawk or white-tailed kite nest tree, the qualified biologist will conduct preconstruction surveys that are consistent with the guidelines provided by the Swainson's Hawk Technical Advisory Committee (2000). If active Swainson's hawk or white-tailed kite nests are found during preconstruction surveys, no tree pruning or removal of the nest tree will take place during the period between March 1 and August 30 within 1,320 feet of an active nest, unless a qualified biologist determines that the young have fledged and the nest is no longer active.

Mitigation Measure BIO-16: Compensate for the permanent loss of foraging habitat for Swainson's hawk

Permanent removal of suitable foraging habitat for Swainson's hawks will be mitigated by providing offsite habitat management lands as described in CDFW's *Staff Report Regarding Mitigation for Impacts to Swainson's Hawks in the Central Valley of California* (California Department of Fish and Game 1994). A portion of the mitigation may be implemented within the project footprint by planting native grasses and forbs on the new levee and drainage ditch to compensate for the loss of foraging habitat. The use of rodenticide would be prohibited on areas created to mitigate for Swainson's hawk foraging habitat. The final acreage of offsite management lands to be provided will depend on the distance between the project footprint and the nearest active nest site. The mitigation ratio varies from 0.5:1 to 1:1 of habitat preserved for each acre lost. If acceptable to CDFW, the City also may be able to purchase mitigation credits for Swainson's hawk foraging habitat from a CDFW-approved mitigation or conservation bank. Information on the nearest nest will be collected during Swainson's hawk surveys conducted under Mitigation Measure BIO-15 to determine the appropriate mitigation ratio. If no active nests are found during this survey, a search of the CNDDB will be conducted, and CDFW will be contacted to determine the nearest active nest.

Impact BIO-6: Potential disturbance or mortality of nesting special-status and non–special-status birds and removal of suitable breeding habitat (less than significant with mitigation)

Special-status birds that may nest in the riparian woodlands in and adjacent to the study area include Modesto song sparrow, western yellow-billed cuckoo, and least Bell's vireo. Suitable nesting habitat is present for both species immediately to the east and north of the CCSB levee. Northern harrier and burrowing owl may nest in ruderal areas in or adjacent to the construction area. Loggerhead shrike may nest in shrubs and trees in more open portions of the construction area. Tricolored blackbirds may nest in blackberry brambles or in emergent vegetation within irrigation ditches, irrigation canals, and ponds. Numerous non–special-status birds also may nest in these areas. Because construction is anticipated to occur during the breeding season (generally February 1 through August 31), impacts on nesting birds may result. Vegetation removal and other construction activities during the breeding season could result in the mortality or disturbance of nesting birds in and adjacent to the construction area. The removal of riparian scrub, ruderal areas, wetland vegetation, orchards, and field crops would reduce the amount of available nesting and foraging habitat for special-status and non–special-status birds (Tables 3.4-4 and Table 3.4-5).

Removal of nests or suitable nesting habitat (trees, shrubs, ruderal areas, field crops) and construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment which would be considered a significant impact. As described in Section 3.4.2.1, *Methods, Effect Assumptions*, above, the City would replace lost oak woodland by planting at a 3:1 ratio. In addition, implementation of Mitigation Measures BIO-1 and BIO-2, Mitigation Measure BIO-14, and Mitigation Measures BIO-17 and BIO-18 would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-1 and BIO-2

See Impact BIO-1 above for full text of mitigation measures.

Mitigation Measure BIO-14

See Impact BIO-5 above for full text of mitigation measure.

Mitigation Measure BIO-17: Conduct nesting surveys for special-status and non–special-status birds and implement protective measures during construction

The City will retain qualified wildlife biologists with knowledge of the relevant species to conduct nesting surveys before the start of construction. A minimum of three separate surveys will be conducted between February 1 and June 1. Surveys will include a search of all suitable nesting habitat (trees, shrubs, emergent wetland, ruderal areas, field crops) in the construction area. In addition, a 500-foot area around the project footprint will be surveyed for nesting raptors, western yellow-billed cuckoo, least Bell's vireo, burrowing owl, and tricolored blackbird, and a 50-foot buffer area will be surveyed for other nesting birds. If no active nests are detected during these surveys, no additional measures are required.

If an active nest is located in the survey area, an appropriate no-disturbance buffer will be established by the biologist. The buffer distance should be determined based on the species, nature of construction activities, and line of sight from the work area. At a minimum, all work will be conducted no less than 500 feet from an active raptor nest, 100 feet from an active migratory bird nest, or another distance as determined during informal consultation with CDFW and/or USFWS. Larger buffers may be required for listed species (e.g., western yellow-billed cuckoo) if a nest is detected within the survey area.

Mitigation Measure BIO-18: Avoid and minimize construction and operation and maintenance impacts on western yellow-billed cuckoo and least Bell's vireo and their habitat

The City and its contractors will implement the following measures to avoid and minimize impacts on western yellow billed cuckoo and least Bell's vireo.

- To the maximum extent practicable, the City will avoid construction in areas within 300 feet of potential western yellow-billed cuckoo and least Bell's vireo nesting habitat between May 15 and September 30.
- When construction within 300 feet of potential western yellow-billed cuckoo or least Bell's vireo nesting habitat must occur between May 15 and September 30, a qualified biologist will conduct presence/absence surveys for western yellow-billed cuckoo and least Bell's vireo within all accessible suitable habitat within 300 feet of the proposed construction area. If any nesting western yellow-billed cuckoo or least Bell's vireo are detected, construction will halt within a 300-foot buffer until the young fledge or the qualified biologist determines that the nest is inactive. Additionally, the qualified biologist will monitor the nest daily when work is occurring within 500 feet of the nest to ensure that the work is not altering nesting behavior.
- Herbicide and pesticide spraying in association with maintenance activities within 300 feet of potential western yellow-billed cuckoo or least Bell's vireo nesting habitat will not be conducted on windy days.

Impact BIO-7: Potential injury, mortality or disturbance of tree-roosting bats and removal of roosting habitat (less than significant with mitigation)

Construction is anticipated to occur during the maternity season of bats (April 1 through September 15) and the beginning of the hibernation period (November 1). Riparian woodland, orchards, and stands of mature broadleaf trees are potential habitat for solitary foliage-roosting bat species. Some of this vegetation may provide suitable roosting habitat (e.g., cavities, crevices, and foliage) for special-status bats (western red bat and pallid bat) and bats for which conservation actions are warranted (hoary bat and silver-haired bat) (Western Bat Working Group 2017). Pallid bat may also roost in abandoned buildings and under bridges that are within the project area. The Proposed Project would result in the loss of oak woodland trees and to orchards (Tables 3.4-4 and

3.4-5); however, as described above, in Section 3.4.2.1, *Methods, Effect Assumptions*, above, the City would replace lost oak woodland by planting at a 3:1 ratio. Larger riparian trees are also present adjacent to the project footprint in the CCSB. Tree removal and noise or other construction activities could result in the injury, mortality, or disturbance of roosting bats, if present in cavities, crevices, or foliage of trees. Mortality of tree-roosting bats during the maternity season or hibernation period that results from tree removal/trimming or other disturbances could affect the local populations of these species and would be considered a significant impact. Implementation of Mitigation Measures BIO-1 and BIO-2 and Mitigation Measure BIO-19 would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-1 and BIO-2

See Impact BIO-1 above for full text of mitigation measures.

Mitigation Measure BIO-19: Identify suitable roosting habitat for bats and implement avoidance and protective measures

If tree removal cannot be conducted between September 15 and October 30, qualified biologists will examine trees to be removed or trimmed for suitable bat roosting habitat before removal. High-quality habitat features will be identified and the area around these features searched for bats and bat sign (e.g., guano, culled insect parts, staining). Riparian woodland, orchards, and stands of mature broadleaf trees should be considered potential habitat for solitary foliage–roosting bat species. Passive monitoring using full spectrum bat detectors may be needed if identification of bat species is required. Survey methods should be discussed with CDFW prior to the start of surveys.

Measures to avoid and minimize impacts to sensitive bats species will be determined in coordination with CDFW and may include the following.

- Tree removal will be avoided between April 1 and September 15 (the maternity period) to avoid effects on pregnant females and active maternity roosts (whether colonial or solitary).
- All tree removal will be conducted between September 15 and October 30, which corresponds to a time period when bats have not yet entered torpor or would be caring for nonvolant young.
- Trees will be removed in pieces rather than felling an entire tree.
- If a maternity roost is located, whether solitary or colonial, that roost will remain undisturbed until September 15 or a qualified biologist has determined the roost is no longer active.
- If avoidance of nonmaternity roost trees is not possible, and tree removal or trimming must occur between October 30 and August 31, qualified biologists will monitor tree trimming/removal. If possible, tree trimming/removal should occur in the late afternoon or evening when it is closer to the time that bats would normally arouse. Prior to removal/trimming, each tree will be shaken gently and several minutes should pass before felling trees or limbs to allow bats time to arouse and leave the tree. The biologists should search downed vegetation for dead and injured bats. The presence of dead or injured bats that are species of special concern will be reported to CDFW. The biologist will prepare biological monitoring report, which will be provided to the project lead and CDFW.

Impact BIO-8: Potential disruption of wildlife movement corridors (less than significant)

The Proposed Project is located adjacent to existing development and is not adjacent to any designated important biological corridors (Spencer et al. 2010) or ecological preserves, so no impact on migratory corridors for larger wildlife species would result from implementation of the Proposed Project. During construction of the Proposed Project, movement through the study area would be temporarily impeded by the placement of physical barriers (fencing) used to protect resources within or near the project footprint. Additionally, animals may avoid movement through the project footprint because of the extensive amount of noise and human activity associated with construction. Upon completion of the levee and other project features, the affected area would have a different footprint but generally would be available as a movement corridor. This impact would be less than significant.

Impact BIO-9: Potential for construction activities to result in removal of special-status plants (less than significant with mitigation)

The study area has potential to support special-status plant species, such as the federally listed palmate-bracted bird's-beak and three non-listed special-status plants (brittlescale, San Joaquin spearscale, and California alkali grass) that were historically recorded as occurring in or adjacent to the project footprint. Potential habitat for these species is present in alkaline seasonal wetlands and in mesic areas in nonnative annual grassland on alkaline soils in the east part of the project footprint. Grading, excavation, and vegetation removal activities for construction of the proposed levee, seepage berm, and drainage channel under the Proposed Project would remove special-status plants if any are present in the project footprint. Indirect impacts on special-status plants could result due to changes in hydrology, sediment movement, or erosion of areas adjacent to the construction area. Because special-status plant surveys have not yet been conducted in the project footprint, their presence or absence cannot be confirmed and, therefore, there is potential to directly and indirectly impact special-status plants. Federal and/or state agencies may require avoidance and minimization of impacts and compensation for the loss of special-status plants. This is a potentially significant impact. Implementation of Mitigation Measures BIO-1 through BIO-3 and Mitigation Measures BIO-20 and BIO-21 would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-1 through BIO-3

See Impact BIO-1 above for full text of mitigation measure.

Mitigation Measure BIO-20: Conduct special-status plants surveys

During the spring and summer prior to project construction, the City will retain a qualified botanist to conduct surveys for special-status plants throughout the project footprint in accordance with the 2018 CDFW *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (California Department of Fish and Wildlife 2018).

If any special-status plants are identified during the surveys, the botanist will photograph and map locations of the plants, document the location and extent of the special-status–plant population on a CNDDB survey form, and submit the completed survey form to the CNDDB. The amount of compensatory mitigation required will be based on the results of these surveys.

Mitigation Measure BIO-21: Avoid or compensate for impacts on special-status plants

If any special-status plants are found within the project footprint, a 100-foot fenced buffer will be established around the plants, and the impact will be considered avoided. If impacts to state- or federally listed special-status plants are unavoidable, or if a 100-foot buffer cannot be established, then a compensatory conservation plan for the affected special-status plants will be developed in coordination with CDFW and, for any federally listed species, also with USFWS.

For any directly and indirectly impacted special-status plant species (i.e., those within a 100-foot buffer of temporary or permanent impacts), a conservation plan will be prepared. The conservation plan will require the City to protect and maintain existing populations of the same special-status plant species in the vicinity of the project footprint. For direct impacts, the City will conserve occupied habitat at a 3:1 ratio (i.e., 3 acres conserved for every 1 acre directly impacted) or at a ratio to be negotiated with the resource agencies. For indirect impacts, the City will conserve occupied habitat at a 1:1 ratio (i.e., 1 acre conserved for every 1 acre indirectly impacted) or at a ratio to be negotiated with the resource agencies. Conservation will not be based on the number of plants, as that can be highly variable by year for annual plant species.

If plants are within the project footprint and will be directly affected, then the conservation plan will include details on the following: seed collection, relocation/ transplant potential, storage, propagation (if deemed appropriate), location and preparation of receptor site, installation, long-term protection and management, monitoring and reporting requirements, and remedial action responsibilities should the initial effort fail to meet compensation requirements.

The conservation plan will include the following for populations to be preserved, as well as any proposed offsite plant establishment locations.

- Monitoring: This will include both success monitoring for newly established populations, and long-term monitoring of all special-status plant populations set aside or established.
- Conservation Easements: Dedication of conservation easements, purchase of mitigation credits, or other offsite dedication measures will be detailed in the conservation plan, along with an endowment for management in perpetuity. This endowment must be funded in full before groundbreaking.
- Long-Term Management: The plan will include information on responsible parties for long-term management, holders of conservation easements, long-term management requirements, and other details, as appropriate, for the preservation of long-term viable populations.
- Reporting: The plan will include reporting requirements for the results of the short-term success monitoring, the long-term special-status population monitoring, and the long-term management.

Impact BIO-10: Potential for construction activities to result in indirect impacts on riparian habitat (less than significant with mitigation)

No direct impacts on sandbar willow riparian scrub or tamarisk riparian scrub are anticipated under the Proposed Project. However, sandbar willow riparian scrub occurs just south of the easternmost part of the proposed levee cutoff wall south of the CCSB, and a stand of tamarisk riparian scrub occurs south of the proposed training levee degrade area. Potential indirect impacts during construction could result in these areas due to erosion or sedimentation effects outside of the construction area.

CDFW could require an LSAA for construction adjacent to the riparian habitat. The loss or disturbance of riparian wetland vegetation is considered significant because it provides a variety of important ecological functions and values, therefore, direct and indirect impacts on riparian habitats would be considered significant impacts. As described above in Section 3.4.2.1, *Methods for Analysis, Effects Assumptions*, and Section 2.3.3.8, *Stormwater Pollution Prevention,* a SWPP would be developed, along with a hazardous materials spill prevention and containment Plan. In addition, Mitigation Measures AQ-1 would reduce dust. Finally, implementation of Mitigation Measures BIO-1 through BIO-3 would reduce these impacts to a less-than-significant level.

Mitigation Measure BIO-1 through BIO-3

See Impact BIO-1 above for full text of mitigation measures.

Impact BIO-11: Potential for construction activities to result in loss of valley oak woodland (less than significant with mitigation)

Under the Proposed Project, levee and channel construction at the crossing of County Road 98, I-5, and Union Pacific Railroad would result in temporary and permanent loss of valley oak woodland. Permanent impacts on valley oak woodland would occur within the footprint of the proposed levee and channel. Temporary impacts on valley oak woodland would occur during construction activities as a result of equipment moving in the construction area for the levee and channel. Indirect impacts on valley oak woodland in areas adjacent to construction activities could occur as a result of erosion or sedimentation effects outside of the construction area, as well as by permanent changes to the hydrology from the constructed project components.

Yolo County does not yet have a heritage tree ordinance, but the General Plan policies support no net loss of oak woodland. Although the valley oak woodland in the project footprint is along roads and agricultural fields and is unconnected to larger oak woodlands, the loss or disturbance of these valley oak woodlands is considered significant because it provides important habitat for special-status wildlife species, such as nesting birds and roosting bats therefore, direct and indirect impacts on valley oak woodland would be considered significant impacts. As described in Section 3.4.2.1, *Methods, Effect Assumptions*, above, the City would replace lost oak woodland by planting at a 3:1 ratio. Native oaks will be planted on the drainage channel, which would compensate for the permanent loss of oak woodland and valley oak trees. In addition, implementation of Mitigation Measures BIO-1 through BIO-3 and Mitigation Measures BIO-22 and BIO-23 below would further reduce this impact to a less-than-significant level.

Mitigation Measure BIO-1 through BIO-3

See Impact BIO-1 above for full text of mitigation measures.

Mitigation Measure BIO-22: Conduct a native tree survey prior to construction

In order to determine the number of native oaks in the project footprint and the extent of compensation needed, the City will retain a qualified arborist to identify, measure, and map the native oak trees in the project footprint.

Mitigation Measure BIO-23: Protect native trees during construction

This measure applies to all native oaks that have a diameter at breast height (dbh) of at least 6 inches, or if it has multiple trunks of less than 6 inches each, a combined dbh of at least 10 inches.

With the exception of the trees slated for removal that will be mitigated for through compensatory measures, all native oak trees in the project footprint, all portions of adjacent offsite native oak trees that have driplines that extend onto the project footprint, and all offsite native oak trees that may be impacted by levee and channel construction associated with this project, will be preserved and protected as follows.

- A circle with a radius measurement from the trunk of the tree to the tip of its longest limb shall constitute the dripline protection area of the tree. Limbs must not be cut back in order to change the dripline. The area beneath the dripline is a critical portion of the root zone and defines the minimum protected area of the tree. Removing limbs which make up the dripline does not change the protected area.
- Chain link fencing or a similar protective barrier shall be installed one foot outside the driplines of the native trees prior to initiating project construction, in order to avoid damage to the trees and their root system.
- No signs, ropes, cables (except cables which may be installed by a certified arborist to provide limb support) or any other items shall be attached to the native trees.
- No vehicles, construction equipment, mobile home/office, supplies, materials or facilities shall be driven, parked, stockpiled or located within the driplines of the native trees.
- Any soil disturbance (scraping, grading, trenching, and excavation) is to be avoided within the driplines of the native trees. Where this is necessary, an ISA Certified Arborist will provide specifications for this work, including methods for root pruning, backfill specifications and irrigation management guidelines.
- Trenching within protected tree driplines is not permitted. If trenching must encroach upon the dripline, they should be tunneled or bored under the tree under the supervision of an International Society of Arboriculture (ISA) Certified Arborist.
- If temporary haul or access roads must pass within the driplines of oak trees, a roadbed of six inches of mulch or gravel shall be created to protect the root zone. The roadbed shall be installed from outside of the dripline and while the soil is in a dry condition, if possible. The roadbed material shall be replenished as necessary to maintain a six-inch depth.
- Drainage patterns on the site shall not be modified so that water collects or stands within, or is diverted across, the dripline of oak trees.
- Tree pruning that may be required for clearance during construction must be performed by an ISA Certified Arborist or Tree Worker and in accordance with the American National Standards Institute (ANSI) A300 pruning standards and the ISA "Tree Pruning Guidelines."

Impact BIO-12: Potential for construction activities to result in fill of non-wetland waters of the United States/waters of the state (less than significant with mitigation)

Under the Proposed Project, the degrading of the training levee and construction of the CCSB inlet weir could result in temporary and permanent fill placement in unvegetated open water in the CCSB.

Permanent impacts on the CCSB would occur within the footprint of the inlet weir. Construction of the levee and channel and degrading of the training levee would fill or excavate potential pond. Construction of the proposed detention basin would fill or excavate irrigation canal.

Temporary impacts on the CCSB, potential pond, and irrigation canal would occur during construction activities as a result of equipment moving in the construction area for the culverts and inlet weir, the training levee degrade, levee and channel construction, and detention basin construction. Indirect impacts on irrigation canal downstream of construction activities, the CCSB adjacent to construction, and part of the pond at the south end of the training levee could occur as a result of erosion or sedimentation effects outside of the construction area, as well as by permanent changes to the hydrology from the constructed project components. Implementation of a SWPPP would minimize and avoid temporary indirect impacts to waters of the United States/waters of the state during construction.

State and federal agencies would require avoidance, minimization, and compensatory mitigation for the loss of waters of the United States/waters of the state. An aquatic resources delineation would be required for submittal to USACE to obtain a preliminary jurisdictional determination, which would be used to confirm the estimated impact acreages. The loss of non-wetland waters is considered adverse because these features provide a variety of important ecological functions and values. As described above in Section 3.4.2.1, *Methods for Analysis, Effects Assumptions*, and Section 2.3.3.8, *Stormwater Pollution Prevention,* a SWPP would be developed, along with a hazardous materials spill prevention and containment Plan. In addition, Mitigation Measures AQ-1 would reduce dust. Furthermore, implementation of Mitigation Measures BIO-1 through BIO-3 and Mitigation Measures BIO-24 would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-1 through BIO-3

See Impact BIO-1 for full text of mitigation measure.

Mitigation Measure BIO-24: Compensate for fill of wetlands and non-wetland waters of the United States/waters of the state

Temporarily disturbed wetlands and non-wetland waters will be returned to pre-construction condition following construction. The City also will implement the conditions and requirements of state and federal permits that will be obtained for the Proposed Project.

The City will compensate for the permanent fill of waters of the United States/waters of the state in four non-wetland waters types (intermittent drainage, open water, pond, and irrigation canal) and in three wetland habitat types (alkaline seasonal wetland, seasonal marsh, and seasonal wetland). The minimum wetland compensation ratio to ensure no net loss of wetland or drainage functions and values will be 1:1 (1 acre of habitat credit for every 1 acre of permanent impact). The final compensation ratio will be approved by USACE. The City will compensate for permanent loss of wetlands and non-wetland waters through one or more of the following mitigation options.

- Purchase habitat credits from a USACE-approved mitigation bank with service areas for Yolo County, such as the River Ranch Wetland Mitigation Bank or Locust Road Mitigation Bank, and provide written evidence to the resource agencies that compensation has been established through the purchase of mitigation credits. The amount to be paid will be according to the fee schedule that is in effect at the time the fee is paid. The mitigation will be approved by USACE and may be modified during the permitting process.

- Pay into the National Fish and Wildlife Foundation Sacramento District In-Lieu Fee Program.

Impact BIO-13: Potential for construction activities to result in fill of wetlands (less than significant with mitigation)

Under the Proposed Project, the degrading of the training levee and construction of the CCSB inlet weir could result in temporary and permanent fill placement in alkaline seasonal wetland, seasonal marsh, and seasonal wetland. Permanent impacts on alkaline seasonal wetland, seasonal marsh, and seasonal wetland would occur within the footprint of the inlet weir.

Temporary impacts of on alkaline seasonal wetland, seasonal marsh, and seasonal wetland would occur during construction activities as a result of equipment moving in the construction area for the culverts and inlet weir, the training levee degrade, and levee and channel construction. Indirect impacts on alkaline seasonal wetland, seasonal marsh, and seasonal wetland could occur as a result of erosion or sedimentation effects outside of the construction area, as well as by permanent changes to the hydrology from the constructed project components. Implementation of a SWPPP would minimize and avoid indirect impacts to waters of the United States/waters of the state during construction.

State and federal agencies would require avoidance, minimization, and compensatory mitigation for the loss of wetlands. An aquatic resources delineation will be required for submittal to the USACE to obtain a preliminary jurisdictional determination, which will be used to confirm the estimated impact acreages. The loss of wetlands is considered adverse because these features provide a variety of important ecological functions and values. As described above in Section 3.4.2.1, *Methods for Analysis, Effects Assumptions*, and Section 2.3.3.8, *Stormwater Pollution Prevention,* a SWPP would be developed, along with a hazardous materials spill prevention and containment Plan. In addition, Mitigation Measures AQ-1 would reduce dust. Furthermore, implementation of Mitigation Measures BIO-1 through BIO-3 and Mitigation Measures and BIO-24 would reduce this impact to a less-than-significant level.

Mitigation Measure BIO-1 through BIO-3

See Impact BIO-1 for the full text of these mitigation measures.

Mitigation Measure BIO-24

See Impact BIO-12 for the full text of this mitigation measure.

Impact BIO-14: Conflict with provisions of an adopted HCP/NCCP or other approved local, regional, or state habitat conservation plan (less than significant)

Within the County of Yolo *2030 Countywide General Plan* and the *City of Woodland General Plan 2035*, there are policies which encourage habitat restoration, land conservation, and species preservation including the policies listed in Section 3.4.1 *Existing Conditions*. Project impacts and mitigation measures would be in compliance with Yolo County policies under the *2030 Countywide General Plan.* The Yolo HCP/NCCP includes biological objectives for the following covered species which have the potential to occur in the study area: valley elderberry longhorn beetle, western pond turtle, giant garter snake, Swainson's hawk, white-tailed kite, western yellow-billed cuckoo, western burrowing owl, least Bell's vireo, tricolored blackbird, and palmate-bracted bird's beak (Yolo Habitat Conservancy 2018, Section 6.3.4. *Covered Species Biological Goals and Objectives*). Objective L-1.4, Objective NC-VFR1.1, and Objective NC-VFR1.2 address the protection and restoration of riparian vegetation within the Cache Creek corridor (Yolo Habitat Conservancy 2018: Table 6.3, *Biological Goals and Objectives and Applicable Conservation Measures and Monitoring*). There would be no loss of riparian vegetation under the Proposed Project. The project features occur primarily south of the Cache Creek corridor, with the exception of the degradation of the existing training levee west of the CCSB and the rehabilitation of the existing levee south of the CCSB. Potential impacts on covered species that have the potential to occur in the study area would not conflict with Yolo HCP/NCCP species objectives, nor would they preclude the projections for species habitat protection, restoration, or management (Yolo Habitat Conservancy 2018: Table 6.3). Mitigation for impacts on covered species for the Yolo HCP/NCCP would be purchased at an existing conservation bank or through onsite restoration and would, therefore, not conflict with conservation easement acquisition through the Yolo Habitat Conservancy. The impact would be less than significant.

Impact BIO-15: Potential for construction activities to introduce and spread invasive species (less than significant with mitigation)

The Proposed Project has the potential to create additional disturbed areas for a temporary period and to introduce and spread invasive plant species to uninfected areas within and adjacent to the project footprint. Movement of construction equipment can spread propagules of invasive species that grow in the project footprint into areas outside of the project footprint that equipment travels to, and conversely, the equipment can carry seed and other propagules of invasive plants that do not currently grow in the project footprint from offsite areas into the project footprint. This would be of particular concern for sensitive natural communities study area, where nonnative invasive plants could outcompete and replace native vegetation.

Yolo County policies support removal of invasives and protection of sensitive natural communities. The potential introduction and spread of invasive plant species would be considered a significant impact. Implementation of Mitigation Measures BIO-1, BIO-2, and BIO-25 below would help to prevent the introduction and spread of invasive plants and reduce this potential impact to a less-than-significant level.

Mitigation Measure BIO-1 and BIO-2

See Impact BIO-1 for full text of mitigation measure.

Mitigation Measure BIO-25: Avoid the introduction and spread of invasive plants during construction

The City will be responsible for avoiding the introduction of new invasive plants and the spread of invasive plants previously documented in the project footprint. Accordingly, the following measures will be implemented during construction.

- Educate construction supervisors and managers on weed identification and the importance of controlling and preventing the spread of invasive weeds.
- Dispose of invasive species material removed during project construction offsite at an appropriate disposal facility to avoid the spread of invasive plants into natural areas.
- Minimize surface disturbance to the greatest extent feasible to complete the work.

- Use weed-free imported erosion-control materials (or rice straw in upland areas).
- Use locally grown native plant stock and native or naturalized (noninvasive) grass seed during revegetation.

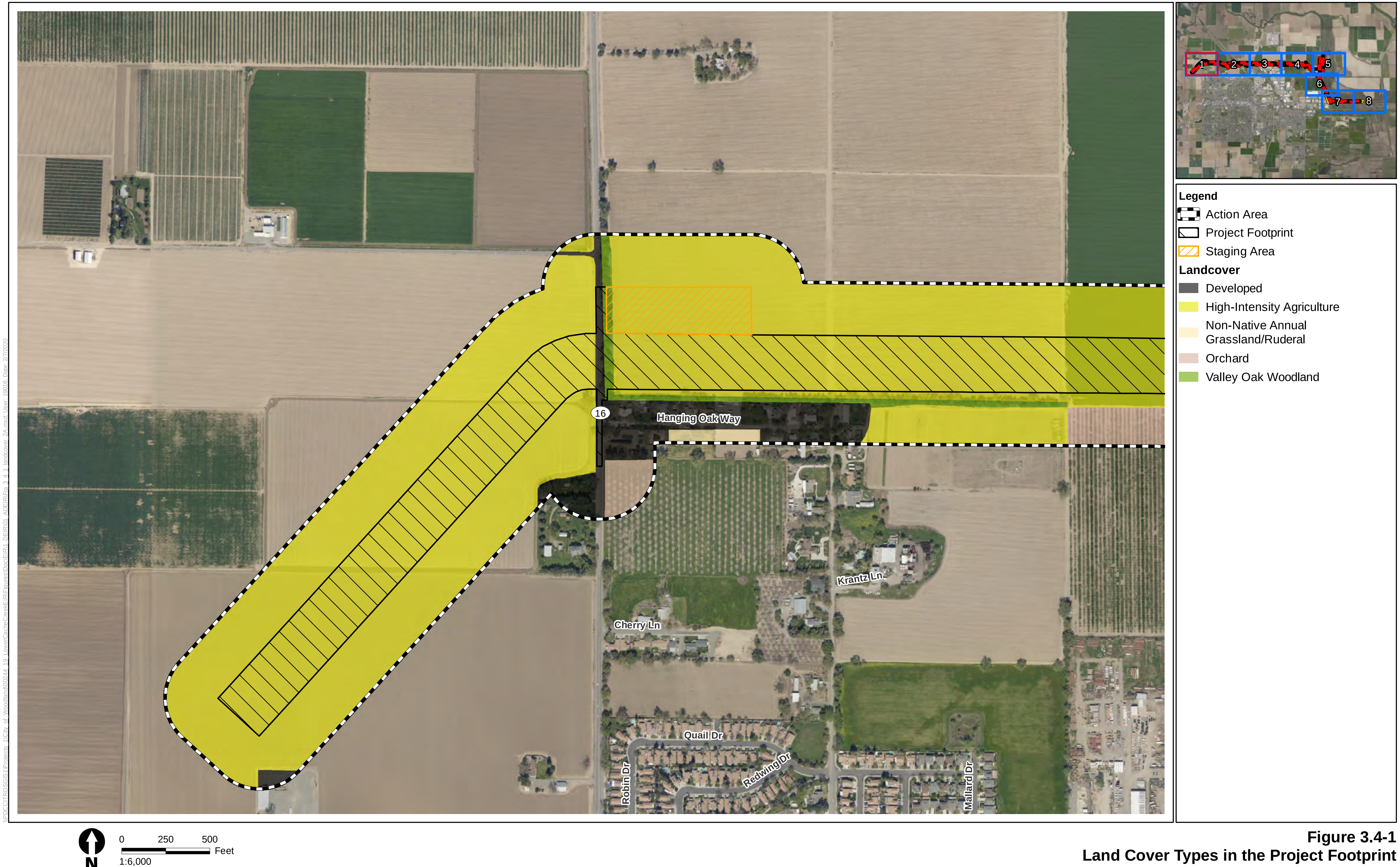
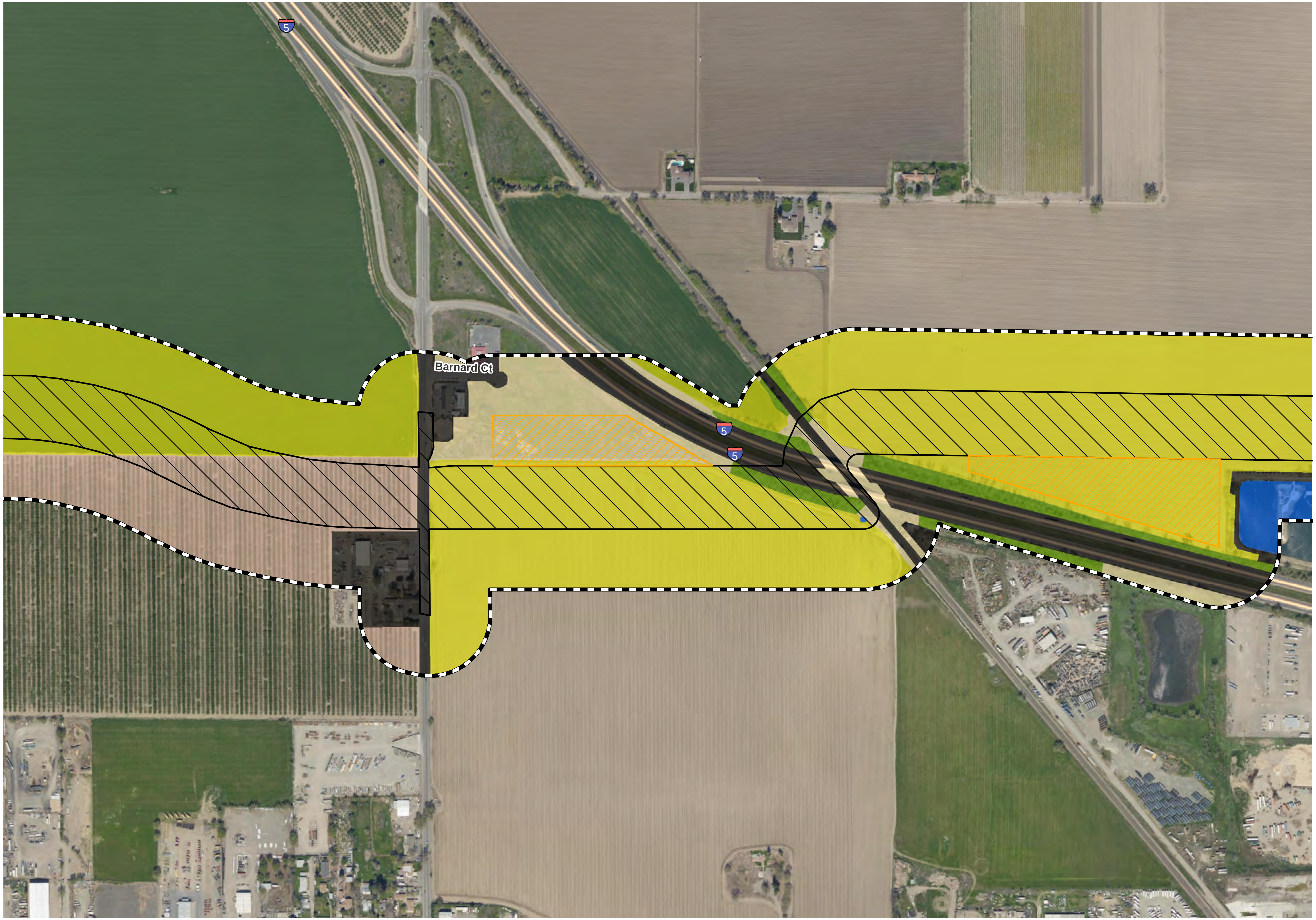
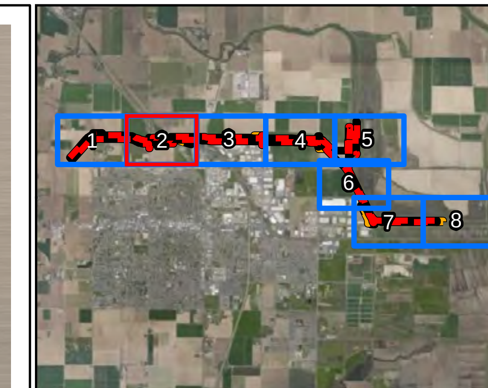


Figure 3.4-1
Land Cover Types in the Project Footprint
Sheet 1 of 8





Legend

- Action Area
- Project Footprint
- Staging Area

Landcover

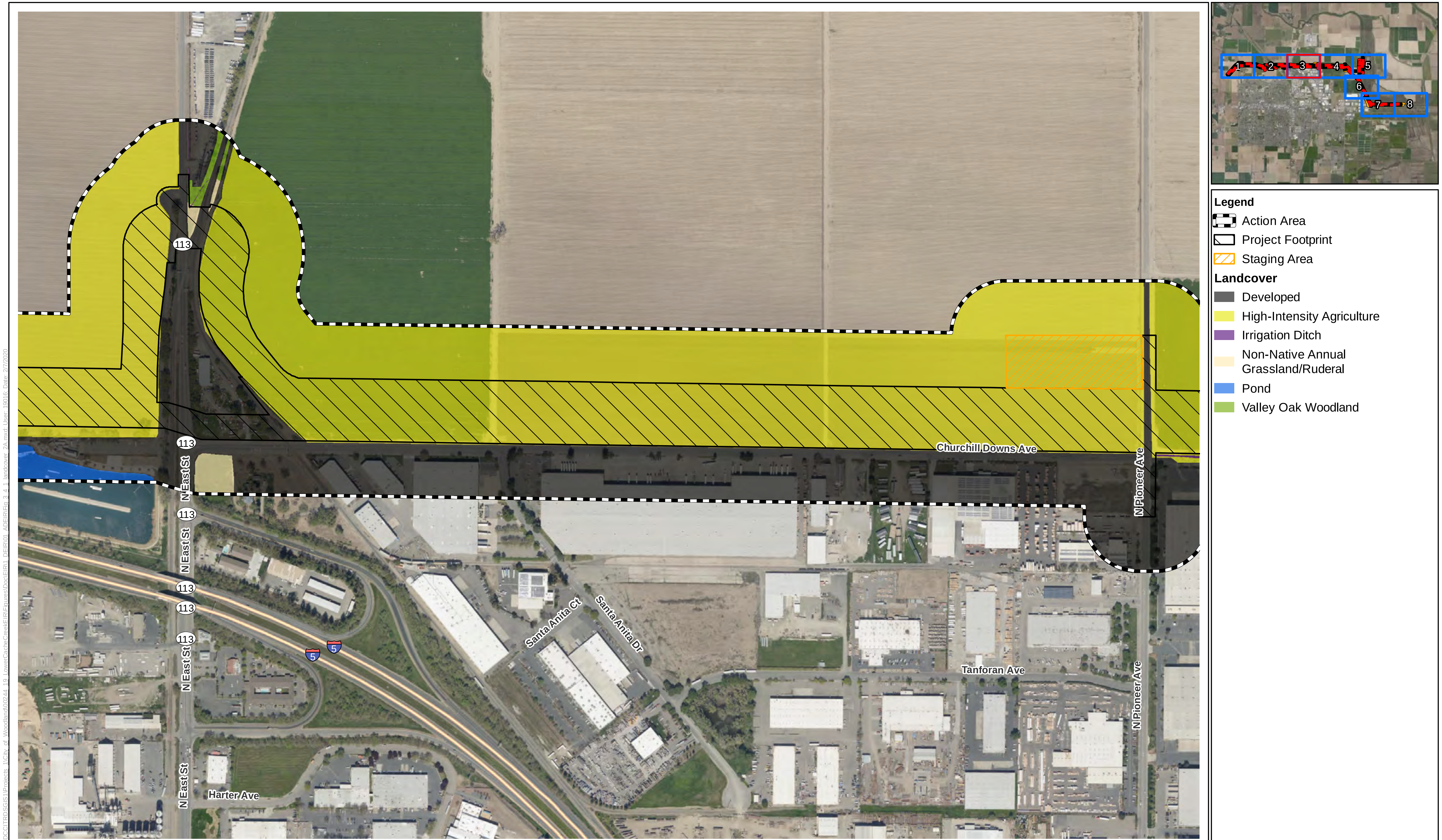
- Developed
- High-Intensity Agriculture
- Non-Native Annual Grassland/Ruderal
- Orchard
- Pond
- Valley Oak Woodland

N

0 250 500 Feet

1:6,000

Figure 3.4-1
Land Cover Types in the Project Footprint
Sheet 2 of 8



Legend

- Action Area
- Project Footprint
- Staging Area

Landcover

- Developed
- High-Intensity Agriculture
- Irrigation Ditch
- Non-Native Annual Grassland/Ruderal
- Pond
- Valley Oak Woodland

N

0 250 500 Feet

1:6,000

Figure 3.4-1
Land Cover Types in the Project Footprint
Sheet 3 of 8

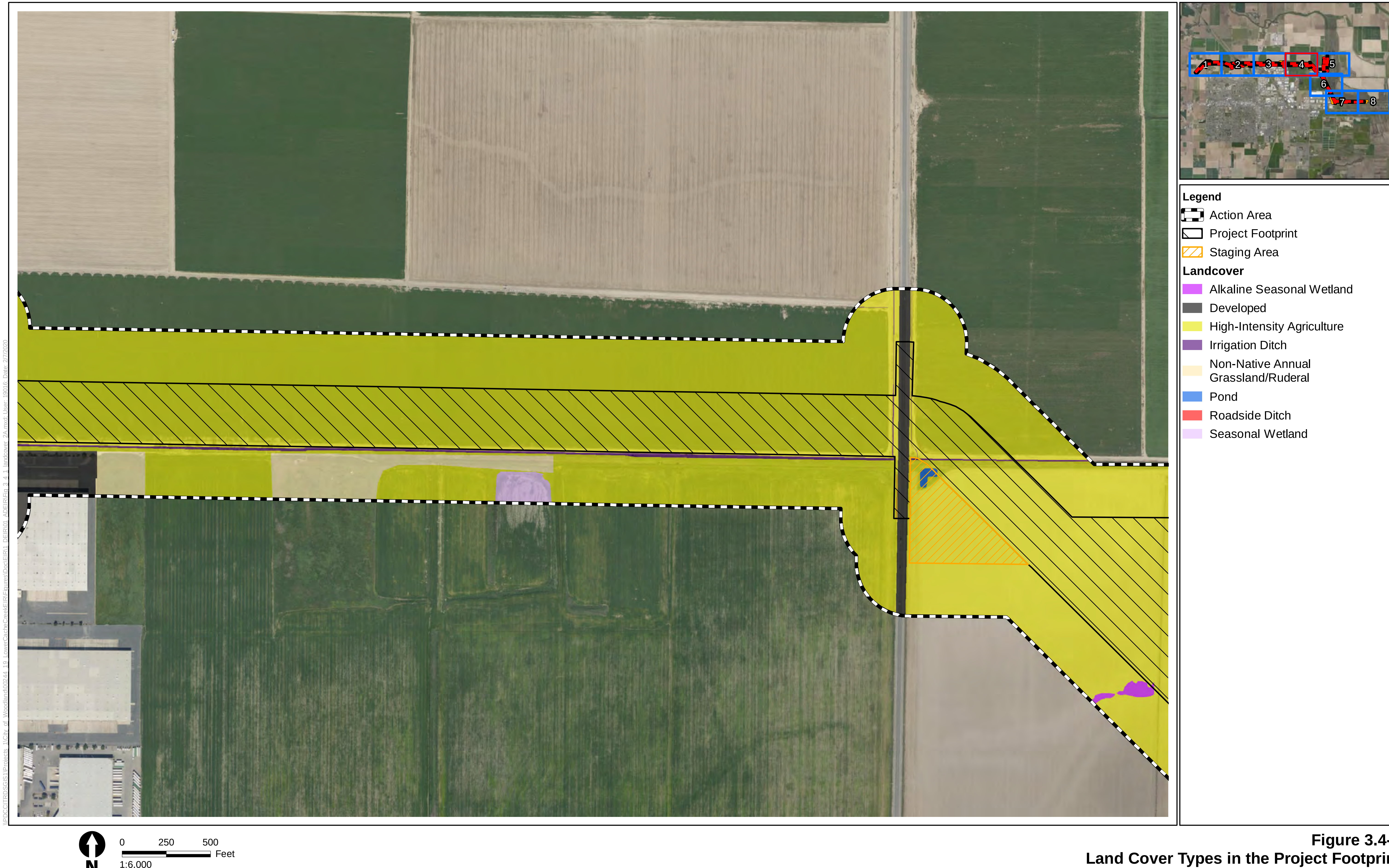


Figure 3.4-1
Land Cover Types in the Project Footprint
Sheet 4 of 8

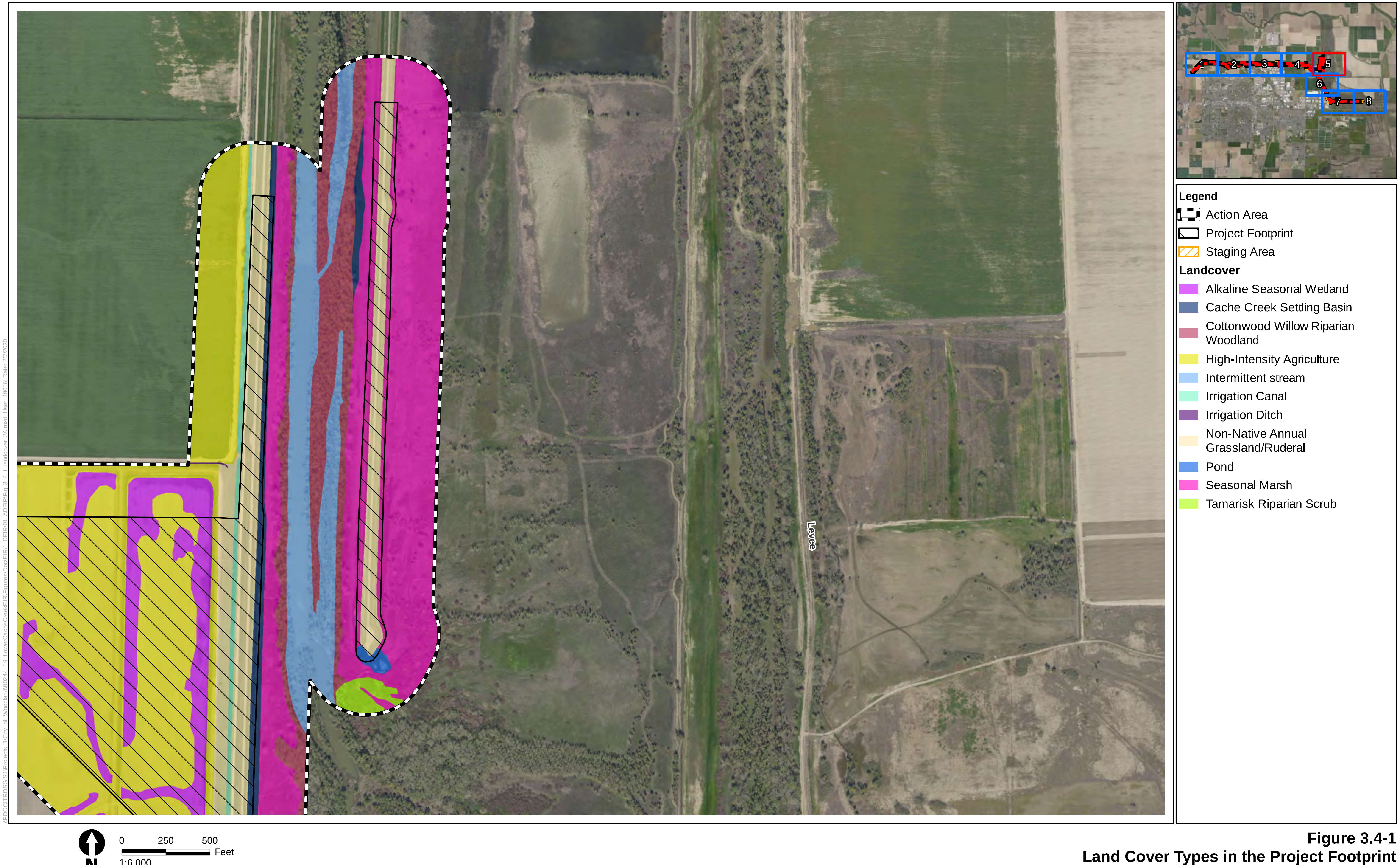
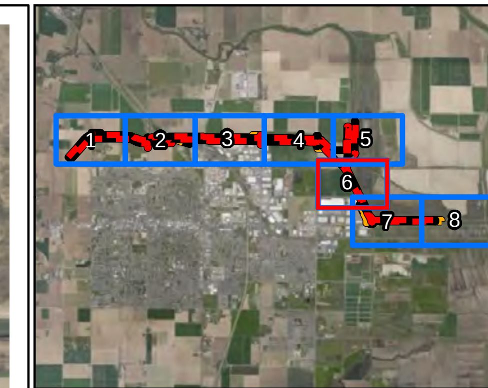


Figure 3.4-1
Land Cover Types in the Project Footprint
Sheet 5 of 8



Legend
- Action Area
- Project Footprint
- Staging Area

Landcover
- Alkaline Seasonal Wetland
- Cache Creek Settling Basin
- Cottonwood Willow Riparian Woodland
- Developed
- High-Intensity Agriculture
- Irrigation Canal
- Irrigation Ditch
- Non-Native Annual Grassland/Ruderal
- Seasonal Marsh
- Seasonal Wetland

N

0 250 500 Feet

1:6,000

Figure 3.4-1
Land Cover Types in the Project Footprint
Sheet 6 of 8

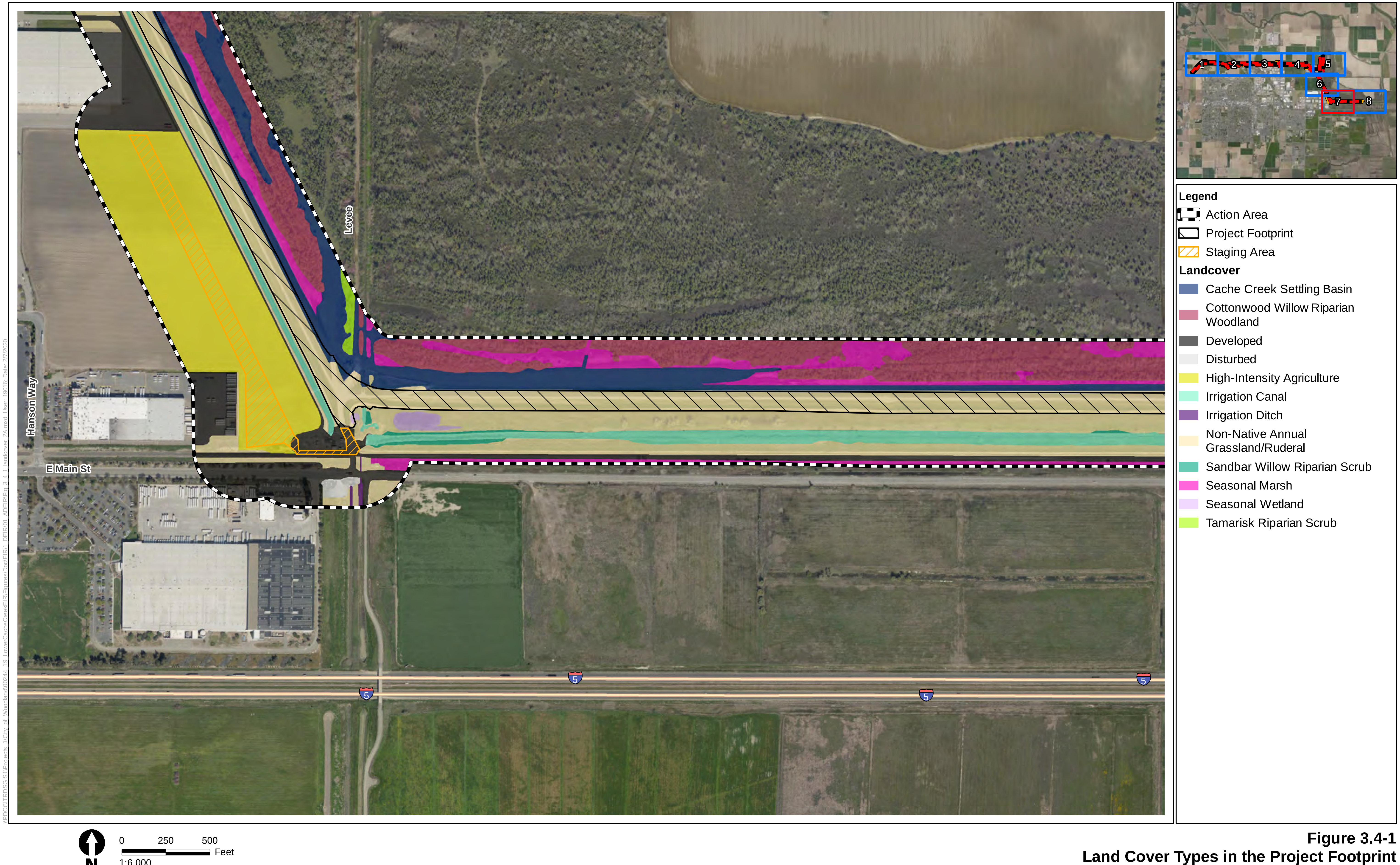


Figure 3.4-1
Land Cover Types in the Project Footprint
Sheet 7 of 8

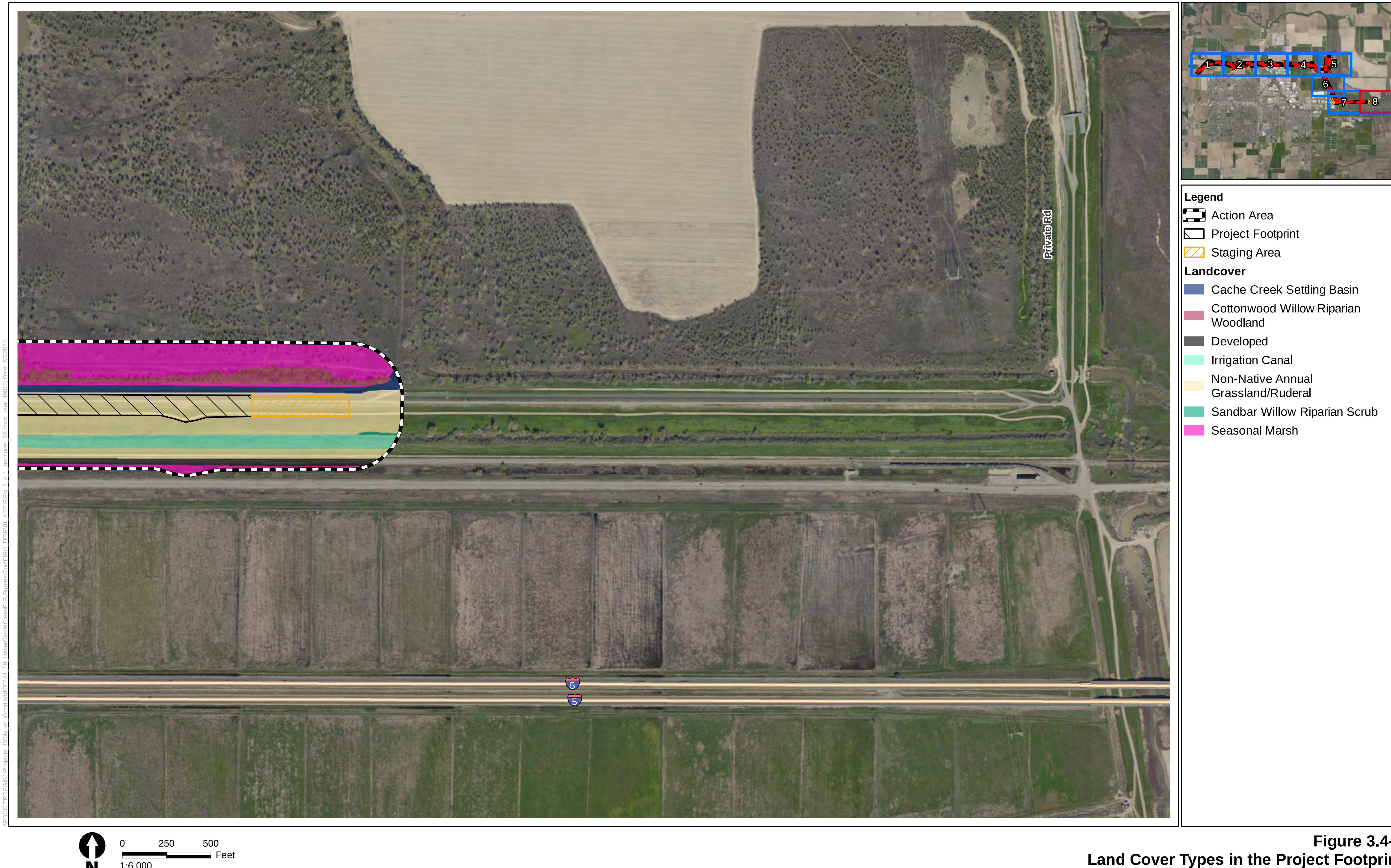


Figure 3.4-1
Land Cover Types in the Project Footprint
Sheet 8 of 8

3.5 Land Use and Planning

This section describes the regulatory and environmental setting for land use and planning in the project area, and analyzes effects on land use and planning that would result from implementation of the Proposed Project. Information presented in the discussion and used for the subsequent analysis was drawn primarily from the following sources.

- *City of Woodland General Plan 2035* (City of Woodland 2017).
- *2030 Countywide General Plan* (Yolo County 2009).

For information regarding land use and zoning related to agriculture, please see Section 3.6, *Agricultural and Forestry Resources*.

3.5.1 Existing Conditions

3.5.1.1 Regulatory Setting

This section summarizes key state and local or regional regulations, laws, and policies relevant to land use and planning in the project area. There are no relevant federal regulations, laws, and policies because land use and planning is primarily regulated at the state and local level.

State

California Planning Law—General Plans

State law requires Yolo County (County), as well as all other cities and counties in the state, to "adopt a comprehensive, long-term general plan for the physical development of the county" (Government Code Section 65300). General plans are to contain development and conservation policies that are designed to guide the city or county's long-term development. State law mandates that general plans address land use, housing, circulation, open space, conservation, noise, and public safety, as well as any other issues that may be of interest to the county or city. The land use element of the general plan should identify the allowable types, density, and intensity of land uses through its list of residential, commercial, agricultural, industrial, and other land use designations. The land use diagram should identify the locations of these existing and future land uses, as well as the communities within which they will be located.

Local

Yolo County General Plan

The *Land Use and Community Character Element* of the *2030 Countywide General Plan* (Yolo County 2009) contains goals and policies that are designed to preserve and foster the rural character of the county. The general plan's goals and policies are designed to protect the county's agricultural and open space resources, resist urbanization, and direct growth into existing incorporated cities and towns. The general plan also contains a land use diagram showing land use designations for all land in unincorporated portions of the county that is consistent with the county's zoning code (Yolo

County 2009). The *Health and Safety Element* of the general plan contains goals, policies, and actions aimed at reducing the risk of flooding in the county.

Agricultural Preservation Goals

Goal LU-2: Agricultural Preservation. Preserve farm land and expand opportunities for related business and infrastructure to ensure a strong local agricultural economy.

Goal LU-3: Growth Management. Manage growth to preserve and enhance Yolo County's agriculture, environment, rural setting and small town character.

Goal AG-1: Preservation of Agriculture. Preserve and defend agriculture as fundamental to the identity of Yolo County.

Agricultural Preservation Policies

Policy AG-1.4: Prohibit land use activities that are not compatible with agriculturally designated areas.

Policy AG-1.5: Strongly discourage the conversion of agricultural land for other uses. No lands shall be considered for resignation from Agricultural or Open Space to another land use designation unless all of the following findings can be made:

- There is a public need or net community benefit derived from the conversion of the land that outweighs the need to protect the land for long-term agricultural use.
- There are no feasible alternative locations for the proposed project that are either designated for non-agricultural land uses or are less productive agricultural lands.
- The use would not have a significant adverse effect on existing or potential agricultural activities on surrounding lands designated Agriculture.

Health and Safety Goals

Goal HS-2: Flood Hazards. Protect the public and reduce damage to property from flood hazards.

Health and Safety Policies

Policy HS-2.2: Ensure and enhance the maintenance and integrity of flood control levees.

Policy HS-2.3: Actively update and maintain policies and programs to ensure consistency with State and federal requirements.

Policy HS-2.6: Maintain the structural and operational integrity of essential public facilities during flooding.

City of Woodland General Plan

The *City of Woodland General Plan 2035* was adopted in 2017 and sets forth the City's goals and policies for development and long-term growth (City of Woodland 2017). The *Land Use, Community Design, and Historic Preservation Element* includes goals and policies designed to promote sustainable development and guide the city's future growth. The general plan also defines land use and zoning categories for the incorporated areas and provides an inventory of existing land uses in the city. The *Safety Element* of the general plan contains goals and policies aimed at reducing the risk of flooding within the city.

Safety Goals

Goal 8.B: Flood Hazards and Protection. Protect the lives and property of the citizens of Woodland from hazards and manage floodplains for their open space and natural resource values.

Safety Policies

Policy 8.B.1: Floodplain Zoning. Continue to implement floodplain zoning and undertake other actions appropriate and/or required to comply with State flood risk management requirements, and to maintain the City's eligibility under the Federal Flood Insurance Program.

Policy 8.B.4: Properties within CVFPB Jurisdiction. Require applicants to secure an encroachment permit from the CVFPB for any project that falls within the jurisdiction of the Board (e.g. levees, regulated streams, and designated floodways).

Policy 8.B.5: Protective Structures. Require installation of protective structures or other design measures to protect proposed building and development sites from the effects of flooding.

Policy 8.B.7: Adjacent Property. Require that new flood management projects or development within areas subject to flooding ensure that floodwaters will not be diverted into adjacent property to increase flood hazards on properties located elsewhere unless secured through a flood easement or fee title buyout.

Development Policies

Policy 2.B.2: Development in the Floodplain. No specific plan for SP-1, SP-2, or SP-3 may be processed until the designs for projects to provide necessary 200-year flood protection have been approved and the funding for construction has been secured. Any contemplated sale of the City's 900-acre property within SP-2 will require a four-fifths (4/5th) vote of the City Council.

City of Woodland Municipal Code

Chapter 8.12, *Flood Control*, of Title 8, *Health and Safety*, of the *Woodland Municipal Code* (City of Woodland 2019) lists the following policy intended to guide the City's approach to flood control planning.

8.12.010 Flood control policy.

A. It shall be the policy of the City to encourage a regional flood control project. Therefore, the City shall not fund or take any action that supports the Lower Cache Creek flood barrier (flood wall) studied by the United States Army Corps of Engineers, nor shall the City fund or take any action that supports a substantially similar structure.

3.5.1.2 Environmental Setting

This section discusses the environmental setting relevant to land use and planning in the project area, as well as established communities within the vicinity of the Proposed Project.

Land Use

The project area primarily consists of the land located to the north of the City of Woodland between the Urban Limit Line and Cache Creek, as well as the Cache Creek Settling Basin (CCSB). The land uses within the project area, as well as the regions to the west, north, and east of the project area, are primarily agricultural.

As shown in Table 3.5-1, the majority of the project footprint for the Proposed Project falls on land that is currently being used for agriculture. Small amounts of land within the project footprint are also used for industrial and open space purposes.

Table 3.5-1. Land Use Acreages in the Project Footprint[a]

Jurisdiction	General Plan Land Use Designation	Acres[b, c]
City of Woodland	Flood Study Area	1
Yolo County	Industrial	0.02
Yolo County	Agriculture	305

Source: Yolo County 2019; City of Woodland 2018.

[a] For the purposes of this table, acreages assessed include only land within the permanent project footprint and, therefore, do not include staging areas.

[b] Values have been rounded.

[c] The total acreage represented in this table, i.e., approximately 306 acres, only accounts for designated land uses within the 318-acre permanent project footprint and therefore does not account for acreage dedicated to roadways or roadway rights of way (approximately 12 acres).

As defined by the Yolo County general plan, agricultural land uses include the following (Yolo County 2009).

> Full range of cultivated agriculture such as row crops, orchards, vineyards, dryland farming, livestock grazing, forest products, confined animal facilities, and equestrian facilities. It also includes agricultural industrial uses (e.g. agricultural research, processing and storage; supply; service; crop dusting; agricultural chemical and equipment sales; surface mining; etc.) as well as agricultural commercial uses.

In Yolo County, the definition of industrial land use includes the following (Yolo County 2009).

> …the full range of light to heavy industrial/manufacturing, including agricultural industrial uses (e.g., storage facilities, contractor's yards, corporation yards, dismantling, etc.). Research and development, including biotechnology, is allowed where manufacturing is the primary use (accounting for more than 50 percent of the total square footage).

The City of Woodland's Flood Study Area land use designation allows for the following (City of Woodland 2017).

> … open space, as well as low-intensity agriculture or recreational uses. Generally, land uses that require extensive capital improvements or permanent infrastructure improvements shall be prohibited, with the exception of improvements related to flood protection and control.

Established Communities

As shown in Figure 2-1, the proposed levee would generally run along the north of the city of Woodland along the Urban Limit Line, with a few areas falling within the Urban Limit Line. the City of Woodland voted to establish an Urban Limit Line in 2006 to reflect a community commitment to focusing future growth within the City of Woodland and preventing urban sprawl. The Proposed Project would be located between Woodland (directly to the south) and the community of Yolo to the north. Woodland encompasses roughly 15 square miles and has a population of approximately 60,292. The land surrounding the city consists of unincorporated Yolo County land that is primarily agricultural. The community of Yolo has a population of approximately 434 and is located roughly 5 miles northwest of Woodland in unincorporated Yolo County (Yolo County 2009).

The Urban Limit Line serves to allow for denser development within the city limits while preserving the agricultural, natural resource, and open space uses outside the boundary. The Urban Limit Line encompasses the city itself as well as an additional 3,148 acres that are not within city limits and is bounded roughly by Churchill Downs Avenue to the north, County Road 98 to the west, and County Road 25A to the south (City of Woodland 2017).

3.5.2 Environmental Impacts

This section describes the environmental impacts associated with land use and planning that would result from implementation of the Proposed Project. It describes the methods used to determine the effects of the Proposed Project and lists the thresholds used to conclude whether an impact would be significant.

3.5.2.1 Methods for Analysis

This evaluation of land use and planning is based on professional standards and on information cited throughout the section. The key effects were identified and evaluated based on the environmental characteristics of the project area and the magnitude, intensity, and duration of activities related to the construction and operations of this project.

3.5.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the Proposed Project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Physical division of an established community.
- Conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

According to CEQA, policy conflicts do not, in and of themselves, constitute a significant environmental impact. A policy inconsistency is considered to be a significant adverse environmental impact when it is related to a policy adopted for the purpose of avoiding or mitigating an environmental effect and it is anticipated that the inconsistency would result in a significant adverse physical impact. Any such associated physical impacts are discussed in this EIR under specific topical sections such as noise, air quality, and transportation and circulation, as appropriate. In addition, the technical sections of this EIR identify specific policies that guide the determination of environmental impact significance (e.g., noise levels and traffic).

Section 3.6, *Agricultural and Forestry Resources*, Impact AG-1, discusses the policies and regulations related to agricultural conservation easements, which area mean to avoid or mitigate the environmental effect of a reduction or permanent conversion of existing agricultural lands. Therefore, this topic is not analyzed further in this section. Furthermore, potential conflicts related to zoning and agricultural uses are discussed in Impact AG-2 and are not discussed further in this section.

3.5.2.3 Impacts and Mitigation Measures

Impact LU-1: Physical division of an established community (less than significant)

The Proposed Project would generally follow Woodland's Urban Limit Line and convert agricultural land for project uses. The Urban Limit Line separates areas available for urban uses from areas reserved for agricultural, recreational, and open space uses. Because the majority of the population in the area is contained within the Urban Limit Line (south of the project footprint), and the project footprint generally follows the edge of this boundary, the project would not physically divide an established community. The area north of the project footprint is primarily agricultural, with scattered rural residences. The Proposed Project would construct a new levee between Woodland and the unincorporated agricultural community north of the city limits. However, access to the city and travel routes would remain unchanged, therefore preventing a project-related division of community. During operations, access to Woodland from the north would be maintained via County Roads 98, 99, 101, and 102, and State Route (SR) 113 and Interstate (I-) 5, except in times of significant flooding when the barriers would temporarily prohibit access and the roads would already be closed due to flooding. The Proposed Project would not create a significant division in an existing community during construction or operations. Therefore, the effect would be less than significant.

Impact LU-2: Conflict with land use plans, policies, and regulations adopted for the purpose of avoiding or mitigating an environmental effect (less than significant)

As discussed in Chapter 2, *Project Description*, Section 2.3.3.1, *Footprint and Right-of-Way Needs*, implementation of the Proposed Project would require that a fee title be obtained for areas beneath the physical project features (e.g., embankment, seepage berm, drainage channel) and the area 15 feet beyond the toe of waterside features and 20 feet beyond the toe of landside features. Site preparation would include clearing, grubbing, and stripping activities of up to approximately 318 acres within the project footprint. As shown in Table 3.5-1, the lands within the permanent project footprint are primarily used for agriculture (approximately 305 acres); in addition, less than one-tenth of an acre is used for industrial purposes, and approximately 1 acre of land is designated as Flood Study Area by the City of Woodland.

2030 Countywide General Plan

The Proposed Project is consistent with the goals and policies related to agriculture that are outlined in the *2030 Countywide General Plan* and identified in Section 3.5.1.1, *Regulatory Setting*.

The Proposed Project is consistent with the goals and policies of the *Health and Safety Element* of the *2030 Countywide General Plan* and listed Section 3.5.1.1 because the Proposed Project would protect the public and reduce damage to property from flood hazards by minimizing the negative effects of natural disasters, such as flooding (Goal HS-2). The Proposed Project would support Policy HS-2.2, Policy HS-2.3, Policy HS-2.6 because it is a flood infrastructure project that would ensure and enhance the maintenance and integrity of the existing flood control system. It would also result in an update in the flood system to ensure consistency with state and federal requirements regarding the 100- and 200-year flood control area and be regularly maintained such that it could withstand flooding. As described in Section 3.1, *Hydrology*, Impact HYDRO-5, any increased flood depths associated with the Proposed Project within the project area would be less than significant with implementation of the non-structural measures described in Chapter 2. Furthermore, there would generally be a reduction in flooding depth in areas within the project area that currently would be expected to experience flooding under 100- or 200-year floods.

The Proposed Project is consistent with the goals and policies of the *Land Use and Community Character* and *Agriculture and Economic Development* elements of the *2030 Countywide General Plan* discussed in Section 3.5.1.1 because the Proposed Project would not conflict with these elements' goals and policies related to agricultural preservation (Goal LU-2, Goal LU-3, Goal AG-1, and Policies AG-1.4 and AG-1.5). The Proposed Project would not conflict with expanding opportunities for related businesses and infrastructure associated with agriculture or conflict with preserving and enhancing Yolo County's agriculture, environment, rural setting, because the Proposed Project is an infrastructure project that would have no effect on these types of goals. While the project footprint is primarily located in areas designated for agricultural use, and therefore may not specifically preserve agricultural land (Goal LU-2 or Goal LU-3), the Proposed Project meets the conditions laid out in Policy AG-1.5 that would allow for the consideration of agricultural lands to be used for another land use. The Proposed Project would benefit the community by minimizing the effects of flooding. Because the Proposed Project is intended to minimize effects of flooding on the city of Woodland, due to the location of the flooding that would occur, the Proposed Project needs to be located to the north of the city. County land to the north of Woodland is primarily zoned for agricultural uses, so there is not a feasible alternative location for the project that could be located on non-agricultural lands. The Proposed Project, once constructed, would not interfere with agricultural uses on surrounding lands. Therefore, while the Proposed Project would convert some existing land designated for agricultural uses to infrastructure, the Proposed Project meets the criteria laid out in Policy AG-1.5 that would allow for the conversion of agricultural land under certain conditions.

City of Woodland General Plan and Municipal Code

The Proposed Project is consistent with the goals and policies outlined in the City of Woodland's General Plan.

As described in Section 3.5.1.1, Policy 2.B.2, Development in the Floodplain, deals with development in the floodplain. The Proposed Project would support this policy because it would provide the 200-year flood protection discussed in the policy, which, in combination with future construction funding, would allow for the development of specific plans for certain areas in the floodplain.

The Proposed Project is consistent with the goals and policies in the *Safety Element* of the *City of Woodland General Plan 2035* listed in Section 3.5.1.1 because it supports proactive solutions to protect areas at risk of flooding. The Proposed Project would protect the lives and properties of the citizens of Woodland by removing the city from the 100-year Federal Emergency Management Agency (FEMA) floodplain and the 200-year floodplain (Goal 8.B, Flood Hazards and Protection, and Policy 8.B.1, Floodplain Zoning). Furthermore, the Proposed Project would require the installation of protective structures as described in Chapter 2, Section 2.3.6, *Additional Features Proposed by City of Woodland*, to protect existing building and development sites from the effects of flooding and therefore is consistent with Policy 8.B.5, Protective Structures. Finally, the Proposed Project also includes non-structural measures, which would allow the purchase flowage easements on properties north of the new embankment that could be affected by increased flood depths, making the Proposed Project consistent with Policy 8.B.7: Adjacent Property.

City of Woodland Municipal Code

As described in Section 3.5.1.1, the Woodland Municipal Code contains a policy (Policy 8.12.010) intended to guide the City's approach to flood control planning. The "flood barrier" project mentioned in this policy was proposed and studied in 2003. The 2003 flood barrier project functioned to prevent waters from flowing into the city in cases of flooding and included features to allow drainage of those waters over an extended period of time as compared to existing conditions (Reinhardt pers. comm.). The 2003 flood barrier project would have increased both flooding depth and duration for areas north of the flood barrier. The Proposed Project would perform much differently than the 2003 flood barrier project by acting more like a bypass to transport water more efficiently through the floodplain and, with the inclusion of the non-structural measures described in Chapter 2, reducing flooding below the existing condition for several structures in the residual floodplain (Reinhardt pers. comm.). The Proposed Project would also reduce flood depth and duration as compared to the 2003 flood barrier project for the 100-year flood in the majority of locations west of County Road 101 (Reinhardt pers. comm.). The primary differences in performance are attributable changes in alignment and the addition of elements that were not included in the 2003 flood barrier project, including the following.

- Construction of a drainage channel that routes floodwaters to culverts that drain into the CCSB and the City's drainage pump stations.
- Design of the levee and drainage channel alignment to route flood waters under I-5 at the railroad underpass.
- Inclusion of culverts under SR 113 to reduce flood stages in the vicinity of a number of structures in the residual floodplain.
- A 2-foot lower crest elevation of the weir that directs flows into the CCSB.
- Addition of a detention basin at the confluence of the new levee embankment and the CCSB to improve drainage of the residual floodplain.
- Inclusion of non-structural measures intended to raise or flood-proof structures in the floodplain to minimize the damage those structures would incur as compared to the existing condition and an option to subsidize flood insurance or purchase flowage easements for properties that have an increase in flood depth or duration.
- Documentation that the existing Cache Creek levee will remain part of the Federal Flood Control Project, and a commitment by the City to advocate for continued state funding to maintain the existing Cache Creek levee.

The effects of the Proposed Project on the properties north of the city are substantially different than under the 2003 flood barrier project. With lower water surface elevations, reduced duration of flooding, raising or flood-proofing structures, subsidizing flood insurance, and purchasing of flowage easements, no residences would be subject to an increase in flood risk (Reinhardt pers. comm.). The 2003 flood barrier project benefited the city, but adversely affected the properties north of the flood barrier by increasing both depth and duration of flooding without consideration of any actions to mitigate those impacts (Reinhardt pers. comm.). The elements of the Proposed Project described above ensure that it is consistent with Woodland Municipal Code Policy 8.12.010.

Because the Proposed Project is consistent with the land use plans, policies, and regulations laid out by Yolo County and the City of Woodland, the effect of the Proposed Project would be less than significant.

3.6 Agricultural and Forestry Resources

This section describes the regulatory and environmental setting for agricultural and forestry resources in the project area (as defined in Chapter 2, *Project Description*, and shown in Figure 2-1), analyzes effects on agricultural and forestry resources that would result from implementation of the Proposed Project, and provides mitigation measures to reduce the effects of any potentially significant impacts. Information presented in the discussion and used for the subsequent analysis was drawn primarily from the following sources.

- *City of Woodland General Plan 2035* (City of Woodland 2017).
- City of Woodland's *General Plan and Climate Action Plan Public Review Draft Environmental Impact Report* (City of Woodland 2016).
- California Department of Conservation Farmland Mapping and Monitoring Program (California Department of Conservation 2016).
- Yolo County Parcels Open Data for 2019 (Yolo County 2019).
- *Farmland Conversion Impact Rating for the Lower Cache Creek Feasibility Study* (U.S. Department of Agriculture 2019).

There are no forestry resources in the project area; therefore, this resource is not discussed further.

3.6.1 Existing Conditions

3.6.1.1 Regulatory Setting

This section summarizes key federal, state, and local or regional regulations, laws, and policies relevant to agricultural resources in the project area.

Federal

Farmland Protection Policy Act

The purpose of the Federal Farmland Protection Policy Act (FPPA) is to minimize the impact of federal programs on unnecessary and irreversible conversion of farmland to nonagricultural uses. "Farmland," for the purpose of the FPPA, includes Prime and Unique farmland, and Land of Statewide or Local Importance (for an explanation of the farmland categories, see *Farmland Mapping and Monitoring Program* under the *State* regulatory setting section).

Projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to nonagricultural use and are completed by a federal agency or with assistance from a federal agency. Where such a project has the potential to convert Important Farmland to non-farm use, the Natural Resources Conservation Service (NRCS) must be contacted to request a farmland conversion impact rating score on the proposed project site(s). NRCS uses the Land Evaluation and Site Assessment (LESA) Model to establish a farmland conversion impact rating score, which is used as an indicator for the project sponsor to consider alternative sites if the potential adverse farmland impacts exceed the recommended allowable level. LESA is a numerical system that measures the quality of farmland. LESA systems have two components. The Land Evaluation element rates soil quality. The Site Assessment component measures other factors that affect the farm's viability, including proximity to water and sewer lines and the size of the parcel. Under FPPA, federal agencies sponsoring a project subject to the law complete a site assessment. NRCS is responsible for the land evaluation component. Sites receiving a combined score of less than 160 do not require further evaluation for protection, and no additional sites need to be evaluated.

State

Farmland Mapping and Monitoring Program

The NRCS classifies the suitability of soils to support agricultural enterprises based on the soil type, drainage characteristics, and the availability of water supply for irrigation. The California Department of Conservation (DOC) uses this information to map Important Farmland within California counties every 2 years (California Department of Conservation 2019a). This mapping is done in accordance with the federal Farmland Protection Policy Act, which provides definitions for Important Farmland types. The DOC Division of Land Protection administers the state Farmland Mapping and Monitoring Program (FMMP), which tracks farmland use and provides a consistent data source to analyze the distribution of farmland and long-term urbanization trends based on soil type and the availability of water.

Important Farmland

The FMMP categorizes farmland on the basis of its soil quality, the availability of irrigation water, current use, and slope, among other criteria. The categories of farmland identified in the FMMP are described below. The FMMP considers all of these categories, except Grazing Land, to be Important Farmland (California Department of Conservation 2019b).

- Prime Farmland—Land that has the best combination of features for producing agricultural crops. Prime Farmland must have been used for production of irrigated crops at some time during the 4 years prior to the FMMP's mapping date. Soil salinity must be below 4 deciSiemens/meter (a measure of electrical conductivity) for part of the year.
- Farmland of Statewide Importance—Land, other than Prime Farmland, with a good combination of physical and chemical characteristics for producing crops. Farmland of Statewide Importance must have been used for production of irrigated crops at some time during the 4 years prior to the mapping date. Soil salinity must be below 16 deciSiemens/meter for part of the year.
- Unique Farmland—Land that has been used to produce specific crops with high economic value but does not meet the criteria for Prime Farmland or Farmland of Statewide Importance. Irrigation is not a requirement for designation as Unique Farmland, and this category includes nonirrigated orchards or vineyards in some climatic zones. However, these lands may be irrigated. Unique Farmland must have been used for crops at some time during the 4 years prior to the mapping date.
- Farmland of Local Importance—Land of importance to the local agricultural economy according to each county's board of supervisors and a local advisory committee.
- Grazing Land—Land on which the existing vegetation is suited to the grazing of livestock.

Under CEQA, for the purposes of environmental review, Prime Farmland, Farmland of Statewide Importance, and Unique Farmland, constitute "agricultural land" (Public Resources Code Section 21060.1).

The FMMP also identifies nonagricultural lands.

- Urban and Built-Up Land—Land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately six structures to a 10-acre parcel (e.g., residential, industrial, commercial, institutional facilities, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, and water control structures).
- Other Land—Land not included in any other mapping category (e.g., low density rural developments, brush, timber, wetland, and riparian areas not suitable for livestock grazing, confined livestock, poultry, or aquaculture facilities, water bodies smaller than 40 acres). Vacant and nonagricultural land surrounded by urban development and greater than 40 acres is mapped as Other Land.

California Land Conservation Act of 1965 (Williamson Act) and Farmland Security Zone Act

The California Land Conservation Act of 1965 (Government Code Section 51200, et seq.), also known as the Williamson Act, protects farmland from conversion to other uses by offering owners of agricultural land a property tax incentive to maintain their land in agricultural use. Under the Williamson Act, landowners contract with the county (or city) in which their property is located, promising to maintain the land in agriculture or a compatible use for a minimum period of 10 years. In return, the property tax on the land is based on its productive value rather than its assessed value.

There are three ways to terminate a Williamson Act contract: nonrenewal, cancellation, and rescission. The preferred method for termination is nonrenewal. Under nonrenewal, the landowner files a notice of nonrenewal. After the next contract anniversary date, the tax rate will adjust over the contract term (generally 9 years). Cancellation is allowed under certain circumstances specified by statute (Government Code Section 51280, et seq.). Under cancellation, the landowner must provide a proposal for a specified alternative use for the property and provide a list of all agencies with permit authority over the proposed alternative use. Although DOC coordinates and monitors implementation of the Williamson Act, Yolo County establishes the criteria for participation and administers the program. The County Board of Supervisors must approve the request for cancellation.

Local

Yolo County

Yolo County General Plan

The *Agriculture and Economic Development Element* of the *2030 Countywide General Plan* contains goals and policies related to agricultural resources. The following goal and policies from the general plan may apply to the Proposed Project (Yolo County 2009).

> **Goal AG-1: Preservation of Agriculture.** Preserve and defend agriculture as fundamental to the identity of Yolo County.
>
> > **Policy AG-1.3.** Prohibit the division of agricultural land for non-agricultural uses.
> >
> > **Policy AG-1.4**. Prohibit land use activities that are not compatible within agriculturally designated areas.

Policy AG-1.5. Strongly discourage the conversion of agricultural land for other uses. No lands shall be considered for redesignation from Agricultural or Open Space to another land use designation unless all of the following findings can be made:

A. There is a public need or net community benefit derived from the conversion of the land that outweighs the need to protect the land for long-term agricultural use.

B. There are no feasible alternative locations for the Proposed Project that are either designated for non-agricultural land uses or are less productive agricultural lands.

C. The use would not have a significant adverse effect on existing or potential agricultural activities on surrounding lands designated Agriculture.

Policy AG-1.6. Continue to mitigate at a ratio of no less than 1:1 the conversion of farm land and/or the conversion of land designated or zoned for agriculture, to other uses.

Policy AG-1.14. Preserve agricultural lands using a variety of programs, including the Williamson Act, Farmland Preservation Zones (implemented through the Williamson Act), conservation easements, an Agricultural Lands Conversion Ordinance and the Right-to-Farm Ordinance.

Policy AG-1.16. Encourage the coordinated acquisition of agricultural conservation easements by local, State and federal agencies and private conservation organizations with established records of responsible stewardship to protect agriculture, from willing sellers or donors.

Policy AG-1.18. When undertaking improvement of public roadways and drainage facilities, consult with adjoining farmland owners and incorporate designs that minimize impacts on agriculture.

Policy AG-1.17. Encourage the coordinated placement of agricultural conservation easements on land most threatened by development, particularly those lands located close to cities and unincorporated communities.

Policy AG-1.18. When undertaking improvement of public roadways and drainage facilities, consult with adjoining farmland owners and incorporate designs that minimize impacts on agriculture.

Yolo County Zoning Code, Title 8, Chapter 2

Section 8-2.301 (Purpose)

The purpose of the agricultural zones is to provide for land uses that support and enhance agriculture in the unincorporated area of Yolo County. These uses must be "compatible with agriculture, and may include uses that support natural resource management, open space, outdoor recreation, and enjoyment of scenic beauty."

Section 8-2.302 (Agricultural Zones)

Agricultural land in Yolo County is separated into five zoning districts, with specific use types, minimum lot area, and other requirements. Most of the project footprint falls within areas zoned as Agricultural Intensive (A-N).

The Agricultural Intensive zone is applied to preserve land suited for intensive agricultural uses typically dependent on higher quality soils, water availability, and relatively flat topography. Uses in the A-N zone are primarily limited to intensive agricultural production and other activities compatible with agricultural uses.

Section 8-2.404 (Agricultural Conservation and Mitigation Program)

Zoning Ordinance Section 8-2.404 implements the agricultural land conservation policies in the Yolo County general plan with a program designed to protect permanently agricultural land located within the unincorporated area through conservation of agricultural land and/or mitigation. Pursuant to this zoning ordinance, mitigation for conversion of agricultural land or change from agricultural use to a predominantly non-agricultural use prior to, or concurrent with, approval of a zone change from agricultural to urban zoning or other discretionary or ministerial approval by the County. With exceptions, projects that convert Prime farmland need to preserve a minimum of 3 acres of agricultural land for each acre of agricultural land converted (a 3:1 ratio). For projects that convert non-Prime farmland, a minimum of 2 acres of agricultural land needs to be preserved for each acre of land changed to a predominantly non-agricultural use or zoning classification (a 2:1) ratio. Projects that convert a mix of Prime and non-Prime lands need to mitigate at a blended ratio that reflects the percentage mix of converted Prime and non-Prime lands within project site boundaries.

For both Prime and non-Prime farmland in Yolo County, mitigation land must be located within 2 miles of the sphere of influence of a city or within 2 miles of the general plan urban growth boundary of the town of Esparto, or in any other area designated by the Yolo County Board of Supervisors based on substantial evidence demonstrating that the parcel at issue consists predominantly of Prime farmland and/or is subject to conversion to non-agricultural use in the foreseeable future. Such designation will be made by resolution and will specify whether the designated area is a "priority conservation area" subject to a 1:1 mitigation ratio. For all other designated areas, the resolution will specify the mitigation ratio for any mitigation occurring in the covered area, which may exceed the applicable base ratio.

There are exemptions from the conservation and mitigation program for uses and activities on agricultural land, including affordable housing projects; public uses such as parks, schools, cultural institutions, and other public agency facilities and infrastructure that do not generate revenue; gravel mining projects regulated under Title 10, Chapter 3-5 of the Yolo County Code; and projects covered by an approved specific plan that includes an agricultural mitigation program. The approving authority may partly or entirely deny the exemption if it is determined that the additional cost of complying with this program does not jeopardize project feasibility and no other circumstances warrant application of the exemption.

Yolo Land Trust

The Yolo Land Trust conserves farmland and ranchland by providing landowners with a financial alternative to selling their land for development. This is most commonly done through conservation easements through which landowners maintain ownership but agree to refrain from developing the land and instead restrict use of the land to farming, ranching, or habitat protection.

City of Woodland

City of Woodland General Plan

The *Land Use, Community Design, and Historic Preservation Element*, and the *Sustainability, Conservation, and Open Space Element* of the *City of Woodland General Plan 2035* support, among other things, the preservation and protection of agricultural lands and their uses within and surrounding the City of Woodland (City of Woodland 2017). The following goal and policies from the general plan may apply to the Proposed Project.

> **Policy 2.A.3. Agricultural Mitigation.** For impacts to agricultural land within the Urban Limit Line, require one acre to be permanently conserved for every acre converted to urban development (1:1 ratio). The farmland being conserved must be of the same Farmland Mapping and Monitoring Program type (Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance) as the farmland that is being converted, or of a type of higher quality, and the conserved farmland should be located outside of, but as close to the Woodland Urban Limit Line as possible.

Goal 7.C. Preserve Farmland. Promote preservation and economic viability of agricultural land surrounding the Urban Limit Line.

> **Policy 7.C.2 Agricultural Uses Within the ULL.** Where agriculture exists within the Urban Limit Line, support existing agricultural uses until urban development (consistent with the General Plan) occurs on these properties.

> **Policy 7.C.5 Agricultural Buffer.** Require new development that occurs at the edge of the ULL to be set back a minimum of 150 feet from adjacent agricultural land where possible. Equivalent means of providing agricultural buffers may be considered by the Planning Commission on a case by case basis for parcels where development potential would be precluded or severely limited as a result of the required buffer size. The buffer shall be landscaped/vegetated and may include public right of way.

City of Woodland Title 17, Chapter 17.20

The Agricultural zone (A-1) is intended to preserve land

> …suited to eventual development in other uses until such time as streets, utilities and other community facilities may be provided or programmed so as to ensure the orderly and beneficial conversion of these lands to nonagricultural use, and to provide appropriate areas for certain predominately open uses of land which are not injurious to agricultural uses.

Permitted uses in the A-1 zone include some residential uses as well as some commercial uses. No part of the permanent project footprint is zoned for agriculture by the City of Woodland.

3.6.1.2 Environmental Setting

Agriculture is the dominant land use in Yolo County—approximately 81 percent of the land is agricultural, and nearly 70 percent of that land is designated as Prime, Unique, or Statewide or Locally Important Farmland (California Department of Conservation 2016). These lands are generally located in the eastern half of the county and include the project area. Table 3.6-1 shows the acreages of Important Farmland in Yolo County in 2006 and 2016. Over that 10-year period, Yolo County lost approximately 24,399 acres of Important Farmland, or 6 percent, which is partially accounted for by urban development and an increase in grazing land (California Department of Conservation 2006, 2016).

Table 3.6-1. Important Farmland in Yolo County in 2006 and 2016 (acres)

Important Farmland Category[b]	2006	2016	Percent Change
Prime Farmland	257,893	250,558	-3
Farmland of Statewide Importance	16,989	19,529	15
Unique Farmland	50,197	46,095	-8
Farmland of Local Importance	65,173	49,671	-24
Total	390,252	365,853	-6

Source: California Department of Conservation 2006, 2016.

Prime Farmland is the predominant agricultural designation within the project area, and comprises approximately 58 percent of the approximate 318 acres of the permanent footprint of the Proposed Project (Figure 3.6-1). Table 3.6-2 identifies the acreages of Important Farmland within the project footprint.

Table 3.6-2. Important Farmland within the Footprint of the Proposed Project[a]

Important Farmland Category[b]	Acres[c]
Prime Farmland	185
Farmland of Statewide Importance	0.0
Unique Farmland	7
Total	192

[a] Acreages assessed include agricultural land within the project footprint that would be permanently converted by project implementation and, therefore, does not include staging areas.
[b] Only Important Farmland categories that are considered "agricultural land," per Public Resources Code Section 21060.1, are included in this table.
[c] Values have been rounded.

There are 423,055 acres of land in Williamson Act contracts in Yolo County, approximately 4,119 acres within the project area, including approximately 17 acres within the project footprint (Figure 3.6-1) (Based on the Yolo County Parcels Open Data 2019).

There are 378,581 acres zoned Agricultural Intensive (A-N) in Yolo County, and 9,692 acres exist within the project area, including 329 acres within the project footprint (see Figure 3.6-2).

3.6.2 Environmental Impacts

This section describes the environmental impacts associated with agricultural resources that would result from implementation of the Proposed Project. It describes the methods used to determine the effects of the Proposed Project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts are provided.

3.6.2.1 Methods for Analysis

The methodology for analyzing the Proposed Project's potential impacts on agricultural resources is based on a review of spatial data from the FMMP (2016) to identify Important Farmland in the project footprint. In addition, spatial data for farmland protected under Williamson Act contract was obtained from Yolo County and reviewed to identify contracted land within the project footprint. In addition, the zoning designations for Yolo County and the City of Woodland as they pertain to agricultural resources in the project area were reviewed. Using geographic information system (GIS) software, this information provided the basis for calculating acreages associated with impacts on agricultural farmland.

A LESA was prepared for the Proposed Project by the U.S. Department of Agriculture, Natural Resources Conservation Service and the U.S. Army Corps of Engineers (USACE). As discussed in Section 3.6.1.1, *Regulatory Setting,* the LESA Model is a point-based approach for rating the relative importance of agricultural land resources based on specific measurable features and may be used by lead agencies in assessing impacts on agriculture and farmland. As part of the land evaluation, the relative value of farmland to be converted was scored 64 out of 100 points, and the site assessment score was 79 out of 160 points; the total combined score was 143. As stated in Section 3.6.1.1, per the FPPA, project sites receiving a total combined score of less than 160 need not be given further consideration for protection and no additional sites need to be evaluated. This score was considered generally in the impact analysis and is primarily identified herein for the purposes of public disclosure.

3.6.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the Proposed Project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to nonagricultural use.
- Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract.
- Conflict with existing zoning for, or cause rezoning of forest land (as defined in Public Resources Code Section 12220[g]), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104[g]).
- Loss of forest land or conversion of forest land to non-forest use.
- Other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to nonagricultural use or conversion of forest land to non-forest use.

There is no forest land in the project area and, therefore, impacts on forestry resources are not considered in this analysis.

3.6.2.3 Impacts and Mitigation Measures

Impact AG-1: Conversion of Farmland to nonagricultural use (significant and unavoidable)

Permanent conversion of Farmland to nonagricultural use would occur where the footprint of the Proposed Project overlaps Prime or Unique Farmland, or Farmland of Statewide Importance (Figure 3.6-1). As indicated in Table 3.6-2, approximately 192 acres of Farmland would be permanently converted to nonagricultural use by implementing the Proposed Project and, of that total, approximately 185 acres would be Prime Farmland. Impacts associated with the permanent conversion of Farmland would be significant.

Establishing staging areas for the Proposed Project would require the temporary use (at least 2 years) of these areas during the construction phase. As shown in Figure 3.6-1, three of the staging areas overlap Prime Farmland (a total of approximately 19 acres). However, because the staging areas would be restored to pre-project conditions following the cessation of construction activities, as described in Chapter 2, *Project Description*, this would not be considered a permanent conversion to nonagricultural use. Therefore, impacts associated with the conversion of Farmland as a result of construction and use of staging areas would be less than significant.

Operation and maintenance activities would not result in the conversion of Farmland to nonagricultural use because these activities (e.g., levee road reconditioning, drainage channel sediment removal) would take place in areas that have already been converted by project construction. Therefore, impacts associated with operation and maintenance activities are less than significant.

While floodproofing individual structures might take place on designated Farmlands, these activities would be on the structures located on those lands, as opposed to in the areas where crops are actually grown. Furthermore, these are structures that support the use of agriculture and the use of the land as a designated Farmland. Therefore, the construction and operation of floodproofing individual structures is not expected to convert designated Farmland to nonagricultural uses and impacts would be less than significant.

As discussed in Section 3.6.1.1, Yolo County requires agricultural mitigation for the conversion of land from an agricultural use to a predominantly nonagricultural use; however, public agency facilities and infrastructure that do not generate revenue are exempt from this mitigation program, as determined on a case-by-case basis. The Proposed Project is a flood infrastructure project that would not generate revenue and as such, is expected to be exempt from the required mitigation. If it is determined that the Proposed Project is not exempt, Mitigation Measure AG-1 could be implemented to reduce impacts; however, impacts would remain significant because the agricultural land would still be converted. Accordingly, this impact would be significant and unavoidable.

Mitigation Measure AG-1: Conserve Farmland (Prime Farmland and Unique Farmland)

The lead agency will preserve Farmland (Prime Farmland and Unique Farmland) in an amount commensurate with the quantity and quality of converted Farmland. This would be satisfied by a replacement ratio of 3:1 for Prime Farmland, and 2:1 for non-Prime farmland, consistent with the Yolo County Agricultural Conservation and Mitigation Program as identified in Zoning Ordinance Section 8-2.404, for lands that are permanently converted to nonagricultural use by the Proposed Project.

Impact AG-2: Conflict with existing zoning for agricultural use or with a Williamson Act contract (less than significant)

The Proposed Project permanent footprint (i.e., not including staging areas) is primarily zoned Agricultural Intensive (A-N) by Yolo County (i.e., approximately 329 acres are zoned A-N). Land within staging areas that is zoned A-N would retain the A-N zoning designation because that land would be used for the Proposed Project only temporarily. No part of the project footprint is zoned for agriculture by the City of Woodland. The County A-N zone allows for land uses that are compatible with agriculture and may include uses that support natural resource management. Other activities compatible with agricultural land uses are allowed by this zoning. The Proposed Project would remove approximately 0.09 percent of lands zoned A-N from Yolo County. However, the construction and operation of a flood levee would be considered compatible with agricultural uses because it would not prohibit the continued use or production of existing agricultural uses to the north of the proposed levee. Furthermore, the Proposed Project is considered a use that supports natural resource management because it provides flood protection and the management of the Cache Creek Settling Basin. Therefore, the Proposed Project would not conflict with existing zoning, and impacts would be less than significant.

The project footprint would not conflict with Williamson Act lands. Under the Williamson Act, termination of participation in the program is acceptable (as described in Section 3.6.1.1, *Regulatory Setting*). There are approximately 17 acres of agricultural land within the footprint of the Proposed Project that are under Williamson Act contract. These contracts would either be non-renewed or cancelled. If cancelled, the alternative use specified for the property may be public infrastructure or infrastructure, to identify the use now as flood infrastructure rather than agriculture. The 17 acres removed would constitute 0.004 percent of Williamson Act lands in Yolo County and 0.4 percent of acres of Williamson Act lands within the project area. Similar to zoning, this removal would not prohibit or change continued use or production on existing Williamson Act lands within the project area or Yolo County. Therefore, the Proposed Project would not conflict with a Williamson Act contract, and impacts would be less than significant.

While floodproofing individual structures might take place on lands zoned A-N or lands within Williamson Act contracts, these activities would be on the structures located on those lands, as opposed to in the areas where crops are actually grown. Furthermore, these are structures that support the use of agriculture and the use of the land within a Williamson Act. Therefore, the construction and operation of floodproofing individual structures is not expected to conflict with existing agricultural zoning or Williamson Act lands and impacts would be less than significant.

Impact AG-3: Other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to nonagricultural use (less than significant)

Although the Proposed Project would permanently convert Farmland as described in Impact AG-1, the purpose of the Proposed Project is to reduce flood risk for the City of Woodland and, thus, to increase public safety for the long term. The Proposed Project is not a use, such as a highway, that would induce further conversion to existing agricultural uses in the project area or in Yolo County. This is evidenced by the combined total LESA score of 143, which takes into account socioeconomic aspects of a project that might result in additional potential conversion. Therefore, the Proposed Project would not result in other changes to the existing environment, which, due to their location or nature, could result in the conversion of Farmland to nonagricultural uses. Similarly, floodproofing individual structures would not result in other changes to the existing environment that would result in the conversion of Farmland because the purpose of the floodproofing would be to support the structures that are there to support farming and agricultural lands. Impacts would be less than significant.

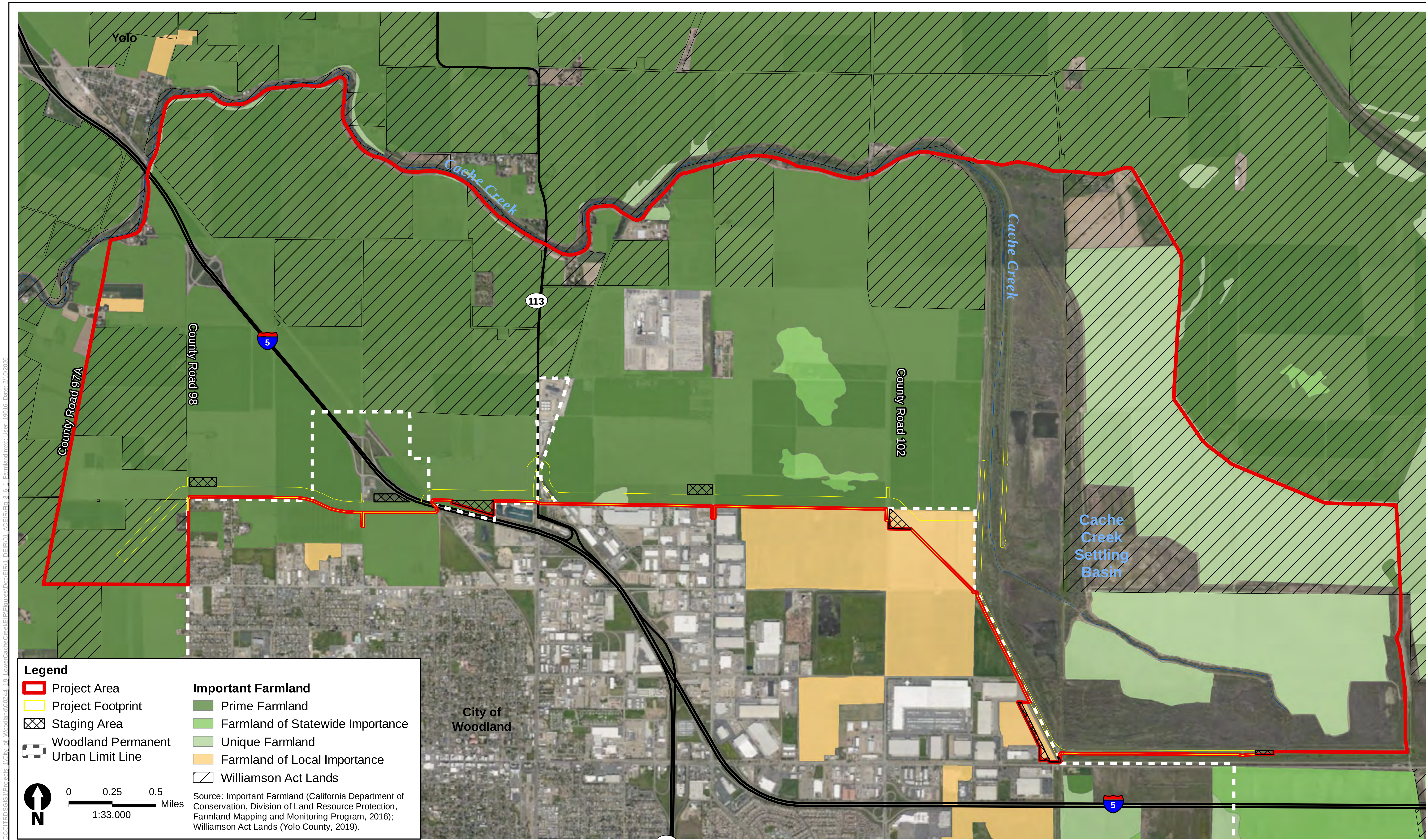


Figure 3.6-1
Important Farmland in the Project Area

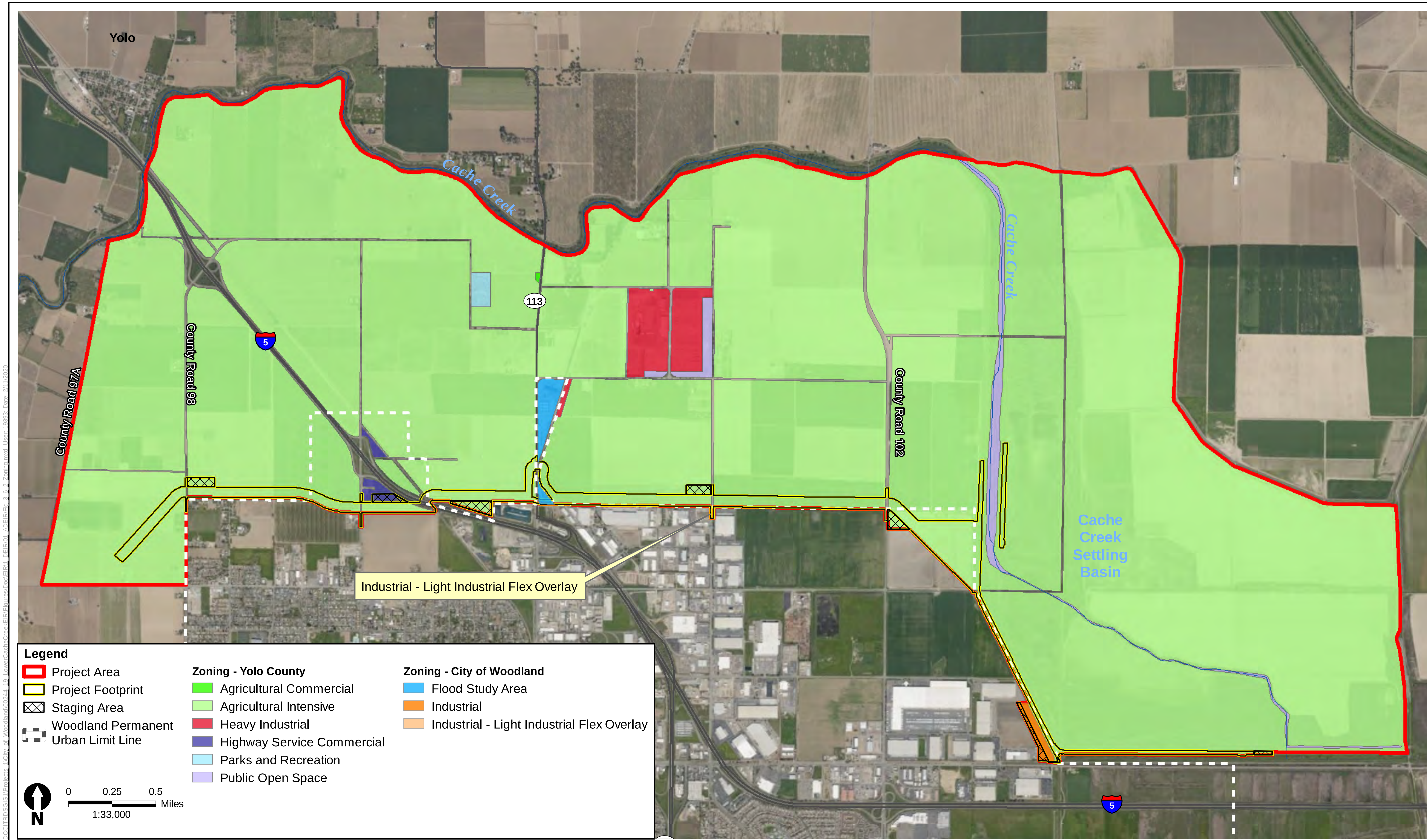


Figure 3.6-2
Zoning in the Project Area

3.7 Air Quality

"Air quality" describes the amount of air pollution to which the public is exposed. Air quality is an important consideration for construction of the Proposed Project because of current regional air quality conditions, which exceed certain federal and state ambient air quality standards. The air quality study area encompasses the areas directly and indirectly affected by construction of the Proposed Project and operations and maintenance (O&M) activities. Two geographic scales define the study area—the "local" study area is the construction footprint plus areas within 1,000 feet of the Proposed Project and haul roads, and the "regional" study area is the affected air basin. These two study areas encompass the project area identified in Figure 2-1. The project would be constructed in the city of Woodland and Yolo County, which are within the Sacramento Valley Air Basin (SVAB). Materials could be transported throughout the SVAB, as discussed further below.

This section describes ambient air quality conditions, including existing pollutant concentrations, meteorology, and locations of sensitive receptors in the City of Woodland and larger air quality study area. The section also discusses applicable air quality regulations as they pertain to the Proposed Project. It describes the air quality impacts that would result from implementation of the Proposed Project and provides mitigation for significant impacts where feasible. Appendix E presents supporting air quality calculations for the impact analysis, as referenced later in this section.

Information presented in the discussion and used for the subsequent analysis was drawn primarily from the following sources.

- Lower Cache Creek construction engineering assumptions (Hilliard pers. comm. [a], [b]).
- Yolo Solano Air Quality Management District's (YSAQMD's) *Handbook for Assessing and Mitigating Air Quality Impacts* (CEQA Handbook) (Yolo Solano Air Quality Management District 2007).
- Sacramento Metropolitan Air Quality Management District's (SMAQMD) Guide to Air Quality Assessment in Sacramento County (CEQA Guide) (Sacramento Metropolitan Air Quality Management District 2019).

3.7.1 Existing Conditions

3.7.1.1 Regulatory Setting

This section summarizes key federal, state, and local or regional regulations, laws, and policies relevant to air quality in the local and regional study areas.

Federal

Clean Air Act and National Ambient Air Quality Standards

The federal Clean Air Act (CAA) and its subsequent amendments form the basis for the nation's air pollution control effort. The U.S. Environmental Protection Agency (USEPA) is responsible for implementing most aspects of the CAA. The CAA was first enacted in 1963 and has been amended numerous times (1965, 1967, 1970, 1977, and 1990). The CAA establishes the National Ambient Air

Quality Standards (NAAQS) for six criteria pollutants and specifies future dates for achieving compliance. The CAA delegates enforcement of the NAAQS to the states and mandates that the states submit and implement a state implementation plan (SIP) for local areas not meeting those standards. The plans must include pollution control measures that demonstrate how the standards will be met.

The 1990 amendments to the CAA identify specific emission-reduction goals for areas not meeting the NAAQS. These amendments require both a demonstration of reasonable further progress toward attainment and incorporation of additional sanctions for failure to attain or meet interim milestones. Table 3.7-1 shows the NAAQS currently in effect for each criteria pollutant, as well as the California Ambient Air Quality Standards (CAAQS) (discussed under *State*).

Table 3.7-1. Federal and State Ambient Air Quality Standards

			National Standards[a]	
Criteria Pollutant	Average Time	California Standards	Primary	Secondary
Ozone	1-hour	0.09 ppm	None[b]	None[b]
	8–hour	0.070 ppm	0.070 ppm	0.070 ppm
Particulate Matter (PM10)	24-hour	50 μg/m³	150 μg/m³	150 μg/m³
	Annual mean	20 μg/m³	None	None
Fine Particulate Matter (PM2.5)	24-hour	None	35 μg/m³	35 μg/m³
	Annual mean	12 μg/m³	12.0 μg/m³	15 μg/m³
Carbon Monoxide	8-hour	9.0 ppm	9 ppm	None
	1-hour	20 ppm	35 ppm	None
Nitrogen Dioxide	Annual mean	0.030 ppm	0.053 ppm	0.053 ppm
	1-hour	0.18 ppm	0.100 ppm	None
Sulfur Dioxide[c]	Annual mean	None	0.030 ppm	None
	24-hour	0.04 ppm	0.014 ppm	None
	3-hour	None	None	0.5 ppm
	1-hour	0.25 ppm	0.075 ppm	None
Lead	30-day Average	1.5 μg/m³	None	None
	Calendar quarter	None	1.5 μg/m³	1.5 μg/m³
	3-month average	None	0.15 μg/m³	0.15 μg/m³
Sulfates	24-hour	25 μg/m³	None	None
Visibility-reducing Particles	8-hour	–[d]	None	None
Hydrogen Sulfide	1-hour	0.03 ppm	None	None
Vinyl Chloride	24-hour	0.01 ppm	None	None

Source: California Air Resources Board 2016.

ppm= parts per million; μg/m³ = micrograms per cubic meter; NAAQS = National Ambient Air Quality Standard; SO_2 = sulfur dioxide; CAAQS = California Ambient Air Quality Standard.

[a] National standards are divided into primary and secondary standards. Primary standards are intended to protect public health, whereas secondary standards are intended to protect public welfare and the environment.

[b] The federal 1-hour standard of 12 parts per hundred million was in effect from 1979 through June 15, 2005. The revoked standard is referenced because it was employed for such a long period and is a benchmark for state implementation plans.

[c] The annual and 24-hour NAAQS for SO_2 only apply for 1 year after designation of the new 1-hour standard to those areas that were previously in nonattainment for 24-hour and annual NAAQS.

[d] CAAQS for visibility-reducing particles is defined by an extinction coefficient of 0.23 per kilometer – visibility of 10 miles or more due to particles when relative humidity is less than 70 percent.

Corporate Average Fuel Economy Standards

The Corporate Average Fuel Economy Standards (CAFÉ) were first enacted in 1975 to improve the average fuel economy of cars and light duty trucks. The National Highway Traffic Safety Administrative (NHTSA) sets the CAFÉ standards, which are regulatory updated to require additional improvements in fuel economy. The standards were last updated in October 2012 to apply new passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2017 through 2025, and are equivalent to 54.5 miles per gallon. However, On August 2, 2018, NHTSA and USEPA proposed to amend the fuel efficiency standards for passenger cars and light trucks and establish new standards covering model years 2021 through 2026 by maintaining the current model year 2020 standards through 2026 (Safer Affordable Fuel-Efficient [SAFE] Vehicles Rule). On September 19, 2019, USEPA and NHTSA issued a final action on the One National Program Rule, which is consider part 1 of the SAFE Vehicles Rule and a precursor to the proposed fuel efficiency standards. The One National Program Rule enables USEPA/NHTSA to provide nationwide uniform fuel economy and GHG vehicle standards, specifically by 1) clarifying that federal law preempts state and local tailpipe GHG standards, 2) affirming NHTSA's statutory authority to set nationally applicable fuel economy standards, and 3) withdrawing California's CAA preemption waiver to set state-specific standards.

USEPA and NHTSA published their decisions to withdraw California's waiver and finalize regulatory text related to the preemption on September 27, 2019 (84 Fed. Reg. 51310). The agencies also announced that they will later publish the second part of the SAFE Vehicles Rule (i.e., the standards). California, 22 other states, the District of Columbia, and two cities filed suit against the proposed One National Program Rule on September 20, 2019 (California et al. v. United States Department of Transportation et al., 1:19-cv-02826, U.S. District Court for the District of Columbia). The lawsuit requests a "permanent injunction prohibiting Defendants from implementing or relying on the Preemption Regulation," but does not stay its implementation during legal deliberations. Part 1 of the SAFE Vehicles Rule went into effect on November 26, 2019.

Non-Road Diesel Rule

USEPA has established a series of increasingly strict emission standards for new off-road diesel equipment, on-road diesel trucks, and locomotives. New equipment used for construction of the Proposed Project, including heavy-duty trucks and off-road equipment, are required to comply with these emission standards.

State

California Clean Air Act and California Ambient Air Quality Standards

In 1988, the state legislature adopted the California Clean Air Act (CCAA), which established a statewide air pollution control program. The CCAA requires all air districts in the state to endeavor to meet the CAAQS by the earliest practical date. Unlike the CAA, the CCAA does not set precise attainment deadlines. Instead, the CCAA establishes increasingly stringent requirements for areas that will require more time to achieve the standards. CAAQS are generally more stringent than NAAQS and incorporate additional standards for sulfates, hydrogen sulfide, visibility-reducing particles, and vinyl chloride. The CAAQS and NAAQS are shown in Table 3.7-1.

The California Air Resources Board (CARB) is responsible for enforcing air pollution regulations and ensuring the NAAQS and CAAQS are met. CARB, in turn, delegates regulatory authority for stationary sources and other air quality management responsibilities to local air agencies. The CAAQS are to be achieved through district-level air quality management plans incorporated into the SIP. In California, the USEPA has delegated authority to prepare SIPs to CARB, which, in turn, has delegated that authority to individual air districts. CARB traditionally has established state air quality standards, maintaining oversight authority in air quality planning, developing programs for reducing emissions from motor vehicles, developing air emission inventories, collecting air quality and meteorological data, and approving SIPs.

The CCAA substantially adds to the authority and responsibilities of air districts. The CCAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. The CCAA also emphasizes the control of "indirect and area-wide sources" of air pollutant emissions. The CCAA gives local air pollution control districts explicit authority to regulate indirect sources of air pollution and to establish traffic control measures.

Statewide Truck and Bus Regulation

Originally adopted in 2005, the on-road truck and bus regulation requires heavy trucks to be retrofitted with particulate matter filters. The regulation applies to privately and federally owned diesel-fueled trucks with a gross vehicle weight rating greater than 14,000 pounds. Compliance with the regulation can be reached through one of two paths: (1) vehicle retrofits according to engine year or (2) phase-in schedule. Compliance paths ensure that by January 2023, nearly all trucks and buses will have 2010 model year engines or newer.

State Tailpipe Emission Standards

Like the USEPA at the federal level, CARB has established a series of increasingly strict emission standards for new off-road diesel equipment, on-road diesel trucks, and harbor craft operating in California. New equipment used to construct the Proposed Project would be required to comply with the standards.

Carl Moyer Program

The Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) is a voluntary program that offers grants to owners of heavy-duty vehicles and equipment. The program is a partnership between CARB and the local air districts throughout the state to reduce air pollution emissions from heavy-duty engines. Locally, the air districts administer the Carl Moyer Program.

Toxic Air Contaminant Regulations

California regulates toxic air contaminants (TACs) primarily through the Toxic Air Contaminant Identification and Control Act (Tanner Act) and the Air Toxics "Hot Spots" Information and Assessment Act of 1987 (Hot Spots Act). In the early 1980s, CARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Tanner Act created California's program to reduce exposure to air toxics. The Hot Spots Act supplements the Tanner Act by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

CARB has identified diesel particulate matter (DPM) as a TAC and has approved a comprehensive Diesel Risk Reduction Plan to reduce emissions from both new and existing diesel-fueled engines and vehicles. The goal of the plan is to reduce DPM emissions and the associated health risk by 75 percent by 2010 and by 85 percent by 2020. The plan identifies 14 measures that CARB will implement over the next several years. The Proposed Project would be required to comply with any applicable diesel control measures from the Diesel Risk Reduction Plan.

Local

Air Quality Management Districts

At the local level, responsibilities of air quality districts include overseeing stationary-source emissions, approving permits, maintaining emissions inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality–related sections of environmental documents required by CEQA. The air quality districts are also responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws and for ensuring that NAAQS and CAAQS are met.

The project area is under the jurisdiction of the YSAQMD. The YSAQMD has local air quality jurisdiction over projects in Yolo County, including Woodland. As discussed further in Section 3.7.2, *Environmental Impacts*, materials may be transported from Sacramento where the SMAQMD has air quality jurisdiction.

YSAQMD developed advisory emission thresholds to assist CEQA lead agencies in determining the level of significance of a project's emissions, which are outlined in its CEQA Handbook (Yolo Solano Air Quality Management District 2007). SMAQMD also recommends analysis thresholds for emissions generated in Sacramento County. Both air districts, as well as other air districts in the Sacramento Federal Nonattainment Area (SFNA), which is a subset of the SVAB, have adopted the *Sacramento Regional 2008 8-Hour Ozone Attainment and Reasonable Further Progress Plan* (2017 Ozone Plan).[1] The 2017 Ozone Plan outlines how the region continues to meet federal progress requirements and demonstrates that the SFNA will meet the 75 parts per billion (ppb) 8-hour ozone NAAQS (Sacramento Metropolitan Air Quality Management District et al. 2017). YSAQMD also prepares a triennial report discussing the progress it has made towards improving the air quality and reducing ozone concentrations in its jurisdiction. The 2015 Triennial Assessment was adopted in July 2016; the draft 2018 Triennial Assessment was released in March 2019.

Air districts adopt rules and regulations to improve existing and future air quality. Construction of the Proposed Project may be subject to the following YSAQMD rules.

- Regulation II, Rule 2.5 (Nuisance)—This rule prohibits the discharge of any air contaminant that causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public or which endangers the comfort, repose, health, or safety of any such persons or the public or which causes to have a natural tendency to cause injury or damage to business or property.
- Regulation II, Rule 2.8 (Particulate Matter Concentration)—This rule limits the emissions of particulate matter (PM) from any source operation which emits, or may emit dust, fumes, or total suspended PM.

[1] Air districts in the SFNA consist of the SMAQMD and YSAQMD, as well as parts of Feather River Air Quality Management District, El Dorado County Air Quality Management District, and Placer County Air Pollution Control District.

- Regulation II, Rule 2.28 (Cutback and Emulsified Asphalts)—This rule limits the emissions of organic compounds from the use of cutback and emulsified asphalts in paving materials, paving, and maintenance operations
- Regulation II, Rule 2.32 (Stationary Internal Combustion Engines)—This rule limits emissions of nitrogen oxides (NO_X) and carbon monoxide (CO) from stationary internal combustion engines of more than 50 horsepower.
- Regulation III, Rule 3.4 (New Source Review)—This rule contains requirements for Best Available Control Technology and emission offsets.
- Regulation III, Rule 3.13 (Toxic New Source Review)—This rule contains requirements for best available control technology for toxics (T-BACT).

3.7.1.2 Environmental Setting

This section discusses the environmental setting relevant to air quality. The Proposed Project would be in Woodland and Yolo County, which is within the larger SVAB. Materials may be transported from Sacramento, which is also within the SVAB. Accordingly, the SVAB comprises the regional air quality study area for the Proposed Project. Ambient air quality is affected by climatological conditions, topography, and the types and amounts of pollutants emitted. The following sections summarize how air pollution moves through the air, water, and soil within the SVAB and how it is chemically changed in the presence of other chemicals and particles. This section also summarizes local climate conditions, existing air quality conditions, and sensitive receptors that may be affected by the emissions generated by the Proposed Project.

Pollutants of Concern

Criteria Pollutants

As described in Section 3.7.1.1, *Regulatory Setting*, the federal and state governments have established ambient air quality standards for six criteria pollutants. Ozone is considered a regional pollutant because its precursors affect air quality on a regional scale. Pollutants such as CO, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead are considered local pollutants that tend to accumulate in the air locally. PM is both a regional and local pollutant. The primary criteria pollutants generated by the Proposed Project are ozone precursors (NO_X and reactive organic gases [ROG]), CO, and PM.[2, 3]

All criteria pollutants can have human health effects at certain concentrations. The ambient air quality standards for these pollutants are set with an adequate margin of safety for public health and the environment (CAA Section 109). Epidemiological, controlled human exposure, and toxicology studies evaluate potential health and environmental effects of criteria pollutants and form the scientific basis for new and revised ambient air quality standards.

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[2] As discussed in Section 3.7.1.1, there are also ambient air quality standards for sulfur dioxide, lead, sulfates, hydrogen sulfide, vinyl chloride, and visibility particulates. However, these pollutants are typically associated with industrial sources, which are not included as part of the Proposed Project. Accordingly, they are not evaluated further.

[3] Most emission of NOx are in the form of NO (Reşitoğlu 2018). Conversion to NO_2 occurs in the atmosphere as pollutants disperse downwind. Accordingly, NO_2 is not considered a local pollutant of concern for the Proposed Project and is not evaluated further.

Principal characteristics and possible health and environmental effects from exposure to the primary criteria pollutants generated by the Proposed Project are discussed below.

Ozone, or smog, is photochemical oxidant that is formed when ROG and NO_X (both by-products of the internal combustion engine) react with sunlight. ROG are compounds made up primarily of hydrogen and carbon atoms. Internal combustion associated with motor vehicle usage is the major source of hydrocarbons. Other sources of ROG are emissions associated with the use of paints and solvents, the application of asphalt paving, and the use of household consumer products such as aerosols. The two major forms of NO_X are nitric oxide (NO) and NO_2. NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure. NO_2 is a reddish-brown irritating gas formed by the combination of NO and oxygen. In addition to serving as an integral participant in ozone formation, NO_X also directly acts as an acute respiratory irritant and increases susceptibility to respiratory pathogens.

Ozone poses a higher risk to those who already suffer from respiratory diseases (e.g., asthma), children, older adults, and people who are active outdoor. Exposure to ozone at certain concentrations can make breathing more difficult, cause shortness of breath and coughing, inflame and damage the airways, aggregate lung diseases, increase the frequency of asthma attacks, and cause chronic obstructive pulmonary diesel. Studies show associations between short-term ozone exposure and non-accidental mortality, including deaths from respiratory issues. Studies also suggest long-term exposure to ozone may increase the risk of respiratory-related deaths (U.S. Environmental Protection Agency 2019a). The concentration of ozone at which health effects are observed depends on an individual's sensitivity, level of exertion (i.e., breathing rate), and duration of exposure. Studies show large individual differences in the intensity of symptomatic responses, with one study finding no symptoms to the least responsive individual after a 2-hour exposure to 400 parts per billion of ozone and a 50 percent decrement in forced airway volume in the most responsive individual. Although the results vary, evidence suggest that sensitive populations (e.g., asthmatics) may be affected on days when the 8-hour maximum ozone concentration reaches 80 parts per billion (U.S. Environmental Protection Agency 2016).

In addition to human health effects, ozone has been tied to crop damage, typically in the form of stunted growth, leaf discoloration, cell damage, and premature death. Ozone can also act as a corrosive and oxidant, resulting in property damage, such as the degradation of rubber products and other materials.

Carbon monoxide is a colorless, odorless, toxic gas produced by incomplete combustion of carbon substances, such as gasoline or diesel fuel. In the study area, high CO levels are of greatest concern during the winter, when periods of light winds combine with the formation of ground-level temperature inversions from evening through early morning. These conditions trap pollutants near the ground, reducing the dispersion of vehicle emissions. Moreover, motor vehicles exhibit increased CO emission rates at low air temperatures. The primary adverse health effect associated with CO is interference with normal oxygen transfer to the blood, which may result in tissue oxygen deprivation. Exposure to CO at high concentrations can also cause fatigue, headaches, confusion, dizziness, and chest pain. There are no ecological or environmental effects from ambient CO (California Air Resources Board 2019a).

Particulate matter consists of finely divided solids or liquids such as soot, dust, aerosols, fumes, and mists. Two forms of particulates are now generally considered: inhalable course particles less than or equal to 10 microns in diameter, or PM10, and inhalable fine particles less than or equal to

2.5 microns in diameter, or PM2.5. Particulate discharge into the atmosphere results primarily from industrial, agricultural, construction, and transportation activities. However, wind on arid landscapes also contributes substantially to local particulate loading.

Particulate pollution can be transported over long distances and may adversely affect the human, especially for people who are naturally sensitive or susceptible to breathing problems. Numerous studies have linked PM exposure to premature death in people with preexisting heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms. In 2008, CARB estimated that PM2.5 emissions for the entire Sacramento Metropolitan Area[4] causes 90 premature deaths, 20 hospital admissions, 1,200 asthma and lower respiratory symptom cases, 110 acute bronchitis cases, 7,900 lost workdays, and 42,000 minor restricted activity days annually (Sacramento Metropolitan Air Quality Management District 2013). Depending on their composition, both PM10 and PM2.5 can also affect water quality and acidity, deplete soil nutrients, damage sensitive forests and crops, affect ecosystem diversity, and contribute to acid rain (U.S. Environmental Protection Agency 2018).

Toxic Air Contaminants

Although ambient air quality standards have been established for criteria pollutants, no ambient standards exist for TAC. Many pollutants are identified as TACs because of their potential to increase the risk of developing cancer or because of their acute or chronic health risks. For TACs that are known or suspected carcinogens, CARB has consistently found that there are no levels or thresholds below which exposure is risk-free. Individual TACs vary greatly in the risks they present. At a given level of exposure, one TAC may pose a hazard that is many times greater than another. The California Office of Environmental Health Hazard Assessment (OEHHA) identifies and studies TACs and their toxicity. The primary TAC of concern associated with the Proposed Project is DPM.

DPM is generated by diesel-fueled equipment and vehicles. CARB estimates that DPM emissions are responsible for about 70 percent of the total ambient air toxics risk (California Air Resources Board 2000). Short-term exposure to DPM can cause acute irritation (e.g., eye, throat, and bronchial), neurophysiological symptoms (e.g., lightheadedness and nausea), and respiratory symptoms (e.g., cough and phlegm). The USEPA (2002) has determined that diesel exhaust is "likely to be carcinogenic to humans by inhalation."

Odors

Offensive odors can be unpleasant and lead to citizen complaints to local governments and air districts. According to CARB's (2005) *Air Quality and Land Use Handbook*, land uses associated with odor complaints typically include sewage treatment plants, landfills, recycling facilities, manufacturing, and agricultural activities. CARB provides recommended screening distances for siting new receptors near existing odor sources.

3.7.1.3 Climate and Meteorology

While the primary factors that determine air quality are the locations of air pollutant sources and the amount of pollutants emitted from those sources, meteorological conditions and topography are also important factors. Atmospheric conditions, such as wind speed, wind direction, and air

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[4] Sacramento Metropolitan Area includes Sacramento and Yolo Counties and portions of Placer, Solano, and El Dorado Counties.

temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants. Unique geographic features throughout the state define fifteen air basins with distinctive regional climates. As discussed previously, the Proposed Project and haul routes are in the SVAB.

The SVAB is bounded on the north by the Cascade Range, on the south by the SJVAB, on the east by the Sierra Nevada, and on the west by the Coast Ranges. The SVAB contains all of Tehama, Glenn, Butte, Colusa, Yolo, Sutter, Yuba, Sacramento, and Shasta Counties, as well as a portion of Solano and Placer Counties (California Code of Regulations [CCR] Section 60106).

The SVAB has a Mediterranean climate characterized by hot, dry summers and cool, rainy winters. During winter, the north Pacific storm track intermittently dominates Sacramento Valley weather, and fair-weather alternates with periods of extensive clouds and precipitation. Periods of dense and persistent low-level fog, which is most prevalent between storms, are also characteristic of winter weather in the valley. The frequency and persistence of heavy fog in the valley diminishes with the approach of spring. The average yearly temperature range for the Sacramento Valley is 20 degrees Fahrenheit (°F) to 115°F, with summer high temperatures often exceeding 90°F and winter low temperatures occasionally dropping below freezing.

In general, the prevailing winds are moderate in strength and vary from moist clean breezes from the south to dry land flows from the north. Figure 3.7-1 presents the prevailing winds for the closest monitoring station, which is located at the Sacramento International Airport, approximately 5 miles east of the project area. The mountains surrounding the SVAB create a barrier to airflow that can trap air pollutants under certain meteorological conditions. The highest frequency of air stagnation occurs in the autumn and early winter when large high-pressure cells collect over the Sacramento Valley. The lack of surface wind during these periods and the reduced vertical flow caused by less surface heating reduce the influx of outside air and allow air pollutants to become concentrated in a stable volume of air. The surface concentrations of pollutants are highest when these conditions are combined with temperature inversions (warm air over cool air), which trap pollutants near the ground.

The ozone season (May through October) in the Sacramento Valley is characterized by stagnant morning air or light winds, with the Delta sea breeze arriving in the afternoon out of the southwest. Usually the evening breeze transports the airborne pollutants to the north out of the Sacramento Valley. During about half of the days from July to September, however, a phenomenon called the Schultz eddy prevents this from occurring. Instead of allowing the prevailing wind patterns to move north carrying the pollutants out, the Schultz eddy causes the wind pattern to circle back to the south. Essentially, this phenomenon causes the air pollutants to be blown south toward the Sacramento Valley and Yolo County. This phenomenon has the effect of exacerbating the pollution levels in the area and increases the likelihood of violating federal or state standards. The eddy normally dissipates around noon when the Delta sea breeze arrives (Yolo-Solano Air Quality Management District 2007).

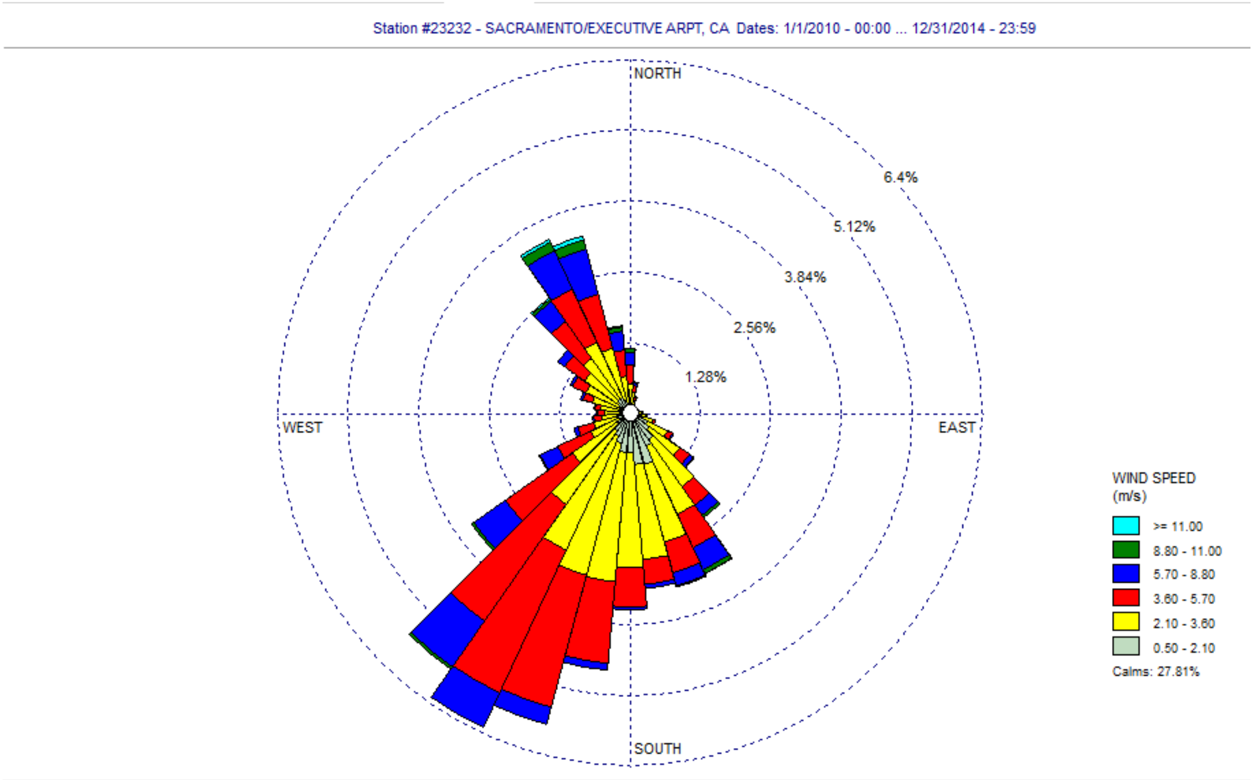

Figure 3.7-1. Prevailing Winds Near the Project Area

3.7.1.4 Existing Air Quality Conditions

CARB collects ambient air quality data through a network of air monitoring stations throughout the state. The nearest monitoring station to the project area is the Woodland-Gibson Road monitoring station, located approximately 2.5 miles south of the project area (measured from the intersection of N. Pioneer Avenue and Churchill Downs Avenue). The Woodland-Gibson Road station monitors ozone, PM10, and PM2.5. The nearest station that collects NO_2 data is the Davis-UCD Campus station, which over 11 miles south of the project area. There are no monitoring stations in Yolo County that currently monitor CO concentrations.

Table 3.7-2 summarizes data for criteria air pollutant levels from the Woodland-Gibson Road and Davis-UCD Campus monitoring stations for the last 3 years for which complete data was available (2016 through 2018). Table 3.7-3 shows the Woodland-Gibson Road monitoring station experienced violations of the state and federal ozone, PM10, and PM2.5 standards. The state standard for NO_2 was not exceeded. Existing violations of the ozone and PM ambient air quality standards indicate that certain individuals exposed to this pollutant may experience certain health effects, including increased incidence of cardiovascular and respiratory ailments.

Table 3.7-2. Ambient Air Quality Data at the Woodland-Gibson Road and Davis-UCD Monitoring Stations (2016 through 2018)

Pollutant Standards	2016	2017	2018
Ozone (O_3)			
Maximum 1-hour concentration (ppm)	0.095	0.089	0.095
Maximum 8-hour concentration (ppm)	0.075	0.074	0.084
***Number of days standard exceeded*[a]**			
CAAQS 1-hour (>0.09 ppm)	1	0	1
CAAQS 8-hour (>0.070 ppm)	4	2	2
NAAQS 8-hour (>0.070 ppm)	4	2	2
Nitrogen Dioxide (NO_2)			
State maximum 1-hour concentration (ppb)	38	28	38
State second-highest 1-hour concentration (ppb)	32	26	35
Annual average concentration (ppb)	–	–	4
***Number of days standard exceeded*[a]**			
CAAQS 1-hour (180 ppb)	0	0	0
Particulate Matter (PM10)			
National[b] maximum 24-hour concentration (μg/m^3)	69.4	128.5	201.1
National[b] second-highest 24-hour concentration (μg/m^3)	53.9	76.1	139.7
State[c] maximum 24-hour concentration (μg/m^3)	68.7	130.8	212.4
State[c] second-highest 24-hour concentration (μg/m^3)	53.3	78.0	147.3
National annual average concentration (μg/m^3)	19.2	21.7	25.3
State annual average concentration (μg/m^3)[d]	19.7	22.0	26.1
***Number of days standard exceeded*[a, e]**			
NAAQS 24-hour (>150 μg/m^3)	0	0	6
CAAQS 24-hour (>50 μg/m^3)	12	18	25
Particulate Matter (PM2.5)			
National[b] maximum 24-hour concentration (μg/m^3)	16.4	60.1	165.4
National[b] second-highest 24-hour concentration (μg/m^3)	13.3	40.6	95.0
State[c] maximum 24-hour concentration (μg/m^3)	16.4	60.1	165.4
State[c] second-highest 24-hour concentration (μg/m^3)	13.3	40.6	95.0
National annual average concentration (μg/m^3)	6.3	8.6	12.7
State annual average concentration (μg/m^3)	6.4	8.7	12.8
***Measured number of days standard exceeded*[a]**			
NAAQS 24-hour (>35 μg/m^3)	0	12	12

Source: California Air Resources Board 2019b.

ppm = parts per million; NAAQS = National Ambient Air Quality Standards; CAAQS = California Ambient Air Quality Standards; μg/m^3 = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter; * = insufficient data available to determine the value.

[a] An exceedance is not necessarily related to a violation of the standard.

[b] National statistics are based on standard conditions data. In addition, national statistics are based on samplers using federal reference or equivalent methods.

[c] State statistics are based on approved local samplers and local conditions data.

[d] State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.

[e] Measurements usually are collected every 6 days.

3.7.1.5 Regional Attainment Status

Local monitoring data are used to designate areas as nonattainment, maintenance, attainment, or unclassified for the ambient air quality standards.

- Nonattainment—assigned to areas where monitored pollutant concentrations consistently violate the standard in question.
- Maintenance—assigned to areas where monitored pollutant concentrations exceeded the standard in question in the past but are no longer in violation of that standard.
- Attainment—assigned to areas where pollutant concentrations meet the standard in question over a designated period.
- Unclassified—assigned to areas where data are insufficient to determine whether a pollutant is violating the standard in question.

Tables 3.7-3 summarizes the attainment status of Yolo County.

Table 3.7-3. Federal and State Ambient Air Quality Attainment Status for Yolo County

Criteria Pollutant	Federal Designation	State Designation
O_3 (8-hour)	Moderate Nonattainment	Nonattainment
CO	Attainment	Attainment
PM10	Attainment	Nonattainment
PM2.5	Moderate Nonattainment (P)	Unclassified
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
Lead	Attainment	Attainment
Sulfates	(No Federal Standard)	Attainment
Hydrogen Sulfide	(No Federal Standard)	Unclassified
Visibility Reducing Particles	(No Federal Standard)	Unclassified

Sources: California Air Resources Board 2018; U.S. Environmental Protection Agency 2019b.

CO = carbon monoxide; PM10 = particulate matter less than or equal to 10 microns in diameter; PM2.5 = particulate matter less than or equal to 2.5 microns in diameter; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide.

Sensitive Receptors

Sensitive land uses are defined as locations where human populations, especially children, seniors, and sick persons, are located and where there is reasonable expectation of continuous human exposure according to the averaging period for the air quality standards (i.e., 24-hour, 8-hour). Typical sensitive receptors are residences, hospitals, and schools (Yolo Solano Air Quality Management District 2007). The alignment of the levee would generally follow the northern city limit line west of State Route (SR) 113 and Churchill Downs Avenue east of SR 113. Equipment and imported materials would reach the project site via Interstate (I-) 5, SR 113, and County Roads 102 and 22. There are no hospitals or schools within 1,000 feet of the construction work area. Open space and agricultural lands boarder the levee to the north. Commercial and industrial uses are predominantly located to the south, except for a small cluster of residential receptors between Pedrick Road and N. Ashley Avenue. Figure 3.7-2 shows these residential receptors relative to the temporary levee construction work area. The closest home is approximately 60 feet south of the project area.

3.7.2 Environmental Impacts

This section describes the impact analysis related to air quality for the Proposed Project. It describes the methods used to determine the impacts of the Proposed Project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts are provided.

3.7.2.1 Methods for Analysis

Air quality impacts associated with construction and O&M of the Proposed Project were assessed and quantified using standard and accepted software tools, techniques, and emission factors as described in detail below. As described in Chapter 2, Project Description, Section 2.3.6, *Additional Features Proposed by the City of Woodland*, floodproofing of individual structures could occur for certain buildings within the project area. The methods for analyzing this aspect of the Proposed Project are also described below.

Construction Emissions

Construction activities associated with construction of the levee would take place in 2023 and 2024, with work occurring between March and September of each year. Construction would generally occur Monday through Saturday from 7 a.m. to 6 p.m. Construction of the Proposed Project would generate emissions of ROG, NO_X, CO, SO_X, PM10, and PM2.5 that could result in short-term air quality effects. Emissions would originate from off-road equipment exhaust, vehicle exhaust (on-road vehicles), site grading and earth movement, slurry wall batching, and paving. These emissions would be temporary (i.e., limited to the construction period) and would cease when construction activities are complete.

Combustion exhaust, fugitive dust (PM10 and PM2.5), and fugitive off-gassing (ROG) were estimated using a combination of emission factors and methods from CalEEMod, version 2016.3.2; the CARB's EMFAC2017 model; and the USEPA's Compilation of Air Pollutant Emission Factors (AP-42) based on project-specific construction data (e.g., schedule, equipment, truck volumes) provided by the project engineering team (Wood Rodgers) (Hilliard pers. comm. [a]). The following assumptions and methods were applied to quantify emissions resulting from each source. A full list of assumptions can be found in Appendix E.

- **Off-road equipment**—Emission factors for off-road construction equipment (e.g., loaders, graders, bulldozers) were obtained from the CalEEMod (version 2016.3.2) User's Guide appendix, which provides values per unit of activity (in grams per horsepower-hour) by calendar year (Trinity Consultants 2017). Criteria pollutants generated by off-road equipment were quantified by multiplying the CalEEMod emission factors by the equipment inventory provided by Wood Rodgers.
- **On-road vehicles**—On-road vehicles (e.g., pickup trucks, flatbed trucks) would be required for material and equipment hauling, onsite crew and material movement, and employee commuting. Analysts estimated exhaust emissions from on-road vehicles using the EMFAC2017 emissions model and activity data (trips and miles traveled per day) provided by Wood Rodgers. Emission factors for haul trucks traveling on offsite roads are based on aggregated-speed

emission rates for EMFAC's T7 Single Construction vehicle category. All materials except bentonite would be sourced or disposed of within YSAQMD. Bentonite would be imported from Sacramento County. Accordingly, emissions resulting from bentonite hauling were apportioned to YSAQMD and SMAQMD based on the distance traveled in each air district. Emission factors for employee commute vehicles are based on a weighted average for all vehicle speeds for EMFAC's light-duty automobile (LDA)/light-duty truck (LDT) vehicle categories. CARB's (2019c) SAFE Rule adjustment factors were applied to the emission factors for gasoline-powered vehicles. Because it is not possible to predict from where workers would be commuting, the Yolo County average one-way commute distance (10.0 miles) from CalEEMod was assumed in the calculation. Fugitive re-entrained paved road dust emissions were estimated using the USEPA's AP-42, Section 13.2.1 (U.S. Environmental Protection Agency 2011a).

Emission factors for haul trucks traveling onsite between borrow and staging areas are based on 15 mph emission rates for EMFAC's T7 Single Construction vehicle category Emission factors for onsite water and pickup trucks were based on 5 mph emission rates for the T6 Instate Heavy and LDT categories, respectively. Fugitive re-entrained unpaved road dust emissions were estimated using the USEPA's AP-42, Section 13.2.2 (U.S. Environmental Protection Agency 2006a).

- **Site grading and earth movement**—Fugitive dust emissions from earth movement (e.g., site grading, bulldozing, and truck loading) were quantified using emission factors from CalEEMod. These factors were multiplied by the acreage graded and quantity of cut-and-fill material, which were provided by Wood Rodgers.
- **Slurry wall batching**—Fugitive dust emissions from slurry wall batching at the new temporary batch plant were quantified using emission factors from the USEPA's AP-42 (U.S. Environmental Protection Agency 2006b). Daily and annual batch quantities (cubic yards) were provided by Wood Rodgers. Exhaust emissions resulting from stationary equipment (e.g., pumps, generators) were quantified using off-road emission factors from CalEEMod and the expected equipment operating hours. Structural concrete required for the I-5 undercrossing would be batched offsite at an existing, permitted facility. Accordingly, criteria pollutant emissions generated from the I-5 undercrossing concrete batching are not included in this analysis.
- **Paving**—Fugitive ROG emissions associated with paving were calculated using activity data (e.g., square feet paved) provided by Wood Rodgers and the CalEEMod default emission factor of 2.62 pounds of ROG per acre paved (Trinity Consultants 2017).

The emissions calculations for all source categories were summed together to obtain total emissions from construction in YSAQMD. The daily estimates were converted to annual totals based on the detailed construction schedule, which was developed by Wood Rodgers. Maximum daily PM10 emissions, based on concurrent construction activity, were also quantified consistent with YSAQMD requirements (Yolo Solano Air Quality Management District 2007). Annual and daily emissions from bentonite hauling in SMAQMD were totaled and reported separately for comparison to SMAQMD thresholds (discussed under Section 2.7.2.2, *Thresholds of Significance*).

Diesel Particulate Matter Risk Analysis

Diesel-powered construction equipment would emit DPM that could expose nearby sensitive receptors to increased cancer and non-cancer risks. A human health risk assessment (HRA) was performed using USEPA's most recent dispersion model, AERMOD (version 19191), and chronic risk assessment values recommended by OEHHA (2015). The HRA analyzes health risks to nearby sensitive receptors and consists of three parts: a DPM inventory, air dispersion modeling, and risk calculations. A description of each of these parts follows.

Diesel Particulate Matter Inventory

The DPM inventory includes emissions associated with short-term construction activity. The construction DPM inventory is based on the CalEEMod and EMFAC calculations for diesel PM10 generated by onsite equipment and haul trucks (described previously).

Air Dispersion Modeling

The HRA used USEPA's AERMOD model, version 19191, to model annual average DPM concentrations at nearby receptors. Modeling inputs, including emissions rates (in grams per second) and source characteristics (e.g., release height, stack diameter, plume width), are based on guidance provided by OEHHA. Meteorological data were obtained from CARB for the Sacramento International Airport, which is approximately 5 miles east of the project area.

Construction equipment emissions were characterized as an area source (AREAPOLY), with release heights of 4.1 meters for off-road equipment and 3.4 meters for water trucks (California Air Resources Board 2000; U.S. Environmental Protect Agency 2015). Haul truck emissions were characterized as a line/area source (LINEAREA) with a release height of 3.4 meters (U.S. Environmental Protect Agency 2015). Emissions from off-road equipment and water trucks were assumed to onsite throughout the construction footprint. Emissions from haul trucks traveling between borrow and staging areas were conservatively assumed to travel along the southern embankment footprint, which is the closest onsite travel route to residential receptors. Emissions from offsite haul trucks were modeled along 1,000-foot segments adjacent to the construction footprint along I-5, SR 113, and County Roads 22 and 102.

The modeling of emissions from construction activities was based on construction hours and days (7:00 a.m. to 6:00 p.m. daily) five days per week, seven months (March through September) per year during 2023 and 2024. To account for plume rise associated with mechanically generated construction emissions sources for the AERMOD run, the initial vertical dimension of the area source was modeled at 3.81 meters; for the line/area source, it was modeled at 3.16 meters (U.S. Environmental Protect Agency 2011b). The urban dispersion option with was also assumed.

Sensitive receptors were placed at individual homes in all directions within 1,000 feet of the construction work areas and haul roads. A 20-by-20-meter receptor grid was also conservatively modeled to capture additional receptors between 1,000 and 3,000 feet southwest of the construction footprint. All receptors were conservatively assumed to be residential, with a height of 1.2 meters.

Risk Calculations

The risk calculations incorporate OEHHA's age-specific factors that account for increased sensitivity to carcinogens during early-in-life exposure. The approach for estimating cancer risk from long-term inhalation, with exposure to carcinogens, requires calculating a range of potential doses and multiplying by cancer potency factors in units corresponding to the inverse dose to obtain a range of cancer risks. For cancer risk, the risk for each age group is calculated using the appropriate daily breathing rates, age sensitivity factors, and exposure durations. The cancer risks calculated for individual age groups are summed to estimate the cancer risk for each receptor.

Chronic cancer and hazard risks were calculated using Equations 5.4.1 and 8.2.4a and Section 8.3.1, respectively, from OEHHA's 2015 HRA guidance (Office of Environmental Health Hazard Assessment 2015).

Floodproofing Individual Structures

Floodproofing individual structures could occur under the Proposed Project between 2024 and 2029. Floodproofing activities would generate criteria pollutant emissions from off-road equipment exhaust, vehicle exhaust (on-road vehicles), and site grading and earth movement. Emissions resulting from these activities for completion of an individual structure were quantified using data from the project engineering team (Wood Rodgers) (Hilliard pers. comm. [b]) and the methods described above.

The exact number structures that will be floodproofed and the specific timing of floodproofing activities is currently unknown. However, it is anticipated these activities would begin during the second year of construction of the proposed levee and would occur on a case-by-case basis that does not overlap in time. In other words, it is assumed a single floodproofing project would be identified and completed before another floodproofing project started. For the purposes of analysis, it was assumed that up to three structures could be floodproofed in 2024 and two structures each year thereafter through 2029. While floodproofing of individual structures will not occur concurrently, it was conservatively assumed that a structure would be floodproofed in 2024 concurrent with the highest anticipated construction activities required for the levee. This assumption was made for the CEQA document to present a worst-case analysis of potential maximum daily air quality impacts.

Operational Emissions

The Proposed Project would require regular O&M for the levee. Minimal amounts of equipment and vehicles would be required for landscaping, levee slope and road conditioning, and periodic sediment removal. Given the limited and infrequent nature of O&M for the levee, emissions are evaluated qualitatively. Floodproofed structures would not require any O&M or result in operational emissions.

3.7.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the Proposed Project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Conflict with or obstruct implementation of the applicable air quality plan.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard.
- Expose sensitive receptors to substantial pollutant concentrations.
- Result in other emissions (such as those leading to odors) affecting a substantial number of people.

According to the State CEQA Guidelines Section 15064.7, the significance criteria established by the applicable air quality management or air pollution control district may be relied on to make significance determinations for potential impacts on environmental resources. As described above, the YSAQMD is responsible for ensuring that state and federal ambient air quality standards are not violated within Yolo County. Emissions generated by material hauling would be subject to the authority of the SMAQMD. Both air districts have developed their own thresholds of significance to evaluate air quality impacts. The following sections summarize the local air district thresholds (where applicable) for each of the four impact criteria.

Plan Consistency

YSAQMD's (2007) CEQA Handbook states that "General Plans of cities and counties must show consistency with [YSAQMD's] Air Quality Attainment Plan (AQAP) and SIP strategies in order to claim a less than significant impact on air quality." Projects that propose development that is consistent with the growth anticipated by the City's and County's general plans would therefore be consistent with YSAQMD's AQAP.

Cumulatively Considerable Net Increase in Criteria Pollutants

YSAQMD has adopted thresholds to assist lead agencies in evaluating the significance of project-level construction and operational criteria pollutant emissions. These thresholds consider whether a project's individual emissions would result in a cumulatively considerable adverse contribution to the local existing air quality conditions. If a project's emissions would be less than these levels, the project would not be expected to result in a cumulatively considerable contribution to the significant cumulative impact. Accordingly, emissions generated by the Proposed Project in YSAQMD would result in a significant impact if any of the thresholds summarized in Table 3.7-4 are exceeded.

Table 3.7-4. YSAQMD's Cumulative Criteria Pollutant Emission Thresholds[a]

Pollutant	Threshold of Significance
ROG	10 tons per year
NO_X	10 tons per year
PM10	80 pounds per day
CO	Violation of the CAAQS

Source: Yolo Solano Air Quality Management District 2007.

CAAQS = California Ambient Air Quality Standards; CO = carbon monoxide; NO_X = nitrogen oxide; PM10 = particulate matter no more than 10 microns in diameter; ROG = reactive organic gases.

[a] Thresholds apply to construction and operational emissions generated within the YSAQMD.

YSAQMD's ozone precursor thresholds are based on the emissions levels identified under Rule 3.20—Ozone Transport Mitigation, which implements the California Ozone Transport Mitigation Regulation codified under California Code of Regulations, Title 17, Division 3, Chapter 1, Subchapter 1.5, Article 6, section 70600(b)(1)(C). The Transport Mitigation Regulation was adopted to ensure that air quality is not significantly degraded by new sources of emissions, inclusive of pollutant transport to downwind air districts. Based on the ozone attainment status of YSAQMD and its location within the broader Sacramento Area, Rule 3.20 requires a 10 tons per year "no net increase" program for NO_X and ROG generated by stationary sources. YSAQMD has concluded that the stationary source restriction established by Rule 3.20 is equally applicable to land use projects. YSAQMD's regional ozone thresholds for attaining the CAAQS and NAAQS were therefore set as the total emission thresholds associated with Rule 3.20 and the California Ozone Transport Mitigation Regulation (Yolo Solano Air Quality Management District 2007).

YSAQMD's PM10 threshold are based on the emissions levels identified under the New Source Review (NSR) program, which is a permitting program established by Congress as part of the CAA

Amendments of 1990 to ensure that air quality is not significantly degraded by new sources of emissions. YSAQMD's NSR program requires best available control technologies (BACT) to be applied where new or modified PM10 emissions exceed 80 pounds per day. Therefore, a project's PM10 emissions that trigger the YSAQMD's BACT threshold for PM10 would result in substantial air emissions and have a potentially significant impact on air quality (Yolo Solano Air Quality Management District 2007).

YSAQMD's (2007) CEQA Handbook states that "localized high levels of CO, or CO hotspots, is the District's concern," and that "hotspots are usually associated with roadways that are congested and have heavy traffic volume." YSAQMD considers projects to result in a significant CO impact if it would create a CO hotspot that would violate the CAAQS of 9 parts per million (8-hour average) or 20 parts per million (1-hour average).

SMAQMD also recommends analysis thresholds for criteria pollutants generated in Sacramento County. Table 3.7-5 presents SMAQMD's thresholds for construction emissions. Like YSAQMD, the thresholds consider whether a project's individual emissions would result in a cumulatively considerable adverse contribution to the local existing air quality conditions, and are derived from district-specific NSR requirements and other regulations. Emissions generated by vehicle hauling within SMAQMD would result in a significant impact if any of the thresholds summarized in Table 3.7-5 are exceeded.

Table 3.7-5. SMAQMD's Cumulative Construction Criteria Pollutant Emission Thresholds

	Ozone Precursors			
Air District	ROG	NO_X	PM10	PM2.5
SMAQMD	–	85 lbs./day	80 lbs./day 14.6 tons/year	82 lbs./day 15.0 tons/year

Source: Sacramento Metropolitan Air Quality Management District 2015.

SMAQMD = Sacramento Metropolitan Air Quality Management District; NO_X = nitrogen oxide; PM2.5 = particulate matter no more than 2.5 microns in diameter; PM10 = particulate matter no more than 10 microns in diameter; ROG = reactive organic gases.

Receptor Exposure to Substantial Pollutant Concentrations

As discussed in Section 3.7.1, *Existing Conditions*, all criteria pollutants that would be generated by the Proposed Project are associated with some form of health risk (e.g., asthma, lower respiratory problems). Criteria pollutants can be classified as either regional or localized pollutants. Regional pollutants can be transported over long distances and affect ambient air quality far from the emissions source. Localized pollutants affect ambient air quality near the emissions source. Ozone is considered a regional criteria pollutant, whereas CO, NO_2, SO_2, and lead are localized pollutants. PM can be both a local and a regional pollutant, depending on its composition. As discussed above, the primary criteria pollutants of concern generated by the Proposed Project are ozone precursors (ROG and NO_X), CO, and PM (including DPM). The following sections discuss thresholds and analysis considerations for regional and local project-generated criteria pollutants with respect to their human health implications.

Regional Project-Generated Criteria Pollutants (Ozone Precursors and Regional Particulate Matter)

Adverse health effects induced by regional criteria pollutant emissions generated by the Proposed Project (ozone precursors and PM) are highly dependent on a multitude of interconnected variables (e.g., cumulative concentrations, local meteorology and atmospheric conditions, the number and character of exposed individuals [e.g., age, gender]). For these reasons, ozone precursors (ROG and NO_X) contribute to the formation of ground-borne ozone on a regional scale. Emissions of ROG and NO_X generated in one area may not equate to a specific ozone concentration in that same area. Similarly, some types of particulate pollution may be transported over long-distances or formed through atmospheric reactions. As such, the magnitude and locations of specific health effects from exposure to increased ozone or regional PM concentrations are the product of emissions generated by numerous sources throughout a region, as opposed to a single individual project. Moreover, exposure to regional air pollution does not guarantee that an individual will experience an adverse health effect as there are large individual differences in the intensity of symptomatic responses to air pollutant. These differences are influenced, in part, by the underlying health condition of an individual, which cannot be known.

Nonetheless, emissions generated by the Proposed Project could increase photochemical reactions and the formation of tropospheric ozone and secondary PM, which at certain concentrations, could lead to increased incidence of specific health consequences, such as various respiratory and cardiovascular ailments. As discussed previously, air districts develop region-specific CEQA thresholds of significance in consideration of existing air quality concentrations and attainment designations under the NAAQS and CAAQS. The NAAQS and CAAQS are informed by a wide range of scientific evidence that demonstrates there are known safe concentrations of criteria pollutants. Accordingly, the Proposed Project would expose receptors to substantial regional pollution if any of the thresholds summarized in Tables 3.7-4 or 3.7-5 are exceeded.

Localized Project-Generated Criteria Pollutants (Carbon Monoxide and Particulate Matter) and Air Toxics (Diesel Particulate Matter)

Localized pollutants generated by a project are deposited and potentially affect population near the emissions source. Because these pollutants dissipate with distance, emissions from individual projects can result in direct and material health impacts on adjacent sensitive receptors. The localized pollutants of concern that would be generated by the project are CO, PM, and DPM. Following are the applicable thresholds for each pollutant.

Carbon Monoxide

As noted above, YSAQMD considers projects to result in a significant CO impact if it would create a CO hotspot that would violate the CAAQS of 9 ppm (8-hour average) or 20 ppm (1-hour average). YSAQMD has adopted screening criteria for localized CO to provide a conservative indication of whether project-generated traffic would cause a potential CO hot spot. If the screening criteria are not met, a quantitative analysis, involving site-specific dispersion modeling of project-related CO concentrations, would not be necessary, and the project would not cause localized violations of the CAAQS for CO. Projects that would not generate CO concentrations in excess of the health-based CAAQS would not contribute a significant level of CO such that localized air quality and human health would be substantially degraded. YSAQMD's (2007) CO screening criteria are summarized below.

1. A traffic study for the project indicates that the peak-hour Level of Service (LOS) on one or more streets or at one or more intersections in the project vicinity will be reduced to an unacceptable LOS (typically LOS E or F); or
2. A traffic study indicates that the project will substantially worsen an already existing peak-hour LOS F on one or more streets or at one or more intersections in the project vicinity. "substantially worsen" includes situations where delay would increase by 10 seconds or more when project-generated traffic is included.

SMAQMD (2019) does not consider construction-generated CO a significant pollutant of concern because construction activities typically do not generate substantial quantities of this pollutant.

Particulate Matter

As shown in Tables 3.7-4 and 3.7-5, both study area air districts have adopted PM threshold of significance to evaluate whether construction generated PM would result in an air quality impact. The air districts also recommend implementation of best management practices to reduce dust emissions and avoid localized health impacts.

Diesel Particulate Matter

YSAQMD (2007) and SMAQMD (2015) have adopted incremental cancer and hazard thresholds to evaluate receptor exposure to single sources of DPM emissions. The "substantial" DPM threshold defined by the air districts is any exposure of a sensitive receptor to an individual emissions source resulting in an excess cancer risk level of more than 10 in 1 million or a non-cancer (i.e., chronic or acute) hazard index (HI) greater than 1.0.

Odors Emissions

YSAQMD (2007) considers projects to have a significant odor impact if they conflict with YSAQMD Rule 2.5.

3.7.2.3 Impacts and Mitigation Measures

Impact AQ-1: Conflict with or obstruct implementation of the applicable air quality plan (less than significant)

A project is deemed inconsistent with air quality plans if it results in regional population, employment, or vehicle-miles-traveled (VMT) growth that exceeds estimates used to develop the applicable air quality plans, which are based on growth projections from the Sacramento Area Council of Governments (SACOG) and local plans, including the City of Woodland's and Yolo County's general plans. Projects that propose development that are consistent with the growth anticipated by SACOG's MTP/SCS and the City's and County's general plans would be consistent with YSAQMD's AQAP.

The purpose of the Proposed Project is to reduce the risk of flooding in the City. As discussed in Chapter 4, *Other CEQA Considerations*, the City could amend the Land Use Diagram and remove certain "Opportunity Sites" from the FEMA designated 100-year floodplain following implementation of the Proposed Project. This would remove potential barriers (e.g., flood insurance rates and land use designations) to growth within these locations. However, because the Opportunity Sites are identified in the City's General Plan Update and, therefore, have been incorporated through local planning process and environmental review, the growth and development that could occur in the Opportunity Sites is planned and consistent with the growth anticipated by SACOG's MTP/SCS and the City's General Plan.

Like in the City, certain areas in Yolo County would also experience reduced flood risk with the Proposed Project, which could remove a potential barrier to growth. However, these areas are all designated agriculture or agriculture type uses and as such, additional barriers (e.g., land use designations) would have to be removed for the land to grow and be developed. The Proposed Project, therefore, would not directly induce growth in the county or result in long-term development that would conflict with the County's general plan growth forecast.

Accordingly, the Proposed Project would not conflict with or obstruct the implementation of YSAQMD's AQAP; therefore, this direct effect would be less than significant.

Impact AQ-2: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (less than significant with mitigation)

Construction

The predominant pollutants associated with construction of the Proposed Project are fugitive dust (PM10 and PM2.5) from earthmoving activities and combustion pollutants, particularly ROG and NO_X, from heavy equipment and trucks. ROG would also be generated from paving activities. Table 3.7-6 presents construction emissions generated by the Proposed Project in the YSAQMD in tons per year and pounds per day. Emissions resulting from bentonite hauling in 2023 in SMAQMD are presented in Table 3.7-7.

Table 3.7-6. Unmitigated Criteria Pollutant Emissions from Project Construction in YSAQMD

Year	ROG (tons per year)	NO_X (tons per year)	CO (tons per year)	PM2.5 (tons per year)	PM10 (pounds per day)
2023	0.7	8.1	5.8	1.6	131
2024	0.8	9.1	7.0	1.4	197
YSAQMD Threshold[a]	10	10	–[b]	–	80
Exceed Threshold?	No	No	–	–	Yes

YSAQMD = Yolo Solano Air Quality Management District; CO = carbon monoxide; NO_X = nitrogen oxide; PM2.5 = particulate matter no more than 2.5 microns in diameter; PM10 = particulate matter no more than 10 microns in diameter; ROG = reactive organic gases; – = no threshold.

[a] In developing these thresholds, YSAQMD considered levels at which project emissions are cumulatively considerable. Consequently, exceedances of project-level thresholds would be cumulatively considerable.

[b] YSAQMD considers violations of the CO ambient air quality standard significant. Refer to Impact AQ-3.

Table 3.7-7. Unmitigated Criteria Pollutant Emissions from Bentonite Hauling in SMAQMD (maximum pounds per day, unless otherwise noted)

Year	ROG	NO_X	CO	PM2.5[a]	PM10[a]
2023	<0.01	0.11	0.02	0.01 [<0.01]	0.03 [<0.01]
SMAQMD Threshold[b]	–	85	–	82 [15.0]	80 [14.6]
Exceed Threshold?	No	No	–	–	–

SMAQMD = Sacramento Metropolitan Air Quality Management District; CO = carbon monoxide; NO_X = nitrogen oxide; PM2.5 = particulate matter no more than 2.5 microns in diameter; PM10 = particulate matter no more than 10 microns in diameter; ROG = reactive organic gases; – = no threshold.

[a] Particulate matter results are given in terms of maximum pounds per day [tons per year] for comparison to SMAQMD daily and annual thresholds. SMAQMD also requires implementation of best management practices to control fugitive dust from site grading and earthmoving. However, these are not applicable to the project activities that would occur in SMAQMD, which are limited to bentonite hauling on regional roadways.

[b] In developing these thresholds, SMAQMD considered levels at which project emissions are cumulatively considerable. Consequently, exceedances of project-level thresholds would be cumulatively considerable.

As shown in Table 3.7-7, bentonite hauling in SMAQMD would not exceed SMAQMD's thresholds. Likewise, as shown in Table 3.7-6, construction of the Proposed Project would not generate ROG or NO_X emissions in excess of YSAQMD's numeric thresholds. However, the proposed project would generate PM10 in excess of YSAQMD's daily threshold. The majority of PM10 emissions would be generated by earthmoving moving activities (e.g., truck hauling and material loading and unloading) and vehicles traveling over unpaved surfaces (i.e., resuspended road dust). Implementation of Mitigation Measure AQ-1 would reduce this impact to a less-than-significant level, as shown in Table 3.7-8.

Table 3.7-8. Mitigated Criteria Pollutant Emissions from Project Construction in YSAQMD[a]

Year	ROG (tons per year)	NO_X (tons per year)	CO (tons per year)	PM2.5 (tons per year)	PM10 (pounds per day)
2023	0.7	8.1	5.8	0.9	77
2024	0.8	9.1	7.0	0.8	47
YSAQMD Threshold[b]	10	10	–[c]	–	80
Exceed Threshold?	No	No	–	–	No

YSAQMD = Yolo Solano Air Quality Management District; CO = carbon monoxide; NO_X = nitrogen oxide; PM2.5 = particulate matter no more than 2.5 microns in diameter; PM10 = particulate matter no more than 10 microns in diameter; ROG = reactive organic gases; – = no threshold.

[a] Pursuant to Mitigation Measure AQ-1, PM10 and PM2.5 emissions from ground disturbance and earthmoving activities were reduced by 61 percent (Trinity Consultants 2017). PM10 and PM2.5 from unpaved vehicle traveled (i.e., resuspended road dust) were reduced by 86% (PennzSuppress 2017).

[b] In developing these thresholds, YSAQMD considered levels at which project emissions are cumulatively considerable. Consequently, exceedances of project-level thresholds would be cumulatively considerable.

[c] YSAQMD considers violations of the CO ambient air quality standard significant. Refer to Impact AQ-3.

Because emissions from bentonite hauling in SMAQMD would not exceed SMAQMD's thresholds, and construction related PM10 emissions generated by construction in YSAQMD would be mitigated to below YSAQMD's significance thresholds, criteria pollutant emissions impacts would be less than significant with mitigation.

Mitigation Measure AQ-1: Implement fugitive dust control best management practices

The City of Woodland will require its contractors, as a condition of contract, to reduce construction-related fugitive dust by implementing the following control measures at all construction and staging areas. The following measures are based on recommendations from YSAQMD's CEQA Handbook.

- All exposed surfaces (e.g., staging areas, soil piles, graded areas) will be watered three times per day.
- Apply the soil stabilizer PennzSuppress D to all unpaved access and embankment roads.
- Prohibit all grading activities and water all areas of disturbed soil under windy conditions (winds more than 20 miles per hour).
- Limit vehicle speeds on unpaved roads, driveways, or driving surfaces to 15 mph.
- Cover all haul trucks transporting soil, sand, or other loose material offsite.
- Cover active and inactive storage piles where appropriate.
- Cover, hydroseed, or apply soil stabilizers to unpaved areas that will remain inactive for extended periods.
- Remove all visible mud or dirt track-out onto adjacent public roads using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- Post a publicly visible sign with the telephone number and the name of the person to contact at the lead agency regarding dust complaints. This person will respond and take corrective action within 48 hours. The phone number of the YSAQMD also will be visible to ensure compliance with the YSAQMD 4 Rule 2.5, Nuisance.

Floodproofing Individual Structures

Floodproofing activities would generate similar types of emissions as construction of the Proposed Project. Table 3.7-9 presents emissions generated by overlapping levee and floodproofing construction activities in 2024. The table also estimates emissions that would be generated by floodproofing activities following construction through 2029. All emissions would occur in the YSAQMD.

Table 3.7-9. Criteria Pollutant Emissions from Floodproofing Activities

Year	ROG (tons per year)	NO_X (tons per year)	CO (tons per year)	PM2.5 (tons per year)	PM10 (pounds per day)
2024[a]	0.9	9.1	7.0	0.9	50
Floodproofing	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*3*
Levee (Table 3.7-8)	0.8	9.1	7.0	0.8	47
2025–2029[b]	*<0.1*	*<0.1*	*<0.1*	*<0.1*	3
YSAQMD Threshold[b]	10	10	–[c]	–	80
Exceed Threshold?	No	No	–	–	No

YSAQMD = Yolo Solano Air Quality Management District; CO = carbon monoxide; NO_X = nitrogen oxide; PM2.5 = particulate matter no more than 2.5 microns in diameter; PM10 = particulate matter no more than 10 microns in diameter; ROG = reactive organic gases; – = no threshold.

[a] Analysis assumes that up to three structures would be floodproofed in 2024. The maximum daily PM10 result assumes that a structure would be floodproofed concurrent with the highest anticipated construction activities required for the levee. Levee construction emissions are from Table 3.7-8 and include implementation of Mitigation Measure AQ-1.

[b] Emissions generated annually assuming up to two structures would be floodproofed per year.

[c] YSAQMD considers violations of the CO ambient air quality standard significant. Refer to Impact AQ-3.

As shown in Table 3.7-9, neither individual floodproofing activities nor concurrent floodproofing and levee construction would result in emissions that exceed YSAQMD thresholds. The impact of floodproofing individual structures (2025 through 2029) would be less than significant. Mitigation Measure AQ-1 is required for all levee construction activities, as described above, and would be implemented during 2024. Accordingly, the impact of concurrent floodproofing and levee construction (2024) would be less than significant with mitigation.

Operations and Maintenance

Long-term O&M would result in limited criteria pollutants emissions from activities such as one to two persons driving trucks on the levees for inspection, maintenance, and patrol actions. Possible limited heavy-duty earth-moving equipment may be used for periodic reconditioning of the levee slope and road and sediment removal. These emissions would be limited to a very temporary timeframe once or twice a year (or less). The analysis presented in Table 3.7-6 demonstrates that construction generated exhaust emissions (e.g., ROG and NO_X) would be less than significant. Mitigation is required to reduce PM10 emissions below YSAQMD's thresholds; these emissions would be primarily generated by earthmoving activities and material hauling, which are not anticipated for routine O&M. Because the amount and intensity of emissions generating activities required for O&M would be substantially less than required for construction of the levee, emissions resulting from long-term O&M activities would not exceed YSAQMD thresholds, and impacts would be less than significant.

Impact AQ-3: Expose sensitive receptors to substantial pollutant concentrations (less than significant with mitigation)

The primary pollutants of concern to human health generated by the Proposed Project are criteria pollutants and TAC.

Regional Criteria Pollutants

YSAQMD develops region-specific CEQA thresholds of significance in consideration of existing air quality concentrations and attainment or nonattainment designations under the NAAQS and CAAQS. Recognizing that air quality is a cumulative problem, YSAQMD typically considers projects that generate criteria pollutants and ozone precursor emissions that are below the thresholds to be minor in nature. Such projects would not adversely affect air quality or exceed the NAAQS or CAAQS. As described under Impact AQ-2, construction of the Proposed Project would not generate ROG, NO_X, or PM10 emissions in excess of air district thresholds with implementation Mitigation Measure AQ-1. Similarly, neither floodproofing individual structure activities nor O&M activities would exceed air district threshold. As such, the Proposed Project would not be expected to contribute a significant level of air pollution that would degrade regional air quality within the SVAB.

The California Supreme Court's decision in *Sierra Club v. County of Fresno* (6 Cal. 5th 502) (hereafter referred to as the Friant Ranch Decision) reviewed the long-term, regional air quality analysis contained in the EIR for the proposed *Community Plan Update* and *Friant Ranch Specific Plan* (Friant Ranch Project). The Friant Ranch Project is a 942-acre master-plan development in unincorporated Fresno County within the San Joaquin Valley Air Basin, an air basin currently in nonattainment under the NAAQS and CAAQS for ozone and PM2.5. The Court found that the EIR's air quality analysis was inadequate because it failed to provide enough detail "for the public to translate the bare [criteria pollutant emissions] numbers provided into adverse health impacts or to understand why such a translation is not possible at this time." The Court's decision clarifies that environmental documents must attempt to connect a project's regional air quality impacts to specific health effects or explain why it is not technically feasible to perform such an analysis.

While regional criteria pollutant emissions generated by the project would not result in a significant impact, consistent with the Friant Ranch Decision, Table 3.7-10 provides a conservative estimate of potential health effects associated with these emissions. The estimates were developed using SMAQMD's draft Project Health Effects Tool (version 1). The draft Minor Project Health Screening Tool was developed by SMAQMD, on behalf of regional air districts in the Sacramento Federal Nonattainment Area (SFNA), including YSAQMD (Ramboll 2019). SMAQMD conducted photochemical and health effects modeling of hypothetical projects throughout the SFNA with NO_X, ROG and PM2.5 emissions at 82 pounds per day, which corresponds to the highest daily emissions threshold of all SFNA air districts.[5] The tool outputs the estimated health effects at the 82 pound per day emissions rate by spatial interpolating the health effects from the hypothetical projects based on user inputs for the latitude and longitude coordinates of a project. Because the Proposed Project is linear, three points along the alignment were selected for analysis, as shown in Table 3.7-10.

Note that the results presented in Table 3.7-10 are conservative for two reasons. First, they are based on a source generating 82 pounds per day of ROG, NOx, and PM2.5. As shown in Table 3.7-9, construction would generate a maximum of 0.9 ton of ROG and PM2.5 in a single year (2024), 9.1 tons of NOx, inclusive of floodproofing activities. These values equate to an average daily emissions rate of 4.7 pounds of ROG and PM2.5 and 49.9 pounds of NOx. Second, the results assume the source would generate emissions 365 days per year. Construction of the Proposed Project would only occur 250 days per year (March through September). For these reasons, any increase in regional health risks associated with construction-generated emissions would be less than those presented in Table 3.7-10, which are already very small increases over the background incident health effect.

[5] YSAQMD's threshold of 10 tons per year is equivalent to 55 pounds per day.

Table 3.7-10. Conservative Estimate of Increased Health Effect Incidence Associated with Project Construction (cases per year)

Health Endpoint	Age Range[a]	Mean Incidences (per year)[b]			Percent of Background Health Incidence[c]		
		1	2	3	1	2	3
Emergency Room Visits, Asthma	0–99	0.50	0.39	0.32	0.06%	0.05%	0.04%
Mortality, All Cause	30–99	1.33	1.15	0.96	0.07%	0.06%	0.05%
Hospital Admissions, Asthma	0–64	0.03	0.02	0.02	0.03%	0.03%	0.02%
Hospital Admissions, All Cardiovascular[d]	65–99	0.06	0.05	0.04	0.01%	<0.01%	<0.01%
Hospital Admissions, All Respiratory	65–99	0.17	0.14	0.12	0.02%	0.02%	0.01%
Acute Myocardial Infarction, Nonfatal	18–24	<0.01	<0.01	<0.01	0.04%	0.04%	0.03%
Acute Myocardial Infarction, Nonfatal	25–44	<0.01	<0.01	<0.01	0.03%	0.02%	0.02%
Acute Myocardial Infarction, Nonfatal	45–54	0.01	<0.01	<0.01	0.02%	0.02%	0.01%
Acute Myocardial Infarction, Nonfatal	55–64	0.01	0.01	0.01	0.02%	0.01%	0.01%
Acute Myocardial Infarction, Nonfatal	65–99	0.04	0.03	0.02	0.02%	0.01%	0.01%
Hospital Admissions, All Respiratory	65–99	0.06	0.05	0.05	0.01%	0.01%	0.01%
Mortality, Non-Accidental	0–99	0.04	0.03	0.03	<0.01%	0.00%	0.00%
Emergency Room Visits, Asthma	0–17	0.30	0.27	0.27	0.12%	0.11%	0.11%
Emergency Room Visits, Asthma	18–99	0.47	0.43	0.43	0.08%	0.08%	0.08%

Source: SMAQMD Minor Project Health Screening Tool, version 1, published January 2020.

Note: The three analysis points are located at the 1) eastern project edge (38.678085, -121.687378), 2) center of the project alignment (38.699195, -121.743411), and 3) western project edge (38.694867, -121.809288).

[a] Affected age ranges are shown. Other age ranges are available, but the endpoints and age ranges shown here are the ones used by the USEPA in their health assessments. The age ranges are consistent with the epidemiological study that is the basis of the health function.

[b] Health effects are shown in terms of incidences of each health endpoint and how it compares to the base (2035 base year health effect incidences, or "background health incidence") values. Health effects and background health incidences are across the Northern California model domain.

[c] The percent of background health incidence uses the mean incidence. The background health incidence is an estimate of the average number of people that are affected by the health endpoint in a given population over a given period of time. In this case, these background incidence rates cover the modeled domain. Health incidence rates and other health data are typically collected by the government as well as the World Health Organization. The background incidence rates used here are obtained from BenMAP, as reported in SMAQMD's Minor Project Health Screening Tool, version 1.

[d] Less Myocardial Infarctions.

Localized Criteria Pollutants

Localized criteria pollutants generated by the Proposed Project (e.g., fugitive dust, carbon monoxide) can be deposited near the emissions source and have the potential to affect the population near that emissions source. Although these pollutants dissipate with distance, emissions from individual projects can result in direct and material health impacts on adjacent sensitive receptors. As discussed above, the NAAQS and CAAQS are health protective standards that have been set at levels considered safe to protect public health, including the health of sensitive populations, such as asthmatics, children, and the elderly.

During earthmoving activities required for construction, localized fugitive dust would be generated. The amount of dust generated by a project is highly variable and dependent on the size of the disturbed area at any given time, the amount of activity, soil conditions, and meteorological conditions. Despite this variability in emissions, YSAQMD acknowledges that there are numerous control measures that can be reasonably implemented to significantly reduce construction fugitive dust PM10 emissions (Yolo Solano Air Quality Management District 2007). Mitigation Measure AQ-1 requires regular watering, application of dust suppressants, covering of materials, and other practices that will reduce construction-related fugitive dust emissions by about 60 to 85 percent, depending on the construction year and emissions source. With implementation of Mitigation Measure AQ-1, PM10 emissions would not exceed YSAQMD threshold of significance (Table 3.7-8). Similarly, floodproofing individual structure activities would generate substantially fewer PM10 emissions at an individual site and these emissions would not exceed YSAQMD threshold (Table 3.7-9). Accordingly, localized PM10 emissions would be less than significant and would not expose receptors to substantial pollutant concentrations or risks.

Continuous engine exhaust may elevate localized CO concentrations, resulting in hot spots. Receptors exposed to these CO hot spots may have a greater likelihood of developing adverse health effects. CO hot spots are typically observed at heavily congested intersections where a substantial number of gasoline-powered vehicles idle for prolonged durations throughout the day. As discussed in Section 3.7.2.2, *Thresholds of Significance*, YSAQMD and SMAQMD have developed screening criteria to assist lead agencies in evaluating potential impacts from localized CO. The construction workforce is not expected to exceed 50 daily trips for a single phase (assuming each person drove to the project site). Offsite hauling trips would range from 1 to 173 trips per day per phase during those phases that require material movement (maximum peak day trips during periods of phase overlap would be about 300 trips). These volumes, which would spread throughout the Project footprint and across numerous county roads, are well below SMAQMD's volume-based screening criteria (31,600 vehicles per hour at a single intersection) and would not negatively impact intersection operations. Therefore, the Proposed Project would not contribute to a localized CO hot spot and would not expose receptors to substantial CO concentrations or risks.

Toxic Air Containments (Diesel Particulate Matter)

The primary TAC of concern associated with the Proposed Project is DPM. DPM is a carcinogen emitted by diesel internal combustion engines. The Proposed Project is not expected to represent a significant source of operational DPM because O&M activities would be infrequent and require minimal diesel-powered equipment. No long-term generators or stationary sources are included as part of the Proposed Project. Therefore, the Proposed Project would not result in any appreciable increases in health risks from DPM during operation. The following analysis, therefore, focuses on DPM that would be generated during construction.

Cancer health risks associated with exposure to DPM are typically related to chronic exposure (30-year exposure period). DPM concentrations, and thus health risks, are generally greatest near the emissions source and dissipate as a function of distance (California Air Resources Board 2005). As previously discussed, there are sensitive land uses within 1,000 feet of the project site and haul routes. Accordingly, an HRA for exposure to construction DPM was undertaken to assess the inhalation cancer risk and non-cancer hazard impacts. The HRA was conducted using the unmitigated construction emissions inventory (see Table 3.7-6) and the USEPA's AERMOD model.

Table 3.7-11 presents the maximum estimated cancer and non-cancer health risks from construction generated DPM. The receptors affected by the highest concentrations of DPM are approximately 36 meters south of the construction footprint off Carter Lane and County Road 98.

Table 3.7-11. Maximum Cancer and Chronic Hazard Risks during Construction

Receptor	Cancer Risk[a] (cases per million)	Non-Cancer Hazard Index
Maximally Exposed Individual (MEI)	3	<1
YSAQMD Threshold	10	1
Exceed Threshold?	No	No

[a] Table presents the highest modeled risk, which occurs along at residential receptors approximately 36 meters south of the construction footprint off Carter Lane and County Road 98. Risks would be lower for all other receptor locations.

As shown in Table 3.7-11, construction of the Proposed Project would not result in a significant increase in cancer risk or chronic health hazards at nearby sensitive receptors. Therefore, construction activities for the levee would not expose receptors to substantial DPM concentrations, and this impact would be less than significant. The construction DPM analysis of construction of the levee shows 3 cancer risk cases per million, which includes more intensive, longer term construction activities than those that would occur under floodproofing individual structures. As shown in Appendix 3.7-1, floodproofing activities at a single structure would require one diesel excavator operating for a total of 6 days and four diesel delivery trips occurring over 2 days. These activities, while onsite of a residential property, would generate considerably fewer DPM emissions over a fraction of the time required for levee construction. Accordingly, floodproofing activities would not expose receptors to significant DPM emissions. Impacts would be less than significant.

Impact AQ-4: Result in other emissions (such as those leading to odors) affecting a substantial number of people (less than significant)

Implementation of the Proposed Project would not result in any major sources of odor and would not involve operation of any of the common types of facilities that are known to produce odors (e.g., landfill, wastewater treatment facility). In addition, odors associated with diesel exhaust from the use of onsite construction equipment, and equipment required for floodproofing individual structures, would be intermittent and temporary and would dissipate rapidly from the source with an increase in distance. Furthermore, as required by CARB regulation, no in-use off-road diesel vehicles may idle for more than 5 consecutive minutes. Accordingly, construction of the levee, floodproofing, or O&M activities would result in nuisance odors that would violate YSAQMD Regulation II Rule 2.5. This impact would be less than significant.

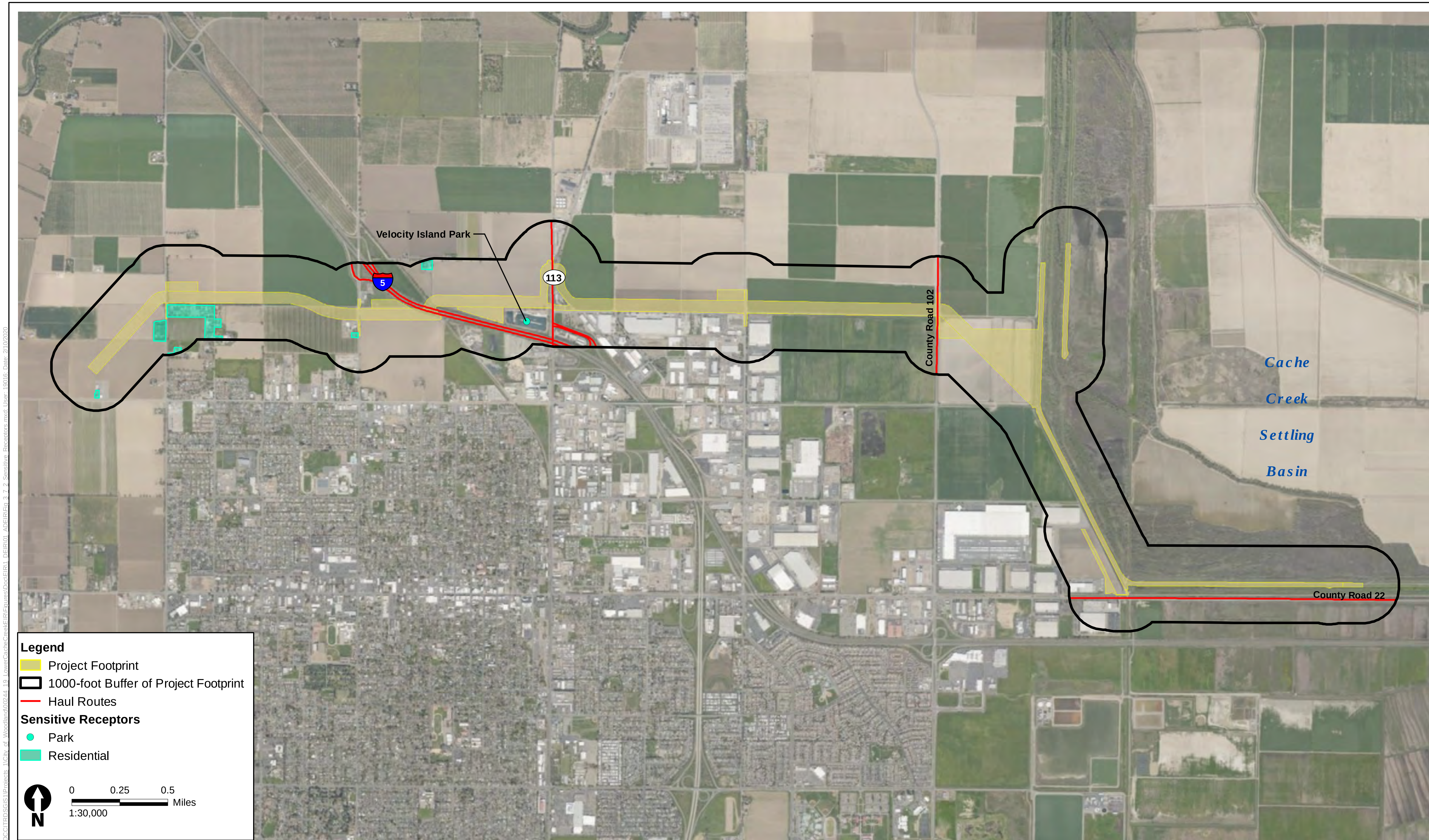

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Figure 3.7-2
Sensitive Receptors

3.8 Greenhouse Gas Emissions

Greenhouse gases (GHGs) are gaseous compounds that limit the transmission of Earth's radiated heat out to space. GHG emissions generated from implementation of the Proposed Project can contribute to global climate change. Climate change is a global problem and GHGs are global pollutants, unlike criteria air pollutants (such as ozone precursors), which are primarily pollutants of regional and local concern. Given the long atmospheric lifetimes of GHGs, GHGs emitted by many sources worldwide accumulate in the atmosphere. No single emitter of GHGs is large enough to trigger global climate change on its own. Rather, climate change is the result of the individual contributions of countless past, present, and future sources. Thus, GHG impacts are inherently cumulative, and the study area for impacts on GHGs includes the entire state and global atmosphere.

This section discusses applicable GHG regulations as they pertain to the Proposed Project and defines key GHG emissions and their current concentrations within the study area. It describes the GHG impacts that would result from implementation of the Proposed Project and provides mitigation for significant impacts where feasible. Appendix E, *Air Quality and Greenhouse Gas Modeling Inputs and Supporting Data*, presents supporting GHG calculations for the impact analysis, as referenced further below.

Information presented in the discussion and used for the subsequent analysis was drawn primarily from the following sources.

- Lower Cache Creek construction engineering assumptions (Hilliard pers. comm. [a], [b]).
- Yolo Solano Air Quality Management District's (YSAQMD) *Handbook for Assessing and Mitigating Air Quality Impacts* (CEQA Handbook) (Yolo Solano Air Quality Management District 2007).
- Sacramento Metropolitan Air Quality Management District's (SMAQMD) *Guide to Air Quality Assessment in Sacramento County* (CEQA Guide) (Sacramento Metropolitan Air Quality Management District 2018).

3.8.1 Existing Conditions

3.8.1.1 Regulatory Setting

This section summarizes key international, federal, state, and local or regional regulations, laws, and policies relevant to GHG emissions in the study area.

International

In 2015, the 21st session of the Conference of Parties (COP21) took place in Paris, France. The session included representatives from 196 parties to the United Nations Framework Convention on Climate Change. The outcomes from the Paris Agreement at COP21 include limiting global temperature increase well below 2 degrees Celsius (°C), establishing binding commitments by all parties to make Nationally Determined Contributions (NDC) and to pursue domestic policies aimed at achieving NDCs, and regular reporting by all countries on their emissions and progress made in implementing and achieving their NDCs. In April 2016, 174 states and the European Union signed the agreement, including the United States. However, on November 4, 2019, President Donald Trump formally notified the United Nations that the United States would withdraw from the Paris

Agreement. This announcement begins a one-year process for exiting the deal, which can occur no sooner than November 2020.

The Under2 Coalition is an international coalition of jurisdictions that signed the Global Climate Leadership Memorandum of Understanding (Under2 MOU) following President Trump's decision to withdraw from the Paris Agreement. The Under2 MOU aims to limit global warming to 2°C, to limit GHGs to below 80 to 95 percent below 1990 levels, and/or achieve a per capita annual emissions goal of less than 2 metric tons by 2050. The Under2 MOU has been signed or endorsed by 135 jurisdictions (including California) that represent 32 countries and 6 continents.

Federal

There is currently no federal overarching law specifically related to climate change or the reduction of GHG emissions. Under the Obama Administration, the U.S. Environmental Protection Agency (USEPA) had been developing regulations under the Clean Air Act (CAA) pursuant to USEPA's authority. There have also been settlement agreements between USEPA, several states, and nongovernmental organizations to address GHG emissions from electric generating units and refineries, as well as the USEPA's issuance of an "Endangerment Finding" and a "Cause or Contribute Finding." USEPA has also adopted a Mandatory Reporting Rule and Clean Power Plan. Under the Clean Power Plan, USEPA issued regulations to control carbon dioxide (CO_2) emissions from new and existing coal-fired power plants. However, on February 9, 2016, the Supreme Court issued a stay of these regulations pending litigation. Former USEPA Administrator Scott Pruitt also signed a measure to repeal the Clean Power Plan. The fate of the proposed regulations is uncertain given the change in federal administrations and the pending deliberations in federal courts.

As discussed in Chapter 3.7, *Air Quality*, the National Highway Traffic Safety Administrative (NHTSA) sets the Corporate Average Fuel Economy Standards (CAFÉ) standards to improve the average fuel economy and reduce GHG emissions generated by cars and light duty trucks. NHTSA and USEPA have proposed to amend the current fuel efficiency standards for passenger cars and light trucks and establish new standards covering model years 2021 through 2026 by maintaining the current model year 2020 standards through 2026 (Safer Affordable Fuel-Efficient [SAFE] Vehicles Rule). California, 22 other states, the District of Columbia, and two cities filed suit against the proposed action on September 20, 2019 (California et al. v. United States Department of Transportation et al., 1:19-cv-02826, U.S. District Court for the District of Columbia). The lawsuit requests a "permanent injunction prohibiting Defendants from implementing or relying on the Preemption Regulation," but does not stay its implementation during legal deliberations. Part 1 of the SAFE Vehicles Rule went into effect on November 26, 2019.

State

California has established various regulations to address GHG emissions. The most relevant of these regulations to the Proposed Project are summarized below.

State Legislative Reduction Targets

Assembly Bill (AB) 32 (Chapter 488, Statutes of 2006), the Global Warming Solutions Act of 2006, requires the state to reduce GHG emissions to 1990 levels by 2020. Senate Bill (SB) 32 (2016) requires the state to reduce emissions to 40 percent below the 1990 level by 2030. The state's plan to reach these targets are presented in periodic scoping plans. The California Air Resources Board (CARB) (2017a) adopted the *2017 Climate Change Scoping Plan* in November 2017 to meet the GHG reduction requirement set forth in SB 32. It proposes continuing the major programs of the previous AB 32 Scoping Plan, including the Cap-and-Trade Regulation, low carbon fuel standard, more efficient cars, trucks, and freight movement, the Renewables Portfolio Standard (RPS), and reducing methane emissions from agricultural and other wastes. The current 2017 Scoping Plan articulates a key role for local governments, recommending they establish GHG reduction goals for both their municipal operations and the community consistent with those of the state.

Executive Order Reduction Targets

In 2005, Executive Order (EO) S-3-05 established goals to reduce California's GHG emissions to (1) 2000 levels by 2010 (achieved); (2) 1990 levels by 2020; and (3) 80 percent below the 1990 levels by 2050. In 2018, EO B-55-18 established a new state goal to achieve carbon neutrality as soon as possible, and no later than 2045, and to achieve and maintain net negative emissions thereafter. Executive orders are binding on state government agencies but are not legally binding on cities and counties or on private development.

Renewables Portfolio Standard

SBs 1078 (2002), 107 (2006), 2 (2011), and 100 (2015) govern California's RPS under which investor-owned utilities, energy service providers, and Community Choice Aggregators must procure additional retail sales per year from eligible renewable sources. The current requirements are 33 percent by 2020, 40 percent by 2024, 50 percent by 2026, 60 percent by 2030, and 100 percent by 2045. The 2045 target can be achieved by eligible renewable resources and other carbon-free sources (e.g., large hydropower).

Vehicle Efficiency Standards

AB 1493 requires CARB to develop and implement regulations to reduce automobile and light-truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the model year 2009. Additional strengthening of the Pavley standards (referred to previously as *Pavley II* and now referred to as the *Advanced Clean Cars* measure) was adopted for vehicle model years 2017 through 2025 in 2012.[1] Together, the two standards are expected to increase average fuel economy to roughly 54.5 miles per gallon in 2025.

Low Carbon Fuel Standard

With EO S-01-07, Governor Schwarzenegger set forth the low carbon fuel standard for California in 2007. Under this EO, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.

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[1] On September 27, 2019, USEPA and NHTSA published a decision to withdraw California's waiver and finalize regulatory text implementing NHTSA statutory authority to set nationally applicable fuel economy standards that made explicit that state programs would also be preempted under NHTSA's authorities (84 FR 51310). A lawsuit filed by California, 22 other states, the District of Columbia, and two cities was filed in advance of the publication on September 20, 2019 *(California et al. v. United States Department of Transportation et al.*, 1:19-cv-02826). California's wavier and current fuel economy standards will remain in effect until the courts rule on the lawsuit and proposed regulatory changes.

Senate Bills 605 and Short-Lived Climate Pollutant Reduction Strategy

SB 605 directed CARB, in coordination with other state agencies and local air districts, to develop a comprehensive Short-Lived Climate Pollutant (SLCP) Reduction Strategy. SB 1383 directed CARB to approve and implement the SLCP Reduction Strategy to achieve the following reductions in SLCPs.

- 40 percent reduction in methane (CH_4) below 2013 levels by 2030.
- 40 percent reduction in hydrofluorocarbon gases below 2013 levels by 2030.
- 50 percent reduction in anthropogenic black carbon below 2013 levels by 2030.

CARB adopted the SLCP Reduction Strategy in March 2017 as a framework for achieving the CH_4, hydrofluorocarbon, and anthropogenic black carbon reduction targets. The SLCP Reduction Strategy includes 10 measures to SLCPs, which fit within a wide range of ongoing planning efforts throughout the state, including CARB's and CalRecycle's proposed rulemaking on organic waste diversion.

Local

Air Quality Management Districts

As discussed in Chapter 3.7, *Air Quality*, the new levee and construction area are under the jurisdiction of the YSAQMD. Materials may be transported from Sacramento where the Sacramento Metropolitan Air Quality Management District (SMAQMD) has air quality jurisdiction (as described in Chapter 2, *Project Description*, Section 2.3.4, *Staging, Site Access, and Construction-Related Traffic*). Both air districts have adopted CEQA guidelines outlining methods for quantifying GHG emissions, as well as potential mitigation measures (Yolo Solano Air Quality Management District 2007; Sacramento Metropolitan Air Quality Management District 2018). SMAQMD (2015) has also adopted advisory emission thresholds to assist CEQA lead agencies in determining the level of significance of a project's GHG emissions.

Climate Action Plans

The City of Woodland adopted a Climate Action Plan (CAP) in May 2017 to reduce community and municipal GHG emissions. The CAP is a planning document that provides a roadmap for reducing GHG emissions consistent with state goals for addressing California's contributions to climate change. The CAP includes 24 recommended community GHG emissions reduction strategies and 5 municipal GHG reduction strategies. The combined implementation of these strategies, alongside local reductions resulting from state programs, achieve the City's 2020 and 2035 reduction targets (City of Woodland 2017). The CAP was prepared consistent with CEQA Guidelines 15183.5(b)(1) and can be used for CEQA review of subsequent plans and projects that are consistent with the GHG reduction strategies and targets in the CAP.

Yolo County adopted a CAP in March 2011 to reduce community GHG emissions. The CAP contains 15 primary measures that will help the community achieve GHG reductions and successfully adapt to climate change. The combined implementation of these strategies, alongside local reductions resulting from state programs, achieve the County's 2020 and 2030 reduction targets (Yolo County 2011). The CAP was prepared consistent with CEQA Guidelines 15183.5(b)(1) and can be used for CEQA review of subsequent plans and projects that are consistent with the GHG reduction strategies and targets in the CAP.

The City and County of Sacramento, as well as other jurisdictions along the material hauling routes, have also adopted CAPs.

3.8.1.2 Environmental Setting

This section discusses the environmental setting relevant to GHG emissions in the study area, which includes the entire state and global atmosphere.

Global Climate Change

The process known as the "greenhouse effect" keeps the atmosphere near Earth's surface warm enough for the successful habitation of humans and other life forms. The greenhouse effect is created by sunlight that passes through the atmosphere. Some of the sunlight striking Earth is absorbed and converted to heat, which warms the surface. The surface emits a portion of this heat as infrared radiation, some of which is re-emitted toward the surface by GHGs. Human activities that generate GHGs increase the amount of infrared radiation absorbed by the atmosphere, thus enhancing the greenhouse effect and amplifying the warming of Earth.

Increases in fossil fuel combustion and deforestation have exponentially increased concentrations of GHGs in the atmosphere since the Industrial Revolution (Intergovernmental Panel on Climate Change 2007). Rising atmospheric concentrations of GHGs in excess of natural levels result in increasing global surface temperatures—a process commonly referred to as "global warming." Higher global surface temperatures, in turn, result in changes to Earth's climate system, including increased ocean temperature and acidity, reduced sea ice, variable precipitation, and increased frequency and intensity of extreme weather events (Intergovernmental Panel on Climate Change 2018). Large-scale changes to Earth's system are collectively referred to as "climate change."

The Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organization and United Nations Environment Programme to assess scientific, technical, and socioeconomic information relevant to the understanding of climate change, its potential impacts, and options for adaptation and mitigation. The IPCC estimates that human-induced warming reached approximately 1°C above pre-industrial levels in 2017, increasing at 0.2°C per decade. Under the current nationally determined contributions of mitigation from each country until 2030, global warming is expected to rise to 3°C by 2100, with warming to continue afterwards (Intergovernmental Panel on Climate Change 2018). Large increases in global temperatures could have substantial adverse effects on the natural and human environments worldwide and in California.

Greenhouse Gases

The principle anthropogenic (human-made) GHGs contributing to global warming are CO_2, CH_4, nitrous oxide (N_2O), and fluorinated compounds, including sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs). Water vapor, the most abundant GHG, is not included in this list because its natural concentrations and fluctuations far outweigh its anthropogenic sources.

The primary GHGs of concern associated with the Proposed Project are CO_2, CH_4, and N_2O. Principal characteristics of these pollutants are discussed below.

Carbon dioxide enters the atmosphere through fossil fuels (oil, natural gas, and coal) combustion, solid waste decomposition, plant and animal respiration, and chemical reactions (e.g., manufacture of cement). CO_2 is also removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.

Methane is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and from the decay of organic waste in municipal solid waste landfills.

Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.

Methods have been set forth to describe emissions of GHGs in terms of a single gas to simplify reporting and analysis. The most commonly accepted method to compare GHG emissions is the global warming potential (GWP) methodology defined in IPCC reference documents. IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of carbon dioxide equivalent (CO_2e), which compares the gas in question to that of the same mass of CO_2 (CO_2 has a global warming potential of 1 by definition).

Table 3.8-1 lists the global warming potential of CO_2, CH_4, and N_2O and their lifetimes in the atmosphere.

Table 3.8-1. Lifetimes and Global Warming Potentials of Key Greenhouse Gases

Greenhouse Gas	Global Warming Potential (100 years)	Lifetime (years)
CO_2	1	50 to 200
CH_4	25	9 to 15
N_2O	298	121

Source: California Air Resources Board 2019a.
CH_4 = methane; CO_2 = carbon dioxide; N_2O = nitrous oxide.

All GWPs used for CARB's GHG inventory and to assess attainment of the State's 2020 and 2030 reduction targets are considered over a 100-year timeframe (as shown in Table 3.8-1). However, CARB recognizes the importance of SLCPs and reducing these emissions to achieve the state's overall climate change goals. SLCPs have atmospheric lifetimes on the order of a few days to a few decades, and their relative climate forcing impacts, when measured in terms of how they heat the atmosphere, can be tens, hundreds, or even thousands of times greater than that of CO_2 (California Air Resources Board 2017a). Recognizing their short-term lifespan and warming impact, SLCPs are measured in terms of CO2e using a 20-year time period. The use of GWPs with a time horizon of 20 years better captures the importance of the SLCPs and gives a better perspective on the speed at which SLCP emission controls will affect the atmosphere relative to CO_2 emission controls. The SLCP Reduction Strategy, which is discussed above under *Regulatory Setting* addresses the three primary SLCPs—CH_4, hydrofluorocarbon gases, and anthropogenic black carbon. Methane has lifetime of 12 years and a 20-year GWP of 72. Hydrofluorocarbon gases have lifetimes of 1.4 to 52 years and a 20-year GWP of 437 to 6,350. Anthropogenic black carbon has a lifetime of a few days to weeks and a 20-year GWP of 3,200 (California Air Resources Board 2017a).

Greenhouse Gas Reporting

A GHG inventory is a quantification of all GHG emissions and sinks[2] within a selected physical and/or economic boundary. GHG inventories can be performed on a large scale (e.g., for global and national entities) or on a small scale (e.g., for a building or person). Although many processes are difficult to evaluate, several agencies have developed tools to quantify emissions from certain sources. Table 3.8-2 outlines the most recent global, national, statewide, and local GHG inventories to help contextualize the magnitude of potential project-related emissions.

Table 3.8-2. Global, National, State, and Regional Greenhouse Gas Emission Inventories

Emissions Inventory	CO_2e (metric tons)
2010 IPCC Global GHG Emissions Inventory	52,000,000,000
2017 USEPA National GHG Emissions Inventory	6,472,300,000
2017 CARB State GHG Emissions Inventory	424,100,000
2008 Yolo County GHG Emissions Inventory	651,740
2005 City of Woodland GHG Emissions Inventory	566,389

Sources: Intergovernmental Panel on Climate Change 2014; U.S. Environmental Protection Agency 2019; California Air Resources Board 2019b; Yolo County 2011; City of Woodland 2017.

Potential Climate Change Effects

Climate change is a complex process that has the potential to alter local climatic patterns and meteorology. Although modeling indicates that climate change will result in sea level rise (both globally and regionally) as well as changes in climate and rainfall, among other effects, there remains uncertainty about characterizing precise local climate characteristics and predicting precisely how various ecological and social systems will react to any changes in the existing climate at the local level. Regardless of this uncertainty, it is widely understood that substantial climate change is expected to occur in the future, although the precise extent will take further research to define. Specifically, significant impacts from global climate change worldwide and in California include the following.

- Declining sea ice and mountain snowpack levels, thereby increasing sea levels and sea surface evaporation rates with a corresponding increase in atmospheric water vapor, due to the atmosphere's ability to hold more water vapor at higher temperatures (California Natural Resources Agency 2018).
- Rising average global sea levels primarily due to thermal expansion and the melting of glaciers, ice caps, and the Greenland and Antarctic ice sheets (Intergovernmental Panel on Climate Change 2018).
- Changing weather patterns, including changes to precipitation, ocean salinity, and wind patterns, and more energetic aspects of extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones (Intergovernmental Panel on Climate Change 2013).

[2] A GHG "sink" is a process, activity, or mechanism that removes a GHG from the atmosphere.

- Declining Sierra Mountains snowpack levels, which account for approximately half of the surface water storage in California, by 70 percent to as much as 90 percent over the next 100 years (California Natural Resources Agency 2018).
- Increasing the number of days conducive to ozone formation (e.g., clear days with intense sun light) by 25 percent to 85 percent (depending on the future temperature scenario) by the end of the Twenty-first Century in high ozone areas, including Southern California (California Natural Resources Agency 2018).
- Increasing the potential for erosion of California's coastlines and seawater intrusion into the Sacramento Delta and associated levee systems due to the rise in sea level (California Natural Resources Agency 2018).
- Exacerbating the severity of drought conditions in California such that durations and intensities are amplified, ultimately increasing the risk of wildfires and consequential damage incurred (California Natural Resources Agency 2018).
- Under changing climate conditions, agriculture is projected to experience lower crop yields due to extreme heat waves, heat stress and increased water needs of crops and livestock (particularly during dry and warm years), and new and changing pest and disease threats (California Natural Resources Agency 2018).
- The impacts of climate change, such as increased heat-related events, droughts, and wildfires, pose direct and indirect risks to public health, as people will experience earlier death and worsening illnesses. Indirect impacts on public health include increased vector-borne diseases, stress and mental trauma due to extreme events and disasters, economic disruptions, and residential displacement (California Natural Resources Agency 2018).

3.8.2 Environmental Impacts

This section describes the environmental impacts associated with GHG emissions for the Proposed Project. It describes the methods used to quantify GHG emissions and discusses the thresholds used to evaluate whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts are provided.

3.8.2.1 Methods for Analysis

GHG impacts associated with construction and operation of the Proposed Project were assessed and quantified (where applicable) using standard and accepted software tools, techniques, and emission factors. As described in Chapter 2, Project Description, Section 2.3.6, *Additional Features Proposed by the City of Woodland*, floodproofing of individual structures could occur for certain buildings within the project area. The methods for analyzing this aspect of the Proposed Project are also described below.

Construction Emissions

Construction activities would take place in 2023 and 2024, with work occurring between March and September of each year. Construction would generally occur Monday through Saturday from 7 a.m. to 6 p.m. GHG emissions would originate from off-road equipment exhaust, vehicle exhaust (on-road vehicles), slurry wall batching, and electricity consumption. Removal of approximately 50 trees would also result in a one-time change in carbon sequestration capacity.

Emissions from off-road equipment and on-road vehicles were quantified using CalEEMod, version 2016.3.2; the CARB's EMFAC2017 model; and the methods described in Chapter 3.7, *Air Quality*, Section 3.7.2.1, Methods for Analysis. CO_2 emissions generated by cement manufacturing, aggregate production, transportation,[3] and facility operation were calculated using lifecycle emission factors from Marceau et al. (2007). It was assumed the Interstate 5 undercrossing would require a compression strength of 3,500 pounds per square (Hilliard pers. comm. [a]). GHG emissions generated by electricity used to power the onsite contractor trailer were quantified using activity data (e.g., megawatt hours) provided by the project engineering team (Wood Rodgers) and emission factors calculating using data from Valley Clean Energy (VCE) and the USEPA (Valley Clean Energy 2019; U.S. Environmental Protection Agency 2020a).[4]

Floodproofing Individual Structures

Floodproofing individual structures could occur under the Proposed Project between 2024 and 2029. Floodproofing activities would generate GHG emissions from off-road equipment exhaust and vehicle exhaust (on-road vehicles). Emissions resulting from these activities for completion of an individual structure were quantified using data from the project engineering team (Wood Rodgers) (Hilliard pers. comm. [b]) and the methods described in Chapter 3.7, *Air Quality*. For the purposes of analysis, it was assumed that up to three structures could be floodproofed in 2024 and two structures each year thereafter through 2029.

Operational Emissions

The Proposed Project will require regular operations and maintenance (O&M) for the levee. Minimal amounts of equipment and vehicles would be required for landscaping, levee slope and road conditioning, and periodic sediment removal. Given the limited and infrequent nature of O&M for the levee, emissions are evaluated qualitatively. Floodproofed structures would not require any O&M or result in operational emissions.

3.8.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the Proposed Project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

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[3] Inclusion of transportation-related emissions in the concrete batching analysis likely overestimates batching-related GHGs. The on-road vehicle assumptions account for material transport to and from the construction site. Accordingly, emissions from transportation of ready mix to the concrete batching plants are already assessed as part of the on-road vehicle analysis. Nevertheless, the full lifecycle factors for concrete batching, which include transportation, were conservatively used in this analysis.

[4] Clearing and grubbing activities would involve the removal of larger woody vegetation, including approximately 50 trees. However, these trees would be replaced by the City at a minimum of a one-to-one ratio (oak woodland would be replaced at a 3:1 ratio). Accordingly, any sequestration losses from removal of the existing trees would be fully compensated for through the City's replacement commitment.

The California Supreme Court's decision in *Center for Biological Diversity v. Department of Fish and Wildlife* (62 Cal.4th 204) confirmed that there are multiple potential pathways for evaluating GHG emissions consistent with CEQA. Several air quality management agencies throughout the state have also drafted or adopted varying threshold approaches and guidelines for analyzing GHG emissions in CEQA documents. Common threshold approaches include (1) compliance with a qualified GHG reduction strategy, (2) performance-based reductions, (3) numeric "bright-line" thresholds, (4) efficiency-based thresholds, and (5) compliance with regulatory programs.

The Office of Planning and Research (OPR) acknowledges that the State Legislature encourages lead agencies to tier or streamline their environmental documents whenever feasible, and that GHG emissions may be best analyzed and mitigated at the programmatic level (California Office of Planning and Research 2018). A qualified GHG reduction strategy may be used in the cumulative impact analysis for later projects when the analysis "identifies those requirements specified in the plan that apply to the project." For a GHG reduction plan to be considered a qualified plan, it must meet certain criteria established under State CEQA Guidelines Sections 15183.5 (b) and 15064.4. Section 15183.5 also specifies that the project's CEQA analysis "must identify those requirements specified in the plan that apply to the project, and, if those requirements are not otherwise binding and enforceable, incorporate those requirements as mitigation measures applicable to the project." Consequently, if a project is consistent with a local CAP that was created to meet that area's fair share reductions towards the state's GHG targets, then the project would be consistent with statewide GHG reduction goals and would not result in a significant GHG impact.

As discussed above, the City of Woodland has adopted a CAP to achieve community and municipal reduction targets for 2035. Yolo County has adopted a CAP to achieve a 2030 community reduction target. Both the City's and County's CAPs are qualified GHG reduction strategies per State CEQA Guidelines and can, therefore, be used to streamline GHG analyses for projects implemented prior to the CAP horizon years (2030 and 2035 for the City and County, respectively). Both CAPs also evaluate GHG emissions from construction activities in their community inventories, forecasts, and reduction target assessments (Yolo County 2011; City of Woodland 2017). Accordingly, the City's and County's community CAPs fully cover emission sources associated with construction of the Proposed Project. Construction GHG emissions generated in the City of Woodland and Yolo County are therefore evaluated based on compliance with City's and County's community CAPs.

Bentonite would be transported from Sacramento, resulting in minor amounts of GHGs from haul trucks traveling in Sacramento County. SMAQMD has adopted a numeric construction threshold of 1,100 metric tons CO_2e. This threshold is based on construction emissions data for infrastructure projects in Sacramento County and is recommended by SMAQMD for assessing the significance of GHG impacts resulting from construction (Sacramento Metropolitan Air Quality Management District 2018). Accordingly, construction GHG emissions generated in Sacramento County are evaluated using SMAQMD's numeric threshold of 1,100 metric tons CO_2e per year.

The City of Woodland will operate and maintain the levee following construction. The City's CAP identifies reduction measures required to achieve the City's 2035 GHG target for municipal activities. Accordingly, the City's municipal CAP fully covers emissions resulting from O&M of the Proposed Project. O&M GHG emissions are therefore evaluated based on compliance with City's municipal CAP.

3.8.2.3 Impacts and Mitigation Measures

Impact GHG-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment (less than significant with mitigation)

Construction of the Proposed Project would generate GHG emissions in 2023 and 2024 from heavy-duty construction equipment, construction worker vehicles, truck hauling, concrete batching, and electricity consumption. Floodproofing activities would generate GHG emissions from heavy equipment and vehicles between 2024 and 2029. Table 3.8-3 summarizes annual and total estimated GHG emissions resulting from construction of the levee of the Proposed Project (including floodproofing activities).

Table 3.8-3. Estimated GHG Emissions from Project Construction and Floodproofing Activities (metric tons per year)

Location/Year	CO_2	CH_4	N_2O	CO_2e
YSAQMD				
2023	3,165	<1	<1	3,213
2024[a]	1,663	<1	<1	1,699
2025	6	<1	<1	6
2026	6	<1	<1	6
2027	6	<1	<1	6
2028	6	<1	<1	6
2029	6	<1	<1	6
Total YSAQMD	4,856	1	<1	4,941
SMAQMD				
2023	1	<1	<1	1
Total SMAQMD	1	<1	<1	1
Construction total (YSAQMD + SMAQMD)	4,857	1	<1	4,942

CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide; CO_2e = carbon dioxide equivalent, which includes the relative warming capacity (i.e., global warming potential) of each GHG.

[a] Emissions from overlapping levee construction and floodproofing activities.

Table 3.8-3 shows that construction of the Proposed Project (including floodproofing activities) would generate a total of 4,942 metric tons of CO_2e during the construction period. This is equivalent to adding about 1,050 typical passenger vehicles per year to the road during construction (U.S. Environmental Protection Agency 2020b). Almost all emissions would be generated in YSAQMD, with most of those emissions resulting from off-road equipment and on-road vehicle exhaust. Long-term O&M for the levee would result in limited GHG emissions from activities such as one to two persons driving trucks on the levees for inspection, maintenance, and patrol actions. Possible limited heavy-duty earth-moving equipment may be used for periodic reconditioning of the levee slope and road and sediment removal. These emissions would be limited to a very temporary timeframe once or twice a year (or less).

As discussed in Section 3.8.2.2., *Thresholds of Significance*, potential GHG impacts resulting from construction and O&M of the Proposed Project are evaluated based on SMAQMD's numeric threshold of 1,100 metric tons of CO_2e and compliance with the City's and County's CAPs. As shown in Table 3.8-3, bentonite hauling in Sacramento County would generate roughly 1 metric ton of CO_2e in 2023. This emission is considerably less than SMAQMD's threshold. Tables 3.8-4 and 3.8-5 evaluate the Proposed Project's consistency with the City's and County's CAPs, respectively. As shown in the tables, construction activities, including those associated with floodproofing individual structures, in the City and County are consistent with all applicable community strategies with implementation of Mitigation Measure GHG-1. O&M activities are consistent with the City's municipal strategies with implementation of Mitigation Measure GHG-2. Accordingly, with implementation of Mitigation Measures GHG-1 and GHG-2, the Proposed Project would not conflict with the City's or County's abilities to achieve the GHG emissions reductions outlined in their CAPs. This impact would be significant. Implementation of Mitigation Measures GHG-1 and GHG-2 would reduce this impact to a less-than-significant level.

Table 3.8-4. Proposed Project Construction and O&M Consistency with City of Woodland's Community and Municipal Climate Action Plan

No.	CAP Measure	Applicable?	Project Implementation	Consistent?
Energy				
E-1	Lighting Efficiency Upgrades	No	Applies to building lighting and is not applicable to construction or O&M of the Proposed Project because the Proposed Project is a flood infrastructure project and does not include buildings.	NA
E-2	Appliance/ Equipment Upgrades	No	Applies to appliances is not applicable to construction or O&M of the Proposed Project because the Proposed Project would not have appliances/equipment.	NA
E-3	Comprehensive Building Efficiency	No	Applies to building efficiency; see E-1.	NA
E-4	Improved Building Temperature Controls	No	Applies to building energy consumption; see E-1.	NA
E-5	Energy Conservation Education	No	City-lead education initiative that applies to building energy consumption; see E-1.	NA
E-6	Renewable Energy Generation and Procurement	No	Applies to residential and commercial renewable energy generation and is not applicable to construction or O&M of the Proposed Project because the Proposed Project is not residential or commercial development.	NA
Transportation and Land Use				
T/LU-1	Complete Streets Program	No	Applies to complete streets development and is not applicable to construction or O&M of the Proposed Project because the Proposed Project does not involve developing streets.	NA
T/LU-2	Infill Development, Redevelopment, and Repurposing	No	City-lead initiative to promote infill and mixed-use development and is not applicable to construction or O&M of the Proposed Project because the Proposed Project does not include development.	NA
T/LU-3	Smart Growth in New Development	No	City-lead initiative to promote smart growth; see T/LU-2.	NA

No.	CAP Measure	Applicable?	Project Implementation	Consistent?
T/LU-4	Reduced Motor Vehicle Trips	Yes	The purpose of this measure is to shorten or eliminate vehicle trips. The measure specifically seeks to achieve this goal by "reducing work commute trips and increasing carpooling". Construction will require approximately 50 workers who are likely to travel to the construction site using personal vehicles. These trips may conflict with the City's goal to reduce vehicle miles traveled. Mitigation Measure GHG-1 is therefore required to achieve consistency with T/LU-4. This mitigation requires the City to develop a Transportation Demand Management (TDM) Plan to reduce the number of construction worker trips.	Yes, with Mitigation Measure GHG-1
T/LU-5	Increased Mass Transit Use, Walking, and Bicycling	No	City-lead initiative to expand alternative transportation and is not applicable to construction or O&M of the Proposed Project because the Proposed Project is a flood infrastructure project that does not directly involve uses related to mass transit or active transportation. Nevertheless, individuals may use the levee for walking or biking once constructed, indirectly supporting this strategy.	NA
T/LU-6	Reduced Emissions from Vehicle Idling and Other Equipment	Yes	The purpose of this measure is to reduce the use of small gasoline powered equipment and reduce vehicle idling by adhering to idling regulations. Diesel haul trucks will be used during construction to transport materials and equipment. Construction contractors are required pursuant to California Code of Regulations, Title 13, sections 2449(d)(3) and 2485 to limit diesel idling time to no more than 5 minutes at a single location. Mitigation Measure GHG-1 supports compliance with this idling regulation by requiring contractors to provide clear signage that posts the 5-minute restriction. Gasoline-powered equipment may be used during O&M for routine landscaping. Mitigation Measure GHG-2 is therefore required to achieve consistency with T/LU-6. This measure requires the City to use electric vehicles for levee O&M.	Yes, with Mitigation Measures GHG-1 and GHG-2
T/LU-7	Increased Use of Alternative-Fuel Vehicles	Yes	The purpose of this measure is to replace fossil-fuel powered equipment with those that run on alternative fuels. Construction and O&M will use equipment that could be powered with fossil fuels. Mitigation Measures GHG-1 and GHG-2 are therefore required to achieve consistency with T/LU-7. Mitigation Measure GHG-1 requires construction contractors to use alternatively fueled construction vehicles/equipment in at least 15 percent of their fleets. Mitigation Measure GHG-2 requires the City to use electric vehicles for levee O&M.	Yes, with Mitigation Measures GHG-1 and GHG-2

No.	CAP Measure	Applicable?	Project Implementation	Consistent?
Urban Forestry and Open Space				
UF-1	Urban Forest Management Plan	No	City-lead initiative to adopt an urban forest management plan and is not applicable to construction or O&M of the Proposed Project.	NA
UF-2	Increased Tree Planting	Yes	The purpose of this measure is to increase the urban tree canopy by planting new trees. As noted above, all tree removed during construction will be replaced by the City at a minimum of a one-to-one ratio.	Yes
UF-3	Maintenance of Existing Trees	No	City-lead initiative to support maintenance of existing trees and is not applicable to construction or O&M of the Proposed Project.	NA
UF-4	Public Education	No	City-lead education initiative and is not applicable to construction or O&M of the Proposed Project.	NA
UF-5	Open Space Preservation	No	City-lead education initiative and is not applicable to construction or O&M of the Proposed Project.	NA
Water and Solid Waste				
W/W-1	Increased Water Conservation	No	Applies to building water efficiency and is not applicable to construction or O&M of the project because the Proposed Project is a flood infrastructure project and does not include buildings.	NA
W/W-2	Solid Waste Reduction and Waste Processing Improvements	Yes	The purpose of this measure is to reduce landfilled waste. One way the City seeks to achieve this goal is to "promote a high level of recycling of construction and demolition debris." Construction activities will generate construction waste. Mitigation Measure GHG-1 is therefore required to achieve consistency with W/W-2. This measure requires construction contractors to recycle or reuse at least 75 percent of construction waste or demolition materials.	Yes, with Mitigation Measure GHG-1
Public Involvement				
PI-1	Citizen-Led Outreach	No	City-lead outreach initiative and is not applicable to construction or O&M of the Proposed Project.	NA
PI-2	Outreach Materials and Activities	No	City-lead outreach initiative and is not applicable to construction or O&M of the Proposed Project.	NA
PI-3	Recognition of Business Sustainability Efforts	No	City-lead outreach initiative and is not applicable to construction or O&M of the Proposed Project.	NA
PI-4	Progress Checks and Recommendations	No	City-initiative to monitor CAP progress and is not applicable to construction or O&M of the Proposed Project.	NA

No.	CAP Measure	Applicable?	Project Implementation	Consistent?
Municipal Operations				
MO-1	Internal Policies	Yes	The purpose of this measure is to integrate CAP implementation and GHG reduction considerations into City operations. The City will implement several actions through Mitigation Measures GHG-1 and GHG-2 to reduce construction and O&M emissions. These include implementing a TDM Plan, using alternative fuels and electric-powered equipment, and recycling and reusing construction materials. These considerations and deliberate actions to reduce GHG emissions are consistent with MO-1.	Yes, with Mitigation Measures GHG-1 and GHG-2
MO-2	Purchasing and Contracting	Yes	The purpose of this measure is to ensure that third-party contractors incorporate, where feasible, measures to advance the City's CAP implementation. See MO-1. The City will implement Mitigation Measure GHG-1, which extends to all construction contractors.	Yes, with Mitigation Measure GHG-1
MO-3	Increased Energy Efficiency and Use of Renewable Energy	Yes	The purpose of this measure is to increase municipal energy efficiency and renewable energy generation for buildings and facilities. The measure does not apply to construction activities and is therefore not applicable to the Proposed Project, which does not include any new buildings or facilities.	NA
MO-5	Reduced Motor Vehicle Use	Yes	The purpose of this measure is to reduce employee commute and work trips. O&M work would be completed by City employees, who will be eligible to for all City programs and benefits relating to commute reduction. The Proposed Project will also implement Mitigation Measure GHG-2 to directly reduce GHG emissions from O&M vehicles.	Yes

Table 3.8-5. Proposed Project Construction Consistency with Yolo County's Community Climate Action Plan

No.	CAP Measure	Applicable?	Project Implementation	Consistent?
Agriculture				
A-1	Reduce nitrogen fertilizer application rates	No	Applies to agricultural activities and is not applicable to construction of the Proposed Project because the Proposed Project does not include agricultural activities.	NA
A-2	Reduce fossil fuel consumption in field equipment	No	Applies to agricultural activities; see A-1.	NA
A-3	Reduce energy use in agricultural irrigation pumping	No	Applies to agricultural activities; see A-1.	NA
A-4	Reduce confined livestock manure methane emissions	No	Applies to agricultural activities; see A-1.	NA

No.	CAP Measure	Applicable?	Project Implementation	Consistent?
A-5	Reduce methyl bromide application	No	Applies to agricultural activities; see A-1.	NA
A-6	Sequester carbon in agricultural landscapes	No	Applies to agricultural activities; see A-1.	NA
–	Supporting Measures for Agriculture	No	Applies to agricultural activities; see A-1.	NA
Transportation and Land Use				
T-1	Reduce Vehicle Miles Traveled in New Development	No	Establishes Vehicle Miles Traveled reduction standards for future development projects and is not applicable to construction of the project because the Proposed Project does not include development.	NA
Energy				
E-1	Pursue a Community Choice Aggregation (CCA) Program	No	County-initiative to evaluate and develop a CCA implementation plan and is not applicable to construction of the project because the Proposed Project does not include development or long-term electricity consumption.	NA
E-2	Reduce Energy Consumption in Existing Residential and Non-Residential Units	No	Applies to existing building efficiency and is not applicable to construction of the project because the Proposed Project is a flood infrastructure project and does not include buildings.	NA
E-3	Reduce Energy Consumption in New Residential and Non-Residential Units	No	Applies to building efficiency; see E-2.	NA
E-4	Increase Onsite Renewable Energy Generation to Reduce Demand for Grid Energy	No	Applies to residential and commercial renewable energy generation and is not applicable to construction of the Proposed Project.	NA
E-5	Promote On-Farm Renewable Energy Facilities	No	Applies to on-farm renewable energy generation and is not applicable to construction of the project because the Proposed Project does not include agricultural activities.	NA
E-6	Reduce Water Consumption in Existing Buildings Through Increased Plumbing Fixture Efficiency	No	Applies to existing building indoor water efficiency and is not applicable to construction of the project because the Proposed Project is a flood infrastructure project and does not include buildings.	NA
E-7	Promote Weather-Based Irrigation Systems and Water Efficient Turf Management	No	Applies to building outdoor water efficiency; see E-6.	NA

No.	CAP Measure	Applicable?	Project Implementation	Consistent?
–	Supporting Measures for Energy	Yes	The CAP identifies a supporting measure to reduce the embodied energy content of construction materials by encouraging recycling of building materials, reusing salvaged products after demolition and using locally available and durable materials. Construction activities would generate construction waste. Mitigation Measure GHG-1 is therefore required to achieve consistency with the supporting CAP strategy. This measure requires construction contractors to recycle or reuse at least 75 percent of construction waste or demolition materials.	Yes, with Mitigation Measure GHG-1
Solid Waste and Wastewater				
WR-1	Expand Landfill Methane Capture Systems	No	Applies to landfill gas collection systems and is not applicable to construction of the project because the Proposed Project is a flood infrastructure project and does not affect landfill operations.	NA
–	Supporting Measures for Waste and Wastewater	Yes	The CAP identifies a supporting measure to expand the County's existing minimum diversion rate from 50 to 65 percent for construction and demolition waste. As noted above, the City will implement Mitigation Measure GHG-1 and recycle or reuse at least 75 percent of construction waste or demolition materials.	Yes, with Mitigation Measure GHG-1
Adaptation				
AD-1	Prepare for the Effects of Climate Change on Agriculture	No	County-initiative to increased community resilience in agriculture and is not applicable to construction of the Proposed Project because the Proposed Project is a flood infrastructure project and does not include agricultural activities.	NA
AD-2	Prepare for the Effects of Climate Change on Water Resources	No	County-initiative to increased community resilience on water resources and is not applicable to construction of the Proposed Project. Once operational, the Proposed Project would help control flooding, which may become more frequent and intense with future climate change.	NA
AD-3	Respond to the Potential Threat of Sea Level Rise	No	County-initiative to increased community resilience and is not applicable to the Proposed Project because the Proposed Project is not located near the ocean and would not experience the threat of sea level rise.	NA
AD-4	Protect the Public from Increased Health Risk	No	County-initiative to update and revise emergency preparedness plans and is not applicable to the Proposed Project because it does not involve revisions to emergency preparedness plans.	NA
AD-5	Develop Governance Strategies to Ensure that Yolo County Remains Resilient to Climate Change	No	County-initiative to increased community resilience and is not applicable to construction of the Proposed Project because the Proposed Project is a flood infrastructure project.	NA

Mitigation Measure GHG-1: Implement measures to reduce GHG emissions from construction

The City of Woodland will reduce GHG emissions generated during short-term construction by implementing the following measures. The measures apply to construction activities in both the City and Yolo County.

- Prior to commencing any construction activities, the City will develop a Transportation Demand Management (TDM) Plan to reduce the number of construction worker trips. The TDM plan will incorporate TDM strategies to be implemented during construction, including the following.
  - Implementation of a ride-sharing program to encourage carpooling among the workers.
  - Adjustment of work schedules (e.g., arrive before 7 a.m. or after 9 a.m.; leave before 4 p.m. or after 6 p.m.) so that workers do not access the site during peak hours.
  - Provision of offsite parking locations for workers outside the City with shuttle services to bring them on site.
  - Provision of subsidized transit passes for construction workers.
- The City will require contractors, as a condition of contracts, to minimize idling time either by shutting equipment off when not in use or reducing the time of idling to 5 minutes [California Code of Regulations, Title 13, sections 2449(d)(3) and 2485]. Contractors must provide clear signage that posts this requirement for workers at the entrances to the site.
- The City will require contractors, as a condition of contracts, to use alternatively fueled (e.g., biodiesel, electric, renewable diesel) construction vehicles/equipment in at least 15 percent of their fleets.
- The City will require contractors, as a condition of contracts, to recycle or reuse at least 75 percent of construction waste or demolition materials.

Mitigation Measure GHG-2: Implement measures to reduce GHG emissions from operations and maintenance activities

The City of Woodland shall reduce GHG emissions generated during long-term operations and maintenance (O&M) by implementing the following measures.

- Require electric battery powered landscaping equipment (e.g., trimmers) for vegetation removal.
- Require electric or hybrid-electric vehicles (passenger vehicles and trucks) for all required levee inspection and maintenance trips.

Impact GHG-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases (less than significant with mitigation)

SB 32 is the state's plan for reducing GHG emissions. At the local level, the City of Woodland CAP and the Yolo County CAP are the City's and County's plans for reducing GHG emissions. The Proposed Project's consistency with SB 32 (including the 2017 Scoping Plan) and the City's and County's CAPs have been assessed below to determine the significance of this impact. In addition, the Proposed Project's consistency with EO B-55-18/S-3-05 has also been reviewed (below).

Senate Bill 32

SB 32 codifies the state's GHG emissions reduction target for 2030. CARB adopted the 2017 Scoping Plan in November 2017 as a framework for achieving the 2030 GHG emissions target.

The 2017 Scoping Plan carries forward GHG emissions reduction measures from the 2014 first update to the AB 32 Scoping Plan and develops new measures to help meet the state's 2030 target across all sectors of the California economy, including transportation, energy, and industry. Some reductions will be achieved by changes pertaining to vehicle emissions and mileage standards, and others from changes pertaining to sources of electricity and increased energy efficiency at existing facilities. The remainder will need to come from state and local plans, policies, or regulations to lower carbon emissions relative to business as usual conditions. Specifically, local governments play a vital role in reducing GHG emissions. Currently, 60 percent of cities and more than 70 percent of counties have completed a GHG inventory. In addition, 42 percent of local governments have completed a climate, energy, or sustainability plan that addresses GHG emissions (California Air Resource Board 2017b).

The consistency of the Proposed Project with the policies in the 2017 Scoping Plan for achieving the 2030 GHG target is analyzed in Table 3.8-6. Although the measures included in the updated scoping plan are necessarily broad, the Proposed Project would be generally consistent with the goals and desired outcomes of the updated scoping plan and, therefore, would not conflict with SB 32.

Table 3.8-6. Consistency of the Proposed Project with 2017 Scoping Plan Policies[a]

Policy	Primary Objective	Consistency Analysis
SB 350	Reduce GHG emissions in the electricity sector by implementing the 50 percent RPS, doubling energy savings, and taking other actions as appropriate to achieve the GHG emissions reductions planning targets in the Integrated Resource Plan process.	This policy is a state program that requires no action at the local or project level.
Low-Carbon Fuel Standard	Transition to cleaner/less-polluting fuels that have a lower carbon footprint.	This policy is a state program that requires no action at the local or project level. Nonetheless, the City will alternatively fueled vehicles/equipment in at least 15 percent of the construction fleet. The City will also use battery electric landscaping equipment for routine vegetation maintenance and electric or hybrid electric vehicles for levee inspections (see Mitigation Measure GHG-2).
Mobile-Source Strategy (Cleaner Technology and Fuels [CTF] Scenario)	Reduce GHGs and other pollutants from the transportation sector by transitioning to zero-emission and low-emission vehicles, operating cleaner transit systems, and reducing vehicle miles traveled.	This policy is a state program that requires no action at the local or project level. Nonetheless, the City will require develop a TDM Plan to reduce construction worker trips (see Mitigation Measure GHG-1). O&M work will be completed by City employees, who will be eligible to for all City programs and benefits relating to commute reduction. The project will also implement Mitigation Measure GHG-2 to directly reduce GHG emissions from O&M vehicles.

Policy	Primary Objective	Consistency Analysis
SB 1383	Approve and implement short-lived climate pollutant strategy to reduce highly potent GHGs.	The Proposed Project does not include any new or expanded sources of high GWP GHGs.
California Sustainable Freight Action Plan	Improve freight efficiency, transition to zero-emission technologies, and increase competitiveness of California's freight system.	The Proposed Project does not include a freight component.
Post-2020 Cap-and-Trade Program	Reduce GHGs across largest GHG emissions sources.	The Proposed Project does not propose any major sources of GHG emissions (i.e., sources with annual emissions greater than 25,000 MT of CO_2e).

[a] The scoping plan policies included in this table are those representing the state strategy for meeting the 2030 GHG target of SB 32.

City of Woodland and Yolo County Climate Action Plans

As discussed under Impact GHG-1, with implementation of Mitigation Measures GHG-1 and GHG-2, the Proposed Project would not conflict with the City's or County's ability to achieve the GHG emissions reductions outlined in their CAPs.

Executive Order B-55-18/S-3-05

Achieving EO B-55-18/S-3-05 targets for the 2045/2050 timeframe will require even more aggressive changes in all sectors of the economy and participation at all levels of government to reduce GHG emissions even further. Although many GHG emissions reduction measures outlined in the 2017 Scoping Plan and the City's and County's CAPs will most likely continue to be implemented and enhanced beyond 2030, no plan for meeting the 2045/2050 GHG emissions reduction goal described in EO B-55-18/S-3-05 has been adopted.

The Association of Environmental Professionals' (AEP's) Climate Change Committee recommended in a 2016 white paper that CEQA analyses for projects with post-2020 development, such as the Proposed Project, "not only consider consistency with the 2020/AB 32-based framework but also analyze the consequences of post-2020 GHG emissions in terms of their impacts on the reduction trajectory from 2020 toward 2050." AEP further recommended that "the significance determination…should be based on consistency with 'substantial progress' along a post-2020 trajectory." The 2016 AEP white paper is advisory only and not considered binding guidance or an adopted set of CEQA thresholds. However, the CEQA Guidelines do authorize a lead agency to consider the thresholds of significance recommended by experts, such as members of the AEP Climate Change Committee, which consists of leaders of climate action planning practices from consulting firms and agencies that have led many of the local GHG emissions reduction planning efforts across California.

Mitigation Measure GHG-1 includes several measures to reduce construction-related GHG emissions. O&M emissions are expected to be minor and further reduced well into the post-2030 timeframe with implementation of Mitigation Measure GHG-2. The Proposed Project would be consistent with various strategies in the 2017 Scoping Plan and other related CARB and City and County programs to reduce GHG emissions over the long term. Project mitigation measures, along with state measures, would reduce emissions over the life of the Proposed Project. Thus, emissions would decline through the life of the project, and GHG emissions would trend downward, consistent with the need for the deeper reductions called for in EO B-55-18/S-3-05. Accordingly, the project's emissions levels would be consistent with the goals in EO B-5-18/S-3-05.

Mitigation Measure GHG-1: Implement measures to reduce GHG emissions from construction

Mitigation Measure GHG-2: Implement measures to reduce GHG emissions from operations and maintenance activities

See Impact GHG-1 for the full text of these mitigation measures.

3.9 Noise

This section describes the regulatory and environmental setting for noise in the project area, analyzes effects related to noise that would result from implementation of the Proposed Project. The noise study area includes areas within a half-mile radius of the project footprint.

3.9.1 Fundamentals of Noise and Vibration

3.9.1.1 Noise

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise can be defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level is the most common descriptor used to characterize the loudness of an ambient sound. The decibel (dB) scale is used to quantify sound intensity. Because sound pressure can vary enormously within the range of human hearing, the logarithmic decibel scale is used to keep sound intensity numbers at a convenient and manageable level.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1-dB changes in sound levels, when exposed to steady, single-frequency (pure-tone) signals in the mid-frequency (1,000 Hertz [Hz] to 8,000 Hz) range. It is widely accepted, however, that people are able to begin to detect sound level changes of 3 dB for typical noisy environments. Further, a 10-dB increase is generally perceived as a doubling of loudness. Therefore, doubling sound energy (e.g., doubling the volume of traffic on a highway), which would result in a 3 dB increase in noise, is generally perceived as a detectable, but not substantial, increase in sound level.

The human ear is not equally sensitive to all frequencies in the entire spectrum, so noise measurements are weighted more heavily for frequencies to which humans are sensitive in a process called “A-weighting.” Because humans are less sensitive to low-frequency sound than to high-frequency sound, A-weighted decibel (dBA) levels deemphasize low-frequency sound energy to better represent how humans hear. Table 3.9-1 summarizes typical A-weighted sound levels.

Table 3.9-1. Typical A-Weighted Sound Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	—110—	Rock band
Jet flyover at 1,000 feet		
	—100—	
Gas lawnmower at 3 feet		
	—90—	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	—80—	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower, 100 feet	—70—	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	—60—	
		Large business office
Quiet urban daytime	—50—	Dishwasher in next room
Quiet urban nighttime	—40—	Theater, large conference room (background)
Quiet suburban nighttime		
	—30—	Library
Quiet rural nighttime		Bedroom at night, concert hall (background)
	—20—	
		Broadcast/recording studio
	—10—	
	—0—	

Source: California Department of Transportation 2013a.
dBA = A-weighted decibel; mph = miles per hour.

Different types of measurements are used to characterize the time-varying nature of sound. These measurements include the equivalent sound level (L_{eq}), the minimum and maximum sound levels (L_{min} and L_{max}), percentile-exceeded sound levels (L_{xx}), the day-night sound level (L_{dn}), and the community noise equivalent level (CNEL). Below are brief definitions of these measurements and other terminology used in this section.

- **Sound**. A vibratory disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.
- **Noise**. Sound that is loud, unpleasant, unexpected, or otherwise undesirable.
- **Ambient noise**. The composite of noise from all sources near and far in a given environment exclusive of particular noise sources to be measured.
- **Decibel (dB)**. A unitless measure of sound. A sound level measurement in decibels describes the logarithmic ratio of a measured sound pressure level to a reference sound pressure level of 20 micropascals.
- **A-Weighted Decibel (dBA)**. An overall frequency-weighted sound level that approximates the frequency response of the human ear.

- **Maximum and Minimum Sound Levels (L_{max} and L_{min})**. The maximum or minimum sound level measured during a specified interval.
- **Equivalent Sound Level (L_{eq})**. L_{eq} represents an average of the sound energy occurring over a specified period. In effect, L_{eq} is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The duration of the measurement is commonly indicated in the subscript; for example, a 1-hour L_{eq} sound level would be indicated as dBA L_{eq}(1h).
- **Exceedance sound level (L_{xx}).** The sound level exceeded XX percent of the time during a sound level measurement period. For example, L_{90} is the sound level exceeded 90 percent of the time, and L_{10} is the sound level exceeded 10 percent of the time. L_{90} is typically considered to represent the ambient noise level.
- **Day-night level (L_{dn}).** The energy average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.
- **Community noise equivalent level (CNEL).** The energy average of the A-weighted sound levels occurring during a 24-hour period with 5 dB added to the A-weighted sound levels occurring during the period from 7:00 p.m. to 10:00 p.m. and 10 dB added to the A-weighted sound levels occurring during the period from 10:00 p.m. to 7:00 a.m.

L_{dn} and CNEL values rarely differ by more than 1 dB. As a matter of practice, L_{dn} and CNEL values are considered to be equivalent. In general, human sound perception is such that a change in sound level of 3 dB is just noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving sound level.

For a point source, such as a stationary compressor, sound attenuates based on geometry at rate of 6 dB per doubling of distance. For a line source, such as free-flowing traffic on a freeway, sound attenuates at a rate of 3 dB per doubling of distance. Atmospheric conditions including wind, temperature gradients, and humidity can change how sound propagates over distance and can affect the level of sound received at a given location. The degree to which the ground surface absorbs acoustical energy also affects sound propagation. Sound that travels over an acoustically absorptive surface such as grass attenuates at a greater rate than sound that travels over a hard surface such as pavement. The increased attenuation is typically in the range of 1 to 2 dB per doubling of distance. Barriers, such as buildings and topography that block the line of site between a source and receiver, also increase the attenuation of sound over distance.

Auditory and non-auditory effects can result from excessive or chronic exposure to elevated noise levels. Auditory effects of noise on people can include temporary or permanent hearing loss. Non-auditory effects of exposure to elevated noise levels include sleep disturbance, speech interference, and psychological effects such as annoyance. Land use compatibility standards for noise typically are based on research related to these non-auditory effects.

3.9.1.2 Vibration

In contrast to airborne sound, groundborne vibration is not a phenomenon that most people experience every day. Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. The background vibration velocity level in residential areas is usually much lower than the threshold of human perception. Most perceptible indoor vibration is caused by sources within buildings, such as mechanical equipment while in operation, people moving, or doors slamming. Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. Dynamic construction equipment, such as pile drivers, can create vibrations that radiate along the surface and downward into the earth. These surface waves can be felt as groundborne vibration. Vibration can result in effects that range from annoyance to structural damage. Variations in geology and distance result in different vibration levels with different frequencies and displacements.

Groundborne vibration can be expressed in terms of root-mean-square (RMS) vibration velocity to evaluate human response to vibration levels. RMS is defined as the average of the squared amplitude of the vibration signal. The vibration amplitude is expressed in terms of vibration decibels (VdB), which use a reference level of 1 micro-inch per second. Vibration can also measured by peak particle velocity (PPV), defined as the maximum instantaneous peak of the vibration signal in inches per second.

Table 3.9-2 summarizes typical vibration levels generated by construction equipment at a reference distance of 25 feet and other distances. The California Department of Transportation (Caltrans) has developed guidelines to assess damage and annoyance potential from the transient and continuous vibration that is usually associated with construction activity. Transient sources create a single isolated vibration event, such as blasting or drop balls. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

Table 3.9-2. Vibration Source Levels for Construction Equipment

Equipment	PPV at 25 Feet	PPV at 50 Feet	PPV at 75 Feet	PPV at 100 Feet
Impact Pile Driver	1.518	0.054	0.2920	0.190
Auger drill	0.089	0.032	0.017	0.011
Hoe ram	0.089	0.032	0.017	0.011
Large bulldozer	0.089	0.032	0.017	0.011
Loaded trucks	0.076	0.027	0.015	0.010
Jackhammer	0.035	0.012	0.007	0.004
Small bulldozer	0.003	0.001	0.001	< 0.001

Source: Federal Transit Administration 2018.
PPV = peak particle velocity.

3.9.2 Existing Conditions

3.9.2.1 Regulatory Setting

This section summarizes key federal, state, and local or regional regulations, laws, and policies relevant to noise in the project area.

Federal

Noise Control Act of 1972

The Noise Control Act of 1972 (Public Law 92 574) established a requirement for all federal agencies to administer their programs in a manner that promotes an environment that is free of noise that jeopardizes public health or welfare. The U.S. Environmental Protection Agency (USEPA) was given the following responsibilities.

- Providing information to the public regarding the identifiable effects of noise on public health and welfare.
- Publishing information on the levels of environmental noise to protect the public health and welfare with an adequate margin of safety.
- Coordinating federal research and activities related to noise control.
- Establishing federal noise emission standards for selected products distributed in interstate commerce.

U.S. Environmental Protection Agency Standards for Environmental Noise

In 1974, USEPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, a comprehensive document that identifies noise levels consistent with the protection of public health and welfare against hearing loss, annoyance, and activity interference.

In response to the requirements of the Noise Control Act, USEPA identified indoor and outdoor noise limits to protect public health and welfare. Outdoor L_{dn} limits of 55 dB and indoor L_{dn} limits of 45 dB were identified as desirable for protecting against speech interference and sleep disturbance in residential areas and at educational and health care facilities. The sound-level criterion for protecting against hearing damage in commercial and industrial areas is identified as the 24-hour L_{eq} value of 70 dB (both outdoors and indoors). Based on attitudinal surveys, USEPA determined that a 5 dB increase in L_{dn} or L_{eq} is the minimum required for a change in community reaction (U.S. Environmental Protection Agency 1974).

The Noise Control Act also directed federal agencies to comply with applicable federal, state, interstate, and local noise control regulations. Although USEPA was given a major role in disseminating information to the public and coordinating with federal agencies, each federal agency retained authority to adopt noise regulations pertaining to agency programs. USEPA can, however, require federal agencies to justify their noise regulations in terms of Noise Control Act policy requirements.

Key federal agencies that have adopted noise regulations and standards are listed below.

- Housing and Urban Development: Noise standards for federally funded housing projects.
- Federal Aviation Administration: Noise standards for aircraft.
- Federal Highway Administration (FHWA): Noise standards for federally funded highway projects.
- Federal Transit Administration (FTA): Noise standards for federally funded transit projects.
- Federal Railroad Administration: Noise standards for federally funded rail projects.

Federal Transit Administration Standards for Construction Noise

FTA has developed methods for evaluating construction noise levels, which are discussed in the *FTA Manual* (Federal Transit Administration 2018). The manual does not contain standardized criteria for assessing construction noise impacts but provides guidelines for suggested noise limits for residential uses exposed to construction noise to describe levels that may result in a negative community reaction. These guidelines are summarized in Table 3.9-3.

Table 3.9-3. Federal Transit Administration Construction Noise Impact Guidelines

Land Use	8-hour L_{eq} (dBA), Day	8-hour L_{eq} (dBA), Night
Residential	80	70
Commercial	85	85
Industrial	90	90

Source: Federal Transit Administration 2018.
L_{eq} = equivalent sound level; dBA = A-weighted decibel.

Thresholds for construction noise may be set at the local level according to expected hours of equipment operation and the noise limits specified in the noise ordinances of the applicable jurisdictions.

State

California Noise Control Act

The California Noise Control Act was enacted in 1973. In preparing its general plan noise element, a city or county must identify local noise sources and analyze and quantify to the extent practicable current and projected noise levels from various sources, including highways and freeways; passenger and freight railroad operations; ground rapid transit systems; commercial, general, and military aviation and airport operations; and other stationary ground noise sources.

The *State of California General Plan Guidelines* (Governor's Office of Planning and Research 2003) provides noise compatibility guidelines for land use planning according to the existing community noise level; however, these guidelines offer no information regarding construction noise. The state has also published its Model Community Noise Ordinance (California Office of Noise Control 1977), which provides guidance to cities and counties on how to develop a community noise ordinance.

California Department of Transportation Vibration Standards

Caltrans provides guidelines regarding vibration associated with construction and operation of transportation infrastructure. Table 3.9-4 provides the Caltrans vibration guidelines for potential damage to different types of structures.

Ground-borne vibration and noise can also disturb people. Numerous studies have been conducted to characterize the human response to vibration. In general, people are more sensitive to vibration during nighttime hours when sleeping than during daytime waking hours. Table 3.9-5 provides the Caltrans guidelines regarding vibration annoyance potential (expressed here as peak particle velocity [PPV]).

Table 3.9-4. Caltrans Vibration Guidelines for Potential Damage to Structures

	Maximum Peak Particle Velocity (PPV, in/sec)	
Structure Type and Condition	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

Source: California Department of Transportation 2013b:Table 19.

Note: Transient sources create a single, isolated vibration event (e.g., blasting or the use of drop balls). Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

PPV = peak particle velocity.

Table 3.9-5. Caltrans Guidelines for Vibration Annoyance Potential

	Maximum PPV (in/sec)	
Human Response	Transient Sources	Continuous/Frequent Intermittent Sources
Barely perceptible	0.04	0.01
Distinctly perceptible	0.25	0.04
Strongly perceptible	0.9	0.10
Severe	2.0	0.4

Source: California Department of Transportation, *Transportation and Construction Vibration Guidance Manual* 2013b:Table 20.

Note: Transient sources create a single, isolated vibration event (e.g., blasting or drop balls). Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

PPV = peak particle velocity.

Local

Yolo County

Yolo County Code of Ordinances

At present, Yolo County does not have a noise ordinance (which sets specific noise levels for different zoning districts or for different land uses in the unincorporated area). Instead, the County relies on the State of California Department of Health Services' recommended Community Noise Exposure standards, which are set forth in the state's *General Plan Guidelines* (2003). These standards are included in the Yolo County *2030 Countywide General Plan* and used to provide guidance for new development projects. The recommended standards provide acceptable ranges of decibel levels. The noise levels are in the context of CNEL measurements, which reflect an averaged noise level over a 24-hour or annual period.

Yolo County General Plan

The Yolo County *2030 Countywide General Plan* includes a policy to "ensure that existing and planned land uses are compatible with the current and projected noise environment." The policy acknowledges that urban development generally experiences greater ambient (background) noise than rural areas, and that increased density generally results in even greater ambient noise levels.

The General Plan establishes Exterior Noise Standards, or Noise Compatibility Guidelines, for development in the county. These guidelines are intended to apply to the outdoor use areas of new development and include different criteria for the variety of land uses that are present in the county (e.g., single-family residential, multi-family residential, schools, etc.). For development of residential land use, an ambient noise level of up to 60 dBA L_{dn} is considered "Normally Acceptable" for single-family or duplex-style residential land uses, and is generally compatible with surrounding uses, based on the assumption of conventional construction materials being used. Noise levels of up to 70 dBA L_{dn} are considered "Conditionally Acceptable" for single-family homes, where new development should only be undertaken after a detailed analysis of the noise reduction requirements is made, and needed noise insulation features are included in the design. In addition to these compatibility guidelines, the General Plan also references state regulations restricting "interior noise levels attributable to exterior sources …[to]… 45 dBA [L_{dn} or CNEL] in any habitable room."

City of Woodland

City of Woodland Municipal Code

The City Municipal Code does not specify numerical noise limits but indicates the following noise policy in Section 9.28.090:

> It is unlawful for any person to make, continue or cause to be made or continued, any loud, unnecessary or unusual noise or any noise which either annoys, disturbs, injures or endangers the comfort, repose, health, peace or safety of others, within the limits of the City.

The Code further states that construction, excavation, demolition or repairs other than between the hours of 7:00 a.m. and 6:00 p.m. Monday to Saturday, and 9:00 a.m. to 6:00 p.m. on Sunday would be considered a violation of the section, except in case of emergency or urgent necessity and for work done in the interest of public health and safety. In such cases, a permit may be granted by the City for a period not to exceed 3 days. The operation of pile drivers, impact hammers and tools such as power saws, power planers or other powered tool or appliances between the hours of 10:00 p.m. and 7:00 a.m. would similarly be a violation of the City Municipal Code.

City of Woodland General Plan

The *Safety Element* of the City of Woodland *General Plan 2035* specifies guidelines for noise compatibility of land uses in the city. For development of residential land use, an ambient noise level of up to 70 dBA L_{dn} is considered "Normally Acceptable," and generally compatible with surrounding use, and conventional construction techniques will typically suffice. An ambient level of up to 75 dBA L_{dn} is considered "Normally Acceptable" for recreational sports, including water recreation.

Where measured noise levels are within "Conditionally Acceptable" or "Normally Unacceptable" values, special acoustic treatments and noise insulation features may be required in order for approval of the development. Where measured noise levels are within the "Clearly Unacceptable" range, the development project should generally not be undertaken.

Noise level performance standards for new projects are shown in Table 3.9-6. The standards are intended to limit the noise emanating from any single land use or noise source, exclusive of transportation sources.

Table 3.9-6. Noise Level Performance Standards for New Non-Transportation Sources

	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly Equivalent Sound Level (L_{eq}), dBA	60	45
Maximum Sound Level (L_{max}), dBA	75	65

Source: Yolo County 2009.
dBA = A-weighted decibel.

The general plan contains a policy specifically related to noise from construction.

Policy 8.G.11 Construction Noise. Consider construction noise to be an acceptable impact that is an expected byproduct of planned growth, so long as the land use is consistent with the General Plan, and noise levels are consistent with the General Plan and Construction Noise Ordinance.

3.9.2.2 Environmental Setting

Noise Sources in the Project Area

The Proposed Project is located along the northern city limit of Woodland and extends north of the City into unincorporated Yolo County. Existing noise sources in the project area include traffic (from Interstate [I-] 5, state highways, county roads, and local roads), locomotive horns at railroad grade crossings, rail car movements, and aircraft overflights from Sacramento International Airport, Yolo County Airport, and Watts-Woodland Airport. Several commercial and industrial facilities are located in areas surrounding the Proposed Project. The Proposed Project also would extend through agricultural areas, where farming equipment would generate noise. The areas immediately surrounding the project footprint would be characteristic of a suburban community, with ambient noise levels typically within a range of 50 to 60 dBA (Cowan 1994).

Surrounding Noise-Sensitive Land Uses

Sensitive land uses are generally defined as locations where people reside or where the presence of noise could adversely affect the use of the land. Sensitive land uses that would potentially be affected by noise from the Proposed Project include single-family residences and lodging along the northern city limit of Woodland. The Velocity Island water park is another sensitive use located along the northern city limit, directly adjacent to the proposed levee.

3.9.3 Environmental Impacts

This section describes the environmental impacts associated with noise that would result from implementation of the Proposed Project. It describes the methods used to determine the effects of the Proposed Project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts are provided.

3.9.3.1 Methods for Analysis

Construction Noise

The assessment of potential construction noise levels was based on methodology developed by the FTA (2018) and construction noise criteria from applicable local guidance (such as local general plan documents or noise ordinances). Noise levels produced by commonly used construction equipment are shown in Table 3.9-7. Individual types of construction equipment are expected to generate maximum noise levels ranging from 76 to 101 dBA at a distance of 50 feet. The construction noise level at a given receiver location depends on the type of construction activity and the distance and shielding between the activity and noise-sensitive receivers.

Table 3.9-7. Commonly Used Construction Equipment Noise Emission Levels

Equipment	Typical Noise Level (dBA) 50 Feet from Source
Pile-driver (Impact)	101
Pile-driver (Sonic)	96
Auger Drill Rig (for drilled piles)	85
Heavy Truck	84
Excavator	85
Bulldozer	85
Pump	81
Generator	81
Mixer	80
Grader	85
Compactor	82
Impact Hammer (Hoe Ram)	90

Source: Federal Transit Administration 2018.
dBA = A-weighted decibel.

Construction equipment used would vary by component or construction phase of the Proposed Project and would involve the use of impact pile drivers (or possibly vibratory pile drivers or drills), excavators, bulldozers, heavy trucks, pumps, generators, graders, compactors, impact hammers, and other heavy equipment. To provide a conservative assessment, this construction noise analysis assumes that piles would be driven using impact methods. However, other methods may be used, such as vibratory or drilling methods, which would result in lower levels of noise levels relative to impact pile-driving. The source levels used to calculate noise exposure are based on the L_{max} of equipment emission levels developed by FTA. Usage factors for construction noise are used in the analysis to develop reasonable worst-case L_{eq} noise exposure values. The L_{eq} value accounts for the energy-average of noise over a specified interval (usually 1 hour), and usage factors represent the amount of time a type of equipment is used during a typical interval.

Potential noise levels resulting from construction of the Proposed Project were evaluated by combining the noise levels of the three loudest pieces of equipment that would likely operate at the same time (for example, an excavator, bulldozer and truck being operated simultaneously during the site preparation phase), and applying the appropriate usage factor (percent of time equipment is in operation) to each piece of equipment. Sound levels from construction activities are calculated as a function of distance from the source(s), based on point-source attenuation over hard (i.e., acoustically reflective) ground, noting that 6 dB of reduction per doubling of distance can be assumed over hard ground.

Construction Haul Truck Noise

Construction haul truck noise is assessed qualitatively based on the likelihood of a noticeable increase in traffic noise at sensitive land uses along Proposed Project haul routes.

Operational Noise

Noise from Proposed Project operations and maintenance, which would involve infrequent site visits to the levee and intermittent landscaping or repair activities, is analyzed qualitatively based on information from the project engineering team.

Construction Vibration

With regard to potential vibration impacts during construction, such effects were evaluated using the construction vibration modeling methods recommended by the U.S. Department of Transportation, along with construction equipment data provided by the project engineering team. Reasonable worst-case construction vibration levels are provided and compared to the *Caltrans Vibration Guidelines for Damage and Annoyance* (refer to Tables 3.9-4 and 3.9-5).

To provide a conservative assessment, this construction vibration analysis assumes that piles would be driven using impact methods. However, other methods may be used, such as vibratory or drilling methods, which would result in lower levels of noise levels relative to impact pile-driving. However, pile driving would only be used for construction of roadway and railroad closure structures, so it would only occur in a few distinct areas of the project footprint.

Vibration source levels for pile drivers are shown in Table 3.9-8.

Table 3.9-8. Vibration Source Levels for Pile Drivers

Equipment		PPV at 25 Feet (inches/second)	Approximate Vibration Level (VdB)
Pile Driver (impact)	Upper range	1.518	112
	Typical	0.644	104
Pile Driver (sonic)	Upper range	0.734	105
	Typical	0.170	93

Source: Federal Transit Administration 2018.
PPV = peak particle velocity; VdB = root mean square velocity in decibels re 1 micro-inch/second.

3.9.3.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the Proposed Project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Generation of substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- Generation of excessive groundborne vibration or groundborne noise levels.

- Placement of project-related activities in the vicinity of a private airstrip or an airport land use plan, or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, resulting in exposure of people residing or working in the project area to excessive noise levels.

The City of Woodland Municipal Code states that construction noise outside of the daytime hours of 7:00 a.m. to 6:00 p.m. would be considered a violation of the code, but it does not specifically regulate the amount of noise that can be generated from construction during these daytime hours. Similarly, Yolo County does not include specific daytime noise thresholds for construction noise. Because the City Municipal Code also does not specify a sound level limit for temporary construction outside of these hours, this assessment evaluates potential temporary noise impacts from construction using the City of Woodland noise level performance standards for non-transportation sources. Potential noise impacts at noise-sensitive uses may occur where construction noise exceeds 60 dBA L_{eq} between the hours of 6 p.m. and 10 p.m., or 45 dBA L_{eq} during nighttime hours between 10 p.m. and 7 a.m.

Note that there would be no impacts related to the influence of noise from aircraft or airports for the Proposed Project. The eastern terminus of the proposed levee is approximately 4 miles away from Sacramento International Airport. The nearest general aviation airports are Woodland-Watts Airport, 3 miles west of the proposed levee, and Yolo County Airport, 5 miles south of Woodland. The Proposed Project would not add sensitive uses that would potentially be affected by aircraft noise. Therefore, there would be no impact, and the topic of impacts related to aircraft noise at public airports or private airstrips will not be discussed further.

3.9.3.3 Impacts and Mitigation Measures

Impact NOI-1: Generation of substantial temporary or permanent increase in ambient noise levels in the project vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies (less than significant)

Construction Noise

To characterize the overall noise level of the worst-case noise condition during a given phase of construction, the three loudest pieces of equipment were assumed to operate simultaneously at a perimeter location, at a receiver distance of 50 feet. Impact pile drivers were assumed to operate up to 25 percent of a given hour, and other equipment, such as excavators and trucks, were assumed to operate up to 50 percent of a given hour. Pumps and generators were assumed to operate up to 100 percent of the time. Sound levels by project phase are shown in Table 3.9-9.

Table 3.9-9. Construction Noise Levels by Activity and Distance to Allowable Sound Levels

Construction Activity	Equipment Used[a]	Combined Source Level at 50 feet (L_{eq}, dBA)[b]	Distance to Exceedance of Daytime Sound Level Limit of 60 dBA L_{eq} (feet)[c]	Distance to Exceedance of Nighttime Sound Level Limit of 45 dBA L_{eq} (feet)[d]
Site Preparation	Excavator, Bulldozer, Heavy Truck	86	1,100	6,000
Cutoff Wall	Pump, Generator, Mixer (Batch Plant)	85	1,000	5,300
Levee and Drainage	Excavator, Grader, Compactor	86	1,000	5,600
Seepage Berm	Excavator, Grader, Compactor	86	1,000	5,600
Closure Structure	Impact Pile Driver[e] Excavator	98	4,000	3,600[f]
West Levee and Weir	Heavy Truck, Excavator	85	900	4,800
Demolition	Impact Hammer, Excavator, Heavy Truck	89	1,400	7,900

Note: Distance calculation do not include the effects, if any, of local shielding from walls, topography or other barriers which may further reduce sound levels.

L_{eq} = equivalent sound level; dBA = A-weighted decibel.

[a] The two or three loudest pieces of equipment that may operate in one location simultaneously.

[b] Based on usage factors of 25 percent to 100 percent, for types of equipment used.

[c] The maximum distance where the combined equipment level may potentially exceed the City daytime threshold of 60 dBA L_{eq} for non-transportation sources. Daytime is defined as the hours between 7:00 a.m. to 10:00 p.m., however, this standard is not applicable during the hours of 7:00 a.m. to 6:00 p.m. (9:00 a.m. to 6:00 p.m. on Sundays) when noise from construction is not regulated by the city. Therefore, the impact threshold applies to work done between the hours of 6:00 p.m. and 10:00 p.m. (also 7:00 a.m. to 9:00 a.m. on Sundays).

[d] The maximum distance where the combined equipment level may potentially exceed the City nighttime threshold of 45 dBA L_{eq} for non-transportation sources. Nighttime is defined as the hours between 10:00 p.m. to 7:00 a.m. The distances shown in this column assume temporary nighttime permits would be obtained if nighttime work is determined to be necessary.

[e] The analysis assumes a maximum level of 101 dBA for impact drivers.

[f] Under the City code, no pile driving is permitted during nighttime hours. This level assumes operation of one excavator during this phase as a worst-case nighttime sound level condition.

The nearest single-family residences are located along Carter Lane, adjacent to the proposed levee, 50 to 100 feet away. There are also residences along Churchill Downs Avenue, Pedrick Road, Ashley Avenue, County Road 20, and Cherry Lane near the proposed levee, and adjacent to a proposed elevated roadway along County Road 99. The Velocity Island water park is located adjacent to the proposed levee, and the Valley Oaks Inn is located along on State Route (SR) 113 south of the levee.

Construction of the three railway closure structures, which would potentially involve the use of impact pile drivers, would have the potential to generate the most noise of any construction component or phase. Pile driving for the construction of closure structures would take one day for each of the three structures. Two piers would be required per closure structure, with two pile drivers operating per closure structure on a given day. It is possible that the piles would be drilled rather than driven or driven using a vibratory pile driver instead of an impact pile driver, which would result in less noise. However, this analysis assumes that an impact pile driver would be used in order to provide a conservative analysis. During the 3 days of foundation pile installation at proposed railway closure structures, impact pile driving may result in a noticeable increase in ambient noise levels at residential and outdoor use areas nearby. Noise levels may potentially exceed 60 dBA L_{eq} within approximately 4,000 feet of pile driving sites, as shown in Table 3.9-9. Sound levels during pile driving would be the most noticeable at residences along Churchill Downs Avenue and the water park.

The construction phase that would generate the most noise besides the closure structure construction phase and that would generally occur throughout the entire project footprint would be the demolition phase of construction. During this phase, a hoe ram, excavator, and heavy truck may all be used simultaneously and in close proximity to one another. The results in Table 3.9-6 indicate that residences, a hotel, the water park, and associated outdoor activity areas located within 1,400 feet of levee construction areas during the demolition phase could be exposed to construction noise levels in excess of the City daytime threshold of 60 dBA L_{eq}. During other construction phases, this maximum distance may be reduced somewhat. For example, during the levee and drainage construction phase, the 60 dBA L_{eq} threshold would be exceeded at distances of up to 1,000 feet instead of 1,400 feet. However, there is still a potential for the threshold to be exceeded at noise-sensitive land uses since there are residences located within 1,000 feet of these areas.

All construction work is planned to be done during daytime hours of 7:00 a.m. to 6:00 p.m., when noise from construction is not regulated by the City. No nighttime work is expected to be required, and any work done during City-regulated hours (between 6:00 p.m. and 7:00 a.m. Monday to Saturday, or between 6:00 p.m. and 9:00 a.m. Sunday) would be done only on an emergency basis with an approved permit from the City or County, as applicable. The use of heavy equipment would be temporary and short-term relative to a given work area, as construction progresses along the alignments of levee and channel areas throughout the construction window. As such, noise from heavy equipment would affect different areas at different times over the course of project construction, and the duration of excessive noise exposure that an individual receptor would experience would be somewhat limited. In addition, construction would only occur for approximately 7 months per year over a 2-year period. Further, and as stated in Chapter 2, *Project Description*, the typical hours of construction would be limited to daytime hours outlined in the City Municipal Code, during which time no quantitative noise threshold would apply. Use of construction equipment during regulated daytime hours (between 6:00 p.m. and 10:00 p.m.) could potentially exceed the City daytime noise limit of 60 dBA L_{eq}, and nighttime construction could potentially exceed the City nighttime noise limit of 45 dBA L_{eq}, within the distances indicated in Table 3.9-6. However, as stated above, nighttime work is not planned as part of the Proposed Project and would only be done on an emergency basis.

The proposed non-structural measures may include floodproofing activities, such as raising the elevation of buildings. The exact locations of these measures are not yet known. A subsequent environmental review may be required for these individual measures in some cases. However, the use of heavy equipment would be done during times of day not regulated by the City.

Construction is not planned during times of day or night when construction noise is regulated by City of Woodland. As such, construction noise impacts for the Proposed Project would be less than significant. However, best noise control practices are recommended where feasible to minimize construction noise levels in the community.

Best practices to minimize construction noise include the following.

- Limiting heavy equipment use to daytime hours not regulated by the City, between 7:00 a.m. and 6:00 p.m. Monday to Saturday, and 9:00 a.m. to 6:00 p.m. on Sunday.
- Limiting pile driving to times of day that would be least disruptive to residences, hotels, and water recreation.
- Locating stationary equipment (e.g., generators, pumps, cement mixers, idling trucks) as far as possible from noise-sensitive land uses.
- Requiring that all construction equipment powered by gasoline or diesel engines have sound-control devices such as exhaust mufflers that are at least as effective as those originally provided by the manufacturer and that all equipment be operated and maintained to minimize noise generation.
- Using equipment powered by electric motors instead of gasoline or diesel powered engines.
- Preventing excessive noise by shutting down idle vehicles or equipment.
- Using noise-reducing enclosures around noise-generating equipment.
- Using noise-reducing shrouds for impact pile drivers.
- Selecting haul routes that affect the fewest number of people.
- Constructing barriers between noise sources and noise-sensitive land uses or take advantage of existing barrier features (e.g., terrain, structures) to block sound transmission to noise-sensitive land uses. The barriers should be designed to obstruct the line of sight between the noise-sensitive land use and onsite construction equipment.
- Notifying adjacent residents in advance of construction work.

Haul Truck Noise

As stated in Chapter 2, up to 600 haul truck trips per day could be required for transfer of material to and from levee construction sites on a worst-case day. However, the number of daily trucks required would more likely be lower than this number. To provide a worst-case analysis, it is assumed that up to 600 offsite haul truck trips per day could occur. This increase in haul truck traffic on local roads would result in a temporary increase in traffic noise along haul routes to these areas. However, this effect would be short-term and would take place during daytime hours (when people are less sensitive to noise and when ambient noise levels are typically higher). Haul routes would be distributed across state highways and I-5 to travel to and from borrow sites and staging areas. Average daily traffic for haul routes are approximately 5,500 vehicles per day on SR 113, 4,900 vehicles per day on County Road 102, 3,900 vehicles per day on County Road 22, and 38,200 vehicles per day on I-5. Based on the existing volumes on these routes, the added truck trips per day would not be expected to substantially increase traffic noise levels along these corridors.

Noise from haul trucks may be noticeable on local roads that connect to major highways. However, the haul truck deliveries would move along the levee and channel alignments as construction progresses, so noise from haul trucks over the project construction window would affect different areas at different times. As such, while the increase in noise from haul trucks may potentially be noticeable during hauling of building materials, the effect would be short-term, temporary, and only take place during daytime hours. For these reasons, temporary and intermittent (in any given area) increases in noise from project haul trucks would be less than significant.

Traffic Detour on State Route 113 during Construction of Box Culverts

The construction of box culverts would require the closure of SR 113 between Churchill Downs Avenue and County Road 18C for 3 months. Traffic driving south on SR 113 from points north of the City of Woodland would use alternate routes during that time. A detour would be provided to allow motorists to access I-5 via County Road 18/Coil Lane during the period of box culvert construction, which would be removed once reconstruction of SR 113 is complete.

While the detour on County Road 18 is in effect, traffic noise levels will increase temporarily at residences along the detour route. Under existing conditions, an estimated average daily traffic (ADT) volume of 950 vehicles use County Road 18 between SR 113 and I-5, derived from traffic count data developed by Caltrans (2017). During the SR 113 road closure, up to an additional 3,600 vehicles may use the County Road 18 detour to access I-5. This is a conservative estimate that assumes that this segment SR 113 would still be the preferred route by motorists to access I-5, as there are other vehicle routing options available.

Assuming 3,600 vehicles would be added to the current ADT, up to 4,550 vehicles would use the County Road 18 detour during the SR 113 closure. This would result in an increase of up to 7 dBA in traffic noise levels along this corridor, which would not be considered a substantial increase in traffic noise. The noise due to the traffic detour would be temporary and would cease once SR 113 reconstruction is complete. Therefore, this impact is considered to be less than significant.

Operation and Maintenance

Operation and maintenance of the new levee and associated features would be required on a periodic basis.

Maintenance would involve use of landscaping equipment and occasional use of heavy equipment to maintain the shape of levee structures, or to remove sediments within the channel. Although heavy equipment may be required to repair any damage over time, repairs are not expected to be required in the first 10 years and would only take place on an as-needed basis. While these activities would occur intermittently over the lifetime of the levee, they are not expected to be a significant or frequent source of operational noise.

In addition, maintenance activities that could require heavy construction equipment are expected to take place during hours when noise from construction is not regulated by the city. This impact, therefore, would be less than significant. However, best noise control practices described under Impact NOI-1 are recommended where feasible to minimize construction noise levels in the community.

Impact NOI-2: Generation of excessive groundborne vibration or groundborne noise levels (less than significant)

Construction of the Proposed Project would involve the use of construction equipment that could generate ground-borne vibration. Typical vibration levels associated with heavy-duty construction equipment at a reference distance of 25 feet and other distances are shown in Table 3.9-2. The most vibration-intensive type of construction equipment that would be used for the Proposed Project is an impact pile driver. Operation of impact pile drivers would result in high levels of groundborne vibration immediately adjacent to the locations of piles. Structures within 100 feet of pile driving activity could be exposed to vibration levels of 0.19 inch per second PPV or greater. The residences nearest to proposed closure structures where pile driving would take place are approximately 400 feet away from the railway closure structures near SR 113 and 900 feet away from the railway near the I-5 undercrossing. At 400 feet, vibration levels from a single pile driver would be approximately 0.02 inches per second PPV. A vibration level of 0.02 would be below the Caltrans distinctly perceptible level for continuous or frequent intermittent sources outlined in Table 3.9-5. Since pile driving would only occur during daytime hours, and since it would be less than the strongly perceptible level of 0.1 inches per second PPV, vibration impacts from pile driving related to annoyance would be less than significant. This vibration level would similarly be below the vibration damage thresholds outline in Table 3.9-4 for all building types, so vibration effects from pile driving related to damage would also be less than significant.

With regard to other construction components, vibration levels from other types of heavy equipment would generally only be perceptible in the localized area of up to approximately 50 feet from each source. For example, vibration from a large bulldozer at a distance of 50 feet would be approximately 0.03 inches per second PPV, which is below the strongly perceptible level outlined in Table 3.9-5. This vibration level is also below the damage criteria for all building types outlined in Table 3.9-4. Therefore, vibration from project construction is not expected to affect any of the structures nearest to the construction areas, or result in excessive effects related to annoyance. Project-related vibration impact would be less than significant.

3.10 Cultural Resources

This section describes the regulatory and environmental setting for cultural resources. The section considers archaeological resources in the project area, as identified on Figure 2-1 in Chapter 2, *Project Description.* The section also discusses built historic resources within a study area consisting of the project footprint and areas that could experience an increase flood depth. This section analyzes effects on these cultural resources that would result from implementation of the Proposed Project and provides mitigation measures to reduce the effects of any potentially significant impacts.

Information presented in the discussion and used for the subsequent analysis was drawn primarily from the following sources.

- Preliminary field survey of the built historic resources study area.
- Communications with the California Institute for Rural Studies, the Yolo County Historical Museum (Gibson House), the Yolo County Historical Society, and the City of Woodland Historical Preservation Commission.

3.10.1 Existing Conditions

3.10.1.1 Regulatory Setting

This section summarizes key federal, state, and local or regional regulations, laws, and policies relevant to cultural resources in the project area.

Federal

Section 106 of the National Historic Preservation Act

For the purposes of the National Environmental Policy Act (NEPA) and compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966 as amended by 16 U.S. Code 470, the U.S. Army Corps of Engineers (USACE) is the federal lead agency and will be completing both the Section 106 process and the NEPA process.

Federal protection of cultural resources is legislated by (a) NHPA, (b) the Archaeological Resource Protection Act of 1979, and (c) the Advisory Council on Historic Preservation. These laws and the council provide processes for determining the effects on historical properties eligible for listing in the National Register of Historic Places (NRHP).

Section 106 of the NHPA and accompanying regulations (36 Code of Federal Regulations [CFR] Part 800) constitute the main federal regulatory framework guiding cultural resources investigations and require consideration of effects on properties that are listed in, or may be eligible for listing in, the NRHP. The NRHP is the nation's master inventory of known historic properties. It is administered by the National Park Service and includes listings of buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archaeological, and cultural importance that is considered significant at the national, state, or local level.

The formal criteria for determining NRHP eligibility (36 CFR Part 60.4) are as follows:

1. The property is at least 50 years old (although properties less than 50 years of age that are of exceptional importance or are contributors to a district can also be included in the NRHP).
2. It retains integrity of location, design, setting, materials, workmanship, feeling, and association.
3. It possesses at least one of the following characteristics:
   a. It is associated with events that have made a significant contribution to the broad patterns of history (events).
   b. It is associated with the lives of persons significant in the past (persons).
   c. It possesses distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant, distinguishable entity whose components may lack individual distinction (architecture).
   d. It has yielded, or may be likely to yield, information important to prehistory or history (information potential).

Listing in or eligibility for listing in the NRHP does not entail specific protection or assistance for a property, but it does guarantee recognition in planning for federal or federally assisted projects, eligibility for federal tax benefits, and qualification for federal historic preservation assistance. Additionally, project effects on properties listed in or eligible for listing in the NRHP must be evaluated under CEQA.

Two issues of the National Register Bulletin also provide guidance for the evaluation of archaeological site significance. If a heritage resource cannot be placed within a particular theme or time period, and thereby lacks "focus," it is considered ineligible for listing in the NRHP. In further expanding upon the generalized NRHP criteria, evaluation standards for linear features, such as roads, trails, fence lines, railroads, ditches, and flumes, are considered in terms of four related criteria that account for specific elements that define engineering and construction methods of linear features: (1) size and length, (2) presence of distinctive engineering features and associated properties, (3) structural integrity, and (4) setting. The highest probability for NRHP eligibility exists within the intact, longer segments where multiple criteria coincide.

National Register of Historic Places Eligibility Criteria

Cultural resources are eligible for the NRHP if they have integrity and significance as defined in the regulations for the NRHP. Four primary criteria define significance; a property may be significant if it displays one or more of the following characteristics.

A. It is associated with events that have made a significant contribution to the broad pattern of our history.

B. It is associated with the lives of people significant in our past.

C. It embodies the distinct characteristics of a type, period, or method of construction, or that represents the work of a master, or that possesses high artistic values, or it represents a significant and distinguishable entity whose components may lack individual distinction.

D. It has yielded, or is likely to yield, information important in prehistory or history (36 CFR Part 60.4).

Some types of cultural resources are not typically eligible for the NRHP. These resources consist of cemeteries, birthplaces, graves of historical figures, properties owned by religious institutions or used for religious purposes, structures that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years. These property types may be eligible for the NRHP, however, if they are integral parts of eligible districts of resources or meet the criteria considerations described in 36 CFR Part 60.4.

In addition to possessing significance, a property must also have integrity to be eligible for listing in the NRHP. The principle of integrity has seven aspects: location, design, setting, materials, workmanship, feeling, and association (36 CFR Part 60.4). To retain historic integrity, a property needs to possess several, and usually most, of these aspects (U.S. Department of the Interior 1995:44).

State

State Historic Significance Criteria

CEQA requires public agencies to consider the effects of their actions on "historical resources," "unique archaeological resources," and "tribal cultural resources." Pursuant to Public Resources Code Section 21084.1, a "project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment." Section 21083.2 requires agencies to determine whether projects would have effects on unique archaeological resources.

The State CEQA Guidelines define three ways that a cultural resource may qualify as a historical resource for the purposes of CEQA.

1. The resource is listed in or determined eligible for listing in the California Register of Historical Resources (CRHR).
2. The resource is included in a local register of historical resources, as defined in Public Resources Code Section 5020.1(k), or is identified as significant in a historical resource survey meeting the requirements of Public Resources Code Section 5024.1(g), unless the preponderance of evidence demonstrates that it is not historically or culturally significant.
3. The lead agency determines the resource to be significant as supported by substantial evidence in light of the whole record (14 CCR 15064.5[a]).

For a historical resource to be eligible for listing in the CRHR, it must be significant at the local, state, or national level under one or more of the following criteria from 14 CCR 15064.5(a)(3)(A–D).

1. It is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
2. It is associated with the lives of persons important in our past.
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
4. It has yielded, or may be likely to yield, information important in prehistory or history.

Historical resources automatically listed in the CRHR include those historic properties listed in, or formally determined to be eligible for listing in, the NRHP (Public Resources Code Section 5024.1).

In addition, CEQA distinguishes between two classes of archaeological resources: archaeological sites that meet the definition of a historical resource as defined above and unique archaeological resources. An archaeological resource is considered unique if meets one of the following criteria.

- Association with an event or person of recognized significance in California or American history or of recognized scientific importance in prehistory.
- Provides information that is of demonstrable public interest and is useful in addressing scientifically consequential and reasonable research questions.
- Has a special or particular quality such as oldest, best example, largest, or last surviving example of its kind (Public Resources Code Section 21083.2).

Resources that qualify as unique archaeological resources also meet at least one of the CRHR criteria. It is current professional practice, therefore, to address the importance or significance of a cultural resource by determining solely whether it qualifies as a historical resource, without the expressed distinction or determination as to its status as a unique archaeological resource. For the purposes of the Proposed Project, significant cultural resources as defined by CEQA are those resources that meet at least one of the CRHR eligibility criteria.

Notably, a project that causes a substantial adverse change in the significance of a historical resource is a project that may have significant impact under CEQA (14 CCR Section 15064.5[b]). A substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resource would be materially impaired. The significance of a historical resource is materially impaired if the project demolishes or materially alters any qualities that justify the inclusion or eligibility for inclusion of a resource in the CRHR (14 CCR Section 15064.5[b][2][A,C]), or inclusion of the resource in a local register (14 CCR Section 15064.5[b][2][B]).

Inadvertent Discovery of Human Remains

The project area is located on non-federal land in California. Therefore, the City must comply with state laws pertaining to the inadvertent discovery of human remains of Native American origin. The procedures that must be followed if burials of Native American origin are discovered on non-federal land in California are described in Section 3.10.2.3, *Effects and Mitigation Measures*.

Local

The following local policies related to cultural resources may apply to implementation of the Proposed Project.

Yolo County General Plan

Yolo County strives to encourage the enhancement of cultural quality and education in Yolo County through the development of goals, objectives, and policies that the county has established in the *Historic Preservation Element* of the *Yolo County General Plan, Part 1* (adopted July 1983) to preserve county history and historical sites (Yolo County 2009).

City of Woodland General Plan 2035

The *City of Woodland General Plan 2035* contains the following historic preservation goals and policies in its *Land Use, Community Design, and Historic Preservation Element* (City of Woodland 2017:LU2-81, 82).

Goal 2.O: Preservation and Adaptive Reuse. Preserve community character and historic buildings while attracting new infill development and investment in existing neighborhoods.

Policy 2.O.1 Neighborhood Preservation Overlay District. Preserve the Neighborhood Preservation Overlay zoning district to ensure that new development in historic neighborhoods is well-designed and appropriately scaled.

Policy 2.O.2 Adaptive Reuse. Promote adaptive reuse of vacant and/ or underutilized historic buildings through public and private investment.

Policy 2.O.3 Relocation of Historic Buildings. Where feasible and appropriate, encourage the relocation of reusable historic buildings within or into historic neighborhoods as a means of historic preservation. Relocation is only permitted upon execution of an agreement covering reuse provisions and approval of a replacement project (City of Woodland 2017:LU 2-81)

Goal 2.P Historic Programs and Requirements. Preserve, maintain, and celebrate sites and structures that serve as significant, visible reminders of the city's social, architectural and agricultural history through adherence to federal, state and local programs and requirements.

Policy 2.O.1 Neighborhood Preservation Overlay District. Preserve the Neighborhood Preservation Overlay zoning district to ensure that new development in historic neighborhoods is well-designed and appropriately scaled.

Policy 2.O.2 Adaptive Reuse. Promote adaptive reuse of vacant and/ or underutilized historic buildings through public and private investment.

Policy 2.O.3 Relocation of Historic Buildings. Where feasible and appropriate, encourage the relocation of reusable historic buildings within or into historic neighborhoods as a means of historic preservation. Relocation is only permitted upon execution of an agreement covering.

The City maintains a list of "historic architectural resources," which are mapped in the general plan (City of Woodland 2017:LU 2-64).

3.10.1.2 Environmental Setting

This section describes the methods used to establish cultural resources within the project area and built historic resources study area, as well as the larger prehistoric context of the Central Valley, in which the project area is located; the ethnographic context of the people who inhabited the Central Valley and the project area; and the historic context of the project area.

Methods for Assessing Cultural Resources in the Environmental Setting

To identify cultural resources within the project area as identified on Figure 2-1 and built resources within the built historic resources study area, three different records searches and a field survey were conducted. The built historic resources study area refers to the project footprint and any area with a projected flood increase due to Proposed Project of at least 0.2 feet. For this analysis, an increase in flood depth of 0.1 feet is considered negligible and within the margin of error for the modeling results. Consequently, it is not considered an increase herein. The records search and field survey methodologies and results are described below.

Records Search and Field Survey

A records and literature search was conducted by USACE in March 2001 for this project area, and a supplemental records search was conducted by the USACE in September 2019. The results of this search indicated that only three previous archaeological investigations have occurred within the project area, covering less than 5 percent of the total area of the project area. Seven previous built resources surveys have been conducted within the project area. Ten cultural resources were located within 0.25 mile of the project area. No known historic or prehistoric archaeological resources are located within the project area. There are five built environment resources within the project area: P-57-000594, P-57-000970. P-57-000977, P-57-000986, and P-57-001272. These resources are summarized in Table 3.10-1.

Table 3.10-1. Cultural Resources within the Project Area

Primary Number	Trinomial	Description	Built/ Archaeology	Historic/ Prehistoric	Eligibility
P-57-000594	NA	Cache Creek Levees	Built	Historic	Ineligible
P-57-000970	NA	Central Pacific Railroad	Built	Historic	Eligible
P-57-000977	NA	California Northern Railroad	Built	Historic	Ineligible
P-57-000986	NA	Barn	Built	Historic	Ineligible
P-57-001272	NA	Sacramento Northern Railway	Built	Historic	Ineligible

ICF archaeologists were unable to conduct field survey due to denial of access by landowners. Aerial analysis of the project area indicates that the majority of the area consists of both fallow and planted agricultural fields with some residential properties. Areas near perennial sources of water, such as portions of the project area closest to Cache Creek have a high potential for the presence of prehistoric archaeological resources. These portions of the project area contain Pleistocene and Holocene deposits, which have high potential for the presence of prehistoric and protohistoric archaeological resources. These sites may also contain human remains. Landform sensitivity thus provides a proxy indicator of prehistoric site sensitivity in the absence of site-specific studies. Buried sites obscured by overlying soil layers are likely to contain deposits that remain intact despite surface disturbance such as agricultural land use; therefore, these sites are likely to have integrity. These sites may also offer material useful in archaeological research. For these reasons, sites that have not been identified may have both significance and integrity and, therefore, may qualify as both historical resources under CEQA and historic properties under the NHPA. On November 22, 2019, two ICF architectural historians conducted an initial field survey of the built historic resources study area. As part of the field process, buildings and structures 50 years old or older were inspected, photographed, and documented. Roughly 80 percent of the built historic resources study area was accessible for survey. Due to access restrictions, several properties were unable to be recorded. Dense vegetation in the form of trees and shrubs presented further problems because they obstructed any available line of sight.

In total, 34 properties containing buildings or structures at least 50 years of age are in the built historic resources study area. The survey population includes 28 residential or agricultural properties, two industrial properties, the Cache Creek levees and Cache Creek Settling Basin (CCSB) (P-57-000594), and three railroads: the California Pacific Railroad (P-57-000970), the California Northern Railroad (P-57-000977), and the Sacramento Northern Railway (P-57-001272).

Native American Consultation

USACE is conducting all Native American consultation associated with the Proposed Project as part of Section 106 requirements for federal NEPA projects.

In accordance with procedures prescribed in Assembly Bill 52, on July 31, 2019, the City sent notice and maps of the Proposed Project to six tribes on a list provided by the Native American Heritage Commission. The City contacted the Torres Martinez Desert Cahuilla Indians, the Ione Band of Miwok Indians, the Miwok Maidu United Auburn Indian Community, Cortina Band of Indians, Rumsey Indian Rancheria of Wintun, and Yocha Dehe Wintun Nation (YDWN). The United Auburn Indian Community responded on August 16, 2019 that the project area was outside its traditional tribal territory and deferred to YDWN. YDWN responded on August 16, 2019 that the tribe would like to consult on the Proposed Project. No responses from the other tribes have been received to date (February 2020). The City and its consultant corresponded with YDWN and provided GIS files for the Proposed Project. The first formal consultation meeting took place at Woodland City Hall on October 28, 2019 with three representatives of the YDWN cultural resources staff, the City's project manager and engineer, and consultants. Please see Section 3.11, Tribal Cultural Resources, for more information regarding tribal consultation under Assembly Bill 52.

Additional Research and Consultation

To identify important historic people, events, and trends that may have been associated with the project area, an ICF historian conducted archival research using historic maps, aerials, the ICF library, Yolo County biographies, State archives, and online research repositories that revealed information relevant to the development of the subject properties. ICF also sent project notification letters on November 15, 2019 to the California Institute for Rural Studies, the Yolo County Historical Museum (Gibson House), the Yolo County Historical Society, and the City of Woodland Historical Preservation Commission requesting information regarding cultural resources that may be located within the project area. To date, no responses have been received.

Prehistoric Context

Although the Sacramento Valley may have been inhabited by humans as early as 10,000 years ago, the evidence for early human occupation likely is buried by deep alluvial sediments that accumulated rapidly during the late Holocene Epoch. Although rare, archaeological remains of this early period allegedly have been identified in and around the Central Valley. (Johnson 1967:283–284) presents evidence for some use of the Mokelumne River area, under what is now Camanche Reservoir, during the late Pleistocene Epoch. These archaeological materials and similar materials in the region have been termed the *Farmington Complex*. Recent work in the vicinity of Camanche Reservoir, however, calls into question whether Farmington Complex exceeds an age of 10,000 Before Present (B.P.) (Rosenthal et al. 2007:151).

Preliminary results from recent excavations at Sacramento City Hall (Sacramento City Hall overlies the Nisenan village of Sacum'ne, CA-SAC-38) reveal the earliest confirmed habitation of the immediate Sacramento vicinity. Obsidian hydration readings on artifacts may represent use of the site during 3000–8000 B.P. Analysis included three radiocarbon assays, which yielded conventional dates of 5870, 6690, and 6700 B.P. The radiocarbon assays were taken between 9.8 feet and 11.5 feet below ground surface (City of West Sacramento 2014:3.8-1).

Later periods of prehistory are better understood because of their more abundant representation in the archaeological record. Fredrickson (1973) identified three general patterns of cultural manifestations for the period between 4500 and 100 B.P.: the Windmiller, Berkeley, and Augustine Patterns.

The Windmiller Pattern (4500–2800 B.P.) shows evidence of a mixed economy consisting of the generalized hunting of game, fishing, and use of wild plant foods. Settlement strategies during the Windmiller period reflect seasonal occupation of valleys during the winter and of foothills during the summer (Moratto 1984:201, 206).

Cultural changes are manifested in the Berkeley Pattern (3500–2500 B.P.). Technological changes in groundstone from handstones and milling slabs to the mortar and pestle indicate a greater dependence on acorns, and the presence of a wide variety of projectile points and atlatls indicates hunting was still an important activity (Fredrickson 1973).

The Berkeley Pattern was superseded by the Augustine Pattern around 1450 B.P., reflecting a change in subsistence and land use patterns similar to those of the ethnographically known people of the proto-historic era. This pattern exhibits a great elaboration of ceremonial and social organization, including the development of social stratification. Complex exchange systems, further reliance on acorns, and a wide variety of artifacts (flanged tubular smoking pipes, harpoons, clamshell disc beads, and an especially elaborate baked clay industry, which included figurines and pottery vessels called *Cosumnes Brownware*) are associated with the Augustine Pattern. Increased village sedentism, population growth, and an incipient monetary economy are also hallmarks of this pattern (Moratto 1984:211, 213).

Ethnographic Context

The project area is in the apparent historic territory of the Patwin (Johnson 1978:350; Kroeber 1925:Plate 34). "Patwin" is a native word meaning "people" that was used by some speakers of one of the Penutian linguistic family's three Wintuan languages. In the late nineteenth century, ethnographers used the term to distinguish Wintuan speakers in the southern half of the central valley from those speakers in the north. Several politically autonomous tribelets in the southwestern part of the Sacramento River Valley are known to have used the word in reference to their respective individual groups. The approximate maximum extent of Patwin territory in the late eighteenth and early nineteenth centuries was from the town of Princeton in Colusa County south to Suisun Bay, and from the Sacramento River west across the eastern slope of the Coast Ranges (Johnson 1978:350).

Historic maps and accounts of early travelers to the Sacramento Valley testify that tule marshes, open grasslands, and occasional oak groves (Jackson 1851; Ord 1843; Wyld 1849) characterized the project vicinity. The area was generally wet in the winter and often subject to flooding; the weather was exceedingly dry in summer. Much of the floodplain presumably was sparsely inhabited, and Native Americans typically situated their larger, permanent settlements on high ground along the Sacramento and American Rivers (Bennyhoff 1977:5-7, 147-149; Kroeber 1925:351, 1932; Wilson and Towne 1978:388).

The Patwin economy was principally based on the utilization of natural resources from the riverine corridor, the wetlands, and the grasslands of the lower Sacramento River Valley, and from the open woodlands on the eastern foothills of the Coast Ranges (Johnson 1978:355; Kroeber 1925, 1932). The family was the basic subsistence unit within the tribelet that engaged in the exploitation of this resource mosaic (Johnson 1978:354). Tribelets with territory primarily on the floor of the Sacramento River Valley were more reliant on riverine and wetland resources. Fish, shellfish, and waterfowl were important sources of protein in the diet of these groups (Johnson 1978:355; Kroeber 1932:277–280). Salmon, sturgeon, perch, chub, sucker, pike, trout, and steelhead were variously caught with nets, weirs, lines and fishhooks, and harpoons. Mussels were taken from the gravels along the Sacramento River stream channel. Geese, ducks, and mudhens were taken with the use of decoys and various types of nets. Tribelets with territory on the western margin of the Sacramento River Valley were less reliant on riverine and wetland animal resources and more reliant on terrestrial game (Kroeber 1932:294–295). Deer, tule elk, antelope, bear, mountain lion, fox, and wolf were variously driven, caught with nets, or shot.

Historic Context

The project area is located in Yolo County, one of the original 27 counties created when California became a state in 1850. Woodland serves as the county seat (Kyle et al. 2002:566). The results of the survey and evaluation of the architectural resources are documented in detail in the technical report prepared for the Proposed Project (in progress). The resources found eligible for the NRHP and CRHR in the built historic resources study area are the Cache Creek levees and CCSB (P-57-000594), and the California Northern Railroad (P-57-000977). The Camillus Nelson/Hackett Ranch property is listed in the NRHR and CRHR. These resources are discussed further below.

Early History

Spanish explorers visited Yolo County as early as the 1700s in their search for suitable inland mission sites. In 1772, Pedro Fages passed through San Francisco Bay and the Delta and reached the San Joaquin and Sacramento Rivers. Between 1793 and 1817, several other mission site reconnaissance expeditions were conducted. The first European American to travel through the area was Jedediah Strong Smith who, in the late 1820s, reported on the quantity and quality of furs in California. Joseph Walker and Ewing Young, during separate excursions, followed his general path in the 1830s. Mexican, American, and European settlers began to arrive and set down roots within the bounds of present-day Yolo County during the 1840s and 1850s (Kyle et al. 2002:566–567).

Yolo County

Yolo County’s first town was Fremont, founded in 1849 near the confluence of the Sacramento and Feather Rivers (south of present-day Knights Landing). It became the first county seat in 1850. After the damaging flood of 1851, the county seat was moved to the town of Washington (now part of present-day West Sacramento). Between 1857 and 1861, the county seat moved from Washington to Cacheville (present day Yolo) and back to Washington. However, in 1862, more flooding episodes had motivated the community voters to select the centrally located town of Woodland as the permanent county seat (Kyle et al. 2002:566, 568–569).

City of Woodland

The first settlers arrived in the area now occupied by the city of Woodland during the early 1850s. Within a few years, they had begun diverting water from Cache Creek for agricultural purposes. The community received a post office in about 1859, at which time it became officially known as “Woodland.” By 1862, the town had become an important agricultural center in Yolo County (Kyle et al.2002:266-267). The town then incorporated in 1871 (Gregory 1913:102–103). Woodland’s economic development has historically been closely tied to local agricultural and included the production of wine, flour, and various dairy products (Gregory 1913:109-110, 112, 114-116). Starting in the late 1930s, sugar production also became an important part of the local economy, with the completion of the Spreckels Sugar Company's factory, a facility that processed beets into granulated sugar.

Early industrial development of the city was concentrated along existing rail tracks, principally in a narrow corridor between East and Fifth Streets. In the later part of the twentieth century, highways gradually superseded railroads as the most important transportation corridors, and industrial development was concentrated along State Route 113 and Interstate (I-) 5 (City of Woodland 1996).

Agricultural Development

The decline of the California gold rush resulted in disenchanted miners who realized they could make a greater fortune through farming and ranching than in gold prospecting, transforming Yolo County from an isolated farming community into a booming agricultural region. Through both the mid-nineteenth and twentieth centuries, Yolo County commerce was generally agrarian in focus, the main crops being wheat, barley, and other grains. Commercial enterprises related to agriculture and livestock also sprang up during this period, furthering the development and growth of the region (Larkey and Walter 1987:25–45). Early crops in the Woodland area included tobacco, peanuts, grapes, rice, various grains, and sugar beets (City of Woodland 1996). Starting in the late 19th century, dairy farming assumed increasing importance, and by the early twentieth century some of the largest dairy farms in the county were found in the vicinity of Woodland (Mann et al. 1911:15).

Railroad Development

Three rail lines run through the project area: the California Pacific Railroad (Davis to Marysville), the Central Pacific Railroad (Davis to Tehama), and the Northern Electric Railway.

The California Pacific's Davis to Marysville route was built to replace slower and less reliable steamboat travel, but in 1871, shortly after it was built, the line was severely damaged by floods in the Sutter Bypass area between Knights Landing and Marysville, and subsequently abandoned. Loss of operation caused the California Pacific financial hardship, and the Central Pacific Company took it over in 1876 but did not rebuild the old connection to Sutter County. The track on the abandoned line between Knights Landing and Marysville was removed in 1877. Parts of the abandoned Marysville line's raised grade currently serve as interior flood control levees. The portions of the at-grade rail in the current project area are mainly abandoned.

In 1876, the Central Pacific Company retained the California Pacific route from Davis to Woodland and realigned the rail through Woodland in order to connect it to Tehama County instead of Sutter County. The completed line from Davis to Tehama was a main line, connecting the state's vast northern agricultural areas with markets in Sacramento, San Francisco, and San Jose, and beyond California via the Transcontinental Railroad. The line remains intact and is owned by Union Pacific Railroad.

In the early twentieth century, the Sacramento Northern Railway ran high-speed electric interurban passenger and freight service for 185 miles between San Francisco and Chico. A portion of its Woodland Branch line is located in the current project area, built in 1911. However, with the rise of the automobile and highway developments, the Sacramento Northern Company began dropping its passenger services in 1940, and portions of the system were de-electrified between 1940 and 1953. The Union Pacific Company acquired the Sacramento Northern Railway between 1983 and 1987, and then abandoned and decommissioned much of the Sacramento Northern rail. The Yolo Short Line Railroad purchased the defunct Woodland Branch line from Union Pacific in 1991, along with other Yolo County rails. Portions of the old Yolo County rail routes were rebuilt for diesel freight traffic, primarily through the county's agricultural areas. In 2003, the Yolo Short Line merged with the Sierra Railroad Company, who today operates freight and passenger service and its service includes excursions between West Sacramento and Woodland, but the line is no longer an electric interurban, instead serving as basic diesel rail.

Flood Control

California's low-lying Central Valley region has historically been subject to regular, natural flooding, making the region ill-suited for agricultural purposes. Flooding was exacerbated in the 1860s and 1870s by hydraulic mining practices that washed massive sediment loads into rivers and streams, undercutting their ability to handle floodwaters. Rapid urban growth and agricultural development in the Central Valley in the late 19th and early 20th centuries increased pressure to control natural flood cycles. The first proposal for an integrated system of levees, weirs, and bypass channels was made in the 1870s by the Office of the of the State Engineer, which was responsible for water planning. Surveying of the Sacramento Valley commenced in the early 1900s and another flood control plan was developed for the region—a plan that was eventually authorized by congress in the Flood Control Act of 1917 as the Sacramento River Flood Control Project (SRFCP). The SRFCP—which consisted of various weirs, flood control structures, bypass channels, and nearly 1,000 miles of levees—was implemented from 1917 until 1961. The CCSB, weir, and levees were in place by 1938 as part of the SRFCP but subsequent modifications were made to them into the 1960s. The CCSB was completed in 1938 and enlarged to its present size in the early 1990s (Pierce 2014:1-6).

Eligible Architectural/Built Environment Resources

The results of the survey of the built historic resources study area and evaluation of the architectural resources are documented in detail in the technical report prepared for the Proposed Project. The resource found eligible for the NRHP and CRHR in the built historic resources study area is the Central Pacific Railroad Davis to Tehama line (P-57-000970). The Camillus Nelson/Hackett Ranch property is listed in the NRHR and CRHR and is, therefore, a historic resource for the purposes of CEQA.

Camillus Nelson/Hackett Ranch

The Nelson Hackett Ranch is a property listed in 1972 on the NRHP (NR #72000266) located at 41070 County Road 18C in Yolo County. The property is an Italianate brick residence and adjacent agricultural lands that were once associated with the property. The property is significant under NRHP/CRHR Criteria A/1 for its association with the early development of agriculture in Yolo County that contributed and continues to contribute to the nation's important agricultural traditions. The property is significant under NRHP/CRHR Criteria B/2 at the local level for its association with Camillus Nelson, an early California pioneer and veteran of the Mexican-American Wars who established a wheat farm and cattle ranch on the Cache Creek floodplain. The property is significant under NRHP/CRHR Criteria C/3 for its Italianate architectural style, recognizable without its porches and much of its exterior trim. Under all criteria, the period of significance is 1872, the year the residence was built on the parcel, and the property's character-defining features are the building, its Italianate features, and its primarily agricultural setting. The historic property boundary is the parcel that contains the extant residence and the two parcels of agricultural land east of the residence.

At the time it was listed, the building lacked its original first and second floor balconies, exterior wood trim, many of its outbuildings, the northern part of its tree-lined arcade, and much of its original landscaping. Since the property's listing, its prominent tank house has been removed. The historic property boundary is not related to the property's significance, but rather defines the boundary of a California Department of Parks and Recreation proposed State Historic Farm. According to the parks department archives, the proposed state park designation was abandoned in 1977, and the parcels were relinquished to the University of California Regents. The University of California system still owns the two agricultural parcels; however, the building's parcel is under private ownership and has been in use as an equestrian park since c. 1993.

Central Pacific Railroad Davis to Tehama Line (P-57-000970)

The subject resource is a segment of the Central Pacific Railroad line between Davis and Tehama. The line is operational and extends 2.8 miles northwest from the northern end of Woodland through rural Yolo County to the bank of Cache Creek. The subject segment has steel rails, wooden ties, and gravel ballast. The Central Pacific Railroad between Davis and Tehama is significant under NRHP/CRHR Criteria A/1 for its association with the important Central Pacific development of main rail corridors connecting large areas of California to the Transcontinental Railroad. The Central Pacific Railroad is not eligible under Criterion B/2 because it is not associated with any one individual who made an important impact on the community at the local, state, or national level, and it is not eligible under Criterion C/3 because it does not demonstrate any significant engineering or design features, nor is it associated with the work of a master architect. Instead, it represents a common type of rail. The line is also not eligible under Criterion D/4 because it is unlikely to reveal important information about historic construction materials or technologies and, given its continued use, the chances of discovery of this sort of important information is exceedingly low.

The period of significance for this resource is 1872–1876, the period that the Davis to Tehama line was built. The property's period of significance is 1872–1876, the year that Central Pacific Railroad realigned its rail at Woodland to connect the Transcontinental Railroad at Davis with the Central Pacific's north valley service. The historic property boundary is the subject segment in the project area, between the northern Woodland city limits and Cache Creek. The elements that contribute to the property's significance, and allow it to convey its significance, are its location (alignment), agricultural setting, and continued operation as part of a main rail connection between the important Davis and Tehama areas of the valley.

The Central Pacific Railroad is eligible for listing in the NRHP and the CRHR, and the subject segment contributes to the overall significance of the line and retains integrity on its own merit, which conveys the property's overall significance. Based on State CEQA Guidelines Section 15064.5 (a)(2) and (3) and the criteria in Public Resources Code Section 5024.1, the Central Pacific Railroad segment is a historical resource for the purposes of CEQA.

3.10.2 Environmental Impacts

This section describes the environmental impacts associated with cultural resources that would result from implementation of the Proposed Project. It describes the methods used to determine the effects of the Proposed Project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts are provided.

3.10.2.1 Methods for Analysis

The built historic resources study area was determined to be any area that would see increased flooding of at least 0.2 feet due to the Proposed Project. For this analysis, an increase in flood depth of 0.1 feet is considered negligible and within the margin of error for the modeling results. Consequently, it is not considered an increase. The following eligible historic resources are within the built historic resources study area and are qualitatively evaluated in accordance with CEQA Guidelines Section 15064.5 (a)(2) and (3) and the criteria in Public Resources Code Section 5024.1.

- Central Pacific Railroad Davis to Tehama line (P-57-000970).
- Camillus Nelson/Hackett Ranch (NR #72000266)

As described in Chapter 2, Project Description, Section 2.3.6, *Additional Features Proposed by the City of Woodland*, floodproofing of individual structures could occur for certain buildings within the project area. Potential impacts to structures are qualitatively discussed below.

Archeological resources, including human remains, are qualitatively evaluated identifying the potential for occurrence based on the records search, prehistoric and historic context, and potential for ground disturbance within the project area.

3.10.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the Proposed Project would be considered to have a significant effect if it would result in any of the conditions listed below.

- A substantial adverse change in the significance of a historical resource pursuant to Section 15064.5.
- A substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.
- Disturbance of any human remains, including those interred outside of formal cemeteries.

3.10.2.3 Impacts and Mitigation Measures

Impact CUL-1: Potential to cause a substantial adverse change in the significance of a historical resource (less than significant with mitigation)

Construction of the Proposed Project would partially alter the physical characteristics of the Central Pacific Railroad, which is a built historic resource in the project area that is eligible for listing in the NRHP and CRHR. Specifically, the railroad closure and short sections of floodwall constructed to connect the closure structure at the I-5 crossing to the existing roadway embankment near I-5 would create a small material change to the section of the Central Pacific Railroad within the project area. However, construction and operation of the closure structure and floodwall would not pose a significant risk to the character-defining features of the Central Pacific Railroad that support its ability to convey significance. The closure structure would not impact that alignment or function of the railroad and would not significantly impact the setting of the railroad. The Central Pacific Railroad could potentially see increases in flood depth due to the Proposed Project, but this increase in depth would not present a significant impact; the railroad is already located at road grade or slightly above road grade, and increased flood depths due to the Proposed Project would not represent greater harm or operational impact than the flooding depths already present. Thus, the railroad closure, floodwall, and increased flood depths would have a less-than-significant impact on the Central Pacific Railroad.

Construction of the Proposed Project would not alter any of the physical characteristics or character defining features of the Camillus Nelson/Hackett Ranch that enable the resource to convey its historical significance. The Camillus Nelson/Hackett Ranch is listed in the NRHP and CRHR. No construction activities are anticipated on the parcel where the residence is situated or are anticipated nearby. However, upon commencement of operation of the Proposed Project, the undeveloped agricultural parcels to the east of the ranch residence could potentially see increases in flood depth. The parcel on which the Camillus Nelson/Hackett ranch residence is located, however, is not predicted to see any increase in flood depth as a result of the Proposed Project. Although the Historic Property Boundary as described in the National Register Nomination includes the agricultural parcels to the east, these parcels are undeveloped and simply provide a portion of the setting for the historic residence to the west. Hydrologic modeling shows there is no increased likelihood of greater flood depths on the parcel which contains the historic residence, which is the only remaining historic built resource associated with the ranch. Therefore, increased flood depths on the agricultural parcels would have a less-than-significant impact on the Camillus Nelson/Hackett Ranch.

Floodproofing individual buildings and structures within the project area could occur under the Proposed Project; however, it is unknown the exact timing and duration of floodproofing efforts. It is anticipated the nature of the floodproofing activities (e.g., raising a structure) may not cause a substantial adverse change in the significance of a historical resource. However, if a structure identified for floodproofing is 50 years or older, it would need to be evaluated for NRHP and CRHR eligibility. (see CUL-1). Therefore, implementation of Mitigation Measure CUL-1, is required and this would reduce impacts to less than significant.

Mitigation Measure CUL-1: Evaluation of resources 50 years or older in the event of floodproofing

When floodproofing measures are undertaken on a property that contains buildings or structures that are 50 years of age or older, those resources will be surveyed and evaluated for NRHP and CRHR eligibility. If the property was evaluated as part of the current study, it will be exempt from reevaluation. The City of Woodland or their agents will be responsible for documenting the evaluation of floodproofing properties and will be responsible for putting in place appropriate measures if any of the properties evaluated are found to be historical resources for the purposes of CEQA.

Impact CUL-2: Change in the significance of an archaeological resource (less than significant with mitigation)

No archaeological resources have been identified in parts of the project area that have been previously surveyed. However, prehistoric resources are likely to occur near perennial sources of water, such as Cache Creek and the adjacent uplands. Such resources have been found during implementation of similar projects in the region, such as in levee work along the Sacramento River (Sacramento Area Flood Control Agency 2007:3.8-17). Although there are no known prehistoric cultural resources documented in the project area, this likely reflects the dearth of previous studies rather than a low density of resources. In addition, some soils in the project area consist of Pleistocene and Holocene deposits, which have high potential for the presence of prehistoric and protohistoric archaeological resources (see the *Prehistoric Context* subsection in Section 3.10.1.2, *Environmental Setting*).

Because the area has a high sensitivity for archaeological resources, and because of limited site access and the infeasibility of identifying all buried resources prior to construction, ground-disturbing activities associated with constructing the levee could unearth unknown buried archaeological materials. Damage to such resources, if they meet the significance criteria of the NRHP or the CRHR, would constitute a significant effect under CEQA (14 CCR 15064.5). Implementation of Mitigation Measure CUL-2 would reduce this impact to a less-than-significant level.

Mitigation Measure CUL-2: Implement inadvertent discovery procedures

If cultural resources are discovered during construction, all construction will immediately stop within 100 feet (30 meters) 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 USACE and the City of Woodland (if not on location). The City, in consultation with USACE, will determine whether the discovery is a potential NRHP-eligible resource by evaluating the resource pursuant to the criteria in 36 CFR Part 60.4. The City will also evaluate the resource to determine whether it is a historical resource or unique archaeological resource under CEQA. If the City and USACE determine that the discovery is neither an NRHP-eligible resource nor a historical resource, the discovery will be documented and construction may proceed at the direction of USACE and the City.

If the City and USACE determine that human remains are not present, that the discovery is not an isolated find, and that the discovery may be eligible for the NRHP or significant under CEQA, the City and USACE will notify the State Historic Preservation Officer and other relevant parties as early as feasible. Notification will 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 and CRHR eligibility recommendation and description of probable effects. If the resource cannot be evaluated based on available evidence (for example, where test excavation is required), the City will use testing and evaluation methods provided in the research design and treatment plan appended to the Programmatic Agreement for further technical work necessary to determine the eligibility of the resource and to describe effects under CEQA and NHPA. Treatment will be implemented where necessary to resolve adverse or significant effects on inadvertently discovered cultural resources that are CRHR or NRHP eligible. The City will consider preservation in place as the preferred mitigation, as required under CEQA Guidelines Section 15126.4(b) for all CRHR-eligible resources that are subject to significant effects. The City will prepare a discussion documenting the basis for the selection of treatment consistent with this section.

If human remains are found as part of the find, those remains will be managed as required under Mitigation Measure CUL-3.

Impact CUL-3: Disturbance of Native American and historic-period human remains (less than significant with mitigation)

The project area is sensitive for archaeological cultural remains, including burials, because it is near Cache Creek (see Section 3.10.1.2 for more information about the existing setting sensitivity). The potential for buried human remains to be unearthed and disturbed during ground-disturbing activities within the project area is considered high because of the tendency for prehistoric occupation sites to be situated near perennial sources of water, and because of the depositional environment of the project area. The disturbance of any human remains is considered a significant direct effect.

YDWN is currently working on the establishment of a Memorandum of Understanding (MOU) with the City for the Proposed Project (see Section 3.11.2.1, *Methods for Analysis*). The MOU would address tribal construction monitoring, avoidance and minimization measures, appropriate mitigation measures if unanticipated tribal cultural resources are identified during consultation and during the Proposed Project's implementation, and other considerations. This MOU was in development as of November 2019.

Implementation of the human remains discovery provisions in Mitigation Measure CUL-2, in accordance with the MOU developed between the City and YDWN would reduce this impact to a less-than-significant level.

Mitigation Measure CUL-3: Implement human remains discovery procedures

Response to human remains discoveries for the Proposed Project is governed California state law, because the Proposed Project is located on non-federal land. In the event of a human remains discovery, the City of Woodland will immediately notify the Yolo County Coroner. The coroner, as required by the California Health and Safety Code Section 7050.5, will make the final determination about whether the remains constitute a crime scene or are Native American in origin. The coroner may take 2 working days from the time of notification to make this determination.

If the coroner determines that the remains are of Native American origin, the coroner will contact the Native American Heritage Commission within 24 hours of the determination. The commission will immediately designate and contact the most likely descendant (MLD), who must make recommendations for treatment of the remains within about 48 hours from completion of their examination of the finds, as required by Public Resources Code Section 5097.98(a). The City will then contact the landowner to notify them of the find.

It is likely that if a Native American burial is found, it will be found in the context of a prehistoric archaeological property. For a prehistoric property associated with burials, decisions must be made about how the remainder of the property will be treated for its archaeological (and possibly other) values. Not only must the MLD make decisions about the burials, but a plan must be devised also for evaluation and—if determined to be eligible for the NRHP—treatment of the property in consultation with the MLD, State Historic Preservation Officer, and other consulting parties (see Mitigation Measure CUL-2).

If the remains are found not to be Native American in origin and do not appear to be in an archaeological context, construction will proceed at the direction of the coroner and the City. It is likely that the coroner will exhume the remains. Once the remains have been appropriately and legally treated, construction may resume in the discovery area upon receipt of the City of Woodland's express authorization to proceed.

3.11 Tribal Cultural Resources

This section describes the regulatory and environmental setting for tribal cultural resources in the project area (described in Chapter 2 and shown on Figure 2-1), analyzes effects that would result from implementation of the Proposed Project, and provides mitigation measures to reduce the effects of any potentially significant impacts. Information presented in the discussion was drawn from multiple sources and is identified where appropriate below.

3.11.1 Existing Conditions

3.11.1.1 Regulatory Setting

This section summarizes key federal and state regulations, laws, and policies relevant to tribal cultural resources in the project area.

Federal

No federal plans, policies, or regulations apply to tribal cultural resources as defined by CEQA. The National Environmental Policy Act (NEPA) and Section 106 of the National Historic Preservation Act (NHPA) guide evaluation of historic and cultural resources during federal project planning. The U.S. Army Corps of Engineers (USACE) is the federal lead agency for the Proposed Project and is evaluating effects on cultural resources under NEPA in a separate supplemental environmental impact statement). USACE will comply with Section 106.

State

Assembly Bill 52

Assembly Bill (AB) 52 was approved by the California State Legislature in September 2014 and went into effect on January 1, 2015. AB 52, which is incorporated into CEQA statute, requires that lead agencies consult with any California Native American tribe that is traditionally and culturally affiliated with the geographic area of a proposed project, if so requested by the tribe. Public Resources Code Section 21084.2 specifies that a proposed project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource may have a significant effect on the environment.

As defined in Public Resources Code Section 21074(a), tribal cultural resources are the following:

1. Sites, features, places, cultural landscapes, sacred places and objects with cultural value to a California Native American tribe that are either of the following:
   A. Included or determined to be eligible for inclusion in the California Register of Historical Resources; or
   B. Included in a local register of historical resources as defined in subdivision (k) of [Public Resources Code] Section 5020.1.
2. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of [Public Resources Code] Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the

purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

Tribal cultural resources are further defined under Public Resources Code Section 21074 as follows:

- A cultural landscape that meets the criteria of subdivision (a) is a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape; and
- A historical resource described in Section 21084.1, a unique archaeological resource as defined in subdivision (g) of Section 21083.2, or a "nonunique archaeological resource" as defined in subdivision (h) of Section 21083.2 may also be a tribal cultural resource if it conforms with the criteria of subdivision (a).

Sacred places can include Native American sanctified cemeteries, places of worship, religious or ceremonial sites, and sacred shrines. In addition, both unique and non-unique archaeological resources, as defined in Public Resources Code Section 21083.2, can be tribal cultural resources if they meet the criteria detailed above. When a resource is not already listed in the California Register of Historic Resources or a local register, the lead agency relies upon substantial evidence to make the determination that a resource qualifies as a tribal cultural resource.

AB 52 defines a "California Native American tribe" as a Native American tribe located in California that is on the contact list maintained by the Native American Heritage Commission (Public Resources Code Section 21073). Under AB 52, formal consultation with California Native American tribes is required prior to determining the level of environmental document that a lead agency will prepare, if a tribe has requested to be informed by the lead agency of proposed projects, and if the tribe, upon receiving notice of the project, accepts the opportunity to consult within 30 days of receiving the notice. AB 52 also requires that consultation, if initiated, address project alternatives and mitigation measures for significant effects, if specifically requested by the California Native American tribe. AB 52 states that consultation is considered concluded when either the parties agree to measures to mitigate or avoid a significant effect on tribal cultural resources, or when either the tribe or the agency concludes that mutual agreement cannot be reached after making a reasonable, good-faith effort. Under AB 52, any mitigation measures recommended by the agency or agreed upon with the California Native American tribe may be included in the final environmental document and in the adopted mitigation monitoring program if the measures were determined to avoid or lessen a significant impact on a tribal cultural resource. If the recommended measures are not included in the final environmental document, then the lead agency must consider the four mitigation methods described in Public Resources Code Section 21084.3(e). Any information submitted by a California Native American tribe during the consultation process is considered confidential and is not subject to public review or disclosure. It will be published in a confidential appendix to the environmental document unless the tribe consents to disclosure of all or some of the information to the public.

Local

Neither the City of Woodland nor Yolo County have plans, policies, or regulations specifically related to tribal cultural resources as defined under AB 52.

3.11.1.2 Environmental Setting

This section discusses the environmental setting relevant to tribal cultural resources in the project area.

The city of Woodland sits south of Cache Creek and in its floodplain. Cache Creek originates in the Coast Range Mountains to the west, and flows east through Yolo County and the Capay Valley to the Sacramento River. The Capay Valley is part of the traditional tribal territory of the Patwin people (Yocha Dehe n.d. [a]), who lived in permanent villages along the waterways in a large territory west of the Sacramento River. Population density in this region was one of the highest in the state. The people lived well on the territory's abundant plant, game, and fish resources until the arrival of European and Euro-Americans during the eighteenth and nineteenth centuries. Missions, mining, and disease decimated the Patwin's numbers and disrupted their lifeways. Euro-American settlement and U.S. federal policy squeezed them onto a small reservation in Rumsey, where they struggled to subsist on the poor land and became known as the Rumsey Band of Wintun Indians (Yocha Dehe 2015). Further prehistoric and ethnographic information is provided in Section 3.10, *Cultural Resources*.

In 1940, the federal government relocated the tribe to Brooks in the Capay Valley, where the tribe was able to farm on 188 acres of trust land. During the 1980s, the tribe seized opportunities for tribal economic development created by the federal Indian Gaming Regulatory Act and the California Lottery by opening a bingo hall (Yocha Dehe 2015).

Today, the Capay Valley's Patwin are known as the Yocha Dehe Wintun Nation (YDWN), a federally recognized tribe and sovereign tribal government. The bingo hall has expanded into the Cache Creek Casino Resort, the largest private employer in Yolo County. The tribe farms more than a dozen crops on 2,200 acres, of which 250 are certified organic; runs more than 400 head of cattle; and has more than 1,200 acres of tribal land in conservation easements (Yocha Dehe n.d. [b], 2015). The Yocha Dehe Golf Club is another tribal enterprise. The tribe also markets its own brand of wine, olive oil, wildflower honey, and organic produce. The extra virgin olive oil is produced at the tribe's olive oil mill that also serves other regional growers. The tribal fire department participates in a fire mutual aid agreement, contributing to Yolo County's emergency response force (Yocha Dehe n.d. [c]). Yocha Dehe businesses support education, cultural and environmental stewardship, philanthropy, and community services (Yocha Dehe 2015).

3.11.2 Environmental Impacts

This section describes the environmental impacts on tribal cultural resources that would result from implementation of the Proposed Project. It describes the methods used to determine the effects of the Proposed Project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts are provided.

3.11.2.1 Methods for Analysis

In accordance with procedures prescribed in AB 52, on July 31, 2019, the City of Woodland sent notice and maps of the Proposed Project to six tribes and the Native American Heritage Commission. The City contacted the Torres Martinez Desert Cahuilla Indians, the Ione Band of Miwok Indians, the Miwok Maidu United Auburn Indian Community, Cortina Band of Indians, Rumsey Indian Rancheria of Wintun, and YDWN. The United Auburn Indian Community responded on August 16, 2019 that the project was outside its traditional tribal territory and deferring to YDWN. YDWN responded on August 16, 2019 that the tribe would like to consult on the project. No responses from the other tribes have been received to date (February 2020).

The City and its consultant corresponded with YDWN and provided GIS files for the Proposed Project. The first formal consultation meeting took place at Woodland City Hall on October 28, 2019 with three representatives of the YDWN cultural resources staff, the City's project manager and engineer, and consultants. No tribal cultural resources were identified during this meeting.

Because the Proposed Project has a long timeline, YDWN and the City agreed at that meeting that YDWN would develop a memorandum of understanding (MOU) between the tribe and the City that would specify ongoing tribal involvement during and after the conclusion of environmental approvals under the CEQA process. The MOU would address tribal construction monitoring, avoidance and minimization measures, appropriate mitigation measures if unanticipated tribal cultural resources are identified during consultation or during the Proposed Project's implementation, and other considerations. On November 1, 2019, YDWN provided the City and its consultant with its standard cultural resources treatment protocol and standard monitoring agreement. The MOU was still in development as of November 2019.

3.11.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the Proposed Project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Potential to cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is listed or eligible for listing in the California Register of Historic Resources or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k).
- Potential to cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

3.11.2.3 Impacts and Mitigation Measures

Impact TCR-1: Potential to cause a substantial adverse change in the significance of a tribal cultural resource (less than significant with mitigation)

As of this writing (October 2019), no tribal cultural resources have been identified. Accordingly, the Proposed Project would have no impact. However, consultations with the YDWN through the AB 52 process may result in identifying tribal cultural resources, given the potentially lengthy timeline anticipated for Proposed Project approval and funding. Tribal cultural resources may be present in the subsurface or on the surface in as-yet-unsurveyed areas of proposed excavations for the new levee and other facilities, or where underground utilities may need to be modified to accommodate Proposed Project operations. If tribal cultural resources are identified through consultation with YDWN or during preconstruction surveys, potentially significant impacts could result during

Proposed Project implementation. The measures specified in the YDWN treatment protocol for human remains, grave goods, ceremonial items, and items of cultural patrimony would be implemented. In addition, if necessary, and with agreement of the tribe and the City, one or more of the standard measures described in Public Resources Code Section 21084.3(b) would be adopted. Finally, YDWN and the City may agree on different or additional measures to be taken if tribal cultural resources are identified during consultation, preconstruction activities, or Proposed Project construction. Therefore, implementation of Mitigation Measures TCR-1 and TCR-2 would reduce impacts to a less-than-significant level.

Mitigation Measure TCR-1: Implement measures in Yocha Dehe Cultural Resources Treatment Protocol

The following measures have been excerpted or summarized from the YDWN treatment protocol; all measures and stipulations in the original protocol will be implemented as appropriate for the identified resource.

Treatment of Native American human remains. The preferred protocol upon the discovery of Native American human remains is to (1) secure the area, (2) cover any exposed human remains or other cultural items, and (3) avoid further disturbances in the area.

If Native American human remains are found during the course of the Proposed Project, the determination of Most Likely Descendant (MLD) under California Public Resources Code Section 5097.98 will be made by the Native American Heritage Commission upon notification to the commission of the discovery of said remains at a project site. In the event that Native American human remains are found during development of the Proposed Project and the Tribe or a member of the Tribe is determined to be MLD pursuant to Section II of this Protocol, the following provisions shall apply. The Medical Examiner shall immediately be notified, ground disturbing activities in that location shall cease and the Tribe shall be allowed, pursuant to California Public Resources Code Section 5097.98(a), to (1) inspect the site of the discovery and (2) make determinations as to how the human remains and grave goods should be treated and disposed of with appropriate dignity.

The Tribe shall complete its inspection and make its MLD recommendation within 48 hours of getting access to the site. The Tribe shall have the final determination as to the disposition and treatment of human remains and grave goods. Said determination may include avoidance of the human remains, reburial onsite, or reburial on tribal or other lands that will not be disturbed in the future.

The Tribe may wish to rebury said human remains and grave goods or ceremonial and cultural items on or near the site of their discovery, in an area which will not be subject to future disturbances over a prolonged period of time. Reburial of human remains shall be accomplished in compliance with the California Public Resources Code Sections 5097.98(a) and (b).

The term "human remains" encompasses more than human bones because the Tribe's traditions call for the burial of associated cultural items with the deceased (funerary objects), and/or the ceremonial burning of Native American human remains, funerary objects, grave goods and animals. Ashes, soils and other remnants of these burning ceremonies, as well as associated funerary objects and unassociated funerary objects buried with or found near the Native American remains are to be treated in the same manner as bones or bone fragments that remain intact.

Nondisclosure of Location of Reburials. Unless otherwise required by law, the site of any reburial of Native American human remains shall not be disclosed and will not be governed by public disclosure requirements of the California Public Records Act, Cal. Govt. Code § 6250 et seq. … The Tribe will require that the location for reburial is recorded with the California Historic Resources Inventory System ("CHRIS") on a form that is acceptable to the CHRIS center. The Tribe may also suggest that the landowner enter into an agreement regarding the confidentiality of site information that will run with title on the property.

Treatment of other cultural resources. Treatment of all cultural items, including ceremonial items and archeological items, will reflect the religious beliefs, customs, and practices of the Tribe. All cultural items, including ceremonial items and archeological items, which may be found at a project site should be turned over to the Tribe for appropriate treatment, unless otherwise ordered by a court or agency of competent jurisdiction. The City of Woodland should waive any and all claims to ownership of tribal ceremonial and cultural items, including archeological items, which may be found on a project site in favor of the Tribe. If any intermediary, (for example, an archaeologist retained by the City) is necessary, said entity or individual shall not possess those items for longer than is reasonably necessary, as determined solely by the Tribe.

Inadvertent discoveries. If additional significant sites or sites not identified as significant during the Proposed Project's environmental review process, but later determined to be significant, are located within the project impact area, such sites will be subjected to further archeological and cultural significance evaluation by the City and the Tribe to determine if additional mitigation measures are necessary to treat sites in a culturally appropriate manner consistent with CEQA requirements for mitigation of impacts to cultural resources. If there are human remains present that have been identified as Native American, all work will cease for a period of up to 30 days in accordance with Federal Law.

Tribal monitors. Tribal monitors shall be present during grading and ground disturbing operations at the development site.

Mitigation Measure TCR-2: Implement measures in Public Resources Code Section 21084.3 (b)

Public Resources Code Section 21084.3 states:

(a) Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.

(b) If the lead agency determines that a project may cause a substantial adverse change to a tribal cultural resource, and measures are not otherwise identified in the consultation process provided in Section 21080.3.2, the following are examples of mitigation measures that, if feasible, may be considered to avoid or minimize the significant adverse impacts:

  (1) Avoidance and preservation of the resources in place, including, but not limited to, planning and construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

  (2) Treating the resource with culturally appropriate dignity taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

    (A) Protecting the cultural character and integrity of the resource.

    (B) Protecting the traditional use of the resource.

(C) Protecting the confidentiality of the resource.

(3) Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

(4) Protecting the resource.

3.12 Transportation

This section describes the regulatory and environmental setting for transportation in the transportation study area, analyzes effects on transportation that would result from implementation of the Proposed Project, and provides mitigation measures to reduce the effects of any potentially significant impacts. The study area for the transportation analysis was determined based on the location of the Proposed Project and the nearby roadways where any potential CEQA-related effects could occur. Determination of the study area included consideration of the primary travel routes utilized by project construction traffic and roadways where temporary closures, modifications, or detours may occur during project construction. Roadways within the study area include those described in Sections 2.3.1.4, *Closure Structures*, 2.3.1.5, *Other Road and Railway Improvements*, and 2.3.4, *Staging, Site Access, and Construction-Related Traffic*.

Transportation-related topics to be assessed include consistency with local plans and policies, the potential for induced automobile travel (in the form of increases in the total mileage traveled by all vehicles, or vehicle miles traveled [VMT]), the introduction of driving or other transit hazards, and the potential for a reduction in emergency access in the study area. Information presented in the discussion and used for the subsequent analysis was drawn primarily from the following sources.

- *City of Woodland General Plan 2035* (City of Woodland 2017).
- *2030 Countywide General Plan* (Yolo County 2009).
- Lower Cache Creek construction engineering assumptions (Hilliard pers. comm. [a]).

3.12.1 Existing Conditions

3.12.1.1 Regulatory Setting

The following sections summarize key state, regional, and local regulations, laws, and policies relevant to transportation in the study area.

State

California Department of Transportation

The California Department of Transportation (Caltrans) has authority over the state highway system, including freeways, interchanges, and arterial routes. Caltrans operates and maintains state highways in Yolo County and the city of Woodland.

Caltrans Construction Manual

The Caltrans *Construction Manual* contains policies and procedures for construction personnel and construction contract administrators to follow when working on the state highway system (California Department of Transportation 2019). The manual also identifies procedures for projects administered by a local agency that modify, maintain, or improve the state highway system so that construction is conducted efficiently and effectively. It requires local agencies to conform to Caltrans standards and practices, as defined in the manuals and guidance documents pertaining to policies and practices.

State Improvement Program

The California Transportation Commission (CTC) administers transportation programming, which is the public decision-making process that sets priorities and funds projects that have been envisioned in long-range transportation plans (California Transportation Commission 2019). The CTC commits expected revenues for transportation projects over a multi-year period. The State Transportation Improvement Program (STIP) is a multi-year capital improvement program for transportation projects both on and off the state highway system. The STIP is prepared by Caltrans in cooperation with the Metropolitan Planning Organizations (MPOs) and Regional Transportation Planning Agencies, and contains all capital and noncapital transportation projects or identified phases of transportation projects for funding under the Federal Transit Act and Title 23 of the United States Code. STIP is funded with revenues from the state highway account and other funding sources. STIP programming typically occurs every 2 years.

California Transportation Plan 2040

The *California Transportation Plan* (CTP) *2040* was adopted in 2016. The plan, which is overseen by Caltrans, serves as a blueprint for California's transportation system, as defined by goals, policies, and strategies to meet the state's future mobility needs (California Department of Transportation 2016). The goals defined in the plan fall into three categories: social equity, prosperous economy, and quality environment. Each goal is tied to performance measures. In turn, members from regional and metropolitan planning agencies report these performance measures to Caltrans. Caltrans is presently working on an update to the CTP that would extend to 2050. The 2040 update is expected to be approved in 2020.

Senate Bill 375

Senate Bill (SB) 375 provides guidance regarding curbing emissions from cars and light trucks to help the State comply with Assembly Bill (AB) 32. There are four major components to SB 375. First, SB 375 requires regional greenhouse gas (GHG) emissions targets. The California Air Resources Board's (CARB's) Regional Targets Advisory Committee guides the adoption of targets to be met by 2020 and 2035 for each MPO in the state. These targets, which MPOs may propose themselves, must be updated every 8 years in conjunction with the revision schedule of the housing and transportation elements of local general plans. Second, MPOs are required to create a sustainable communities strategy (SCS) that provides a plan for meeting regional targets. The SCS and the regional transportation plan (RTP) must be consistent, including action items and financing decisions. If the SCS does not meet the regional target, the MPO must produce an alternative planning strategy that details an alternative plan for meeting the target. Third, SB 375 requires regional housing elements and transportation plans to be synchronized on 8-year schedules. In addition, regional housing needs allocation numbers must conform to the SCS. If local jurisdictions are required to rezone land as a result of changes in the housing element, rezoning must take place within 3 years of adoption of the housing element. Finally, MPOs must use transportation and air emissions modeling techniques that are consistent with the guidelines prepared by the CTC. Regional transportation planning agencies, cities, and counties are encouraged, but not required, to use travel demand models that are consistent with CTC guidelines.

CEQA Section 21099(b)(1) (Senate Bill 743)

CEQA section 21099(b)(1) requires the Office of Planning and Research (OPR) to develop revisions to the CEQA Guidelines, thereby establishing criteria for determining the significance of transportation impacts from projects that "promote the reduction of GHG emissions, the development of multimodal transportation networks, and a diversity of land uses." CEQA section 21099(b)(2) states that, upon certification of the revised guidelines for determining transportation impacts, pursuant to section 21099(b)(1), automobile delay, as described solely by level of service (LOS) or similar measures of vehicular capacity, or vehicular traffic congestion shall not be considered a significant impact on the environment under CEQA.

Previously, LOS measured the average amount of delay experienced by vehicle drivers at an intersection during the most congested time of day, while the new metric—VMT—measures the total number of daily miles traveled by vehicles on the roadway network and thereby the impacts on the environment from those miles traveled. SB 743 changes the focus of transportation impact analysis in CEQA from measuring impacts *on* drivers, to measuring the impact *of* driving.

In January 2016, OPR published for public review and comment its *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA, Implementing Senate Bill 743* (proposed transportation impact guidelines), recommending that project transportation impacts be measured using a VMT metric (Office of Planning and Research 2016). OPR later developed the *Technical Advisory on Evaluating Transportation Impacts in CEQA* (Technical Advisory), which contains OPR's technical recommendations regarding assessment of VMT, thresholds of significance, and mitigation measures. This Technical Advisory provides screening criteria for certain project types, including a daily trip threshold to define "small projects" with respect to their potential to result in significant transportation effects. The Technical Advisory states that "absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with an SCS or general plan, projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than-significant transportation impact" (Office of Planning and Research 2019).

The Technical Advisory outlines VMT significance thresholds for different project types not meeting the screening criteria. For example, it would be reasonable to conclude that residential and office projects demonstrating a VMT level that is 15 percent less than existing (2015 through 2018 average) conditions are consistent with statewide VMT reduction targets. The VMT level is commonly assessed on a per capita or per service population basis.[1] With respect to retail land uses, any net increase of VMT may indicate a significant transportation impact.

In January 2019, changes to the CEQA statutes and guidelines went into effect, including a new section 15064.3 that states that VMT is the most appropriate measure of transportation impacts, and includes updated criteria for analyzing transportation impacts. This shift in transportation impact criteria is expected to better align transportation impact analysis and mitigation outcomes with the State's goals to reduce GHG emissions, encourage infill development, and improve public health through more active transportation.

Regional

Sacramento Area Council of Governments

The Sacramento Area Council of Governments (SACOG) is the MPO for the Counties of El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba, as well as 22 cities (including the Cities of Davis, West

[1] VMT per capita is calculated by dividing the project-generated VMT by the number of residents. VMT per service population is calculated by dividing the project-generated VMT by the number of residents plus employees.

Sacramento, Winters, and Woodland). As an MPO, SACOG is required to prepare a long-range transportation plan for all modes of transportation (including public transit, automobile, bicycles, and pedestrians) every 4 years.

Metropolitan Transportation Plan/Sustainable Communities Strategy

SACOG is responsible for the preparation of, and updates to, the metropolitan transportation plan/sustainable communities strategy (MTP/SCS) and the corresponding metropolitan transportation improvement program (MTIP) for the six-county Sacramento region. The MTP/SCS for the Sacramento region pro-actively links land use, air quality, and transportation needs. The MTP/SCS is federally required to be updated every 4 years. The SACOG board adopted the 2020 MTP/SCS and accompanying documents at a special board meeting on November 18, 2019 (Sacramento Area Council of Governments 2019).

The congestion management process (CMP) and MTP/SCS are developed as a single integrated document. As part of the MTP/SCS, SACOG's CMP addresses the six-county Sacramento region and the transportation network therein. The CMP focuses on travel corridors with significant congestion and critical access and mobility needs to identify projects and strategies that meet CMP objectives.

Transportation projects are nominated by local agencies and analyzed against community priorities identified through public outreach as well as technical performance and financial constraints. The output of the MTP and CMP is a list of projects with identified lead agencies and completion years, contained in Appendix A-1 of the MTP/SCS. The adopted list and schedule of projects for the MTP/SCS then informs the development of the MTIP.

Metropolitan Transportation Improvement Program

Approximately every 2 years, SACOG prepares and adopts the MTIP. The MTIP is a short-term listing of surface transportation projects that receive federal funds, are subject to a federally required action, or are regionally significant. SACOG adopted the 2019/20 MTIP in September 2018 (Sacramento Area Council of Governments 2018). The 2019/20 MTIP covers 4 years of programming: federal fiscal years 2019 through 2022.

Local

City of Woodland General Plan

According to the *City of Woodland General Plan 2035*, with a shift in emphasis away from LOS, VMT is the State preferred alternative performance metric recommended to describe the overall amount of travel in the city based on distance and is directly related to fuel consumption, air pollution, and GHG emissions (City of Woodland 2017). VMT is defined as the total mileage traveled by all vehicles. Although VMT relates specifically to autos, it is able to capture the effects of development patterns, such as land use mix and density, along with transit, bike, and pedestrian infrastructure improvements by reflecting their impacts on vehicle trip generation and trip lengths. According to the general plan, the City will use a combination of LOS and VMT metrics to ensure the efficient movement of people and goods in the area, as well as a reduction in GHG emissions (City of Woodland 2017). Reducing VMT is also consistent with the City's desire to promote biking, walking, and transit usage as viable transportation alternatives to driving.

The City General Plan has a number of goals and policies related to transportation. The goals are related to the multimodal transportation system, complete streets, roadway functional classification and street typology, residential streets, a comprehensive pedestrian system, a comprehensive bicycle system, an effective transit system, managed parking, the safe and efficient movement of goods, air transportation facilities, and transportation funding (City of Woodland 2017). The general plan also includes a number of policies under each of these topics.

Yolo County General Plan

The *Circulation Element* of the Yolo County *2030 Countywide General Plan* provides the framework for Yolo County decisions concerning the countywide transportation system and provides coordination with the incorporated cities within the County, the Yolo County Transportation District (YCTD), and SACOG and the State and federal agencies that fund and manage the county's transportation facilities. (Yolo County 2009)

The general plan *Circulation Element* contains a number of goals and policies related to transportation in the project area and study area; specifically, the goals and policies emphasize multiple modes of travel and encourage non-vehicular trips. Topics of these goals include the development and maintenance of a comprehensive and coordinated transportation system (which includes a policy related to a reduction in VMT and an efficient use of transportation facilities); mode and user equity (transportation systems reflects the needs of all transportation types and users); service thresholds, which includes a discussion of LOS criteria and the goal of designing roadways to reduce VMT; environmental impacts caused by transportation; system integration (the promotion of safe and convenient sidewalks, bikeways and trails, etc.); accessible transit; and truck and rail operations.

3.12.1.2 Environmental Setting

The following section describes the existing roadways, airports, rail service, transit, and bicycle routes in the study area that may be affected by the Proposed Project and discusses the environmental setting relevant to transportation in the study area.

Highways and Roadways

One interstate and two state highways provide transportation through the study area. Interstate (I-) 5 provides north–south circulation through the eastern portion of the project study area. State Route (SR) 113 also provides north–south circulation, but through the approximate center of the project study area. SR 16 provides north–south circulation through the western portion of the project study area. With the exception of I-5, a four-lane highway, all other state highways in the project study area are two lanes.

The majority of the roadways in the study area are county roads. The most heavily traveled county road in the project study area is County Road 102, which runs north–south. County Road 102 is one of two county roads that cross Cache Creek in the study area; the second is County Road 99W. County Road 99W runs parallel to I-5 and serves mostly local traffic to and from the town of Yolo. Other county roads in the study area include (north–south circulation) County Roads 101, 99, 97A, and 96B and (east–west circulation) County Roads 18C, 18A, 18, 19A, 19B, and 20. County Road 22 is an east–west county road that traverses Woodland and runs parallel to the eastern portion of the proposed levee.

As described in Section 3.1, *Hydrology*, flooding from Cache Creek is anticipated to occur on a once-in-20 year to once-in-30 year recurrence interval due to the limited capacity of Cache Creek, and the CCSB levees do not meet current design standards. During a 100-year or 200-year storm event under existing conditions, I-5 would be largely under water and inaccessible from Woodland in either direction. The other roads in the study area (SR 113, and County Roads 102, 101, 99, 98, and 22) would also experience flooding under 100-year and 200-year storm events (see Figures 3.1-2 and 3.1-3).

Transit

YCTD administers Yolobus, which operates local and intercity bus service in Yolo County and neighboring areas. Yolobus operates 14 routes that pass within the study area, 6 of which run hourly.

Bikeways

Bicycle and pedestrian travel specifically within the study area is somewhat limited because of the rural character of the area. The main designated bikeway in the study area is along County Road 102. The bikeway begins at the city of Woodland/Yolo County line and continues north through the study area. Roadway width, specifically shoulder width, restricts bicycle traffic on many roadways in the project study area.

Railroads

Two railroads are located in the study area. The California Northern Railroad (CNRR) runs alongside I-5 between Cache Creek and the city of Woodland/Yolo County line. The Southern Pacific Railroad runs north–south through the study area on the east side of SR 113. Both railroads are branches of larger lines, but they serve the community's industries locally and do not carry passengers.

The CNRR traverses the study area on a railroad embankment. There are no elevated sections of the tracks except for the railroad bridge across Cache Creek just east of I-5. At the intersection of the tracks and Churchill Downs Avenue, warning gates are in place to alert vehicles and pedestrians of an oncoming train. The train schedules depend on necessity and do not run on a consistent basis.

3.12.2 Environmental Impacts

This section describes the environmental impacts associated with transportation that would result from implementation of the Proposed Project. It describes the methods used to determine the effects of the Proposed Project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts are provided.

3.12.2.1 Methods for Analysis

The analysis methodology for specific topics assessed in this transportation analysis is described in the following subsections. Because the Proposed Project does not involve any major long-term changes to the roadway network in the study area (i.e., the improvements are limited to the raising of roadways or addition of closure structures) or any new land uses that would require operational trips, potential impacts are largely limited to short-term construction-related effects. These effects were assessed based on the preliminary construction and operational information available for the Proposed Project and available information from the Yolo County *2030 Countywide General Plan*, the *City of Woodland General Plan 2035*, the Caltrans Traffic Census Program, and regional VMT data from Fehr & Peers (Choa pers. comm.).

Conflict with Applicable Programs and Policies Analysis

As discussed under *Regional* and *Local* in Section 3.12.1.1, *Regulatory Setting*, the general plans for Yolo County and the City of Woodland include a number of policies and goals related to the transportation and circulation systems (roadways as well as transit, bicycle and pedestrian facilities). Many of these policies aim to help preserve and improve the efficiency of existing transportation facilities, and to help make public transit and alternative mode transit choices (besides the automobile) more viable and attractive. This analysis assesses if the Proposed Project, and if potential effects from project implementation, would conflict with applicable transportation-related plans, ordinances, or policies, such as policies contained in the City and County general plans.

Vehicle Miles Traveled Analysis (Consistency with CEQA Guidelines Section 15064.3, Subdivision [b])

As discussed under *State* in Section 3.12.1.1, Senate Bill 743 and the resulting CEQA Guidelines update completed in early 2019 replaces the use of LOS for determining transportation impacts with an evaluation of VMT. The project-specific analysis of VMT impacts assesses the potential for the Proposed Project to result in a long-term (operations and maintenance [O&M]) and short-term (construction) increases in VMT in the region. Although the Proposed Project would result in relatively few long-term trips per year once project construction is complete, and therefore a relatively small long-term increase in VMT, the potential for both a substantial long-term and a substantial short-term increase in VMT must be assessed. If trips generated by project construction or operations would be greater than the 110 trip per day screening criteria (Office of Planning and Research 2018), project-related VMT impacts are quantitatively assessed. If the Proposed Project would result in a substantial increase in VMT per service population (e.g., population plus jobs) in the region, then the Proposed Project could result in a significant short-term VMT impact. See Appendix E, *Air Quality and Greenhouse Gas Modeling Inputs and Supporting Data*, for the background assumptions regarding project-related vehicle use.

Driving, Bicycle, and Pedestrian Hazards Analysis

In assessing driving hazards, the Proposed Project's temporary changes to the transportation network were reviewed to determine whether they would obstruct, hinder, or impair reasonable and safe views by drivers traveling on the same street, or restrict the ability of a driver to stop the motor vehicle short of a collision. No permanent changes would be made to roadway alignments in the study area under the Proposed Project, except for the raising of roadways. Where roadways are raised (specifically, County Roads 98, 99, 101 and 102), the alignment would remain the same, and safe passage through intersections adjacent to these areas would be maintained for all transit modes (e.g., driving, walking and biking). For this reason, the analysis focuses on potential temporary impacts related to hazards that could occur during project construction.

Bicycle conditions as well as pedestrian accessibility conditions were also assessed qualitatively. The qualitative assessment considered safety and right-of-way issues; potential worsening of existing or creation of new safety hazards; conflicts with bicycles, transit, and vehicles; and whether the Proposed Project would interfere with the accessibility of people walking in the study area.

Emergency Access Analysis

Potential impacts related to restricted emergency access were assessed qualitatively. Specifically, the analysis assessed whether the temporary closures or construction-related re-routing of roads for project construction would impair, hinder, or preclude adequate emergency vehicle access.

3.12.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the Proposed Project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Conflict with a program, plan, ordinance, or policy addressing the circulation system including transit, roadway, bicycle, and pedestrian facilities.
- Conflict or be inconsistent with State CEQA Guidelines Section 15064.3, subdivision (b).
- Substantial increase in hazards because of a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Potential to cause inadequate emergency access.

3.12.2.3 Impacts and Mitigation Measures

Impact TRA-1: Conflict with a program, plan, ordinance, or policy addressing the circulation system including transit, roadway, bicycle, and pedestrian facilities (less than significant)

The Proposed Project is located in the City of Woodland and in unincorporated Yolo County. The General Plans for these two jurisdictions include a number of policies and goals related to the transportation and circulation systems. Many of these policies relate to the goal of preserving and improving the efficiency of existing transportation facilities, and of making public transit and alternative mode transit choices (besides the automobile) more viable and attractive. An objective of both jurisdictions is to avoid increasing, or to reduce, the reliance on the automobile, and to reduce overall VMT in the region. Specifically, both the policies contained in the City and County general plans demonstrate a shift towards the use of VMT to determine potential traffic impacts. Both the City and the County general plans still include policies that contain LOS standards, but the intent of these policies are to consider LOS as a limit on the planned (e.g., long-term) capacity on the county's roadways. CEQA, however, no longer considers effects related to congestion to be environmental impacts. Therefore, LOS policies are not considered thresholds under which the Proposed Project should be assessed for transportation impacts.

According to the City general plan, although VMT relates specifically to autos, the VMT metric can also be used to assess the effects of development patterns such as land use mix and density along with transit, bike, and pedestrian infrastructure improvements by reflecting their impacts on vehicle trip generation and trip lengths (City of Woodland 2017). Reducing VMT is consistent with the City's desire to promote biking, walking, and transit usage as viable transportation alternatives to driving. Reducing VMT is also consistent with the City's general plan overall, as a reduction in VMT is an overarching theme of the plan. For example, Policy 3.A.4 includes a goal of new development projects reducing VMT by 10 percent per capita or per service population compared to the General Plan 2035 VMT performance or baseline conditions. The Proposed Project is not a development project, as no new operational land uses would be created, but this policy indicates that a reduction in VMT is a primary objective in the City.

With regard to long-term project-related VMT, O&M would be relatively limited after construction activities are complete, and consist of one to two persons driving trucks on the levees for inspection, maintenance, patrol actions, and potential small-scale floodproofing activities. Therefore, there would only be a small number of annual operational trips once project construction is complete. In addition, construction-related increases in traffic (due to haul truck or delivery truck trips and employee trips of construction works) in the area would be short-term, and would cease as soon as project construction was completed.

Roadways in the study area would maintain their basic footprint with implementation of the Proposed Project (even though some roadways would be raised), and no new land uses would be developed that would generate daily operational automobile trips (e.g., retail, office, residential uses, etc.).

With regard to rail transit, because the existing railroads in the study area do not carry passengers, project implementation would not result in any effects on rail-related transit. The County general plan does not contain any policies or plans related to freight rail. However, as described in Chapter 1, *Introduction*, Section 1.3.3.3, *Railway Coordination*, the City is actively engaging with railway representatives as part of the Proposed Project to ensure minimal disruption of rail operations. No long-term, large-scale changes to the transportation network would take place under the Project Proposed that would reduce or restrict access for bicyclists, pedestrians, or persons using transit. Once construction is complete, the project would only be expected to add a few annual O&M trips per year and would not induce substantially more automotive traffic or a substantial increase in VMT in the region than would occur without the Proposed Project. As a result, the Proposed Project would not conflict with policies from the City and County general plans pertaining to a reduction in VMT and a reduced reliance on the automobile or other policies, such as those related to the development and maintenance of an efficient transportation network for all modes of transit. Therefore, the Proposed Project would not conflict with a program, plan, ordinance, or policy addressing the circulation system (including transit, roadway, bicycle, and pedestrian facilities), and this impact would be less than significant.

Impact TRA-2: Conflict or be inconsistent with State CEQA Guidelines Section 15064.3, subdivision (b) by temporarily causing substantial additional VMT or induced automobile travel (significant and unavoidable)

As discussed under Impact TRA-1, the Proposed Project would not result in any major long-term changes to the roadway network in the study area (the only changes would be minor—the raising of roads and the installation of closure structures for flood events), and would, therefore, not be expected to increase the trip length of individual trips in the study area after construction is complete. However, the Project would result in the generation of a small number of new O&M vehicle trips per year after construction is complete (e.g., one to two persons driving trucks on the levees for inspection, maintenance, and patrol actions, once or twice per year, or less). Additionally, floodproofing of individual structures could occur under the Proposed Project for certain buildings in the study area. However, the exact location, timing, and duration of floodproofing efforts is unknown. It is possible that some of these activities could take place at the same time as the main project construction activities (e.g., levee construction) during year 2024, but it is anticipated that many would take place after the construction of the proposed levee is complete. Floodproofing construction activities would occur on a case-by-case basis, and it is unlikely that multiple floodproofing activities would overlap in time. In other words, it is assumed a single floodproofing project would be identified and completed before another floodproofing project started.

Floodproofing individual structures would result in a limited amount of construction worker or truck trips, given the very small scale of these activities on single structures. Once construction related to an individual floodproofing activity is complete, there would be no related operational vehicle trips. Therefore, the number of project-related vehicle trips during the operational period, including potential floodproofing activities, would not exceed the previously cited 110 per day screening level (Office of Planning and Research 2018). For this reason, potential VMT impacts during project operations would be less than significant.

Because no large-scale changes to the transportation network would result from the Proposed Project, the Proposed Project would not be expected to reduce or restrict access to bicyclists, pedestrians, or persons using transit in the long-term. For this reason, it would not induce more automotive traffic due to access restrictions for alternative modes of transit. As the Proposed Project would not result in a substantial amount of induced automobile travel after construction is complete outside of a few trips per year for O&M, impacts related to a permanent or long-term increase in VMT would be less than significant.

During the construction periods for the Proposed Project (approximately 6 to 7 months in both 2023 and 2024), heavy trucks would be used to deliver construction materials and haul soil and other materials to and from the project site. The number of truck trips per day would vary depending on the subphase of construction. As shown in Table 3.12-1, on a worst-case day, there could be as many as approximately 295 one-way truck trips traveling to or from the project construction areas. When considering trucks operating on the project site, the number of maximum daily truck trips (including pick-up trucks, water trucks, and onsite haul trucks) would increase to approximately 347 trips per day. However, there would be many days when fewer heavy trucks would be required for project construction. In addition to trucks, up to approximately 100 one-way vehicle trips in the form of employees accessing the project construction areas would be added to the regional transportation network during construction.

Although it is not known with certainty at this time, it is possible that some floodproofing activities could occur concurrently with the larger-scale project construction activities during the year 2024. It is estimated that up to three floodproofing activities could occur during that year. These three floodproofing activities could add up to 8 employee trips per day for a period of 20 days per action, resulting in an addition of up to 480 annual trips occurring in the year 2024. Including these additional trips, the average number of trips per day when considering the total employee and haul truck trips (both onsite and offsite) and the number of construction working days would be 195 trips per day in 2023 and 123 trips per day in 2024. Over the entire two-year construction window, the average number of trips would be approximately 159 vehicle (truck and employee) trips per day attributable to the Proposed Project. These construction-related truck and employee trips would result in a temporary increase in regional VMT during construction periods. As discussed in the methods section, because the number of project-related vehicle trips during construction would exceed the 110 trip per day screening level, potential VMT impacts must be quantitatively assessed.

Table 3.12-1. Summary of Construction-Related Vehicle Trips for the Proposed Project

Type of Vehicle Trips	Total One-way Trips
Worst-case Truck Trips per day (offsite)	295
Worst-case Truck Trips per day (onsite and offsite)	347
Worst-case Employee Trips per Day	100
Worst-case Total Truck and Employee Trips per day (including onsite)	447
Average number of offsite Truck Trips per day (years 2023 and 2024)	71
Average number of Trips (All Truck and Employee) per day in 2023	195
Average number of Trips (All Truck and Employee) per day in 2024	123
Overall Average Trips per day (Truck and Employee, years 2023 and 2024)	159

During construction, personnel, equipment, and imported materials would reach the project site via I-5, SR 113, and County Roads 102 and 22. The project would result in a temporary increase in VMT based on the addition of vehicle trips for hauling and employees. The total VMT attributable to the Proposed Project over the duration of the two 6 to 7-month construction windows (in 2023 and 2024) is 706,861 miles (see Appendix E for a full list of assumptions regarding project-related vehicle use). This includes miles traveled both by employees for the main project construction activities (including employee travel, offsite haul truck travel as well as onsite haul truck, water truck, and pick-up truck travel), and for the limited floodproofing activities that could occur concurrently. There is a total of 295 construction days during both 2023 and 2024, which results in an average VMT per construction day of approximately 2,396 miles.

Because the Proposed Project would not construct any residences or result in a population increase, it is more appropriate to assess the VMT effects by looking at the VMT per service population (population plus jobs) instead of looking at VMT per capita (population). However, because the Proposed Project would not be resulting in a population increase, project-related VMT can only be calculated in terms of VMT per employee. Therefore, for the purposes of this analysis, VMT per service population is equivalent to VMT per employee because there are no residences (and therefore, no population) affiliated with the Proposed Project.

There would be approximately 50 employees working on a given day, not including haul truck drivers. An average of 71 daily haul truck trips would occur during project construction. This analysis assumes that a truck driver could complete 10 one-way trips (or 5 round trips) during an 11-hour work day,[2] which would mean that there would be approximately 7 truck drivers hauling project-related material on a given day. Using the total number of employees (50 construction workers plus 7 haul truck drivers), the average VMT per employee for the Proposed Project would

[2] Approximately 24 minutes would be required for a single haul truck trip based on an average haul truck speed of 55 miles per hour and a maximum trip length of 22 miles per single trip (22 miles / 55 miles per hour). Accordingly, a roundtrip would take approximately 48 minutes without including time for loading and unloading (24 minutes per single trip * 2 single trips per roundtrip). Analysts conservatively assumed that loading and unloading could be completed in as little as 15 minutes, indicating that one round trip inclusive of loading and unloading would take approximately 63 minutes. Therefore, it was assumed that 1 truck roundtrip would take a little more than an hour, and that over an 11-hour workday, up to 10 round trips per truck could occur per day. Therefore, if a single driver can make up to 10 trips per day and there would be an average of 71 trips per day total, then approximately 7 haul truck drivers would work on an average day (71 trips per day / 10 trips per driver).

be approximately 42 miles per employee per day (2,396 average daily miles divided by 57 employees).

The 2019 VMT per service population for Yolo County is 36, and the 2019 regional VMT per service population for the SACOG region is 47 (Choa pers. comm.). Note that both the county and SACOG region have targets (to obtain SB 743 consistency) of a VMT per service population reduction of 15 percent below the existing (2015 through 2018 average) VMT. Because the current VMT per service population in the SACOG region is 47, the SACOG regional target is approximately 39.95 VMT per service population. Because the current VMT per service population in Yolo County is 36, the regional target is approximately 30.6 VMT per service population. Although the project-added VMT would only exist on roadways in the study area for up to 7 months during 2023 and up to 7 months during 2024, and although the project would contribute less VMT per service population than the SACOG regional target, the Proposed Project would temporarily contribute more VMT per service population than the target for Yolo County during the construction window (e.g. 42 miles per employee per day compared to the target of 30.6). Similarly, the Proposed Project would temporarily contribute more VMT per service population than the target for SACOG during the construction window as compared to the target VMT (e.g., 42 miles per employee per day compared to the target of 39.95). Therefore, the Proposed Project would not help meet the regional objectives of a 15 percent reduction in VMT in Yolo County or in the SACOG region, and potential impacts related to a substantial temporary increase in VMT during project construction would be significant.

Implementation of Mitigation Measure GHG-1, described in Section 3.8, *Greenhouse Gas Emissions*, would help reduce project-related VMT. Specifically, this measure requires the development of a transportation demand management (TDM) plan to reduce the number of construction worker trips and to reduce construction-related VMT increases. The TDM plan includes strategies such as the implementation of a ride-sharing program to encourage carpooling among the workers, the adjustment of construction worker schedules (e.g., arrive before 7 a.m. or after 9 a.m.; leave before 4 p.m. or after 6 p.m.) so that workers do not access the site during peak hours, a provision of offsite parking locations for workers outside the city with shuttle services to bring them on site, and a provision of subsidized transit passes and secure bicycle parking spaces for construction workers. These strategies, as well as others that may be implemented under the TDM plan, would help to reduce employee VMT during construction of the Proposed Project. However, they would not have an effect on haul truck and delivery truck VMT during construction.

Other mitigation measures that could possibly reduce haul truck and delivery truck trips and VMT during the construction window include extending the construction schedule, using larger haul trucks, and reusing material on site; however, these types of measures are infeasible or are not proportional to the impact associated with VMTs. The possibility of extending the construction schedule so the number of trips per day would result in a longer duration of impacts to various other resource areas (e.g., noise), would increase the cost of the Proposed Project and may only slightly reduce the severity of the impact related to VMTs on a given day. The use of larger-sized haul trucks would not be possible because they would exceed the load limits for public roads. Reusing more material onsite also is infeasible because the Proposed Project has already been designed so that the earthwork is balanced onsite (to the maximum extent possible). All of the earthen material needed for construction of the levee and berm would come from onsite sources (i.e., the excavation of the drainage channel), and the Proposed Project would require no borrow sites. Therefore, no measures to reduce haul truck trips and the associated VMT during project construction would be feasible. Because Mitigation Measure GHG-1 may not reduce project-related VMT to below the average VMT per service population numbers in the region, and although the VMT increases in the region resulting from the

Proposed Project would be temporary and only occur during construction, temporary VMT impacts from construction are conservatively concluded to be significant and unavoidable.

Mitigation Measure GHG-1: Implement measures to reduce GHG emissions from construction

See Impact GHG-1 in Section 3.8, *Greenhouse Gas Emissions*, for the full text of this mitigation measure.

Impact TRA-3: Create major driving or transportation- and circulation-related hazards (less than significant with mitigation)

All roadways in the study area would maintain their basic footprint even though some roadways would be raised to provide access over the newly constructed levee. For example, the construction of closure structures where the new levee crosses certain roads and rail lines would require roadway construction and involve roadway improvements, but would not alter the general footprint of any of the roads. These modifications would, therefore, not introduce any new roadway hazards, such as a sharp curve or dangerous intersections. Similarly, County Roads 98, 99, 101, and 102 would be raised where the roads cross the levee, but the roadway alignments would not change. No roadway improvements or modifications that would result from implementation of the Proposed Project would substantially alter the transportation network. In addition, the relatively small-scale changes to the roadways in the study area resulting from the Proposed Project (specifically, the raising of roadways) would not be expected to obstruct, hinder, or impair reasonable and safe views by drivers traveling on the same street or restrict the ability of a driver to stop the motor vehicle short of a collision (noting that the roadway design would adhere to the *County of Yolo Improvement Standards* [County of Yolo Department of Planning and Public Works 2008]). Similarly, no new long-term hazards to pedestrians or bicyclists would result from project implementation because no pedestrian or bicycle paths would be directly altered as a result of the project. For these reasons, long-term impacts related to an increase in hazards from project implementation would be less than significant.

Although there would be no permanent changes to roadway alignments in the study area that would increase hazards, there would be a temporary increase in truck traffic on roads in the area resulting from construction. The addition of heavy trucks (with up to approximately 330 one-way truck trips or 430 total vehicle trips added on a worst-case day) utilizing roadways in the study area could potentially increase hazards for drivers, pedestrians, and bicyclists, depending on the road being used, and the specific features of that road. The potential effect of increasing haul truck traffic on I-5, for example, would likely be less substantial than the potential effect of increasing haul trucks on County Road 102 or 22, as these two-lane roads typically have a smaller amount of daily automobile traffic than I-5 under existing conditions. Therefore, the Proposed Project would result in a higher ratio-increase of vehicle traffic and a higher ratio increase of haul trucks (which could be considered an incompatible use), on these roads than it would on I-5.

In addition, although specifics are not known at this time for all temporary roadway closures or temporary roadway modifications during construction, it is possible that some roadways in the study area may be temporarily reduced in width (e.g., from two lanes to one lane) or temporarily closed (resulting in detours for normal roadway traffic) during construction of the Proposed Project. For example, the county roads that will be raised would likely be closed during construction, and the use of roadway detours would be required. It is also possible that other roads (Churchill Downs

Avenue, County Road 22, East Main Street) would need to be temporary closed or reduced in width to allow for the construction of closure structures (Hilliard pers. comm. [b]). These types of temporary roadway modifications or closures could also result in a temporary increase in roadway hazards.

At this time, one detour is specifically planned for the project construction period. The construction of box culverts for the Proposed Project would require the closure of SR 113 between Churchill Downs Avenue and County Road 18C for 3 months. Traffic driving south on SR 113 from points north of the City of Woodland would use alternate routes during that time. A detour would be provided to allow motorists to access I-5 via County Road 18/Coil Lane during the period of box culvert construction, which would be removed once reconstruction of SR 113 is complete.

While the detour on County Road 18 is in effect, traffic would increase temporarily along the detour route. Under existing conditions, an estimated average daily traffic (ADT) volume of 950 vehicles use County Road 18 between SR 113 and I-5, derived from traffic count data developed by Caltrans (2017). During the SR 113 road closure, up to an additional 3,600 vehicles may use the County Road 18 detour to access I-5. This is a conservative estimate that assumes that this segment SR 113 would still be the preferred route by motorists to access I-5, as there are other vehicle routing options available.

Assuming 3,600 vehicles would be added to the current ADT, up to 4,550 vehicles would use the County Road 18 detour during the SR 113 closure. This temporary roadway closure could result in a temporary increase in roadway hazards.

Because a temporary increase in incompatible uses (such as heavy trucks utilizing a relatively small county road) or in hazards on area roadways could occur during project construction, impacts would be significant. Implementation of Mitigation Measure TR-1, which includes measures that would minimize roadway and transportation hazards during project construction, would reduce any potential increase in hazards that could occur during project construction to a less-than-significant level.

Mitigation Measure TRA-1: Traffic management plan for project construction

The City of Woodland will develop and, upon review and consultation with Yolo County implement a traffic management plan for construction of the Proposed Project to address issues related to transportation-related circulation, access, staging, and hours of delivery during the construction window. The traffic management plan would disseminate appropriate information to contractors and affected agencies regarding coordinating construction activities to minimize disruption and maintain circulation to the extent possible, with particular focus on ensuring connectivity for transit, people walking, and people bicycling. The traffic management plan would supplement and expand, rather than modify or supersede, any manual, regulations, or provisions set forth by relevant City or County departments and agencies, and the California Department of Transportation.

The traffic management plan will include a range of measures to minimize disruption, to the extent feasible, so that overall circulation is maintained to the extent possible during project construction. The construction management plan may include the following measures.

- Restricted Truck Access Hours—Limit truck movements to weekdays and restrict the amount of truck movement that occurs between the peak hours of 7 a.m. and 9 a.m. and between 4 p.m. and 7 p.m. to the extent feasible and reasonable (in light of noise regulations, labor and contract requirements, available daylight hours, and critical-path construction schedules). This will help to minimize disruptions to vehicular traffic and the addition of potential roadway hazards during the a.m. and p.m. peak periods.

- Emergency Access—Traffic control and local traffic access will be provided at all times for residents, schools, emergency response vehicles (fire department, etc.), agricultural operations, business and property owners on closed roads, should detours or temporary roadway modifications occur during construction of the Proposed Project.
- Emergency Response Liaison—Appoint an emergency response liaison to coordinate the reduction of construction-related traffic for the duration of any emergency at or nearby the project site. The City of Woodland and Yolo County Fire Departments and Sherriff's Offices and the California Highway Patrol will be provided with the construction schedule and the onsite contact information for the emergency response liaison prior to construction. The emergency response liaison will be immediately reachable at all times during project construction. The emergency response liaison will have radio contact with project construction vehicles at all times to coordinate traffic reduction measures. In addition, the emergency response liaison will coordinate with the local fire and sheriff's departments and the California Highway Patrol to establish emergency procedures for access to the project site in the event of an emergency.
- Community Liaison Officer—Appoint a community liaison officer to respond to inquiries or concerns of surrounding residents and businesses, as well as the general public. The community liaison officer will be located onsite during construction hours and may be contacted via a project hotline. The name of the community liaison officer and the hotline phone number shall be conspicuously posted at the construction site. The community liaison officer will notify the contractor if they have been notified of any construction activities that potentially violate the traffic management plan.
- Roadway Signage—The City or the City's contractor will clearly identify the work zone and any temporary roadway modifications with signage and warning lights, noting that the driver's sight lines will vary from location to location depending on the curve of the road, hills/valleys, or objects/buildings beside the road. The contractor will ensure that any signs, devices, or barriers are visible in all varying conditions of light and weather, and make sure that the work zone is indicated far enough in advance (so that drivers have time to adjust their speed and plan for temporary roadway changes). In addition, electrically operated programmable signs warning the public about upcoming closures or modifications will be places at locations of closures beginning 1 week prior to the roadway closure.
- Pedestrian/Bicycle Route Signage—Proper sidewalk or bicycle lane/trail closure signs and signage will be utilized to clearly indicate any required detours resulting from construction. Sidewalks will not be closed without proximate usable alternative walkways being available.

Impact TRA-4: Result in inadequate emergency access (less than significant with mitigation)

The Proposed Project would not result in any major or long-term changes to roadways in the study area except for the raising of some roadways and the construction of one roadway closure structure (which would only close during a large-scale flood event when the road is already at risk of flooding, or during an emergency situation). As described under Impact TR-3, although there would be some roadway modifications (e.g., the raising of roads), all roadways in the study area would maintain their basic footprint after the completion of construction. For this reason, there would be no long-term change in emergency access in the study area. During flood events, there would be fewer access restrictions than under existing conditions. This is because the proposed levee would prevent some portions of roadways that provide access to Woodland, (such as I-5 and SR 113 south of the proposed levee), from flooding and becoming inaccessible (see Figures 3.1-5 and 3.1-6). As described in Section 3.12.1.2, I-5 would be largely under water and inaccessible from the City in either direction under existing conditions. Implementation of the Proposed Project would remove the risk of flooding from I-5 both in the city and to the east of the city, allowing access into and out of the city from/to the east towards Sacramento.

Project construction would be temporary (for two 6 to 7-month periods over a 2-year span), and would not occur in the same location for the full 2-year period (as construction activity would move along the levee alignment). However, during construction, the Proposed Project would increase the number of heavy trucks on roadways in the study area, and could also result in the temporary modification or closure of some roadways due to construction (potentially requiring the use of roadway detours). Specifically, and as mentioned above, one detour is currently planned for the construction period. Project construction would require the closure of SR 113 between Churchill Downs Avenue and County Road 18C for approximately 3 months. Traffic driving south on SR 113 from points north of the City of Woodland would use alternate routes during that time. A detour would be provided to allow motorists to access I-5 via County Road 18/Coil Lane during the period of box culvert construction, which would be removed once reconstruction of SR 113 is complete. The closure of SR 113 could potentially obstruct emergency vehicle access to locations along the closure.

Since some temporary roadway closures or modifications during the project construction period may result in heavier traffic along open roads and access issues in certain areas, it is possible that emergency access (including the response time of emergency vehicles) to certain areas in the project vicinity could be affected during construction.

Because the temporary construction-related increase in roadway truck traffic and the construction-related temporary road closures or detours could potentially delay or obstruct the movement of emergency vehicles in the study area, temporary impacts related to emergency access during project construction would be significant. Implementation of Mitigation Measure TRA-1 under Impact TRA-3 would ensure the emergency vehicle access to the project vicinity during construction would not be significantly restricted. The processes identified in the traffic management plan under this mitigation measure would reduce any temporary construction-related emergency access impact to a less-than-significant level.

Mitigation Measure TRA-1: Traffic management plan for project construction

See Impact TRA-3 above for the full text of this mitigation measure.

3.13 Public Services, Utilities, and Service Systems

This section describes the regulatory and environmental setting for public services (fire and police protection, schools, and parks), utilities and service systems in the project area, as identified in Chapter 2, *Project Description*, Figure 2-1, analyzes effects on public services, utilities, and service systems that would result from implementation of the Proposed Project.

3.13.1 Existing Conditions

3.13.1.1 Regulatory Setting

This section summarizes key federal, state, and local or regional regulations, laws, and policies relevant to utilities and service systems in the project area.

Federal

Clean Water Act

Federal environmental regulations based on the Clean Water Act (CWA) have evolved to require the control of pollutants from *Municipal Separate Storm Sewer Systems* (MS4s), construction sites, and industrial activities. Discharges from these sources were brought under the National Pollutant Discharge Elimination System (NPDES) permit process by the 1987 CWA amendments and subsequent 1990 and 1999 promulgation of stormwater regulations by the U.S. Environmental Protection Agency (USEPA). In California, USEPA has delegated the administration of the federal NPDES program to the State Water Resources Control Board (State Water Board) and the nine Regional Water Quality Control Boards (Regional Water Boards). The Proposed Project will be required to comply with the NPDES program and MS4 through various activities (e.g., the preparation of a Stormwater Prevention Pollution Plan). See Section 3.2 *Water Quality*, for discussion of the CWA.

State

Porter-Cologne Water Quality Control Act (Section 13000 et seq.)

The Porter-Cologne Water Quality Control Act directs the State Water Board and Regional Water Boards to prepare water quality control plans (basin plans) that establish water quality objectives and beneficial uses for each body of water, including groundwater basins, within the regional boundaries. The Porter-Cologne Act empowers the State Water Board and Regional Water Boards to protect the beneficial use of California waters, thereby providing broader authority than offered by the Clean Water Act alone. The State Water Board and Regional Water Boards adopt regulations to protect surface water quality. The Proposed Project will be required to comply with the Porter-Cologne Water Quality Control Act through a CWA 401 Water Quality Certification as part of obtaining permits for implementation. See Section 3.2, *Water Quality*, for further discussion of the Porter-Cologne Water Quality Control Act.

California Integrated Waste Management Board

The California Integrated Waste Management Board is the state agency designated to oversee, manage, and track California's 76 million tons of waste generated each year. It is one of the six agencies under the umbrella of the California Environmental Protection Agency. The California Integrated Waste Management Board develops laws and regulations to control and manage waste; enforcement authority is typically delegated to the local government. The board works jointly with local government to implement regulations and fund programs.

Pursuant to the California Integrated Solid Waste Management Act of 1989, all cities in California are required to reduce the amount of solid waste disposed in landfills. Contracts that include work that will generate solid waste, including construction and demolition debris, have been targeted for participation in source-reduction, reuse, and recycling programs. Contractors are urged to manage solid waste to divert waste away from disposal in landfills (particularly Class III landfills) and to maximize source reduction, reuse, and recycling of construction and demolition debris. The Proposed Project would generate solid waste during construction through the demolition of structures and roads, clearing and grubbing of vegetation, and soil excavation and will need to comply with the California Integrated Solid Waste Act.

Local

Yolo County General Plan

The *Public Facilities and Services Element* of the Yolo County *2030 Countywide General Plan* (Yolo County 2009) contains the following titles goals and policies applicable to the Proposed Project.

- Goals and policies related to wastewater and stormwater management (Goal PF-1 Wastewater Management, Goal PF-2 Stormwater Management. Provide efficient and sustainable stormwater management to reduce local flooding in existing and planned land uses, Policy PF-2.1 Improve stormwater runoff quality and reduce impacts to groundwater and surface water resources).
- Goals and policies relating to law enforcement services, fire services, and other emergency services including response times for these services (Policy PF-4.2 Strive to maintain an average response time of 12 minutes for 90 percent of priority law enforcement calls in the rural areas, Goal PF-5 Fire and Emergency Medical Services, Policy PF-5.1 Improve the performance and efficiency of fire protection and emergency medical services, Policy PF-5.2 Maintain mutual aid agreements.)
- Goals and policies related to solid waste and recycling (Goal PF-9 Solid Waste and Recycling. Provide safe, cost-efficient, and environmentally responsible solid waste management, Policy PF-9.1 Meet or exceed State waste diversion requirements, Policy PF-9.8 Require salvage, reuse or recycling of construction and demolition materials and debris at all construction sites).

City of Woodland General Plan

The *Public Facilities and Safety Element* of the *City of Woodland General Plan 2035* (City of Woodland 2017) contains the following titles of goals and policies applicable to the Proposed Project.

- Goals and policies related to law enforcement services, fire services, and other emergency services including response times for these services (Goal 5.A, Law Enforcement Services, Policy 5.A.1, Response Time; Goal 5.B, Fire Protection Services, Policy 5.B.1 Response Time and Service Standards)

- Goals and policies related to stormwater management and stormwater drainage system to maintain such system such that the protection from flooding and enhance water quality (Goal 5.I Stormwater Management, Policy 5.I.1, Storm Drainage System and Cost Recovery)
- Goals and policies related to coordinating with utility companies and government agencies (Policy 5.K.1, Coordinate with Private Utility Companies and Policy 5.K.2, Coordinate with Government Agencies).

City of Woodland Groundwater Management Plan

The *City of Woodland Groundwater Management Plan* (GWMP) (City of Woodland 2011) was developed in coordination with other local agencies with adopted plans and other basin stakeholders in order to better manage groundwater resources and continue to meet the city's water demands. The GWMP addresses groundwater issues through agency coordination; groundwater quality monitoring; land subsidence monitoring; groundwater-surface water interaction monitoring; and data management, quality assurance, and quality control.

City of Woodland Urban Water Management Plan

The *2015 Urban Water Management Plan* (UWMP) was developed in compliance with the Urban Water Management Planning Act which requires water suppliers in California that provide water for more than 3,000 customers to prepare and adopt an UWMP every 5 years (City of Woodland 2016). The UWMP details the city's existing and future water uses, sources of supply, reliability of water supply, and conservation measures.

3.13.1.2 Environmental Setting

This section discusses the environmental setting relevant to public services, utilities and service systems in the project area.

Fire Protection

The project area is served by the Woodland Fire Department (WFD). The WFD provides fire and emergency medical services to 56 square miles including 41 square miles of rural area outside the city limits. The WFD operates three fire stations, Station #1 at 101 Court Street, Station #2 at 1619 West Street, and Station #3 at 1550 Springlake Court. All three stations are within 1.25 miles of the project area. Currently, the WFD is staffed with 45 personnel and is assisted by a part-time administrative staff person. The WFD is only staffed to meet National Fire Protection Association (NFPA) standards for low hazard fires and rely heavily on mutual aid partners for support to meet NFPA standards for higher risk fire incidents (City of Woodland 2017). This includes mutual aid agreements with the fire departments of Yolo County; Yocha Dehe Wintun Nation; the University of California, Davis; and the cities of Davis, Dixon, West Plainfield, West Sacramento, and Willow Oak (Woodland Fire Department n.d.).

Law Enforcement

Most of the project area is served by the City of Woodland Police Department located at 1000 Lincoln Avenue, Woodland. The department has a staff of 79 paid employees, including 64 sworn patrol officers and 15 non-sworn support personnel (City of Woodland 2017). The Yolo County Sheriff's Office provides law enforcement services to unincorporated areas of Yolo County. The Sheriff's Office is located at 140 Tony Diaz Drive, Woodland.

Schools

The project area is in the Woodland Joint Unified School District. However, no school facilities are located within the project area. The closest schools to the project area are Freeman Elementary (126 North West Street) and Woodland Senior High School (21 North West Street) located. Both schools are approximately 0.63 miles south of the project area.

Parks

There are 17 existing county parks in Yolo County, both resource (open space) and community parks, totaling approximately 1,976.5 acres (Yolo County 2009). The City of Woodland has numerous recreational facilities and parks. In the project vicinity, there are two federal recreation areas: Yolo Bypass and Fremont Weir Wildlife Areas. Park and recreational facilities are discussed in Section 3.16, *Recreation.*

Libraries

Libraries near the project area include the Woodland Public Library (250 1st Street, Woodland) and the Yolo Branch Public Library (37750 Sacramento Street, Yolo). The project area is in the Yolo County Libraries system, which has eight locations throughout the County. In the City of Woodland, there are three libraries. No libraries are in the project area.

Water Service and Supply

Most of Yolo County's domestic water supply originates from groundwater. The East Yolo subbasin extends from south of Dunnigan to Davis and provides the greatest supply of residential water extraction. See Section 3.2., *Water Quality*, for more information on groundwater.

In 2016, the Woodland–Davis Clean Water Agency (WDCWA) completed its water supply project, which includes a jointly owned and operated intake on the Sacramento River connecting to a regional water treatment facility (RWTF) which delivers treated water to Woodland, Davis, and the University of California, Davis. Woodland receives 18 million gallons of water per day from the RWTF, which is the primary source of drinking water in the city, supplemented by groundwater supplies during times of high-water demand or decreased surface water availability. The City maintains an Urban Water Management Plan, adopted in in 2016, and a Groundwater Management Plan, adopted in 2010 (City of Woodland 2016). The municipal water supply distribution system consists of 260 miles of transmission and distribution lines, a 3-million-gallon ground-level storage tank, and a 400,000-thousand-gallon elevated storage tank. There is one water main and one sewer line that cross the levee along West Street that might be affected by the Proposed Project.

Wastewater

Wastewater service is provided to Woodland by the City's Public Works Department. Wastewater is conveyed by gravity pipelines to the Water Pollution Control Facility (WPCF), located on County Road 24 east of the city, where it is treated and discharged into a large, unimproved channel. The treated wastewater eventually drains to the Tule Canal on the east side of the Yolo Bypass (City of Woodland 2017). Yolo County is primarily served through septic systems and, therefore, septic systems are present in the project area.

Stormwater Drainage

Within Woodland, much of the area is developed and has impervious surfaces that increase direct runoff during storm events. The city's stormwater system includes 130 miles of stormwater drainpipe, 14 miles of drainage channel, 1,600 catch basins, 1,874 drain inlets, nine detention ponds, and nine stormwater pumps in three locations (City of Woodland 2017). There is a limited impervious stormwater system within the project area, comprising mainly of culverts and gutters along roads, and most of the project area drains into the City of Woodland's North Drainage Canal.

Solid Waste Disposal

Solid waste collection and management within Woodland is provided by a franchise agreement with Waste Management. Material is disposed and processed at Yolo County Central Landfill, a 722-acre facility located on County Road 28H, approximately 6 miles southeast of Woodland. As of May 24, 2017, the solid waste unit of the Yolo County Central Landfill is permitted to process 1,800 tons per day has a remaining capacity of 35,171,142 cubic yards (California Department of Resources Recycling and Recovery 2019). Solid waste disposal capacity is anticipated to expire in approximately 2090. The large volume debris facility is permitted for 500 tons per day and has a maximum capacity of 57,000 cubic yards. The composting facility can accept a maximum of 500 tons per day and has a maximum capacity of 208,000 cubic yards. (California Department of Resources Recycling and Recovery 2019).

In addition to city waste, county waste is also collected and disposed of at this landfill. Collection for Yolo County is conducted by Waste Management. Based on historical waste disposal and population projections, countywide permitted municipal solid waste disposal capacity is anticipated to expire in approximately 2090 (Yolo County Planning and Public Works Department 2012:1).

Electricity and Gas

In 2016, Yolo County and the City of Davis formed the Community Choice Energy Program (City of Woodland n.d.). Community Choice Energy was launched in 2018, offering customers the option to select either Valley Clean Energy or Pacific Gas & Electric (PG&E) as their electricity provider. PG&E remains responsible for distributing electric services and maintaining the infrastructure.

Natural gas is provided by PG&E throughout the county. Three major PG&E gas transmission lines extend through the project area. The first gas transmission line runs north to south along County Road 98. The second runs northwest to southeast intersecting the project area near Truck Mixer Supply on Highway 113 and again at Churchill Downs Avenue west of Santa Anita Drive. The third gas transmission line begins at Churchill Downs Avenue and continues north along County Road 101. (City of Woodland 2017.)

Telecommunications

The primary provider of land line telephone service throughout the county is AT&T. Residents of Woodland are provided broadband services predominantly by AT&T of California and Wave Broadband.

3.13.2 Environmental Impacts

This section describes the environmental impacts associated with utilities and service systems that would result from implementation of the Proposed Project. It describes the methods used to determine the effects of the Proposed Project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts are provided.

3.13.2.1 Methods for Analysis

The methods for conducting the impact analysis for public services and utilities are based on service ratios, capacities, response times, or other performance objectives and whether implementation of the Proposed Project would result in an exceedance of an existing, permitted, or acceptable performance objective.

3.13.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the Proposed Project would be considered to have a significant effect if it would result in any of the following conditions.

- Substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the following public services:
    - Fire protection
    - Police protection
    - Schools
    - Parks
    - Other public facilities
- Relocation or construction of new or expanded water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities, with the potential to cause significant environmental effects.
- Creation of a need for new or expanded entitlements or resources for sufficient water supply to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years.
- A determination by the wastewater treatment provider that serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.
- Generation of solid waste in exceedance of state or local standards or in excess of the capacity of local infrastructure, or other impediment to the attainment of solid waste reduction goals.
- Failure to comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

The Proposed Project, including floodproofing individual structures, would not result in a direct population increase that would require new government facilities or lead to the physical alteration of existing facilities, including fire and police protection, schools, parks, or other public facilities. There are no community facilities within the project area and the project would not physically alter any government facilities because the Proposed Project is an infrastructure project. The Proposed Project would not result in any loss of service ratios, response times, or other performance objectives of fire, policy, or library services because the Proposed Project is not resulting in a direct population increase that would require these services to increase to maintain existing service ratios. Emergency access would be maintained during construction as already described in Sections 3.12, *Transportation*, and 3.18, *Hazards, Hazardous Materials, and Wildfire* through the preparation of a transportation management plan. Accordingly, impacts on public services do not apply to the Proposed Project and are not considered further.

The Proposed Project, including floodproofing individual structures, would not generate a significant amount of wastewater because the Proposed Project is an infrastructure project and would not involve residential or commercial uses that would generate wastewater. No septic systems are proposed, and portable toilets would be provided during construction which would be properly maintained and disposed of once construction was complete. Therefore, impacts on wastewater treatment facilities' capacity do not apply to the Proposed Project and are not considered further.

The Proposed Project, including floodproofing individual structures, would be required to comply with local, state, and federal solid waste regulations. Therefore, impacts on solid waste reduction statutes and regulations do not apply to the Proposed Project and are not considered further.

3.13.2.3 Impacts and Mitigation Measures

Impact PSU-1: Relocation or construction of new or expanded water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction of which could cause significant environmental effects (less than significant)

The Proposed Project is an infrastructure project that does not involve the construction or operation of residential, commercial, industrial, or agricultural uses that would require water use or need a water supply. Floodproofing individual structures would not alter any existing water use that might be needed by the existing structure. Therefore, the Proposed Project would not require the construction of new or expanded water facilities, the construction of which could cause significant environmental effects.

Water for construction use, including an onsite batch plant to produce slurry, would be trucked in and, therefore, would not require the construction of new or expanded water facilities. There are multiple existing water lines within the project footprint; however, no impacts or disruption of water or sewer utilities is anticipated. It is assumed that the levee can be constructed over any underground utilities, including the water main and sewer line along the levee. However, project engineers may determine water or sewer lines should be redesigned to meet Urban Levee Design Criteria (Busch pers. comm.). Therefore, impacts related to water facilities would be less than significant.

The Proposed Project, including floodproofing individual structures, does not involve the construction or operation of uses such as residential, commercial, or industrial that typically generate wastewater; as such, the Proposed Project would not require the construction of new or expanded wastewater facilities, the construction of which could cause significant environmental effects. Therefore, there would be no impacts related to wastewater facilities.

The Proposed Project would not require or result in the construction or expansion of stormwater drainage facilities because the Proposed Project is an infrastructure project and would not be developing uses that would require the conveyance of stormwater offsite. However, the purpose of the Proposed Project is to provide 100- and 200-year flood protection, so it would capture potential floodwaters and divert them away from existing development. As discussed in Section 3.1, *Hydrology*, Impact HYDRO-1, drainage patterns would be altered to complete the Proposed Project; however a significant reduction in the amount of natural soil surfaces available for infiltration of rainfall and runoff would not occur, and thereby generating little, if any, additional runoff and associated erosion and siltation would occur during storm events. Furthermore, as discussed in Chapter 2, *Project Description*, Section 2.3.3.8, *Stormwater Pollution Prevention* and Section 3.2, *Water Quality*, a Stormwater Pollution Prevention Plan would be required in order to manage stormwater during construction activities. Finally, as discussed in Impact HYDR-1, floodproofing individual structures would not significantly alter the existing drainage pattern of the site or area. Therefore, impacts on stormwater facilities would be less than significant.

In order to clear the levee, overhead electrical lines along County Road 98, West Street, East Street, Pioneer Avenue, and County Road 102 would be raised (Busch pers. comm.). Any disruption in service would be temporary and coordinated with PG&E and other service providers. Coordination with utility service providers would occur prior to, during, and immediately after construction to manage any necessary temporary service disruptions so the effects would be minimized. As part of utility agency coordination, information would be provided in sufficient detail and with sufficient notice to allow temporary delays or disruptions in service to be communicated with customers in advance and for alternative service arrangements to be put in effect. As a result, impacts on utilities would be less than significant.

Impact PSU-2: Have sufficient water supply to serve the Proposed Project and reasonably foreseeable future development during normal, dry, and multiple dry years (less than significant)

The Proposed Project, including floodproofing existing structures, does not involve the construction or operation of residential, commercial, industrial, or agricultural uses that would require water use or need a water supply. Water use would take place during construction. Water would be used for mixing slurry, as well as for dust control on roads and during grading and site work. Daily water use would vary. A minimal amount of water would be required for construction worker needs (e.g., drinking water, sanitation facilities). The City of Woodland plans to draw needed water for water trucks and drinking water from an offsite source for construction, and no water would be needed for project operation. No new or expanded entitlements to supply the project during construction or operation are anticipated. This impact would be less than significant.

Impact PSU-3: Project-related exceedance of state or local solid waste standards or of the capacity of local infrastructure, or other impediments to attaining solid waste reduction goals (less than significant)

Most of the solid waste generated would be during construction of the levee. The Proposed Project is not anticipated to generate a substantial amount of solid waste because most of the excavated soils would be used elsewhere in the project footprint, which would reduce the amount of solid waste taken to landfills. As described in Chapter 2, *Project Description,* earthwork quantities for the Proposed Project are nearly balanced; however, some material is expected to be unsuitable for use in levee construction.

Site preparation would also require clearing and grubbing which would involve the removal of larger woody vegetation, including trees, rootballs, and other existing debris within the project footprint. Structure and road demolition activities would include removing standing structures within the levee and borrow area footprints.

Accounting for this unsuitable material, along with the waste material from clearing and grubbing and expected demolition and construction debris, it is estimated that approximately 100,000 cubic yards of material will require disposal. These materials would be loaded into waste containers and transported by truck to the Yolo County Central Landfill.

If applicable, some of the waste generated during project construction would utilize the landfill's composting facility that accepts green materials and the construction debris facility that are in addition to the solid waste facility of the Yolo County Central Landfill

Therefore, the approximately 100,000 cubic yards of waste generated by project construction would not be considered a substantial amount for the landfill to process. This amount is 0.28 percent of the remaining landfill capacity. It is not anticipated that the construction or operation of the Proposed Project would generate enough solid waste to affect the function or capacity of the landfill. This impact would be less than significant.

Similarly, floodproofing existing structures might generate small amounts of solid waste, but would not require the demolition of structures and therefore is expected to result in even smaller amounts of solid waste generated by the construction of the levee. As such, impacts would be less than significant.

3.14 Energy

This section describes the regulatory and environmental setting for energy in the project area, which is primarily located in unincorporated areas of Yolo County; analyzes effects related to energy that would result from implementation of the Proposed Project; and provides mitigation measures to reduce the effects of any potentially significant impacts. Information presented in the discussion and used for the subsequent analysis was drawn primarily from the following sources.

- Lower Cache Creek construction assumptions (Hilliard pers. comm. [a], [b]).
- California Energy Commission electricity and natural gas consumption data (California Energy Commission 2016a, 2016b)
- California Energy Commission annual retail fuel report data (California Energy Commission 2019b, 2019c)
- *City of Woodland Climate Action Plan* (City of Woodland 2017a)
- *City of Woodland General Plan 2035* (City of Woodland 2017b)
- Yolo County *2030 Countywide General Plan* (Yolo County 2009)
- *Yolo County Climate Action Plan* (Yolo County 2011)

3.14.1 Existing Conditions

Energy use includes direct and indirect consumption of energy during construction and operation, including electricity and natural gas and fuel associated with transportation-related energy. This section describes the regulatory setting and environmental setting associated with indirect and direct energy use.

3.14.1.1 Regulatory Setting

This section summarizes key federal, state, and local or regional regulations, laws, and policies relevant to energy in the project area. This section also identifies regulations applicable to renewable energy use or energy efficiency. Please also see Sections 3.7, *Air Quality*, and 3.8, *Greenhouse Gas Emissions*, for more information regarding the regulations controlling and governing emissions. Vehicle fuel economy regulations are included in this section because they are relevant to construction vehicles and equipment that would be required for the Proposed Project.

Federal

Energy Policy and Conservation Act of 1975 and Corporate Average Fuel Standards

The Energy Policy and Conservation Act of 1975 established the first fuel economy standards for on-road motor vehicles sold in the United States. The National Highway Traffic and Safety Administration is responsible for establishing vehicle standards and revising existing standards. Its Corporate Average Fuel Economy program was created to determine vehicle manufacturers' compliance with the fuel economy standards. The U.S. Environmental Protection Agency administers the testing program that generates the fuel economy data.

Energy Policy Act of 2005

The Energy Policy Act of 2005 establishes a comprehensive, long-term federal energy policy and is implemented by the U.S. Department of Energy. The act addresses energy production in the United States, including oil, gas, coal, and alternative forms of energy and energy efficiency and tax incentives. Energy efficiency and tax incentive programs include credits for the construction of new energy efficient homes, production or purchase of energy efficient appliances, and loan guarantees for entities that develop or use innovative technologies that avoid the production of greenhouse gas emissions (GHGs).

Energy and Independence Security Act of 2007

The Energy Independence and Security Act (EISA) of 2007 was passed to increase the production of clean renewable fuels; increase the efficiency of products, buildings, and vehicles; improve the energy performance of the federal government; and increase U.S. energy security, develop renewable fuel production, and improve vehicle fuel economy. The act included the first increase in fuel economy standards for passenger cars since 1975, a new energy grant program for use by local governments in implementing energy-efficiency initiatives, and a variety of green building incentives and programs.

State

California has recently focused on energy efficiency and planning for energy resources at a statewide level, which influences local planning efforts. The following state regulations provide context for these planning efforts.

Assembly Bill 2076, Reducing Dependence on Petroleum (2000)

The California Energy Commission (CEC) and California Air Resources Board (CARB) are directed by Assembly Bill 2076 to develop and adopt recommendations for reducing dependence on petroleum. A performance-based goal is to reduce petroleum demand to 15 percent less than 2003 demand by 2020.

Senate Bill 1389 (2002) and California Integrated Energy Policy Report

Senate Bill (SB) 1389 requires the CEC to develop an integrated energy plan for electricity, natural gas, and transportation fuels. The CEC adopts an Integrated Energy Policy Report (IEPR) every 2 years and an update every other year. The IEPR covers a broad range of topics, including environmental performance of the electricity generation system, landscape-scale planning, transportation fuel supply reliability, climate adaptation activities, and climate and sea level rise scenarios intended to support improvements to the California energy system that reduce air pollution, congestion, and wasteful energy use. The Draft 2019 IEPR was recently released for public review and comment, with a public comment period end date of November 27, 2019.

Renewables Portfolio Standard Program—Senate Bills 1078 (2002), 107 (2006), and 2 (2011)

In 2002, California established its Renewables Portfolio Standard (RPS) Program, with the goal of increasing the percentage of renewable energy in the state's electricity mix to 20 percent of retail sales by 2010. In 2006, California's 20 percent by 2010 RPS goal was codified under SB 107. Under the provisions of SB 107, investor-owned utilities were required to generate 20 percent of their retail electricity using qualified renewable energy technologies by the end of 2010. In 2008, Governor's Executive Order S-14-08 was signed into law requiring California retail sellers of electricity serve 33 percent of their load with renewable energy by 2020.

Clean Energy and Pollution Reduction Act of 2015, 100 Percent Clean Energy Act of 2017 (2015, 2018)—Senate Bills 350 and 100

SB 350 was approved by the California legislature in September 2015 and signed by Governor Brown in October 2015. Its key provisions include: (1) a RPS of 50 percent by 2030; and (2) a doubling of energy efficiency (electrical and natural gas) by 2030, including improvements to the efficiency of existing buildings. These mandates will be implemented by future actions of CPUC and CEC. SB 100 was approved by the California Legislature in August 2018 and signed by Governor Brown in September 2018. Its key provisions are to raise the RPS requirement set by SB 350 from 50 to 60 percent by 2030 and to create a new policy to meet all of the state's retail electricity supply with a mix of RPS-eligible and zero-carbon resources by December 31, 2045, for a total of 100 percent clean energy.

Local

Climate Action Plans

As discussed in more detail in Section 3.8, the City of Woodland adopted a Climate Action Plan (CAP) in May 2017, and Yolo County adopted a CAP in March 2011. These plans include goals and strategies to mitigate the impacts of climate change and achieve GHG reductions within their jurisdictions consistent with state goals for addressing California's contributions to climate change (City of Woodland 2017a; Yolo County 2011). The City and County of Sacramento, as well, as other jurisdictions along the material hauling routes for construction of the Proposed Project, also have adopted CAPs.

Yolo County General Plan

The *2030 Countywide General Plan* contains goals, actions, and policies in its *Public Facilities and Services* and *Conservation and Open Space Elements* relevant to energy resources in the project area (Yolo County 2009). These elements emphasize use and development of alternative energy sources, energy efficiency, and conservation in the region. The goals, actions, and policies are not directly relevant to the Proposed Project; however, because they focus on opportunities or requirements associated with homes, businesses, or agricultural land uses. The Proposed Project does not involve development of these uses and would not conflict with the intent of the County's goals for the region.

City of Woodland General Plan

The *Public Facilities and Services* and *Sustainability, Conservation, and Open Space Elements* of the *City of Woodland General Plan 2035* (2017b) have goals and policies that encourage a shift to renewable energy use and improvement of community-wide energy conservation to reduce the amount of energy consumed across land uses and transportation choices and promote use of more renewable energy sources, such as solar and wind energy. The policies are not directly relevant to the Proposed Project because they focus on implementation of measures or actions related to site planning and construction or retrofit of residential or commercial buildings and the installation of renewable energy production systems, facilities, or technologies.

3.14.1.2 Environmental Setting

This section discusses the environmental setting relevant to energy resources. Information and data is provided for Yolo County as the project area primarily includes land within unincorporated Yolo County (approximately 10,292 acres).

Natural Gas and Electricity

Pacific Gas and Electric (PG&E) provides natural gas and electric service within 70,000 square miles of northern and central California. PG&E's service area extends from Eureka to Bakersfield (north to south) and from the Sierra Nevada to the Pacific Ocean (east to west). PG&E purchases both gas and electrical power from a variety of renewable and non-renewable sources, including other utility companies. PG&E obtains its energy supplies from power plants and natural gas fields in northern California. It also purchases energy from outside the service area and delivers it through high-voltage transmission lines. PG&E operates a grid distribution system that channels all power produced at the various generation sources into one large energy pool for distribution throughout the service territory. The city of Woodland and Yolo County are within the Sacramento–Sierra Division, which serves over 1.3 million residents in Sacramento, Yolo, Solano, Colusa, Yuba, Sutter, Sierra, Nevada, Placer, and El Dorado Counties.

In June 2018, Valley Clean Energy (VCE), a local electricity provider, began offering customers in the cities of Davis and Woodland and unincorporated Yolo County an alternative, low carbon power source. VCE is a not-for-profit agency that customers can choose as an alternative to PG&E. VCE pools the electricity demands of the communities it serves and purchases power with higher renewable and lower GHG content than is offered by PG&E. PG&E continues to deliver electricity, maintain the power lines, handle customer billing, and respond to new service requests and emergencies. (Valley Clean Energy n.d.)

With a relatively mild Mediterranean climate and strict energy-efficiency and conservation requirements, California has lower energy consumption rates than other parts of the country. According to the Energy Information Administration (EIA), California's per capita energy consumption, at 200 million British Thermal Units (BTUs) ranked 48th in the nation as of 2017 (U.S. Energy Information Administration 2017). California has among the lowest annual electrical consumption rates per person of any state (California Energy Commission 2019a).

Between 2012 and 2018, total electricity use in Yolo County was 11,975 gigawatt hours (GWh), with annual ranges of between 1,674 to 1,745 GWh. Non-residential uses (industrial, commercial) make up approximately 70 percent of total use each year and residential uses the remaining 30 percent (California Energy Commission 2016a). In this same timeframe, total natural gas consumption in Yolo County was 406 million therms, with annual ranges of between approximately 54 to 60 million therms per year. Non-residential uses were in the range of approximately 55 to 59 percent of the total annual consumption, while residential uses ranged from approximately 41 to 45 percent of total annual consumption.

Fuel

The sale of gasoline and diesel in the state and in Yolo County, and therefore the use of these two energy sources fluctuate over time. Between 2012 and 2018, annual sales in California ranged from 14,486 to 15,584 million gallons of gasoline and approximately 2,603 to 3,124 million gallons of diesel (California Energy Commission 2019b). By comparison, in Yolo County, between 2012 and

2018, annual sales ranged from 87 to 113 million gallons of gasoline and approximately 33 to 40 million gallons of diesel (California Energy Commission 2019c).

3.14.2 Environmental Impacts

This section describes the environmental impacts associated with energy resources that would result from implementation of the Proposed Project. It describes the methods used to determine the effects of the Proposed Project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts are provided.

3.14.2.1 Methods for Analysis

Impacts on energy resources associated with construction and operations and maintenance (O&M) of the Proposed Project were assessed and quantified (where applicable) using standard and accepted software tools, techniques, and emission factors and on information provided by the project engineering team (Wood Rodgers, Hilliard pers. comm. [a], [b]). As described in Chapter 2, *Project Description*, Section 2.3.6, *Additional Features Proposed by the City of Woodland*, floodproofing of individual structures could occur for certain buildings within the project area. The methods for analyzing this aspect of the Proposed Project are also described below.

Construction

Proposed Levee

Construction activities associated with construction of the proposed levee would primarily take place in 2023 and 2024, with work occurring between March and September of each year. Construction would generally occur Monday through Saturday from 7 a.m. to 6 p.m. Construction-related energy consumption would result from mobile and stationary construction equipment, as well as employee and haul truck vehicle travel. These energy demands would be temporary (i.e., limited to the construction period) and would cease when construction activities are complete.

Fuel consumption from off-road equipment and onsite vehicle travel were quantified by converting metric tons of carbon dioxide (CO_2) emitted using fuel to gas ratios from The Climate Registry (2019). Fuel consumption from offsite vehicle travel were quantified using CARB's EMFAC2017 model. Electricity consumption was provided directly by Wood Rodgers. Fuel use was converted to one million BTUs (mmBTUs) using the USEPA's high heat values per their Mandatory Greenhouse Gas Reporting (78 Federal Register [FR] 71950, Nov 29, 2013, as amended at 81 FR 89252, December 9, 2016).

Floodproofing Individual Structures

Additional construction associated with floodproofing of individual structures could occur between 2024 and 2029. Floodproofing construction-related energy consumption (i.e., gasoline and diesel fuel usage) would result from mobile and stationary construction equipment, as well as employee vehicles and haul truck travel. Energy demands associated with construction of these individual structures would be temporary and cease when construction activities are complete. Estimated energy use resulting from these activities for completion of an individual structure were quantified using data from the project engineering team (Wood Rodgers) (Hilliard pers. comm. [b]) and the methods described above. There would be no electricity use associated with these activities and this analysis focus is on fuel consumption.

The exact number of structures that would be floodproofed and the specific timing of floodproofing activities is currently unknown. However, it is anticipated these activities would begin during the second year of construction of the proposed levee and would occur on a case-by-case basis that does not overlap in time. In other words, it is assumed a single floodproofing project would be identified and completed before another floodproofing project started. For the purposes of analysis, it was assumed that up to three structures could be floodproofed in 2024 and two structures each year thereafter through 2029. While floodproofing of individual structures would not occur concurrently, it was conservatively assumed that a structure would be floodproofed in 2024 concurrent with the highest anticipated construction activities required for the levee. This assumption was made for the CEQA document to present a worst-case analysis of potential impacts.

Operations and Maintenance

The existing Cache Creek levees will continue to undergo regular O&M. Minimal amounts of equipment and vehicles would be required for landscaping, levee slope and road conditioning, and periodic sediment removal. Given the limited and infrequent nature of O&M for the proposed levee, energy use is evaluated qualitatively. The individual floodproofed structures would not require any O&M or require additional energy consumption.

3.14.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the Proposed Project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operations.
- Conflict with or obstruction of a state or local plan for renewable energy or energy efficiency.

3.14.2.3 Impacts and Mitigation Measures

Impact EN-1: Wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation (less than significant)

The Proposed Project consists of developing flood control infrastructure in the City of Woodland and Yolo County and would use energy primarily for construction and with less energy needed during operations and maintenance.

Construction

Levee

Construction energy consumption would vary depending on the level of activities throughout the proposed levee construction stages. Table 3.14-1 summarizes the estimated annual energy consumption for construction of the levee.

Table 3.14-1. Summary of Annual Fuel and Electricity Consumption from Construction of the Proposed Levee

Year/Source	Gallons	kWh	mmBTU
2023			
Off-road Equipment	90,037	0	12,425
Employee Travel	1,832	0	229
Haul Trucks	66,640	0	9,196
Onsite Vehicles	5,451	0	740
Concrete Batching	5,401	0	745
Electricity	0	7,320	25
Total 2023	169,361	7,320	23,361
2024			
Off-road Equipment	127,523	0	17,598
Employee Travel	1,859	0	232
Haul Trucks	13,901	0	1,918
Onsite Vehicles	54,642	0	7,532
Concrete Batching	0	0	0
Electricity	0	7,320	25
Total 2024	197,926	7,320	27,306
Construction Total	367,287	14,640	50,666

kWh = kilowatt hour, mmBTU = one million British Thermal Units.

Electricity use would include supply for the onsite contractor trailer. Electricity usage was estimated using activity data provided by Wood Rodgers. As shown in Table 3.14-1, an estimated 7,320 kilowatt hours (kWh) or 25 mmBTU would be used each construction season. This represents a very small fraction (0.0004 percent) of total annual electricity use in Yolo County.

Gasoline and diesel fuels would be used for on-road vehicles (e.g., pickup trucks, flatbed trucks), haul trucks, and off-road construction vehicles and equipment (e.g., loaders, graders, bulldozers). Estimates were developed based on construction activity data (trips and miles traveled per day) provided by Wood Rodgers.

The proposed levee construction would consume approximately 367,287 gallons of fuel (50,666 mmBTUs), over the 2-year construction period. This amount of fuel consumption is very small compared to the overall sale of gasoline and diesel in the county (described in Section 3.14.1.2, *Environmental Setting*). It is less than 1 percent (0.92 percent) of the highest total annual amount of diesel sold in the county and less than one-half a percent (0.33 percent) of the highest annual total amount of gasoline sold in the county.

Overall, the energy consumed by construction of the levee would be negligible. Additionally, relative to other states and the country as whole, construction projects in California generally use more energy-efficient equipment in order to meet state and local goals for criteria air pollutant and greenhouse gas emissions reductions, as described in Section 3.7, *Air Quality*, and Section 3.8.

Because overall consumption would be negligible when considered within the context of the county's consumption of energy, and because construction of the proposed levee would not require the use of energy in appreciable quantities, the proposed levee would not directly or indirectly require the construction of new energy generation or supply facilities. Therefore, the proposed levee would not result in a wasteful, inefficient, or unnecessary usage of direct or indirect energy. The impact would be less than significant.

Floodproofing Individual Structures

Floodproofing of individual structures could occur under the Proposed Project, although the exact location, timing and duration of floodproofing efforts is unknown. Floodproofing activities would only result in construction-related energy (fuel) use, as a result of raising a structure. Limited equipment and truck trips would likely be needed given the very small scale of these activities on single structures (e.g., backhoe, trucks, forklifts). There would be no additional electricity demand. The amount of fuel needed for these individual floodproofing activities would be less than required for construction of the proposed levee, which is a negligible amount. For purposes of a conservative analysis, it was assumed that up to three structures could be floodproofed in 2024 and two structures floodproofed each year thereafter through 2029. While floodproofing of individual structures would not occur concurrently, it was conservatively assumed that a structure would be floodproofed in 2024 concurrent with the highest anticipated level of construction activity required for the levee.

Table 3.14-2 presents estimates of fuel consumption if levee and floodproofing construction activities were to overlap in 2024. The table also provides estimates of fuel consumption generated by floodproofing structure construction activities for the period 2025 through 2029, after the levee construction is completed.

Table 3.14-2. Summary of Annual Energy Consumption from Floodproofing Construction

Year/Source	Gallons	kWh	mmBTU
2024			
Levee (Table 3.14-1)	197,926	7,320	27,306
Floodproofing[a]	1,666	0	228
Total 2024	199,592	7,320	27,534
2025–2029[b]	1,111	0	152

[a] Analysis assumes that up to three structures would be floodproofed in 2024, concurrent with the highest anticipated construction activity for the levee. Levee construction energy consumption estimates are from Table 3.14-1.

[b] Energy consumption generated annually assuming up to two structures would be floodproofed per year during 2025 through 2029.

Assuming up to three individual floodproofing activities could occur and overlap levee construction activity during 2024, the Proposed Project would consume approximately 368,953 gallons of fuel (50,894 mmBTUs), over the 2-year construction period. The addition of the small amount of fuel consumption for construction of the floodproofing structures in 2024 would not change the relative percentages these values represent when compared to the annual county overall sales (described in Section 3.14.1.2, *Environmental Setting*). The fuel consumption by the Proposed Project would still be less than 1% (0.92%) of the highest total annual amount of diesel sold in the county and less than one-half a percent (0.33%) of the highest annual total amount of gasoline sold in the county. The annual fuel consumption associated with floodproofing individual structures during the 2025 through 2029 timeframe would be negligible.

Energy use resulting from levee construction activities combined with individual structure floodproofing actions would not result in wasteful, inefficient, or unnecessary consumption of energy. This impact would be less than significant.

Operation

Because of the intermittent and unknown nature of the operations activities for the Proposed Project, energy consumption for these activities cannot be quantified. However, based on the types of vehicles and equipment and occasional/infrequent nature of activities, operational energy usage would be considered minor.

Long-term O&M would result in limited activities such as one to two persons driving trucks on the levees for inspection, maintenance, and patrol actions. Fuel consumption for these light-duty vehicle trips is anticipated to be increasingly efficient and total amounts used reduced over time as increased vehicle fuel efficiencies are mandated at the state and/or federal level, and electric vehicles continue to displace internal combustion vehicles.

Other activities would include vegetation maintenance using handheld landscaping equipment and infrequent limited use of heavy-duty earth-moving equipment for periodic reconditioning of the levee slope and road and sediment removal. These activities would be limited to a short-term, temporary timeframe once or twice a year, and likely less often for use of heavy-duty equipment.

Operation of the project would not require any ongoing use of electricity because the project does not include use of any pump stations or other stationary equipment. Small amounts of electricity may be used during maintenance tasks.

The amount of fuel or electricity needed for these O&M activities would be substantially less than required for construction, which is a negligible amount. Energy use resulting from long-term O&M activities would not result in wasteful, inefficient, or unnecessary consumption of energy. Therefore, this impact would be less than significant.

Once construction of individual structure floodproofing actions is complete there would be no operational emissions.

Additionally, although the overall energy consumption associated with operation of the Proposed Project would be less than significant, implementation of Mitigation Measure GHG-2, intended to minimize operations and maintenance GHG emissions, would further reduce fuel consumption by requiring use of electric battery powered landscaping equipment for vegetation removal and use of electric or hybrid-electric passenger vehicles and trucks for all required levee inspection and maintenance trips. These measures would result in use of less fuel associated with O&M worker travel and activities.

Impact EN-2: Conflict with or obstruct a state or local plan for renewable energy or energy efficiency (less than significant with mitigation)

The Proposed Project is a flood control infrastructure project intended to protect existing land uses and people from flood risks in the project area. Construction activities would generate more demand for energy resources than operation activities. Even so, construction would not require the use of energy in appreciable quantities (see Impact EN-1) and would not directly result in a need to construct new energy generation or supply facilities. Furthermore, the Proposed Project does not involve investor-owned utilities or retail sellers of electricity that are subject to the requirements of the state and local energy plans or regulations.

The Proposed Project would not affect PG&E's or VCE's ability to provide renewable energy resources and would not obstruct implementation of the RPS or result in energy consumption that would require the City or County to install more energy production facilities.

The City and County CAPs contain measures to reduce community and municipal GHG emissions consistent with state goals for addressing California's contributions to climate change. Focus areas related to renewable energy and energy efficiency include energy, transportation and land use, and municipal operations, although not all measures are directly related to the Proposed Project. Section 3.8 includes evaluations of the Proposed Project's consistency with the City's and County's CAPs as they relate to the City's and County's abilities to achieve GHG emissions strategies outlined in the CAPs (Tables 3.8-4 and 3.8-5). City CAP measures specifically applicable to energy use related to implementing the Proposed Project include T/LU-4, Reduced Motor Vehicle Trips; T/LU-6, Reduced Emissions from Vehicle Idling and Other Equipment, T/LU-7, Increased Use of Alternative-Fuel Vehicles, MO-3, Increased Energy Efficiency and Use of Renewable Energy, and MO-5, Reduced Motor Vehicle Use. Other City measures and Yolo County measures, including specific energy measures, are not applicable to energy consumption as anticipated would occur under the Proposed Project because the Proposed Project does not involve development of buildings, residential or commercial land uses, installation of appliances, or agricultural uses (see more detail on measures that are not applicable to the Proposed Project in Tables 3.8-4 and 3.8-5).

Overall, the evaluation of the City's and County's CAP measures determined that the proposed construction activities would be consistent with all applicable community strategies with implementation of Mitigation Measure GHG-1 and that O&M activities would be consistent with the City's municipal strategies with implementation of Mitigation Measure GHG-2. These mitigation measures would reduce impacts related to conflict with or obstruction of local plans that address renewable energy or energy efficiency to a less-than-significant level.

Mitigation Measure GHG-1: Implement measures to reduce GHG emissions from construction

Mitigation Measure GHG-2: Implement measures to reduce GHG emissions from operations and maintenance activities

See Impact GHG-1 in Section 3.8, *Greenhouse Gas Emissions*, for the full text of these mitigation measures.

3.15 Aesthetics

This section describes the regulatory and environmental setting for aesthetics in the aesthetics study area, analyzes effects on aesthetics that would result from implementation of the Proposed Project, and provides mitigation measures to reduce the effects of any potentially significant impacts. The aesthetics study area is defined as the project area (Figure 2-1) plus all areas within a half-mile radius south of the project footprint. The study area was determined by identifying primary viewer groups and key observation points (KOPs) in relation to those primary viewer groups. Primary viewer groups include residents, businesses, roadway users, and recreationists and are further defined in this section. KOPs are representative points of potential effects based on the potential to change views available to primary viewer groups or from sensitive viewing areas and are further identified and defined in this section. Information presented in the discussion and used for the subsequent analysis was drawn primarily from the following sources.

- Study area site visit (November 15, 2019).
- Google Earth and Google Maps (street view) (2019).
- *2030 Countywide General Plan* (Yolo County 2009).
- *City of Woodland General Plan 2035* (City of Woodland 2017a, 2017b).
- *Cache Creek Parkway Plan* (Yolo County 2018).

3.15.1 Existing Conditions

3.15.1.1 Regulatory Setting

This section summarizes key federal, state, and local or regional regulations, laws, and policies relevant to aesthetics.

Federal and State

There are no roadways in or near the study area that are designated in federal or state plans as scenic highways worthy of protection for maintaining and enhancing scenic viewsheds. A portion of State Route (SR) 16, from approximately the town of Capay at County Road 85 north to the county line, is identified as eligible for designation as a State Scenic Highway but is not officially designated (California Department of Transportation 2017). However, SR 16 is located 13 miles west of the Proposed Project and does not have views of study area. Likewise, there are no federal- or state-designated Wild and Scenic Rivers in the study area. Although a 31-mile section of Upper Cache Creek upstream of the study area is designated as a State Wild and Scenic River, the portion of Lower Cache Creek adjacent to the study area is not included in this designation. There are no other federal or state regulations related to visual resources that apply to the implementation of the Proposed Project.

Local

Yolo County General Plan

The *Land Use and Community Character Element* of the *2030 Countywide General Plan* contains several policies relevant to aesthetics in the study area. These policies seek to protect and enhance the rural landscape and night sky, important site features (e.g., watercourses), and scenic views, and to minimize the aesthetic impact of infrastructure and utility facilities (Yolo County 2009).

> **Policy LU-3.7** Prohibit the designation of new urban development in places with one or more of the following characteristics: Areas where there are significant natural resources (e.g., groundwater recharge, wildlife habitat, mineral or timber resources, scenic areas, etc.).
>
> **Policy CC-1.2** Preserve and enhance the rural landscape as an important scenic feature of the County.
>
> **Policy CC-1.3** Protect the rural night sky as an important scenic feature to the greatest feasible extent where lighting is needed.
>
> **Policy CC-1.5** Significant site features, such as trees, water courses, rock outcroppings, historic structures and scenic views shall be used to guide site planning and design in new development. Where possible, these features shall become focal points of the development.
>
> **Policy CC-1.8** Screen visually obtrusive activities and facilities such as infrastructure and utility facilities, storage yards, outdoor parking and display areas, along highways, freeways, roads and trails.
>
> **Policy CC-1.10** Protect existing ridgelines and hillsides from visually incompatible development.
>
> **Policy CC-1.12** Preserve and enhance the scenic quality of the County's rural roadway system. Prohibit projects and activities that would obscure, detract from, or negatively affect the quality of views from designated scenic roadways or scenic highways.

Yolo County has designated five highway segments as local scenic highways worthy of protection for maintaining and enhancing scenic viewsheds, and the general plan contains several community character policies to preserve and protect the scenic qualities of these roadways (Yolo County 2009). However, these policies are not listed herein because none of these local scenic highways is in the study area. Because these highways are located approximately 2.5 to 5 miles northeast and east of the project footprint, and due to intervening topography, there are no views of the Proposed Project from these highways.

Cache Creek Area Plan and Cache Creek Parkway Plan

Yolo County adopted the *Cache Creek Area Plan* (CCAP) in 1996 as part of its general plan. The CCAP, which is in the process of being updated, is a rivershed management plan for 14.5 miles of Lower Cache Creek, between the Capay Dam and the town of Yolo. The overall area covered by the CCAP is 28,130 acres composed of all land designated by the state as falling within designated state mineral resources zones (Yolo County 2019). The CCAP balances many interests, including aggregate resource management, agricultural resources, habitat preservation and restoration, flood protection, groundwater management, channel stabilization and maintenance, and public open space and recreation. The CCAP consists of the *Off-Channel Mining Plan* (OCMP) and the *Cache Creek Resources Management Plan* (CCRMP), which together regulate and protect the area and manage the creek as an integrated system, primarily for mining resource management, creek stabilization and restoration, maintaining flood capacity, and providing recreational opportunities (Yolo County 2019).

The CCAP's OCMP and CCRMP refer to an anticipated second phase of planning involving development of the *Cache Creek Parkway Plan* (Parkway Plan) (Yolo County 2018). The Parkway Plan is intended to establish an integrated system of trails and recreational areas along Cache Creek. Relevant goals, objectives, and actions from the OCMP and CCRMP are part of the Parkway Plan and aim to establish a variety of outdoor recreational and educational opportunities by creating a continuous corridor of open space along Cache Creek that is compatible with surrounding land uses and that avoids impacts on sensitive habitat and surrounding property owners. The following goals specifically strive to improve and preserve scenic resources in the CCAP and Parkway Plan planning area (Yolo County 2018).

Goal CCRMP 5.2-1: Improve scenic resources within the Cache Creek channel.

Goal OCMP 7.2-1: Preserve scenic resources within the off-channel planning area.

The planning area of the CCAP and Parkway Plan overlaps the western portion of the study area but is not in the project footprint.

Yolo County Oak Woodland Conservation and Enhancement Plan

The Yolo County *Oak Woodland Conservation and Enhancement Plan* (Yolo County 2007) promotes voluntary efforts to conserve and enhance the county's existing oak woodlands and the aesthetic, ecological, and economic benefits they provide. The plan aims to minimize the effects of land conversion and other factors that negatively affect oak woodlands and seeks to guide woodland mitigation, provide access to state funding, and assist with state efforts to conserve and enhance oak woodlands. Oaks are located within the study area.

City of Woodland General Plan

The *Land Use, Community Design, and Historic Preservation* and *Sustainability, Conservation, and Open Space Elements of the City of Woodland General Plan 2035* (2017a, 2017b) contains policies that are relevant to aesthetics for the Proposed Project. These policies seek to control light and glare, and to maintain the visual integrity of neighborhoods and landscapes.

Policy 2.E.5 View Corridors. Create attractive view corridors that frame the streets with distinctive buildings, trees, and other landscaping complemented by well-designed and integrated signage. At community entry points, provide a clear, physical sense of arrival into the community.

Policy 2.F.4 Light Pollution. Control artificial lighting to avoid spill-over lighting and preserve the night sky.

Policy 2.F.5 Glare. Control artificial lighting to prevent glare.

Policy 2.G.2 Sensitive New Development. Require new construction, additions, renovations, and infill to be physically compatible with neighborhood context, historic development patterns, and building form and scale.

Policy 7.B.8 Native and Compatible Non-Native Plant Species. Require developers to use native and compatible non-native species, especially drought-resistant species, to the extent possible in order to preserve the visual integrity of the landscape, provide benefits for native wildlife, and ensure that a variety of plants suited to the region are maintained.

3.15.1.2 Environmental Setting

This section discusses the environmental setting relevant to aesthetics in the study area. KOPs within the study area are identified and documented in Appendix F, *Key Observation Points for Aesthetics Analysis*, and are referenced throughout this section.

Concepts and Terminology

Identifying an area's aesthetic conditions involves three steps.

1. Objective identification of the visual features (aesthetics) of the landscape.
2. Assessment of the character and quality of those resources relative to the overall regional visual character.
3. Determination of a viewer response, which is a view's importance to people, or viewer sensitivity, to aesthetic resources in the landscape.

The aesthetic value of an area is a measure of its visual character and quality, combined with the viewer response to the area (Federal Highway Administration 2015). Visual quality can best be described as the overall impression that an individual viewer retains after driving through, walking through, or flying over an area (Bureau of Land Management 1980). Viewer response is a combination of viewer exposure and viewer sensitivity. Viewer exposure is a function of the number of viewers, number of views seen, distance of the viewers, and viewing duration. Viewer sensitivity relates to the extent of the public's concern for a particular viewshed. A "viewshed" is defined as all of the surface area visible from a particular location (e.g., an overlook) or sequence of locations (e.g., a roadway or trail) (Federal Highway Administration 2015).

"Scenic vista" views generally encompass a wide area with long-range, high-quality views to surrounding elements in the landscape. Such vistas are often available to viewers of open, flat agricultural lands with few obstructions and from elevated vantages with views out and over the landscape. In addition, vistas have a directional range in that some areas have scenic vistas with a 360-degree view in all directions, while others may be limited in one direction in a manner that reduces the line of sight angle and amount of vista that is visible, resulting in a narrower vista view. Expansive vistas may not be scenic vistas if there are intervening elements that detract from views, such as development in the foreground.

Visual Character

The visual character of an area or view consists of natural and artificial landscape features. Hydrologic, botanical, wildlife, recreational, and urban features influence visual character. Urban features include those associated with landscape settlements and development, including roads, utilities, structures, earthworks, and the results of other human activities. The perception of visual character can vary significantly seasonally, even hourly, as weather, light, shadow, and elements that compose the viewshed change. The basic components used to describe visual character for most visual assessments are the elements of form, line, color, and texture of the landscape features (U.S. Forest Service 1995; Federal Highway Administration 2015). The appearance of the landscape is described in terms of the dominance of each of these components.

Visual Quality

Visual quality is evaluated using the approach to visual analysis adopted by the Federal Highway Administration, which employs the concepts of vividness, intactness, and unity (Federal Highway Administration 2015).

- "Vividness" is the visual power or memorability of landscape components as they combine in striking and distinctive visual patterns.

- "Intactness" is the visual integrity of the natural and human-built landscape and its freedom from encroaching elements; this factor can be present in well-kept urban and rural landscapes and in natural settings.
- "Unity" is the visual coherence and compositional harmony of the landscape considered as a whole; it frequently attests to the careful design of individual components in the landscape.

Visual quality is evaluated based on the relative degree of vividness, intactness, and unity as modified by its visual sensitivity. High-quality views are highly vivid, relatively intact, and exhibit a high degree of visual unity. Low-quality views lack vividness, are not visually intact, and possess a low degree of visual unity.

Viewer Sensitivity

The measure of the quality of a view must be tempered by the overall sensitivity of the viewer. Viewer sensitivity or concern is based on the visibility of resources in the landscape, proximity of the viewers to the visual resource, elevation of viewers relative to the visual resource, frequency and duration of views, number of viewers, and type and expectations of individuals and viewer groups.

The importance of a view is related in part to the position of the viewer to the resource; therefore, visibility and visual dominance of landscape elements depend on their placement within the viewshed.

To identify the importance of views of a resource, a viewshed must be divided into distance zones of foreground, middleground, and background. Generally, the closer a resource is to the viewer, the more dominant it is and the greater its importance to the viewer. Although distance zones in a viewshed may vary among different geographic regions or types of terrain, the standard foreground zone is 0.25 to 0.5 mile from the viewer, the middleground zone is from the foreground zone to 3 to 5 miles from the viewer, and the background zone is from the middleground to infinity (U.S. Forest Service 1995).

Viewer sensitivity depends on the number and type of viewers and the frequency and duration of views. Visual sensitivity is also modified by viewer activity, awareness, and visual expectations in relation to the number of viewers and viewing duration. For example, viewer sensitivity is generally higher for views seen by people who are driving for pleasure, people engaging in recreational activities, and homeowners. Sensitivity tends to be lower for views seen by people driving to and from work or as part of their job (U.S. Forest Service 1995; Federal Highway Administration 2015; U.S. Soil Conservation Service 1978). Travelers use roadways at varying speeds; normal highway and roadway speeds differ based on the traveler's familiarity with the route, the weather, and roadway conditions. Single views typically are of short duration, except on straighter stretches where views may last slightly longer. Commuters and nonrecreational travelers typically have fleeting views and tend to focus on commute traffic, not on surrounding scenery; therefore, they are generally considered to have low visual sensitivity. Residential viewers typically have extended viewing periods and are concerned about changes in the views from their homes; therefore, they are generally considered to have high visual sensitivity. Viewers using recreational areas, scenic highways, and scenic overlooks are usually assessed as having high visual sensitivity.

Judgements of visual quality and viewer response must be made with a regional frame of reference (U.S. Soil Conservation Service 1978). The same landform or visual resource appearing in different geographic areas could have a different degree of visual quality and sensitivity in each setting. For example, a small hill may be a significant visual element on a flat landscape but have very little significance in mountainous terrain.

Visual Character and Quality

The study area north of the project footprint is primarily rural, located in an unincorporated area of Yolo County in California's Sacramento Valley, with the city of Woodland directly south and the community of Yolo to the north. Cache Creek and the existing Lower Cache Creek levees are located at the northern and eastern portions of the study area, and meandering riparian vegetation can be seen along Cache Creek and the existing levee. However, the predominant views are of a patchwork of agricultural lands that are linear patterned, consisting of row crops and orchards, with scattered rural homes located along rural roadways that line the agricultural fields. Low-density industrial urban uses are located in the eastern portion of the study area between SR 113 and County Road 102. Several county roads cut through the fields and orchards, Interstate (I-) 5 intersects with the proposed levee alignment in the western portion of the study area and continues northwest toward the community of Yolo, and SR 113 dissects the study area going north to south. Railroad tracks extend through the area running east to west and north to south. The Vaca Mountains and Coast Ranges can be seen in the background to the west from much of the study area when air quality and weather conditions allow, but the mountains are not dominant landscape features.

To the south of the project footprint in the study area, the city of Woodland's residential neighborhoods and commercial and industrial areas create a stark contrast to the adjacent agricultural area. Woodland residential neighborhoods are located along the southwestern end of the project footprint. The homes directly south of the project footprint (e.g., on Hanging Oak Way, Carter Lane, and North Ashley Avenue/County Road 98B) are eclectic in nature, varied in both age and aesthetic qualities. These homes have direct and indirect views of the agricultural land to the north. Tall grasses, shrubs, and mature trees partially filter these views (Appendix F, KOP 1). Farther south of these homes, just north of Kentucky Avenue, are the more homogenous, denser residential housing developments of North Park and Woodland West, largely characterized by one-story homes built during the 1980s. These homes typically are surrounded by mature landscaping and fencing between homes and around most backyards. Some backyards and dead-end streets in the development have partial views of agricultural lands to the north (Appendix F, KOP 2). Although the North Park homes on the western end of the neighborhood are adjacent to agricultural land off of Pedrick Road/County Road 98 a brick sound wall around the neighborhood prevents views to the west (Appendix F, KOP 3). Four rural homes scattered on the western side of Pedrick Road/County Road 98 and south of the western portion of the project footprint have expansive foreground and middleground views of agricultural lands to the west and north and have views of the Vaca Mountains and Coast Ranges, beyond, in the background (Appendix F, KOP 4). Approximately eight homes on Cherry Lane, east off of Pedrick Road/County Road 98 similarly have views to orchards to the north and agricultural fields to the west, with some sparse residential development within the views.

Also south of the project footprint, along the eastern end of the project footprint north of I-5 and east of SR 113 in the city of Woodland, is an industrial area with some scattered commercial uses. Views from this largely industrial area vary. Locations farthest north along Churchill Downs Avenue have views of agricultural lands in the foreground, some additional scattered rural industrial facilities in the middleground, and the riparian area and existing levee along Lower Cache Creek in the background (Appendix F, KOP 5). Those industrial buildings farther south and east have views of surrounding industrial buildings, I-5, and the existing levee where it turns southeast (Appendix F, KOP 6).

There is one park in the project area, Nelson's Grove, a YMCA facility nestled within a dense stand of mature oak trees just west of SR 113. Visitors to Nelson's Grove, once inside the facility, cannot see the surrounding scenery, including the rest of the study area, and the dense trees create a marked difference in landscape from the surrounding agricultural fields and orchards. Velocity Island Park, a 15-acre waterpark, is not in the project area but is in the study area directly adjacent to the project footprint on the northern edge of Woodland and adjacent to I-5 and SR 113. Users of the waterpark engage in activities such as wakeboarding, paddle boarding, or swimming. Velocity Island Park is at a lower elevation than the agricultural lands to the north and west and the roadways to the east and south, with berms surrounding the entire facility. These berms, along with mature trees growing at the tops of the northern and southern berms, somewhat limit views toward the project footprint (Appendix F, KOPs 7 and 8).

Because of the rural character of the study area north of the project footprint, night light and glare (the reflection of natural or artificial light off existing building surfaces) mostly result from the city of Woodland directly to the south. Nighttime lighting in the project area results from vehicle headlights on I-5 and other local roadways, as well as from possible night operations in isolated areas of agricultural industrial facilities.

Scenic vista views are also available in the study area and are mostly available from the agricultural areas (fields, rural residences, local roadways) north of Woodland and consist of sweeping views of agricultural fields looking north, east, and west that are backdropped by the Vaca Mountains and Coast Ranges to the west and northwest on clear days. When looking south, viewers in the study area north of the project footprint also have expansive views. However, these views are not considered scenic vista views because intervening elements in the middleground that are associated with I-5, scattered agricultural industrial facilities, and city of Woodland development detract from these views.

Although there are high quality, rural views of agricultural lands in the study area, scenic vista views are not available from most residential, recreational, commercial, and industrial areas in Woodland near the project footprint. However, limited scenic vista views are available from residences in northwest Woodland along Pedrick Avenue/County Road 98, near Cherry Lane. These views consist of long-range views over agricultural fields that are backdropped by the Vaca Mountains.

In the study area when Cache Creek floods, the agricultural lands and parts of the city of Woodland can experience floodwater inundation. In 1958 and 1995, Cache Creek rose to the top of both levees and overflowed its banks toward the city of Woodland. In 1983, a breach in the Cache Creek south levee occurred just upstream of the CCSB, flooding areas in the eastern part of an area now within the city limits of Woodland (industrial area). In 1995, overland flood flows reached within one block of Woodland. Floods are part of the existing conditions in the study area because they have occurred and been experienced by viewer groups in the past (i.e., 1958, 1983, and 1995). Floodwaters change the immediate views of the rural nature of the study area for viewer groups. Typically, floodwaters are brown and may contain debris such as trees, fences, or other materials, depending on the severity of the flood, including the depth and velocity. Flood waters can also be reflective depending on the depth, coverage area, and the weather conditions, causing some amount of light and glare.

Viewer Groups and Responses

The primary viewer groups in the study area are persons living or conducting business near the project footprint; travelers using I-5, SR 113, or the smaller local and county roads in the area; and recreationists using parks near the project footprint, and bicyclists or walkers and joggers using local roadways near the project footprint. Foreground views for primary viewer groups in the study area consist of the project footprint. Middleground views for primary viewer groups in the study area are those views up to 3 miles from the project footprint. These views are considered where elevated or more expansive views are present. Background views (i.e., views beyond 3 miles from the project footprint) are discussed as contributing visual elements to the study area where project elements would affect the views of such features (e.g., distant views of mountain ranges). Details become diminished beyond the middleground and specific project features do not typically stand out in background views.

Residents

Residents in the study area with views of the project footprint consist of people living in suburban and rural areas. Most suburban residences are oriented inward toward the housing developments of North Park and Woodland West and do not have views of the project footprint because orientation and intervening development prevent views. Although some suburban residences are located directly adjacent to the western end of the project footprint, only residences on the outer edge of the developments or those on Hanging Oak Way, Carter Lane, the end of North Ashley Avenue/County Road 98B, or Cherry Lane currently have views of project footprint. These views consist of open agricultural land in the foreground and middleground and I-5 or local roadways in the middleground and background. However, fences or vegetation prevent direct, open views of the project footprint for some of these residents. Rural residents along Pedrick Road/CR 98 have foreground views of the project footprint and middleground and background views of agricultural lands that are backdropped by the Vaca Mountains and Coast Ranges on a clear day. Other rural residents north of the project footprint are separated from the project footprint by distance and oriented such that inhabitants have views of the surrounding mature oaks and other trees, orchards, or agricultural lands but generally do not have views of the project footprint. Both these residential groups could have views of floodwaters depending on their exact location and the flooding in 1958, 1983, and 1995. Both suburban and rural residents are likely to value highly the inherent scenic quality of the largely pastoral open space around them. Because residents live within a short distance of the project footprint and have a sense of ownership of nearby visual resources, residents in and near the study area are considered to have high sensitivity to changes in the viewshed.

Businesses

Viewers from industrial and commercial facilities south of the project footprint in the eastern portion of Woodland have views of the project footprint, I-5, the existing levee, other industrial and commercial facilities in the foreground and middleground. Some of these industrial and commercial locations have full or filtered middleground and background views of agricultural lands to the north. Employees and users of these industrial and commercial facilities are likely to be occupied with their work activities and, therefore, spend a limited time viewing their surroundings. However, there are also some agricultural industrial facilities scattered in eastern portion of the study area situated amidst the rural landscape upon which the industries rely that have sweeping views of agricultural land that extend to the background. Employees and users of these facilities also have middleground views of the project footprint. The employees and users of industrial and commercial facilities near the existing levee may spend leisure time on the levee and waterway. Lastly, agricultural workers in the study area also have views of the project footprint. However, agricultural viewers only come into contact with the project footprint intermittently and for relatively short durations of time as they are working the fields. Overall, industrial, commercial, and agricultural viewers are focused at the task at hand, and these viewers are considered to have low to moderate sensitivity to changes in the viewshed.

Roadway Users

Available views of the project footprint vary for roadway users based on the nature of the roadway they are traveling, the direction the viewer is traveling, the elevation of the roadway, and the speed at which the viewer is traveling on the roadway. Motorists traveling on I-5, which bisects the study area going northwest midway through the project footprint, have expansive views of the area, including agricultural lands extending to the background, with scattered rural residences and agricultural industry in the foreground and middleground; those traveling north can see the existing Lower Cache Creek levee and associated riparian vegetation in the middleground, and those traveling south from the northern portion of the study area experience a dramatic and sudden change in scenery moving from a rural landscape to seeing the city of Woodland's industrial, commercial, and residential development south of the project footprint. All travelers also could see flood waters in middle and foreground throughout the study area. However, drivers on the interstate are typically occupied with the act of driving safely at high speeds and with getting to their destination. Travelers can also enter the study area and Woodland from the north and south on SR 113 or on local roads, such as County Roads 102, 101, 99, or 98. These travelers have views of the study area similar to those of travelers on I-5; however, because of the slower speed of travel and the smaller, more rustic nature of the roadways, these views are more available to motorists. Overall, viewers who travel these routes generally possess moderate visual sensitivity to their surroundings. The passing landscape becomes familiar to these viewers, and their attention typically is focused not on the passing views but on the roadways, road signs, and surrounding traffic.

Viewers who travel local routes for their scenic quality generally possess higher visual sensitivity to their surroundings because they are likely to appreciate the natural environment and holistic visual experience. Although there are no officially designated scenic roadways in the study area, there are several picturesque stretches of country road passing through the study area that offer sweeping views of the surrounding open agricultural lands that may be of interest to motorists. Overall, viewer sensitivity is considered moderate among roadway travelers in the study area.

Recreationists

Recreationists in the study area primarily consist of park visitors, bicyclists, and pedestrians, and they view the study area from parks, local roadways, and trails. There is one recreational facility in the project area, Nelson's Grove, but recreationists at this location do not have views of the project footprint because of distance and intervening vegetation and development. Recreationists that do have views of the project footprint include bicyclists, walkers, and runners who view the project footprint from local roadways as they pass by the site. In addition, Velocity Island Park users have somewhat impeded views of project footprint. While the facility is located adjacent to the project footprint in the study area, it is somewhat sheltered by berms, mature trees, and the adjacent I-5 corridor. Recreationists at the park are focused typically on watersport activities, not on their surroundings. Recreational viewers in the study area are likely to value the visual experience of being in the rural environment the region offers, and viewer sensitivity for recreationists is generally high because, during recreational activities, viewers tend to be more aware of their surroundings for an extensive duration of time and tend to have the expectation of views. However, recreational viewers associated with project footprint are considered to have a low sensitivity to changes in the viewshed because of the limited recreational opportunities in the study area and limited views at the recreational facilities that are present. Overall, recreationists in the study area are expected to have a relatively low sensitivity to changes in the viewshed.

3.15.2 Environmental Impacts

This section describes the environmental impacts associated with aesthetics that would result from implementation of the Proposed Project. It describes the methods used to determine the effects of the Proposed Project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts are provided.

3.15.2.1 Methods for Analysis

This analysis of the Proposed Project's effects on recreation is based on standard professional practice and the information resources cited herein. A combined methodology approach using Federal Highway Administration, U.S. Bureau of Land Management, U.S. Forest Service, and professional standards of visual assessment methodology has been used to determine potential effects on aesthetics in the study area. ICF staff made direct field observations and photographic documentation of the study area and direct field observations of the study area on November 15, 2019 to assess aesthetic resources and key views (Appendix F). All of the KOPs identified in Appendix F are in the study area because the study area captures the sensitive viewers who would be exposed to construction and operation of the Proposed Project. Effects were identified and evaluated qualitatively using the concepts and terminology described in Section 3.15.1.2, *Environmental Setting*, and based on the environmental characteristics of the study area and the magnitude and duration of activities related to the construction and operation of the Proposed Project.

3.15.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the Proposed Project would be considered to have a significant effect if it would result in any of the conditions listed below.

- A substantial adverse effect on a scenic vista.
- Substantial damage to scenic resources, including but not limited to trees, rock outcroppings, and historic buildings along a scenic highway.
- In non-urbanized areas, substantial degradation of the existing visual character or quality of public views of the site and its surroundings. In urbanized areas, conflict with applicable zoning or other regulations governing scenic quality.
- Introduction of a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.

There are no roadways within or near the study area that are designated in federal, state, or local plans as a scenic highway or route worthy of protection for maintaining and enhancing scenic viewsheds. Therefore, implementation of the Proposed Project would not damage scenic resources, such as trees, rock outcroppings, and historic buildings along a scenic highway. There would be no impact, and this threshold is not discussed further in this analysis.

In addition, the project footprint is located entirely within a rural setting north of the city of Woodland. Furthermore, the Proposed Project would not change the views or scenic quality within the urbanized areas of the city of Woodland. Therefore, the Proposed Project would not conflict with applicable zoning and other regulations governing scenic quality associated with an urbanized area and impacts on urbanized areas are not discussed further in this analysis.

3.15.2.3 Impacts and Mitigation Measures

Impact AES-1: Substantial adverse effect on a scenic vista (less than significant)

Scenic vistas in and from the study area consist of sweeping views of agricultural fields looking north, east, and west, with the Vaca Mountains and Coast Ranges in the background on clear days. Scenic vista views that are available to the north of the study area would not be affected because the new levee would not interfere with existing vista views. The new levee would slightly block portions of sweeping pastoral views that are available from Pedrick Road/County Road 98. However, the grassy levee slopes would only be 6 feet high and would be set back from the roadway so that the levee would not appear as tall and it would not obscure views of the Vaca Mountains in the background. In addition, many portions of the scenic vista views would remain available to the south of the proposed levee. Lastly, the new levee would provide a new, elevated surface that residents and recreationists would be able to access for elevated views; thus, the new levee would enhance the availability of scenic vista views in this area. Therefore, impacts on scenic vistas would be less than significant.

Impact AES-2: Substantially degrade the existing visual character or quality of public views in non-urbanized areas due to construction (less than significant with mitigation)

Proposed Project construction would create temporary changes in views of and from the study area. Construction activities would involve clearing, grubbing, and stripping within the footprint, which would require use of heavy equipment such as excavators, bulldozers, and hauling trucks. Excavated soil would be stockpiled at staging areas all along both sides of the proposed levee alignment, including one staging area near the residences in northwestern Woodland and one adjacent to Velocity Island Park. A temporary onsite batch plant also would be located in the staging area near the southeast corner of the Cache Creek Settling Basin (CCSB) and would occupy 1 to 2 acres. This equipment and the staging area stockpiles would be visible throughout the construction season, temporarily degrading the visual quality of and from the study area and adversely affecting views of adjacent residents, recreational users, motorists, and businesses. The batch plant would be visible to industrial businesses in eastern Woodland.

Residential viewers are not accustomed to seeing construction activities and equipment, and sensitivity to these effects would be high. Informal recreational users (walkers, runners and bicyclists) of country roads that are appreciated for their rural views would have scenic views disrupted during construction. Recreationists at Nelson's Grove would not have views of this construction and would be unaffected. Velocity Island Park users would be adjacent to the construction activity but would be largely focused on watersport activities at the park; therefore, their sensitivity to these effects would be moderate.

Effects on roadway users would be minimal because, although some users may be enjoying a country drive on rural roadways, most drivers would be focused on the act of driving, they would pass by areas affected by project construction relatively quickly, and most drivers are accustomed to seeing construction along roadways and in developed areas. Affected businesses are mostly industrial in nature; their sensitivity would be low because workers would be focused on their job activities and would not have long-term views of construction activities. Overall, this effect would be temporary, lasting no longer than the construction duration (spring through fall for approximately 24 months), and would be limited to small portions of the larger rural landscape north of Woodland; therefore, construction would not substantially degrade the visual character or quality of the study area. For highly sensitive residential viewers, however, the effect would be significant where construction staging and construction activities are directly adjacent to or near their homes. Implementation of Mitigation Measure AES-1 would reduce this impact on residential viewers to a less-than-significant level.

The Proposed Project includes floodproofing individual structures; however, it is unknown the exact location, timing, and duration of floodproofing efforts. While construction of floodproofing could result in a change to the structure itself, the small scale of these efforts in the much larger rural context of the study area would not represent a significant change to the visual character or quality of the rural setting of the study area. Furthermore, floodproofing would likely not be experienced by a sensitive viewer group such as recreationists. Therefore, impacts would be less than significant.

Mitigation Measure AES-1: Install temporary visual barriers between construction zones and residences and maintain construction sites and staging areas in an orderly fashion

To obstruct undesirable views of construction activities from residence front yards and backyards that abut the project footprint the project proponent or contractor will install fencing (such as chain link with slats or fencing made of windscreen material) or other structures. The fencing will be a minimum of 7 feet high to help maintain residents' privacy. In addition, construction sites and staging areas will be maintained in a neat and orderly fashion. The construction site and staging areas also will be kept free of debris and trash to the degree possible. The construction site and staging areas will be left in a clean state upon completion of construction.

Impact AES-3: Substantially degrade the existing visual character or quality of public views in non-urbanized areas due to operations (significant and unavoidable)

Under the Proposed Project, a new levee would be constructed that would range from 6 feet tall (near Country Road 98) to 14 feet tall (at its intersection with the existing west levee of the CCSB). A trapezoidal drainage channel and seepage berm would be constructed on the landside, and some areas of rock slope protection (RSP) would be provided on the waterside (see Figures 2-2 and 2-3). Within the study area, visual changes would be minimal, and the primary visual changes would result from changes to the flood regime. As described under Impact HYDRO-5 in Section 3.1, *Hydrology*, flood depths would increase up to 13 feet in the far eastern portion of the study area north of the new levee, near the CCSB west levee, for both the 100- and 200-year flood. However, there are no habitable structures that would be affected in this area. A few structures north of the new levee would experience an increase in inundation of up 2.0 feet. However, all of the remaining structures within the study area north of the new levee would experience no change from existing conditions (i.e., no current flooding) or a decrease in flood depth inundation that ranges from -0.9 to -0.1 feet (Figures 3.1-5 and 3.1-6). In addition, areas south of the new levee would no longer experience flooding with implementation of the Proposed Project. Visually, changes to the flooding regime as a result of the Proposed Project would mean that viewers would see an overall decrease in the size of the areas that would be covered by floodwaters during such events, which would result in beneficial visual impacts. Increased water depths may be noticeable in the eastern study area, near the CCSB west levee; however, flooding is an existing condition in this area. Under existing conditions, viewers would see a large expanse of flat water surface present in this area during flooding. Under the Proposed Project, visual conditions that would result from increased flood depths would be similar in this area, and increased depths would not result in a notable difference between existing and proposed conditions. Therefore, changes to the flood regime as a result of the Proposed Project would not degrade the existing visual character or quality of public views in the study area.

County Roads 98, 99, 101, and 102 would be raised to cross over the new levee prism. The existing Cache Creek levees are along the water channel, whereas the Proposed Project would be located at least 1 mile south of the existing waterway along most of the footprint, except where it would follow the existing levee alignment adjacent to the CCSB. Therefore, in much of the study area, the Proposed Project would introduce a new, elevated visual element into the viewshed of all viewer groups. Rural residences and industry north of the project footprint would have indirect, more distant views of the new levee and associated seepage berm and drainage channel. However, these viewers currently have middleground and background views of I-5 and suburban and industrial development in Woodland. The Proposed Project would not affect the foreground agricultural views of those north of the project footprint.

Operation of the Proposed Project would affect foreground views in the study area. The Proposed Project would require the removal of trees and vegetation 15 feet beyond the toe of the waterside and 20 feet beyond the toe of the landside of project elements. Trees at various locations along the project footprint, including trees along the northern berm of Velocity Island Park, would be removed. However, the Proposed Project includes the project design feature to plant oak woodland trees on the south slope of the drainage channel, north of the proposed levee, after construction is complete to compensate for tree loss. These replantings would provide a visual screen of the new levee embankment by replacing trees that were removed as part of project construction. However, because they would be planted north of the proposed levee, these replacement plantings would not provide visual screening for the new levee for residents who are located south of and closest to the proposed levee. These residences are on Hanging Oak Way, Carter Lane, the end of North Ashley Avenue/County Road 98B, Cherry Lane, and Pedrick Road/County Road 98 in northwestern Woodland (see *Viewer Groups and Responses* in Section 3.15.1.2, *Environmental Setting*). In addition, replacement plantings may not be located in the same area where mature landscaping and native trees were removed. Therefore, the aesthetic qualities of portions of the study area where mature vegetation is permanently removed and cannot be replanted are likely to be substantially changed. In addition, the levee structure, associated seepage berm, and potential landscape scars from vegetation removal and the staging areas would change the existing visual character and quality of foreground views for these residents. As discussed in Impact AES-1, the levee would block the sweeping pastoral views of agricultural fields to the north and west from these homes. Although the levee slopes, seepage berm, and other disturbed areas would be hydroseeded and hence provide residents closest to the levee with foreground views of grassy slopes and a terraced seepage berm, the 6-foot-high structure would replace these residents' existing views of agricultural fields. This effect would be significant, and there is no available mitigation because there is no space for visual screen on the south side of the levee.

Operation of the Proposed Project would not greatly affect middleground views for rural residents located north of the project footprint. The new levee, RSP that would be placed on some of the northward-facing waterside levee slopes, the drainage channel, and potential landscape scars from vegetation removal and the staging areas would not stand out in views from a distance. In addition, tree replantings would look like an agricultural hedgerow to viewers to the north and would screen portions of the levee once trees mature.

The levee would undergo regular operation and maintenance that could include hand and mechanical mowing, burning, or application of herbicides, and which may require tree and shrub pruning. The levee slope and road would occasionally need reconditioning using a bulldozer. The presence of this equipment and activities of mowing and burning would be visible to all viewer groups but would be short-term and temporary and would appear similar in nature to operations on agricultural lands in the study area. Therefore, regular operation and maintenance activities of the Proposed Project would not degrade the existing visual character or quality of public views.

Similar to the discussion in Impact AES-2, operation of floodproofing individual structures would not substantially degrade the existing visual character or quality of public views in non-urbanized areas due to operations because they would be of very small scale in the much larger rural context of the study area. Furthermore, floodproofing would likely not be experienced by a sensitive viewer group, such as recreationists. Therefore, impacts would be less than significant.

Because the Proposed Project would substantially degrade the existing visual character or quality of public views of residents experiencing foreground views, this impact would be significant and unavoidable.

Impact AES-4: Create a new source of substantial light or glare that would adversely affect day or nighttime public views during construction and operations (less than significant)

Construction work would generally occur Monday through Saturday during normal working hours as allowed by the noise ordinances of the City of Woodland and Yolo County. However, equipment maintenance could occur before and after working hours and on Sunday. As indicated in Section 3.9, *Noise*, the City of Woodland Municipal Code limits construction work to the hours of 7:00 a.m. and 6:00 p.m. Monday to Saturday and 9:00 a.m. to 6:00 p.m. on Sunday. County regulations, however, limit construction noise to different levels between and after the hours of 6:00 a.m. to 6:00 p.m. These noise limits would prevent heavy construction activities from occurring before 6:00 a.m. and after 6:00 p.m. During both construction seasons, the sun will rise before 6:30 a.m. and will set, most often, between 6:30 p.m. and 8:30 p.m. (Sunrise Sunset Calendars 2019). Therefore, it is anticipated that construction activities would generally not occur before sunrise or past sunset, negating the need for high-powered lighting that could affect nearby residents who may be inside their homes or outside in their yards during the spring and summer months. Therefore, light and glare impacts during construction would be less than significant.

Proposed Project operation would not require any lighting features. The only design features that involve any potentially reflective surfaces are the concrete retaining walls, steel supports, and galvanized metal steel plates that would compose the closure structures located where the proposed levee would cross existing improvements that cannot be raised (i.e., major roads and railroads) (Chapter 2, *Project Description*, Section 2.3.3.6). Some of these closure structures would be permanent and others temporary, only being installed during high-water events. In addition, potentially reflective features (concrete, steel) would only be located at major road and railroad crossings where existing light and glare from paved roadways, signs, and vehicle lights already exists. Therefore, the Proposed Project would not result in the introduction of a new source of substantial light or glare that would adversely affect daytime or nighttime views of the area during operation. As described under Impact AES-3, changes to the flooding regime as a result of the Proposed Project would mean that viewers would see an overall decrease in the size of the areas that would be covered by floodwaters during such events. This would result in a reduction in glare associated with flat water surfaces that reflect sunlight and that would be present within the study area or near the project footprint during flood events. Therefore, light and glare impacts would be less than significant during construction and operation.

3.16 Recreation

This section describes the regulatory and environmental setting for recreation in the project area and analyzes effects on recreation that would result from implementation of the Proposed Project. Information presented in the discussion and used for the subsequent analysis was drawn primarily from the following sources.

- *2030 Countywide General Plan* (Yolo County 2009).
- *City of Woodland General Plan 2035* (City of Woodland 2017).
- *Cache Creek Parkway Plan* (Yolo County 2018).

3.16.1 Existing Conditions

3.16.1.1 Regulatory Setting

This section summarizes key local regulations, laws, and policies relevant to recreation in the project area. There are no federal or state recreation regulations, laws, or policies applicable to the project area. Although the Proposed Project does not involve the construction of any recreational facilities, local plans and policies related to recreation development are summarized below for informational purposes.

Yolo County

Yolo County General Plan

The *2030 Countywide General Plan* contains several policies and actions in its *Conservation and Open Space*, *Public Facilities and Services*, and *Land Use and Community Character Elements* relevant to recreation in the project area (Yolo County 2009). These policies and actions emphasize creating habitat-sensitive public access and recreational uses along waterways such as Cache Creek, connecting communities in the region through park and trail systems, and coordinating and implementing the *Cache Creek Area Plan*.

Cache Creek Area Plan

Yolo County adopted the *Cache Creek Area Plan* (CCAP) in 1996 as part of the county general plan. The CCAP, which is in the process of being updated, is a rivershed management plan for 14.5 miles of lower Cache Creek, between the Capay Dam and the town of Yolo. The CCAP balances many interests, including aggregate resource management, agricultural resources, habitat preservation and restoration, flood protection, groundwater management, channel stabilization and maintenance, and public open space and recreation. The CCAP is currently composed of the *Off-Channel Mining Plan* (OCMP) and the *Cache Creek Resources Management Plan* (CCRMP), which together regulate and protect the area and manage the creek as an integrated system. The OCMP and CCRMP emphasize mining resource management, creek stabilization and restoration, maintaining flood capacity, and providing recreational opportunities (Yolo County 2019).

Cache Creek Parkway Plan

The CCAP's OCMP and CCRMP refer to an anticipated second phase of planning involving development of a *Cache Creek Parkway Plan* (Parkway Plan) (Yolo County 2018) to provide policy, regulation, and strategy for management of dedicated lands and easements transferred to public ownership as a result of implementation of the CCAP. A baseline inventory and financial feasibility study for the Parkway Plan are available, and a master plan component is currently being drafted. The Parkway Plan's baseline inventory describes proposed improvements to former gravel mining quarry sites that extend along Lower Cache Creek and restore them for wildlife habitat, passive open space, and parklands for various active uses. Recreational improvements would include building new trails and trail connections, providing lookout areas with interpretative signage and trail maps, and improving wildlife habitat. The Parkway Plan's financial feasibility study examines costs and management for further development and maintenance of a parkway system. The master Parkway Plan, once drafted, will allow for community involvement.

In addition to the OCMP and CCRMP goals, objectives, and actions listed for the CCAP, the Parkway Plan incorporates 16 performance standards from the CCRMP that cover types, placement, and limits on recreational uses and facilities along Cache Creek and protections for biological habitat to help guide development of the parkway. Chapter 7.0 of the OCMP and Chapter 5.0 of the CCRMP contain complementary Open Space and Recreation Elements. The merged goals, objectives, and actions from those two elements are part of the Parkway Plan and are intended to establish a variety of outdoor recreational and educational opportunities by creating a continuous corridor of open space along Cache Creek that is compatible with surrounding land uses and that avoids impacts on sensitive habitat and surrounding property owners. These goals, objectives, and actions also are intended to improve and preserve scenic resources within the Cache Creek channel and the off-channel planning area (Yolo County 2018). The planning area of the CCAP and Parkway Plan overlaps the western portion of the project area but is not in the construction footprint of the proposed levee.

Yolo County Bicycle Transportation Plan

The purpose of the *Yolo County Bicycle Transportation Plan* is to formulate a long-range, comprehensive, and consistent policy guide for achieving a countywide bikeway network, and list current priorities for bicycle facility development. The plan sets forth goals and policies for bicycle facilities in the unincorporated county and proposes a viable system of bike routes. The plan does not contain funding or construction schedules (Yolo County 2013).

City of Woodland

City of Woodland General Plan and Parks, Recreation, and Community Services Master Plan

The *Public Facilities and Services Element* of the *City of Woodland General Plan 2035* (2017) sets standards, goals, and policies for the development and maintenance of parks and recreational facilities in the city and in collaboration with Yolo County. The City is in the process of preparing an updated *Parks, Recreation, and Community Services Master Plan* to reflect the recreation-related policies outlined in the general plan. This plan will contain an inventory and analysis of existing parks and open spaces and potential new park areas, and provides an analysis of current demand and future trends for parks and recreational facilities.

City of Woodland Bicycle Transportation Plan

The *City of Woodland Bicycle Transportation Plan* sets forth a master plan, including approximate construction schedule goals and funding information, for bicycle routes and facilities in the city (City of Woodland 2002).

3.16.1.2 Environmental Setting

This section discusses the environmental setting relevant to recreation in the project area.

Informal Recreational Uses

Although 31 miles of Upper Cache Creek upstream of the project area are designated as State Wild and Scenic River, the portion of Lower Cache Creek adjacent to the project area is not included in this designation. Nonetheless, recreationists utilize Lower Cache Creek for kayaking, walking/hiking, wildlife viewing, and similar activities. However, public access to the creek specifically in the project area is limited. Access is restricted as a result of private lands bordering the creek to the north and south, and locked gates at the entrances of the existing levee.

Yolo County is a popular area for bicycling because of its flat terrain, rural environment, mild climate, and relatively short distances between cities and unincorporated communities (Yolo County 2013). An existing Class II bike lane along County Road 102 from Knights Landing to the eastern portion of Woodland, and which continues nearly to Davis, directly crosses the project alignment.

Parks and Recreational Areas and Facilities

In the project vicinity, there are two federal recreation areas: Yolo Bypass and Fremont Weir Wildlife Areas; however, they are not in the project area. There are 17 county parks in Yolo County, both resource (open space) and community parks, totaling approximately 1,976.5 acres (Yolo County 2009), none of which is in the project area.

In the city of Woodland, there are a total of approximately 408 acres of parks and recreational facilities, including about 139 acres of developed parkland, 246 acres of undeveloped parkland, (including undeveloped parks and stormwater detention basins), and 24 acres of other facilities (City of Woodland 2017). Currently, there are 9 mini parks or plazas, 15 neighborhood parks, 1 community sports park, and 6 recreational facilities; the City also owns a 154-acre undeveloped park site, Woodland Regional Park, which is anticipated to become a nature and science center. The City anticipates that additional parkland will be created as part of future development, as well as additional linear greenbelt space, trails, and paths for walking, biking, and running, such as the currently incomplete systems along the east side of County Road 98 and the greenbelt south of Kentucky Avenue (City of Woodland 2017). Although some City parks and facilities, such as Beamer Park (a neighborhood park with ball fields, barbeques, picnic areas, playgrounds, and tennis courts) and Woodland Regional Park, are located south of the proposed embankment and within flood-prone portions of the City, they are not in the project area.

There is one recreational facility in the project area, Nelson's Grove. Nelson's Grove is a 12-acre YMCA park site and event venue located within an oak woodland about 2 miles north of Woodland on County Road 99 East. Nelson's Grove is used for youth activities, weddings and graduations, family reunions, company picnics, and camping (YMCA of Superior California 2019).

Velocity Island Park is a privately owned, 15-acre waterpark facility on the northern edge of Woodland adjacent to Interstate (I-) 5 and State Route (SR) 113, approximately 1.5 miles south of Lower Cache Creek. The park offers a multi-use aqua park, wakeboarding, paddle boarding, swim beach with cabanas, beach volleyball, birthday party facilities, and food services (Velocity Island Park 2019). The park is not in the project area but is adjacent to the project footprint and is subject to flooding under existing conditions.

Future Development of Recreational Facilities

The CCAP, *2030 Countywide General Plan*, and *Yolo County Bicycle Transportation Plan* each anticipate future development of recreational facilities in the project area. The easternmost limits of the CCAP planning boundary is the Rio Jesus Maria reach of Cache Creek, which extends close to County Road 98, overlapping the project area near the westernmost end of the project alignment but not in the construction footprint of the proposed levee. Yolo County anticipates additional parks and trail linkages along the Cache Creek corridor, west of I-5 (Yolo County 2009). The *Yolo County Bicycle Transportation Plan* contains proposals for additional Class I bike paths and Class II and III bikeways. The additional bikeways would complete the existing gaps between the four incorporated cities in Yolo County (Davis, West Sacramento, Winters, and Woodland) and provide additional connectivity to expanding communities in the county (Yolo County 2013). The City also proposes additional bikeways, including Class II bike lanes adjacent to the project footprint along Churchill Downs Avenue between East Street and Pioneer Avenue (City of Woodland 2002).

3.16.2 Environmental Impacts

This section describes the environmental impacts associated with recreation that would result from implementation of the Proposed Project. It describes the methods used to determine the effects of the Proposed Project and lists the thresholds used to conclude whether an impact would be significant.

3.16.2.1 Methods for Analysis

This analysis of the Proposed Project's effects on recreation is based on standard professional practice and the information resources cited herein. In addition, ICF staff made field observations of the project area on November 15, 2019 to assess recreational uses in the project area. Effects were identified and evaluated qualitatively based on the environmental characteristics of the project area and the magnitude and duration of activities related to the construction and operation of the Proposed Project.

3.16.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the Proposed Project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Increased use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.
- Construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

The Proposed Project does not involve construction or expansion of recreational facilities. In addition, although the levee to be constructed as part of the Proposed Project might be used for informal casual recreational activities (e.g., walking, running, biking), the levee would be built for flood risk protection, not for recreational purposes. Therefore, the second threshold specified above does not apply to the Proposed Project and this topic is not discussed further.

3.16.2.3 Impacts and Mitigation Measures

Impact REC-1: Increased use of existing recreational facilities, resulting in substantial physical deterioration (less than significant)

The Proposed Project does not involve residential or commercial development that would increase use of existing recreational facilities. Most of the project area is on privately owned lands, and there are no public recreational facilities in the project footprint that would be affected by the Proposed Project. The only mechanism through which the Proposed Project could increase use of existing recreational facilities would be through changing flood risk or flood conditions at existing facilities.

Nelson’s Grove is the only recreational facility in the project area, but the park is well outside of the project footprint and would not be affected by construction or operation of the Proposed Project. Although Nelson’s Grove is located north of the proposed levee, flood depths at Nelson’s Grove would not change with implementation of the Proposed Project (Figures 3.1-5 and 3.1-6); therefore, the park would not experience increased use due to changes in flood risk.

The Proposed Project would reduce flood risk for the recreational facilities in Woodland that are currently susceptible to flooding (e.g., Beamer Park and Woodland Regional Park). However, any resulting increased usage of these facilities would be negligible because, under existing conditions, the type of catastrophic flooding that would cause flooding of these facilities is uncommon. As described in Section 3.1, *Hydrology*, although Cache Creek has historically overflowed its current levee, Woodland itself has not experienced flooding other than during 1983, when a levee failure near County Road 102 caused flooding in the industrial area of Woodland.

Proposed Project implementation would reduce flood risk and potential damage from erosion and scour at Velocity Island Park. However, because the park is not open during the rainy season when it is most likely to flood under existing conditions, the reduced flooding due to the Proposed Project would not lead to increased use of the facility. Implementation of the Proposed Project could temporarily affect access to Velocity Island Park, but, as described in Chapter 2, *Project Description*, the project proponent would ensure through the design process that access to the park is not obstructed during or after construction. The private access road to the west of SR 113 currently used to access the park would be closed temporarily (for approximately 3 months) to install the precast box culverts under SR 113, the two adjacent railroad crossings, and the private access road itself where they cross over the drainage channel. However, as described in Chapter 2, temporary access will be arranged for the private road to Velocity Island, potentially utilizing a temporary ramp, to maintain continuous access to the park.

The Proposed Project would not lead to population growth or reduce existing flooding in parks such that an increased use of existing recreational facilities would result. The effect would be less than significant.

3.17 Population and Housing

This section describes the regulatory and environmental setting for population and housing in the project area shown on Figure 2-1 in Chapter 2, *Project Description*, and analyzes effects that would result from implementation of the Proposed Project. Information presented in the discussion and used for the subsequent analysis was drawn primarily from the following sources.

- *City of Woodland General Plan 2035* (City of Woodland 2017).
- *Yolo County Housing Element* (Yolo County 2013).
- The Sacramento Area Council of Governments (SACOG) *Regional Housing Needs Plan 2013–2021* (Sacramento Area Council of Governments 2012).
- California Department of Finance population projections (California Department of Finance 2019a, 2019b).

3.17.1 Existing Conditions

3.17.1.1 Regulatory Setting

This section summarizes key state and local or regional regulations, laws, and policies relevant to population and housing in the project area. Population and housing development in Yolo County and the city of Woodland are guided by state housing element law (Government Code Sections 65580–65590), and SACOG's *Regional Housing Needs Plan 2013–2021*.

State

California state law requires each city and county to adopt a general plan to guide future growth. These plans must include a housing element that identifies housing needs in the city or county and provides opportunities to meet those needs. The California Department of Housing and Community Development (HCD) administers population and housing policy laws at the state level, including the review of the local general plan housing elements. State housing element law (Government Code Sections 65580–65590) requires HCD to determine the relative share of existing and projected housing needs for each county. For Yolo County, HCD provides this information to ACOG, of which Yolo County and the City are members. SACOG, in turn, assigns a share of identified regional housing need to each of its member counties and cities through its regional housing needs allocation (RHNA) and plan process. Each city and county, including the City and Yolo County, must update its general plan housing element at least every 8 years. The housing element must incorporate policies and identify sites that may be available to accommodate jurisdiction's share of the regional housing need as identified in the RHNA.

Local

The state requires every county and city to plan for and accommodate its fair share of regional growth through the RHNA process.

Yolo County adopted its *Housing Element* in 2013. This element of the general plan establishes the County's goals for the maintenance and development of housing to meet the needs of existing and future residents, creates policies to guide County decision-making, and sets forth an action program to implement housing goals through June 2023 (Yolo County 2013).

The City's *Housing Element* was adopted in 2017 as part of the *City of Woodland General Plan 2035*. The *Housing Element* defines the City's housing goals, policies, and objectives and provides background information and analysis to support these goals, policies, and objectives (City of Woodland 2017).

3.17.1.2 Environmental Setting

This section discusses the environmental setting relevant to population and housing in the project area.

In 2019, California's population was estimated to be nearly 40 million people. By 2035, the state population is expected to rise to over 45 million (California Department of Finance 2019a, 2019b). The project area encompasses portions the City of Woodland and of unincorporated Yolo County, both of which have been experiencing population growth during recent years and which is expected to continue. Locally, the population of Woodland has grown from 55,468 people in 2010 to an estimated 60,292 people as of January 1, 2019. It is expected that the city's population will continue growing, and it is projected that in 2035 the population will be approximately 75,000 (City of Woodland 2017). The total population of Yolo County has increased from 200,849 in 2010 people to an estimated 222,581 people in 2019. The population of unincorporated Yolo County has grown from 24,391 people in 2010 to an estimated 31,200 people in 2019 and is expected to continue growing similarly to Woodland and Yolo County as a whole (California Department of Finance 2019b).

Both Yolo County and the City have inventoried the existing housing in their jurisdictions and identified housing targets to meet the needs of their growing populations. The *City of Woodland General Plan 2035* identified a need for a total of 1,458 new housing units to be constructed from 2013 to 2021, and an additional 55 units to be rehabilitated during that time (City of Woodland 2017). SACOG has identified Yolo County's share of the RHNA to be 11,129 units to be developed from 2013 to 2021 (Sacramento Area Council of Governments 2012).

3.17.2 Environmental Impacts

This section describes the environmental impacts associated with population and housing that would result from implementation of the Proposed Project. It describes the methods used to determine the effects of the Proposed Project and lists the thresholds used to conclude whether an impact would be significant.

3.17.2.1 Methods for Analysis

This evaluation of population and housing is based on professional standards and on information cited throughout the section. The key effects were identified and evaluated based on the environmental characteristics of the project area and the magnitude, intensity, and duration of activities related to the construction and operation of the Proposed Project.

3.17.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the Proposed Project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Creation of substantial unplanned population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure).
- Displacement of a substantial number of existing people or housing, necessitating the construction of replacement housing elsewhere.

3.17.2.3 Impacts and Mitigation Measures

Impact POP-1: Creation of substantial population growth (No impact)

The Proposed Project would not induce substantial population growth directly. The Proposed Project is an infrastructure project that is intended to protect the existing population in the area and would not provide any infrastructure that would create additional capacity for population growth in Woodland or in Yolo County. The Proposed Project could result in some indirect population growth in currently designated Flood Zone areas inside the City of Woodland Urban Limit Line. These areas have been subject to development restrictions because the areas are prone to flooding. However, many of these areas are industrial or within or adjacent to agricultural areas. Thus, even if development restrictions were to be lifted, it is unlikely that the subsequent development would be housing that results in substantial population growth. Furthermore, because these areas have been identified in the *City of Woodland General Plan 2035*, development in these areas has been incorporated in the overall planning process for the City. Therefore, the Proposed Project would have no impact.

Impact POP-2: Substantial displacement of people or housing (less than significant)

Because no housing is located within the footprint of the Proposed Project, the Proposed Project would not result in the direct displacement of people or housing or necessitate the construction of replacement housing elsewhere.

It is possible that, in the event of a 100-year or 200-year flood, the Proposed Project may result in slightly deeper floodwaters in areas that contain housing than would occur without the implementation of the Proposed Project. Figures 3.1-5 and 3.1-6 show that, in the event of a 100-year or 200-year flood, floodwaters in areas north of the project footprint and south of Cache Creek could be slightly deeper after the implementation of the Proposed Project. These areas do contain some structures, including some rural homes and businesses. However, flooding events on this level are expected to be temporary and very infrequent, and are not expected to result in the permanent displacement of residents in these areas or necessitate the construction of replacement housing elsewhere. Furthermore, the Proposed Project incorporates non-structural measures as described in Chapter 2, Section 2.3.6, *Additional Features Proposed by the City of Woodland*, that the City would institute and which would benefit the properties north of the city. The measures would be determined on a case-by-case basis, but may include floodproofing individual structures, including homes, by either modifying structures or providing the residents with a temporary, erectable barrier that could be deployed around the structure. Therefore, the impact of the Proposed Project would be less than significant.

3.18 Hazards, Hazardous Materials, and Wildfire

This section describes the regulatory and environmental setting for hazards and hazardous materials, as well as wildfire, in the project area, as identified in Chapter 2, *Project Description*, Figure 2-1, analyzes effects that would result from implementation of the Proposed Project, and provides mitigation measures to reduce the effects of any potentially significant impacts. The primary concerns pertaining to hazardous materials[1] in the project area are their use, transportation, storage, and handling (i.e., potential accidents or spills). Additionally, hazardous materials (e.g., gasoline, diesel fuel, hazardous waste) are conveyed along highways and railways in the region. Wildfire information presented in the discussion and used for the subsequent analysis was drawn primarily from the following sources.

- Fire and Resource Assessment Program (FRAP). State Responsibility Area (SRA) Viewer and Fire Hazard Severity Zones (FHSZs) (California Department of Forestry and Fire Protection n.d.)
- County of Yolo *2030 Countywide General Plan* (Yolo County 2009)
- *Yolo Operational Area Mutual Aid Plan* (Yolo County 2018)

3.18.1 Existing Conditions

3.18.1.1 Regulatory Setting

This section summarizes key federal, state, and local or regional regulations, laws, and policies relevant to hazards and hazardous materials, as well as wildfire, in the project area.

Federal

The U.S. Environmental Protection Agency (USEPA) is the principal federal regulatory agency responsible for the safe use and handling of hazardous materials. The key federal regulations pertaining to hazardous wastes relevant to the Proposed Project are described below. There are no relevant federal regulations to discuss in this section because the responsibility to fight fires and the identification of wildfire risk in the Central Valley is primarily governed by the State of California or local agencies.

Toxic Release Inventory

The Emergency Planning and Community Right-to-Know Act of 1986 and the Pollution Prevention Act of 1990 established the Toxic Release Inventory, a publicly available database that has information on toxic chemical releases and other waste management activities. USEPA annually updates the inventory and lists chemical releases by industry groups and federal facilities managed.

[1] A "hazardous material" is any substance or material that, because of its physical or chemical characteristics, may pose a real hazard to human health or the environment. Hazardous materials may be classified as toxic, flammable, corrosive, or reactive. Hazardous materials can be stored, handled, or transported through the normal course of business in some industries; however, hazardous materials can also be found in contaminated soil or groundwater in the form of petroleum hydrocarbons, volatile organic compounds, or chlorinated solvents that have been released into the subsurface from surface spills or leaking underground storage tanks (U.S. Environmental Protection Agency 2019).

The local inventory of locations related to the Proposed Project is discussed in Section 3.18.1.2, *Environmental Setting*.

Occupational Safety and Health Standards

Occupational safety standards exist in federal and state laws to minimize worker safety risks from both physical and chemical hazards in the workplace. The Occupational Safety and Health Administration (OSHA) is responsible for assuring worker safety in the workplace.

OSHA asbestos regulations are contained in 29 Code of Federal Regulations (CFR). Lead-based paint (LBP) regulations are described in the Lead-Based Paint Elimination Final Rule (24 CFR 33), governed by the U.S. Department of Housing and Urban Development. The potential to encounter lead-based paint and asbestos found in building materials relevant to the proposed project is discussed in Section 3.18.1.2, *Environmental Setting*.

State

California hazardous materials and wastes regulations are equal to or more stringent than federal regulations. EPA has granted the state primary oversight responsibility to administer and enforce hazardous waste management programs. State regulations require planning and management to ensure that hazardous materials are handled, stored, and disposed of properly to reduce risks to human health and the environment.

CAL FIRE is the primary state agency responsible for fire suppression and prevention in California. CAL FIRE establishes areas and zones in which the state identifies the responsibility to fight fires and the risk of wildfire to certain areas. SRAs are areas in which CAL FIRE is responsible for fighting the fire (CAL FIRE n.d.). FHSZs indicate the potential fire hazards in wildland areas (Yolo County 2009). The FHSZs are derived from the Fire Hazard Severity Scale, which was created by CAL FIRE and is used for evaluating and designating potential fire hazards in wildland areas.

California Accidental Release Prevention Program

As specified in 19 California Code of Regulations (CCR) 2, Chapter 4.5, Articles 1 through 11, all businesses that handle specific quantities of hazardous materials are required to prepare a California Accidental Release Prevention (CalARP) Program risk management plan (RMP). The CalARP RMP is the state equivalent of the federal RMP. CalARP RMPs include the preparation of an offsite consequence analysis of worst-case release of the stored chemicals and the preparation of emergency response plans, including coordination with local emergency response agencies. CalARP RMPs are required to be updated at least every 5 years and when there are significant changes to the stored chemicals.

California Health and Safety Codes

The California Environmental Protection Agency (Cal-EPA) has been granted primary responsibility by USEPA for administering and enforcing hazardous materials management plans within California. Cal-EPA, more generally than USEPA, defines a hazardous material as a material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released (26 CCR 25501).

State regulations include detailed planning and management requirements to ensure that hazardous materials are properly handled, stored, and disposed of to reduce human health risks. In particular, the state has acted to regulate the transfer and disposal of hazardous waste. Hazardous waste haulers are required to comply with regulations that establish numerous standards, including criteria for handling, documenting, and labeling the shipment of hazardous waste (26 CCR 25160 et seq.).

Cortese List

Cal-EPA maintains the Hazardous Wastes and Substances Site (Cortese) List, a planning document used by state and local agencies and developers to comply with CEQA requirements in providing information about the locations of hazardous materials release sites. Per Government Code section 65962.5, the Cortese List must be updated at least once annually. The DTSC, State Water Resources Control Board (State Water Board), and California Department of Resources Recycling and Recovery contribute to the hazardous material release site listings.

Emergency Services Act

Under the California Emergency Services Act, the state developed an emergency response plan to coordinate emergency services provided by all governmental agencies. The plan is administered by the California Office of Emergency Services (OES). OES coordinates the responses of other agencies, including USEPA, the Federal Emergency Management Agency (FEMA), the California Highway Patrol (CHP), regional water quality control boards, air quality management districts, and county disaster response offices. Local emergency response teams, including fire, police, and sheriff's departments, provide most of the services to protect public health.

Worker Safety

The California Division of Occupational Safety and Health (Cal/OSHA) is the state agency responsible for assuring worker safety in the workplace.

Cal/OSHA assumes primary responsibility for developing and enforcing standards for safe workplaces and work practices within the state. At sites known to be contaminated, a site safety plan must be prepared to protect workers. The site safety plan establishes policies and procedures to protect workers and the public from exposure to potential hazards at the contaminated site.

California Public Resources Code—State Responsibility Area

The California Public Resources Code (PRC) requires the designation of SRAs, which are identified based on cover, beneficial water uses, probable erosion damage, and fire risks and hazards. The financial responsibility of preventing and suppressing fires in an SRA is primarily the responsibility of the state. Fire protection in areas outside SRAs are the responsibilities of local or federal jurisdictions and are referred to as local responsibility areas and federal responsibility areas, respectively.

California Public Resources Code Sections 4201 through 4204

This section of the Public Resources Code was amended in 1982 to require the California Department of Forestry and Fire Protection (CAL FIRE) to classify FHSZs within SRAs. Lands within SRAs are classified in accordance with the severity of fire hazard present to identify measures to be used to retard the rate of spreading and reduce the potential intensity of uncontrolled fires that threaten to destroy resources, life, or property (California Department of Forestry and Fire Protection 2012).

Fire Hazard Severity Zones

Government Code Section 51178 requires CAL FIRE to identify fire hazard severity zones in the state. Government Code Section 51179 requires a local agency to designate, by ordinance, FHSZs in its jurisdiction. Specifically, the state is required to designate Very High Fire Severity Zones (VHFHSZs) in Local Responsibility Areas (LRAs) (Yolo County 2009). LRAs consist of areas where local agencies are responsible for fire suppression rather than the state, but since VHFHSZs in Yolo County are in SRAs rather than LRAs, they are not subject to the government codes referenced above.

Local

Certified Uniform Program Agency

Cal-EPA can delegate responsibility for many of its programs to a local government through certification as a Certified Uniform Program Agency (CUPA). A CUPA is responsible for implementing a unified hazardous materials and hazardous waste management program. This program was established under the amendments to the California Health and Safety Code (HSC) made by Senate Bill 1082 in 1994. HSC 25505 requires handlers of hazardous materials to submit business plans to the CUPA if hazardous materials inventories meet or exceed established thresholds. A CUPA can be a county, city, or joint powers authority that demonstrates its ability to administer the program.

The Environmental Health Services Division of Yolo County has been designated by Cal-EPA as the CUPA for Yolo County. As the CUPA, the division is responsible for performing all assessments of environmental contamination and/or human exposure and providing oversight of cleanup activity and coordination with the lead state agency having cleanup jurisdiction. In addition, the division oversees permitting and inspection of water wells and sewage disposal, petroleum waste injection wells, implements programs for hazardous materials emergency response, hazardous waste generators, and regulates the construction, operation, repair and removal of both aboveground storage tanks and underground storage tanks.

Yolo County Operational Area Multi-Jurisdictional Hazard Mitigation Plan and Mutual Aid Plan

The Yolo County Operational Area Multi-Jurisdictional Hazard Mitigation Plan identifies and evaluates specific local hazard mitigation strategies to be considered and provides planning support for those strategies developed by its political subdivisions, agencies, special districts, and organizations.

The Yolo Operational Area Mutual Aid Plan identifies Fire and Rescue as a formal Mutual Aid System in California where information flow and coordination travels from the local government to the state level in the event of an emergency (Yolo County 2018). Furthermore, a discussion on local fire departments can be found in Section 3.13, *Public Services, Utilities, and Service Systems*.

Yolo Operational Area Hazardous Materials Emergency Response Plan

The Yolo Operational Area Hazardous Materials Emergency Response Plan provides for an organized and structured response. This plan defines the structure of the emergency response effort made by the county Hazardous Materials Response Team. This team becomes active when deemed necessary by a fire department officer, and combines the forces of the University of California, Davis;

Davis; West Sacramento; and Woodland fire departments and the Environmental Health Division (EHD).

Yolo County General Plan

The following goals and policies excerpted from the *Health and Safety Element* of the 2*030 Countywide General Plan* pertain to hazards and hazardous materials (Yolo County 2009).

Health and Safety

GOAL HS-3 Wildland Fires. Protect the public and reduce damage to property from wildfire hazard.

Policy:

HS-3.1 Manage the development review process to protect people, structures, and personal property from unreasonable risk from wildland fires.

GOAL HS-4 Hazardous Materials. Protect the community and the environment from hazardous materials and waste.

Policy:

HS-4.1 Minimize exposure to the harmful effects of hazardous materials and waste.

GOAL HS-5 Airport Operations. Protect the community from the risks associated with airport operations and protect airports from the economic impacts of encroachment from incompatible land uses.

Policy:

HS-5.1 Ensure that land uses within the vicinity of airports are compatible with airport restrictions and operations.

GOAL HS-6 Emergency Preparedness. Provide timely and effective emergency response to reduce the potential loss of life and property.

Policy:

HS-6.1 Respond to catastrophic emergencies by:

- Continuing and restoring critical services.
- Maintaining order.
- Supporting evacuations.
- Distributing emergency supplies.
- Ensuring search/rescue operations and medical care.
- Saving lives and protecting property.
- Repairing and restoring essential public infrastructure.
- Mobilize the necessary resources to carry out emergency response efforts.
- Coordinating operations with other jurisdictions.
- Disseminating emergency public information.
- Establishing emergency operation centers and maintaining communications.
- Notifying vulnerable populations (e.g., seniors, schoolchildren, disabled, non-English speaking households, etc.).

HS-6.2 Provide continuous advance planning to anticipate potential threats and improve emergency response effectiveness.

City of Woodland General Plan

The *Safety Element* of the *City of Woodland General Plan 2035* (City of Woodland 2017) contains goals and policies aimed at reducing hazards within the city.

Goal 8.E Hazardous Materials. Minimize the risk of loss of life, injury, serious illness, damage to property, and negative economic and social impacts resulting from the use, transport, treatment, and disposal of hazardous materials and hazardous materials waste.

Policy 8.E.1 Coordination. Coordinate with Yolo County and other relevant agencies to ensure that the manufacture, purchase, use, storage, transportation, and disposal of hazardous materials in the city is conducted in a responsible manner that complies with local, State, and federal safety standards.

Policy 8.E.4 Emergency Response. Coordinate with Yolo County to provide for safe and efficient hazardous waste emergency response and plan for contaminated site cleanup.

Policy 8.E.5 Hazardous Materials Database. Coordinate with Yolo County to develop a database and maintain complete and accurate information on the types, quantities, sources, and management of all hazardous materials and wastes generated in Woodland to aid in management planning and emergency response.

Goal 8.F Emergency Response. Foster an efficient and coordinated response to emergencies and natural disasters.

Policy 8.F.2 Coordination. Continue to coordinate emergency preparedness, response, recovery, and mitigation activities with Yolo County, special districts, service agencies, voluntary organizations, other cities within the county, surrounding cities and counties, and State and federal agencies. Upon the next update of the Yolo County Operational Area Multi-Jurisdictional Hazard Mitigation Plan, participate in the effort to address topics related to climate change vulnerability, as required by SB 379.

Policy 8.F.5 Emergency Access and Evacuation. Require areas subject to fires, flooding, and other hazards to have emergency access and evacuation routes that are clearly marked with consistent signage. Make evacuation and rescue maps available to the public.

Sacramento-Yolo Mosquito and Vector Control District

The Sacramento-Yolo Mosquito and Vector Control District (SYMVCD) provides mosquito and vector control services to Sacramento and Yolo Counties. Services include ongoing surveillance of mosquitoes and other vectors to determine the threat of disease transmission and lower annoyance levels and communication with property owners, residents and governmental agencies to help in these efforts. The SYMVCD takes the following actions to monitor and control vectors and vector diseases.

- Public Information and Education. Outreach program educates and informs the public about mosquito control and prevention.
- Mosquito and Vector Surveillance. Laboratory and surveillance program monitors mosquito and virus activity by testing mosquitos, birds, and sentinel chickens for the presence of a viral pathogen.
- Biological Control. Use of living organisms to control a pest. Organism will attack the harmful pest, resulting in reduction of population levels. The primary biological control used against mosquitoes is the mosquitofish, *Gambusia affinis*.

- Physical Control and Source Reduction. Reduce mosquito breeding sites by promoting effective drainage, controlling vegetation, appropriate timing of irrigation, and encouraging best management practices (BMPs) in urban, agricultural and conservation areas.
- Microbial and Chemical Control. Prudent use of chemical compounds (insecticides) that reduce mosquito populations.

The SYMVCD may administer Ultra Low Volume (ULV) treatments by using backpack foggers, hand sprayers, truck-mounted foggers or aircraft, in and around areas where virus activity has been detected (Sacramento-Yolo Mosquito and Vector Control District 2018). Currently as a part of the Mosquito and Mosquito-Borne Disease Management Plan, areas of concern in Sacramento and Yolo County are sprayed with ULV treatments.

3.18.1.2 Environmental Setting

This section discusses the environmental setting relevant to hazards and hazardous materials in the project area. The project area consists of 10,292 acres of primarily agricultural lands, rural homes, and the Cache Creek Settling Basin (CCSB). It is also adjacent to low density residential or industrial urban areas between State Route (SR) 113 and County Road 102. Two lines of the California Northern Railroad extend through the project area north to south, and one line of the Sierra Northern Railway extends through the project area east to west. There are railroad crossings at SR 113 and at Interstate (I-) 5 to the west.

Hazardous Materials Sites in the Project Area

Previous Investigations

In 2000, a Phase 1 Environmental Site Assessment (Phase I ESA) was performed by the Environmental Design Section of the U.S. Army Corps of Engineers (USACE) Sacramento District for the 2003 *Lower Cache Creek, Yolo County, California, Draft Environmental Impact Statement/Environmental Impact Report for Potential Flood Damage Reduction Project*. This assessment resulted in the identification of 12 potential hazardous materials sites. However, these sites have been investigated and remedial efforts completed. As such, these sites no longer pose a threat.

Another Phase I ESA was conducted in 2014 for USACE's *General Investigation Feasibility Study* by the Environmental Chemistry Section of the USACE Sacramento District. This assessment consisted of a records investigation and site reconnaissance encompassing both the project area and the surrounding area. The assessment revealed no evidence of recognized environmental conditions[2] (RECs) in the project area.

Current Investigations

To identify potential hazardous sites within the project area, government databases of hazardous waste sites and facilities were reviewed. This search of the California Department of Toxic Substances Control's (DTSC) Envirostor database and the State Water Board's Geotracker database

[2] "Recognized environmental condition": hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances into structures or into the ground, ground water, or surface water of a property.

covered the project area (Figure 2-1) and a 0.25-mile buffer (Department of Toxic Substances Control 2019a). Three sites were identified and are described below.

Agriform Farm Supply Company

Agriform Farm Supply Company is located on SR 113 and County Road 18C. A release of pesticides was reported in the soil starting in 1965. Remediation efforts commenced in 1992 with contaminated soils removed from the site. Sixty-seven tons of soil was excavated. As of January 13, 2012, no further remediation was deemed necessary, and the case was closed (State Water Resources Control Board 2019a).

Western Wood Treating, Inc.

Located at 1492 Churchill Downs Avenue, Western Wood Treating, Inc. site was used for agricultural purposes prior to development as a wood treating facility in 1979. The site was referred to the Regional Water Quality Control Board (Regional Water Board) on August 7, 1997 for potential soil contamination of chromium and arsenic from release of wood treating solution. In addition, soil sampling indicated some areas of elevated metals. Minor soil excavations followed. Post site investigations were conducted in 1991. Impacted soil is now covered and paved (Department of Toxic Substances Control 2019b). Groundwater contamination of chromium was reported as discharged into an open trench drain in January 1, 1985. In March 2019, the groundwater elevation was 5 feet below ground surface, and remediation by groundwater circulation beneath the drip pad continued in April 2019. Verification monitoring continues. (State Water Resources Control Board 2019b.)

Cache Creek Settling Basin

CCSB is located within the project area. CCSB has long been a significant contributor of mercury, primarily from historic mining operations, to the Sacramento River. Mercury is carried from the hills of the Coast Ranges via Cache Creek until it settles and accumulates in the settling basin. Approximately 60 percent of the mercury entering the Yolo Bypass from the Cache Creek watershed passes through CCSB. It is the largest single source of mercury entering the San Francisco Bay-Delta annually. In addition, methyl mercury (a byproduct of mercury) has been found in the settling basin. (Department of Toxic Substances Control 2010).

Testing conducted in 1997 by the Regional Water Board reported an inflow concentration of mercury at 1,295 nanograms per liter (ng/L) and an outflow of 984 ng/L during the rainy season. Sampling in 2009 showed sediments in the settling basin contained up to 1.4 milligrams per kilogram (mg/kg). Another study indicated soil mercury levels at 0.959 mg/kg in 2005. These values are considered significant in terms of total mercury in the watershed system and for bioaccumulation in fish. In terms of human exposure to the CCSB, however, these values are considered low and do not exceed USEPA screening level or drinking water maximum contaminant level thresholds. (Department of Toxic Substances Control 2010). See Section3.2, *Water Quality* for more on this topic.

Agricultural Land Uses

Historically and currently, much of the project area is used for agricultural purposes. As a result, soils contaminated with pesticides, herbicides, and other agricultural chemicals may be present within the project area.

Railroads in the Project Area

Multiple railroad lines pass through the project area. Railcars frequently hold and transport different hazardous material. In addition, soils next to railroad tracks have typically been affected by heavy metals, total petroleum hydrocarbons as diesel, fuel oil, and polychlorinated biphenyls. Soils along railroad tracks may be affected by locomotives (total petroleum hydrocarbons as diesel), railroad ties (polynuclear aromatics) or slag ballast used to set the ties (heavy metals). As a result, it is possible that soil and groundwater in the immediate area of the railroad lines are contaminated.

Lead-Based Paint and Asbestos Containing Materials

Hazardous materials are commonly found in building materials that may be affected during demolition and renovation activities associated with redevelopment. Prior to 1978, lead compounds were commonly used in interior and exterior paints. Prior to the 1980s, building materials often contained asbestos fibers, which were used to provide strength and fire resistance.

Demolition of older buildings has the potential to release lead particles, asbestos fibers, and/or other hazardous materials to the air where they may be inhaled by construction workers and the general public. Federal and state regulations govern the demolition of structures where lead or material containing lead is present. During demolition, LBP that is securely adhering to wood or metal may be disposed of as demolition debris, which is a non-hazardous waste. Loose and peeling paint must be disposed of as a California and/or federal hazardous waste if the concentration of lead exceeds applicable waste thresholds. State and federal construction worker health and safety regulations require air monitoring and other protective measures during demolition activities where LBP is present.

Under the Proposed Project, the Truck Mixer Supply building located at 1201 Churchill Downs Avenue would be acquired and demolished. An exact date of construction is not known at this time; however, according to historic aerial photographs, the building was constructed sometime between 1968 and 1993 (HistoricAerials.com 2019a). It is possible therefore, that the building contains LBP or asbestos containing materials (ACM) in its construction materials.

Schools

Hazardous emissions and accidental release or combustion of hazardous materials near existing schools could result in health risks or other dangers to students. The closest schools to the project area (Figure 2-1), are Freeman Elementary (126 N. West Street) and Woodland Senior High School (21 N. West Street) located. Both schools are approximately 0.63 miles south of the project area.

Airports

Airport-related hazards are generally associated with aircraft accidents, particularly during takeoff and landing. Airport operation hazards include incompatible land uses, power transmission lines, wildlife hazards (e.g., bird strikes), and tall structures that penetrate the imaginary surfaces surrounding an airport. The closest public airport is the Watts-Woodland Airport, approximately 3.4 miles west of the project area (Figure 2-1). Sacramento International Airport is approximately 4.03 miles east of the project area. The closest private airport is Medlock Field, approximately 4.42 miles south of the project area.

Evacuation and Emergency Routes

In conjunction with the Yolo County Office of Emergency Services, the City of Woodland has identified six different evacuation zones. These zones are designated by local emergency services providers. The Proposed Project is in three evacuation zones (38, 39, 40). The primary evacuation route for zone 38 is Main Street/SR 16, West Street, and County Road 98. Zone 39's primary evacuation route is Main Street/SR 16 and East Street. The primary evacuation route for Zone 40 is Main Street/SR 16 and County Road 102 (Yolo County Office of Emergency Services 2019).

Fire-Related Hazards

Much of the project is located adjacent to an urbanized area. The remainder is located along Cache Creek and agricultural fields. Topography is the project area is primarily flat. CAL FIRE has designated the majority of the project area as an LRA. Unzoned adjacent to incorporated cities, neither of which is considered high for fire risks. Figure 3.18-1 shows the closest SRA, which is approximately 14 miles east of Woodland, west of Esparto, California. Similar to the SRA, there is no VHFHSZ in the project area. The closest VHFHSZ is also approximately 14 miles from the project area, west of Esparto, California. Due to the topography (i.e., flat) and limited fuel for wildland fires, there is less severe fire behavior in or around the project area (Yolo County 2009). As seen in Figure 3.18-2, the project area is not located near a VHFHSZ. A small portion of the project area near the proposed detention basin is zoned as having moderate fire hazard risks (California Department of Forestry and Fire Protection 2007).

Mosquitos

Mosquitos are a prevalent vector[3] in and around Woodland and Yolo County due to the topography (flat), location (generally rural in nature with various waterways and agricultural uses that use water) and the temperatures (generally warm/hot in the spring and fall). There are a number of common mosquitos, including the Western Encephalitis Mosquito (*Culex tarsalis*), Northern House Mosquito (*Culex pipiens*), Western Malaria Mosquito (*Anopheles freeborni*), Inland Floodwater Mosquito (*Aedes vexans*), and Western Treehole Mosquito (*Aedes sierrensis*) that have ranges in rural areas of Sacramento and Yolo Counties. These mosquitos can spread various diseases, including West Nile and western equine encephalitis.

3.18.2 Environmental Impacts

This section describes the environmental impacts associated with hazards and hazardous materials and wildfire that would result from implementation of the Proposed Project. It describes the methods used to determine the effects of the Proposed Project and lists the thresholds used to conclude whether an impact would be significant. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts are provided.

3.18.2.1 Methods for Analysis

The baseline for hazards and hazardous materials includes the hazards and hazardous materials that currently exist in the project area and which are identified in sources cited in Section 3.18.1.2, *Environmental Setting*. This section provides a qualitative discussion of the potential risks involving

[3] A "vector" is any organism that can serve as a transmission vehicle for a disease-causing agent.

hazards and hazardous materials as a result of the Proposed Project. The impact analysis makes the following assumptions.

- BMPs will be incorporated during construction related to Storm Water Pollution Prevention Plans (SWPPPs) described in Chapter 2, *Project Description*, and Section 3.2, *Water Quality*.
- The Truck Mixer Supply building located at 1201 Churchill Downs Avenue will be demolished.

The impact analysis associated with wildfires uses data from various state sources to determine the proximity of the project area to various wildfire responsibility and risk locations. CAL FIRE data of SRAs was used to determine if the project area is located in or near a designated SRA (Figure 3.18-1). Yolo County data from the FRAP was used to determine if the project area is located in or near a VHFHSZ (Figure 3.18-2).

3.18.2.2 Thresholds of Significance

In accordance with Appendix G of the State CEQA Guidelines, the Proposed Project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Creation of a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- Creation of a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.
- Emission of hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.
- Placement of project-related facilities on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and resulting creation of a significant hazard to the public or the environment.
- Placement of project-related facilities within an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, resulting in a safety hazard or excessive noise for people residing or working in the project area.
- Impair implementation of or physical interference with an adopted emergency response plan or emergency evacuation plan.

In accordance with Appendix G of the State CEQA Guidelines, the Proposed Project, if located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would be considered to have a significant wildfire effect if it would result in any of the conditions listed below.

- Substantial impairment of an adopted emergency response plan or emergency evacuation plan.
- As a result of slope, prevailing winds, or other factors, the exacerbation of risks of and exposure of project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire.
- Installation or maintenance of project-associated infrastructure (e.g., roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts on the environment.

- Exposure of people or structures to significant risks such as downslope or downstream flooding or landslide as a result of runoff, post-fire slope instability, or drainage changes.

The Proposed Project is not located within 0.25 mile of any schools. Thus, the threshold of significance for hazardous emissions near a school does not apply and is not evaluated further. Similarly, the Proposed Project is not located within 2 miles of an airport or airport land use plan. Therefore, the threshold of significance for a safety hazard or excessive noise near the project does not apply and is not evaluated further.

While there is no specific threshold related to mosquito control or vectors, construction of the 150-foot wide drainage canal at the northern toe of the levee and the detention basin at the inlet weir to the CCSB would create more opportunities for standing water and potential locations for mosquitos. Standing water would only be present in the wet, winter months, typically from December through March following a significant storm event and would drain into the CCSB following the winter rain events. The average high temperature during winter months is around 50 degrees, and because mosquitos (the main vector of concern) cannot survive in temperatures 50 degrees and below, standing water would not create suitable warm habitat for mosquito egg laying. Additionally, the Proposed Project would serve to move water away from the town and towards the CCSB and the city of Woodland pump plants. As such, in the case of a large storm or flood event, prolonged standing water would be a safe distance from residents. Finally, SYMVC would continue to treat areas in Yolo County with ULV treatments, as part of the Mosquito and Mosquito-Borne Disease Management Plan. Therefore, impacts related to mosquitos and are not evaluated further.

The Proposed Project is not located in or near a SRA or in a VHFHSZ (see Figures 3.18-1 and 3.18-2). Thus, the thresholds of significance for wildfire do not apply and are not evaluated further.

3.18.2.3 Impacts and Mitigation Measures

Impact HAZ-1: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials (less than significant)

The Proposed Project is an infrastructure project that would not result in the routine transport, use, or disposal of hazardous materials. While operation and maintenance of the Proposed Project would involve small quantities of commonly used materials, such as fuels and oils, to operate construction equipment, this type of use is not considered routine such that the use is regularly or frequently conducted. Accidental releases of small quantities of these substances during operation and maintenance could contaminate soils and degrade the quality of surface water and groundwater, or be released into the air, resulting in a potential public safety hazard. However, consistent with applicable laws and regulations, as discussed above in Section 3.18.1.1, *Regulatory Setting*, the transportation, handling, and disposal of these materials would be compliant with regulations enforced by CUPA and Cal-OSHA. In addition, the implementation of standard BMPs under the SWPPP (see Section 2.3.3.8, *Storm Water Pollution Prevention*, and Section 3.2, *Water Quality*, for a discussion of SWPPPs) would further reduce the potential of accidental release or exposure. This impact would be less than significant.

Impact HAZ-2: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment (less than significant with mitigation)

Site workers, the public, and the environment could be inadvertently exposed to preexisting onsite contaminants during construction of the levee within the project footprint including chromium in groundwater, soils contaminated by pesticides and/or railroad operations. Structure demolition and ground disturbing activities associated with construction may result in the release or disturbance of contaminated soil or hazardous building materials. In addition, floodproofing individual structures could also result in exposure to hazardous materials through an upset or accident conditions.

Groundwater Contamination

The Western Wood Treating, Inc. site is adjacent to the project area and was referred to the Regional Water Board for potential soil contamination. Subsequent remediation efforts addressed soil contamination. However, verification monitoring for groundwater contamination of chromium is ongoing. Construction of the drainage and levee in the project footprint is expected to excavate below ground surface up to a depth of 5 feet. Because groundwater at this particular site has been documented at 5 feet, there is a potential that excavation could expose workers and the public to contaminated groundwater, resulting in adverse health effects.

Implementation of Mitigation Measures HAZ-1 and HAZ-2 would reduce the potential for construction worker's exposure to hazards and hazardous materials to a less-than-significant level.

Agricultural and Railroad Land Uses

As previously discussed, much of the project area was and still is used for agricultural purposes. As a result, soils contaminated with pesticides, herbicides, and other agricultural chemicals may be present within the project area. Ground disturbing activities, such as grading and excavation, may expose construction workers and the general public to hazardous materials that may result in health effects. Similarly, if soils adjacent to railroad tracks are disturbed during construction (i.e., installation of culverts), workers could be exposed to heavy metals, total petroleum hydrocarbons as diesel, fuel oil, and polychlorinated biphenyls. Finally, railroad freight cars traveling through the project area can contain hazardous materials. Depending on the timing of construction and the schedule of the railroads, there is the risk of a potentially significant hazard to the public or the environment through reasonably foreseeable accident conditions involving the release of hazardous materials into the environment depending on the amount and type of hazardous freight being carried.

Implementation of Mitigation Measures HAZ-1, HAZ-2, and HAZ-3 would reduce impacts related to hazardous materials exposure to a less-than-significant level.

Lead-Based Paint and Asbestos Containing Materials

The Truck Mixer Supply building located at 1201 Churchill Downs Avenue, would be acquired and demolished as part of the Proposed Project. The building was constructed sometime between 1968 and 1993. Building materials manufactured before the 1980s could contain ACM and/or LBP. These materials are known to be hazardous to human health and could be released if disturbed during demolition. Confirmation of the construction date of this building would be required. If the date of construction is before 1980, building components should be tested for LBP and ACM prior to demolition. In addition, due to the age of buildings that may be floodproofed, LBP and ACM, may be present.

Implementation of Mitigation Measures HAZ-1 and HAZ-2 would identify the potential for LBP and/or ACM to be present in building components and would reduce impacts related to LBP and ACM to a less-than-significant level.

Mitigation Measure HAZ-1: Develop and implement a health and safety plan

The City of Woodland will develop and implement a Health and Safety Plan to address worker safety when working with potentially hazardous materials (e.g., levels of protective personal equipment, emergency action plan, procedures for encountering hazardous materials) including potential ACMs, LBPs, pesticides, and other construction-related materials within the project area during any soil-disturbing activity. Additional measures shall include identification of appropriate fueling and maintenance areas for equipment, daily equipment inspection schedule, a spill response plan, spill response supplies to be maintained onsite, and a complete list of the agencies to be notified (with their telephone number).

Mitigation Measure HAZ-2: Perform a phase I environmental site assessment prior to construction activities and remediate if necessary

Prior to construction, the project proponent will conduct a phase I environmental site assessment in conformance with the American Society for Testing and Materials Standard Practice E1527-05. All environmental investigation, sampling, and remediation activities associated with properties in the project area will be conducted under a work plan approved by the regulatory oversight agency and will be conducted by the appropriate environmental professional consistent with Phase I environmental site assessment requirements.

A Phase I environmental site assessment should, at a minimum, include the following components.

- An onsite visit to identify current conditions (e.g., vegetative dieback, chemical spill residue, presence of above- or underground storage tanks).
- An evaluation of possible risks posed by neighboring properties.
- Interviews with persons knowledgeable about the site's history (e.g., current or previous property owners, property managers).
- An examination of local planning files to check prior land uses and any permits granted.
- File searches with appropriate agencies (e.g., State Water Board, fire department, County health department) having oversight authority relative to water quality and groundwater and soil contamination.
- Examination of historical aerial photography of the site and adjacent properties.
- A review of current and historic topographic maps of the site to determine drainage patterns.
- An examination of chain-of-title for environmental liens and/or activity and land use limitations.

If the phase I environmental site assessment indicates likely site contamination, a phase II environmental site assessment will be performed (also by an environmental professional).

A phase II environmental site assessment would comprise the following.

- Collection of original surface and/or subsurface samples of soil, groundwater, and building materials to analyze for quantities of various contaminants.
- An analysis to determine the vertical and horizontal extent of contamination (if the evidence from sampling shows contamination).

If contamination is uncovered as part of phase I or II environmental site assessments, remediation will be required. If materials such as asbestos-containing materials, LBP, or PCB-containing equipment are identified, these materials will be properly managed and disposed of prior to or during the demolition process.

Any contaminated soil identified on a project site must be properly disposed of in accordance with DTSC regulations in effect at the time.

If, during construction/demolition of structures, soil or groundwater contamination is suspected, the construction/demolition activities will cease and appropriate health and safety procedures will be implemented, including the use of appropriate personal protective equipment (e.g., respiratory protection, protective clothing, helmets, goggles).

Mitigation Measure HAZ-3: Develop a freight rail management plan

The City will designate a City representative work with the railroad(s) to identify a rail representative such that coordination and communication can occur between the City and railroad(s). As part of this coordination, a freight rail management plan will be developed documenting the communications protocol between the City and the railroads to inform the railroads of construction timing and duration and to inform the City as to when rail cars need to pass. Safety protocols for those individuals working near or on the railroad will also be identified in this management plan and implemented by the City.

Impact HAZ-3: Place project-related facilities on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment (less than significant with mitigation)

As described above under Impact HAZ-2, Western Wood Treating, Inc. is listed on the DTSC and State Water Board databases for soil and groundwater contamination. Although soil remediation efforts have concluded, there is the possibility of groundwater contamination. Excavations of depths up to 5 feet below ground surface during construction could expose workers and the public to contaminated groundwater resulting in adverse health effects. However, Mitigation Measures HAZ-1 and HAZ-2 require a health and safety plan to protect workers and preconstruction investigations to determine the potential for encountering contaminants, and if necessary, remediation. The exact location, timing and duration of floodproofing efforts are unknown. The structures for floodproofing would be selected on a case-by-case basis and currently it is unknown if one or more of those structures are included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. Implementation of the preconstruction investigation as required by Mitigation Measure HAZ-2 would identify any contaminated sites and ensure remediation if needed.

Therefore, implementation of Mitigation Measures HAZ-1 and HAZ-2 would reduce this impact to a less-than-significant level.

Mitigation Measure HAZ-1: Develop and implement a health and safety plan

Mitigation Measure HAZ-2: Perform a phase I environmental site assessment prior to construction activities and remediate if necessary

See Impact HAZ-2 for the full text of these mitigation measures.

Impact HAZ-4: Impair implementation of or physical interference with an adopted emergency response plan or emergency evacuation plan (less than significant with mitigation)

During operations and maintenance, all roadway work would be completed, and the Proposed Project would not impair or interfere with any adopted emergency response or evacuation plans. There is the potential for flooding of roadways in the project area. However, roadway flooding in the project area already occurs and is considered an existing condition.

During construction, the Proposed Project could cause temporary changes in emergency access because of potential lane closures or detours that could result in interference with the designated evacuation routes identified in Section 3.18.1.2, *Environmental Setting Evacuation and Emergency Routes*. The primary evacuation route for zone 39 is Main Street/SR 16 and N. East Street. Northbound SR 113, north of Churchill Downs Avenue, would be closed for up to 3 months during construction. Although this is part of the evacuation route 39, other roads would remain open including Kentucky Avenue, County Road 99, CR101, and N. East Street to the I-5 interchange. Construction-related traffic could potentially delay or obstruct the movement of emergency vehicles. This would be a significant impact. As identified in Section 3.12, *Transportation*, Mitigation Measure TR-2 requires preparation and implementation of a Transportation Management Pan that details requirements for signage, emergency services notifications, and traffic controls would ensure continued emergency access during construction. With implementation of Mitigation Measure TR-2, this impact would be reduced to a less-than-significant level.

Mitigation Measure TR-2: Traffic management plan for project construction

See Impact TR-2 in Section 3-12, *Transportation*, for the full text of this mitigation measure.

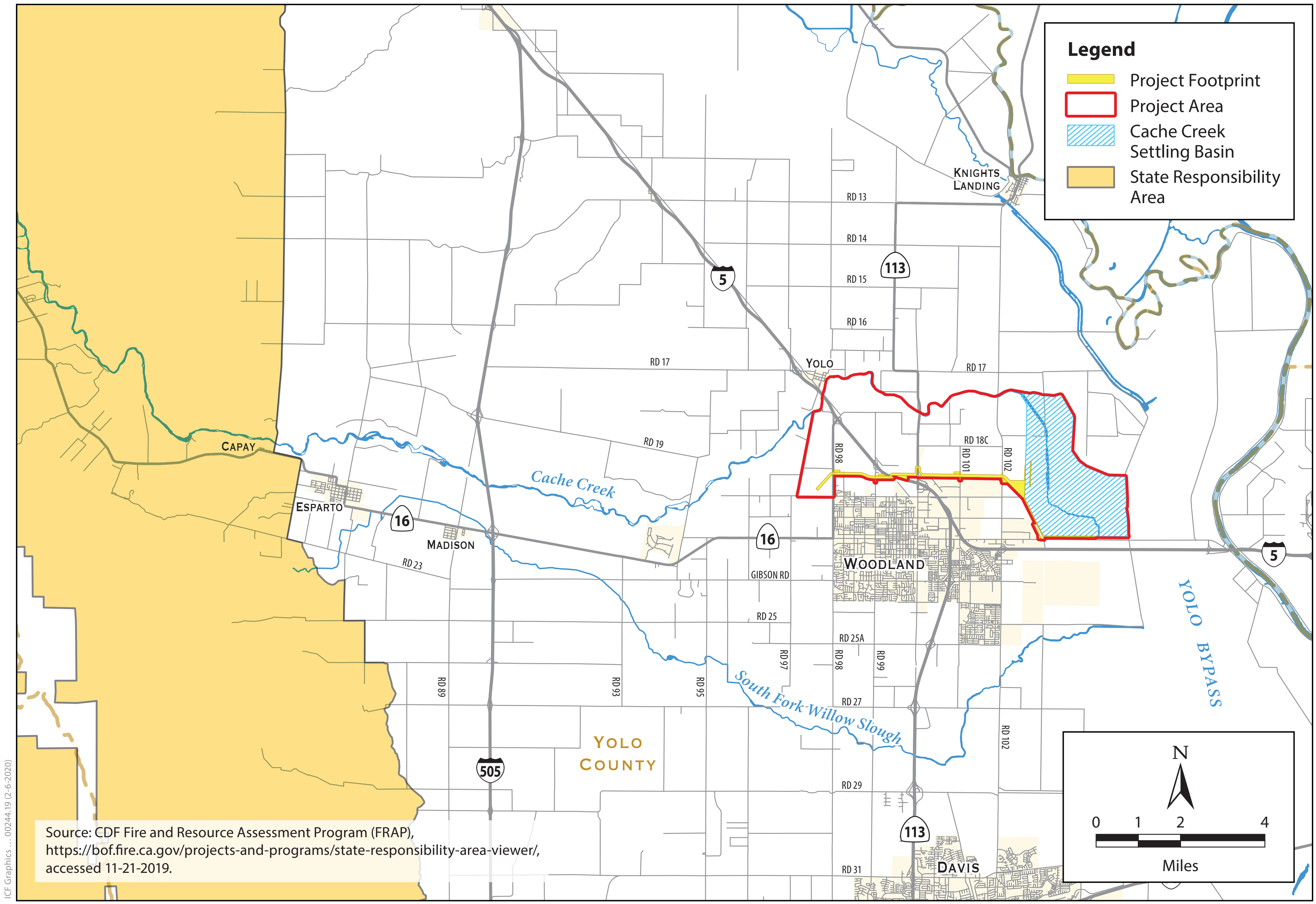

Figure 3.18-1
State Responsibility Areas

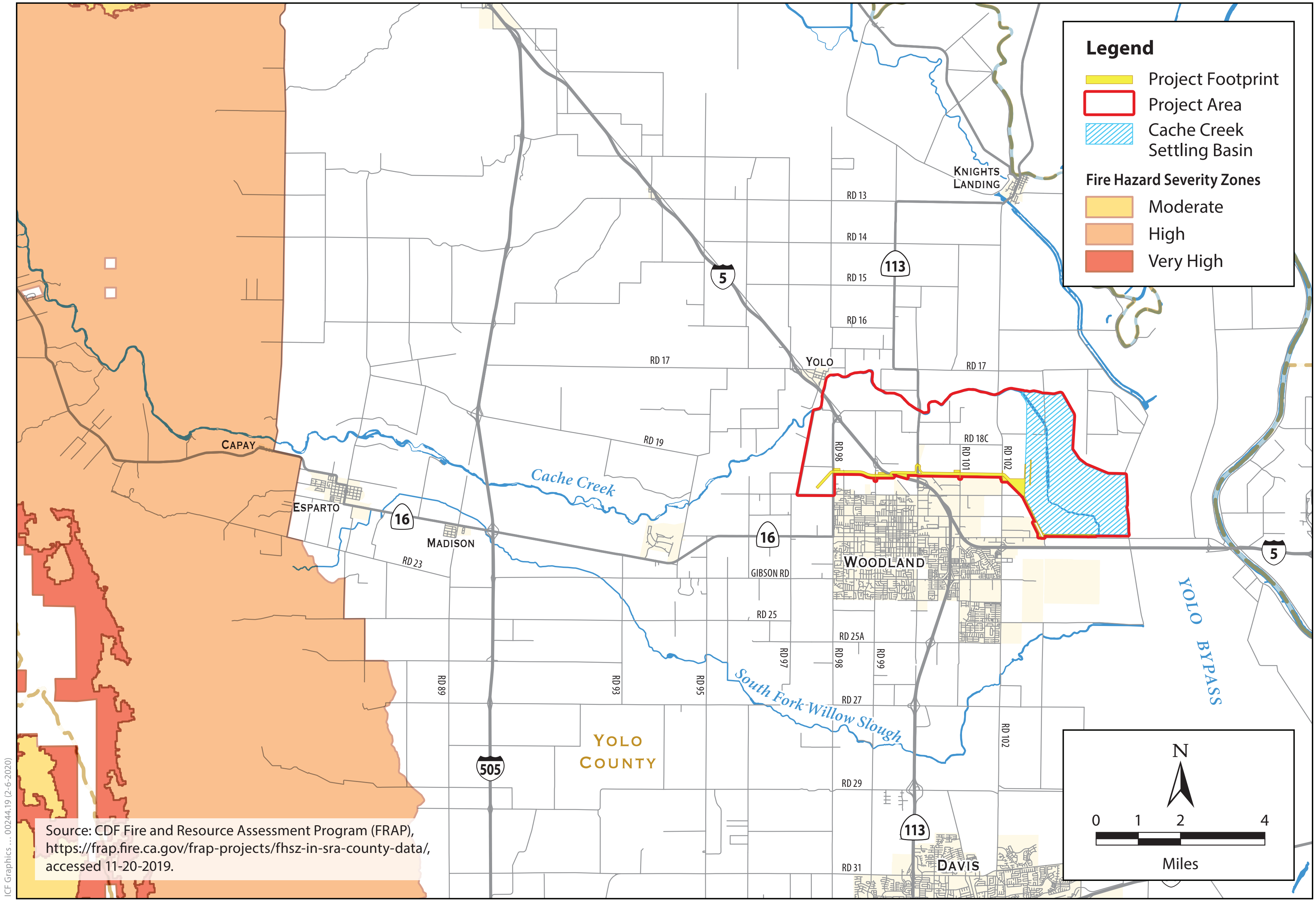

Figure 3.18-2
Fire Hazard Severity Zones

Chapter 4
Alternatives Analysis

4.1 Alternatives Overview

CEQA requires that an EIR include a reasonable range of feasible alternatives to the project that meet most or all of the project objectives while reducing or avoiding one or more significant impacts of the project. According to State CEQA Guidelines Section 15126.6(f), the range of alternatives required in an EIR is governed by a "rule of reason" that requires an EIR to set forth only those alternatives necessary to allow a reasoned choice. An EIR need not consider every conceivable alternative to a project. Instead, the discussion of alternatives must "focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project." Where a potential alternative is examined but not chosen as one of alternatives, the State CEQA Guidelines require that an EIR briefly discuss the reasons the alternative was dismissed. An EIR is not required to consider alternatives that are infeasible. In addition to a range of alternatives, an EIR must discuss the "No Project Alternative," which describes the reasonably foreseeable probable future conditions if the project is not approved (State CEQA Guidelines Section 15126.6).

The lead agency must consider the alternatives discussed in an EIR before acting on a project. The agency is not required to adopt an alternative that may have environmental advantages over the project if specific economic, social, or other conditions make the alternative infeasible (Public Resources Code [PRC] Section 21002).

This chapter describes the alternatives to the Woodland Flood Risk Management Project (Proposed Project) and compares the anticipated environmental impacts of the alternatives to those of the Proposed Project, analyzed in Chapter 3, *Impact Analysis*, Sections 3.1 through 3.18.

4.2 Alternatives Development and Screening Criteria

The alternative screening criteria are listed here and are described below in detail.

- **Ability to meet project objectives**—the extent to which the alternative fulfills the project's objectives.
- **Impact avoidance**—the extent to which the alternative substantially avoids, minimizes, reduces, or eliminates an impact associated with the proposed project.
- **Feasibility—**the extent to which the alternative is potentially capable of being accomplished given economic, environmental, legal, social, and technological factors.

Through this screening process, alternatives were considered and included for further analysis in the EIR or removed from further consideration. Those alternatives that meet the project objectives, that would reduce one or more project impacts, and that appear feasible are discussed in greater detail in Section 4.3, *Alternatives Analysis*. Those alternatives that were considered but removed from further consideration are summarized under Section 4.5, *Alternatives Considered but Dismissed from Further Analysis.*

4.2.1 Ability to Meet Project Objectives

The City's primary objective, as described in Chapter, 2, *Project Description,* is to develop and implement a plan that meets California's Urban Level of Protection and the Federal Emergency Management Agency (FEMA) 100 year requirements to reduce the risk of flooding to avoid loss of life, property damage, and economic effects that result from flooding in both the project area and Woodland, while also providing measures to address concerns north of the city in the project area. The objectives are as follows.

- *Provide 200-Year Flood Protection.* Comply with recent state legislation and flood protection criteria by providing the urban area with a 200-year level of flood protection from Cache Creek.
- *Obtain FEMA Certification***.** Provide 100-year flood protection to Woodland in order to obtain FEMA certification and remove the city from the mapped floodplain.
- *Develop a project that meets U.S. Army Corps of Engineers (USACE) planning criteria and federal requirements for investment.* The City lacks the financial capability to construct a project without significant State and federal funding. The USACE Civil Works Program is the only viable mechanism through which to secure federal investment.
- *Avoid or reduce risk associated with increases to the 100-year flood depth at existing structures north of the city.*
- *Maintain the functionality of the Cache Creek Settling Basin (CCSB).* Ensure the efficient and effective functioning of the CCSB to capture sediment from waters flowing out of Cache Creek before the water is discharged into the Yolo Bypass.
- *Ensure no net loss of native trees.* Provide a location that can serve as a replacement planting area for native trees removed during construction.

4.2.2 Impact Avoidance

In addition to identifying feasible mitigation for a proposed project's impacts, a lead agency must also consider alternatives that could provide a means of avoiding altogether or reducing the level of impact that would otherwise result from implementation of a project. The following significant impacts would result from the Proposed Project. These impacts are analyzed in detail in Chapter 3, *Impact Analysis*, Sections 3.1 through 3.18.

4.2.2.1 Significant and Unavoidable Impacts

Agricultural and Forestry Resources

- Impact AG-1: Conversion of Farmland to nonagricultural use

Transportation

- Impact TRA-2: Conflict or be inconsistent with State CEQA Guidelines Section 15064.3, subdivision (b) by temporarily causing substantial additional VMT or induced automobile. travel

Aesthetics

- Impact AES-3: Substantially degrade the existing visual character or quality of public views in non-urbanized areas due to operations

4.2.2.2 Significant Impacts that can be Mitigated to Less-than-Significant Levels

Water Quality

- Impact WQ-1: Violation of water quality standards or waste discharge requirements or substantial degradation of surface water or groundwater quality

Geology, Soils, and Paleontological and Mineral Resources

- Impact GEO-7: Damage to paleontological resources as a result of project construction

Biological Resources

- Impact BIO-1: Potential disturbance or mortality of vernal pool branchiopods and their habitat
- Impact BIO-2: Potential disturbance or mortality of valley elderberry longhorn beetle and its habitat
- Impact BIO-3: Potential disturbance or mortality of western pond turtle
- Impact BIO-4: Potential disturbance or mortality of or loss of habitat for giant garter snake
- Impact BIO-5: Potential disturbance or mortality of nesting Swainson's hawk and white-tailed kite and loss of nesting and foraging habitat
- Impact BIO-6: Potential disturbance or mortality of nesting special-status and non–special-status birds and removal of suitable breeding habitat
- Impact BIO-7: Potential injury, mortality or disturbance of tree-roosting bats and removal of roosting habitat
- Impact BIO-9: Potential for construction activities to result in removal of special-status plants
- Impact BIO-10: Potential for construction activities to result in indirect impacts on riparian habitat
- Impact BIO-11: Potential for construction activities to result in loss of valley oak woodland
- Impact BIO-12: Potential for construction activities to result in fill of non-wetland waters of the United States/waters of the state
- Impact BIO-13: Potential for construction activities to result in fill of wetlands
- Impact BIO-15: Potential for construction activities to introduce and spread invasive species

Air Quality

- Impact AQ-2: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard
- Impact AQ-3: Expose sensitive receptors to substantial pollutant concentrations

Greenhouse Gas Emissions

- Impact GHG-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment
- Impact GHG-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases

Cultural Resources

- Impact CUL-1: Potential to cause a substantial adverse change in the significance of a historical resource
- Impact CUL-2: Change in the significance of an archaeological resource
- Impact CUL-3: Disturbance of Native American and historic-period human remains

Tribal Cultural Resources

- Impact TCR-1: Potential to cause a substantial adverse change in the significance of a tribal cultural resource

Transportation

- Impact TRA-3: Create major driving or transportation- and circulation-related hazards
- Impact TRA-4: Result in inadequate emergency access

Energy

- Impact EN-2: Conflict with or obstruct a state or local plan for renewable energy or energy efficiency

Aesthetics

- Impact AES-2: Substantially degrade the existing visual character or quality of public views in non-urbanized areas due to construction

Hazards, Hazardous Materials, and Wildfire

- Impact HAZ-2: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment
- Impact HAZ-3: Place project-related facilities on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment
- Impact HAZ-4: Impair implementation of or physical interference with an adopted emergency response plan or emergency evacuation plan

4.2.3 Feasibility

CEQA requires that alternatives considered in an EIR be feasible. Section 15364 of the State CEQA Guidelines defines “feasible” as “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors." CEQA does not require that an EIR determine the ultimate feasibility of a selected alternative, but rather that an alternative probably be feasible. Determination of an alternative's feasibility in this analysis was informed primarily by cost/benefit ratio and took into account efficiency of achieving project objectives, federal interest, site suitability, and property acquisition issues.

4.3 Alternatives Analysis

After the screening process, the City determined that one alternative would fulfill the CEQA requirements of meeting most of the project objectives, being feasible and reducing or eliminating project impacts. This alternative was also identified as having community support in both the FloodSAFE Yolo Pilot Program and in the City of Woodland Alternative Analysis. Throughout the USACE planning process, this alternative was known as "Alternative 2C." For consistency's sake, this alternative is referred to as Alternative 2C in this EIR.

In addition, a No Project Alternative must be considered in an EIR. Therefore, the No Project Alternative and Alternative 2C are evaluated in comparison with the Proposed Project in this EIR. More detail regarding the selection of alternatives for analysis in this EIR is provided in the "Selection of California Environmental Quality Act Alternatives" section of Appendix A, *Technical Memorandum, City of Woodland, Previous Alternatives Analysis Related to the Lower Cache Creek Feasibility Study.*

4.3.1 No Project Alternative

Section 15126.6(e)(2) of the State CEQA Guidelines requires an EIR to include an analysis of the No Project Alternative. Evaluation of the No Project Alternative allows decision makers to compare the impacts of approving a proposed project with the impacts of not approving the proposed project. The No Project Alternative evaluated in this EIR assumes that the Proposed Project would not be implemented and considers "what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services" (State CEQA Guidelines Section 15126.6 [e][2]).

4.3.1.1 Alternative Description

For this EIR, the No Project Alternative assumes that current conditions and operation and maintenance practices would continue into the foreseeable future. No additional work would be performed to address overtopping, seepage, or levee stability concerns along Lower Cache Creek. Damages to real property from Cache Creek overflows would be expected to total approximately $22 million annually. The city of Woodland would remain at risk of severe flooding from upstream overtopping and could experience flood-related loss of life, contamination from sewage and hazardous materials, and the closure of Interstate (I-) 5 at locations both north and east of the city, preventing residents from easily escaping rising floodwaters.

The existing levees would continue to require improvements to meet FEMA's minimum acceptable level of flood protection. Regular operation and maintenance of the existing Cache Creek levees would continue as currently executed by the local maintaining agencies.

The CCSB would continue to be maintained to meet sediment trap efficiency requirements. The USACE *Cache Creek Settling Basin Draft O&M Manual* (2007) states that, beginning in year 25 of the project, 400-foot sections of the training levee are to be removed every 5 years, starting with a section 1,100 feet upstream from the current terminus of the training channel. Each subsequent section would be removed 1,100 feet upstream from the last removed section.

4.3.1.2 Alternative Analysis

Hydrology

As described in Section 4.3.1.1, Alternative Description, under the No Project Alternative, no additional work would occur to address levee overtopping concerns in the project area. If a levee overtopping were to occur, people and structures in the study area, including the city of Woodland, would be exposed to risks due to inundation. Flooding under the No Project Alternative would be much more widespread than under the Proposed Project and could result in inundation of substantial portions of the city of Woodland that are dense in structures and population. Additionally, under the No Project Alternative, the non-structural measures intended to benefit and protect the properties north of the city would not be implemented. These conditions would constitute a significant impact related to inundation (Impact HYDRO-5). Recent studies conducted on the increased rate of land subsidence caused by groundwater extraction in the western portion of the Sacramento Valley may alter the existing hydrology in the project area (California Department of Water Resources 2014:Appendix A). Local rates of subsidence may induce channel incision (leading to an increase in the already over-steepened banks), cause existing levees to settle, and increase the risk of flooding in the project area. The issue of subsidence compounds the existing flood risk to the local community.

The potential for erosion and/or scour could potentially be more widespread under the No Project Alternative (as compared with Alternative 2A) because the floodwaters (from levee overtopping) would inundate a larger area and could cause localized erosion or sedimentation within the City limits. This is because such flows would not be contained as they would be by the proposed levee and drainage channel under the Proposed Project. The impact would be significant, which is a greater impact than under the Proposed Project.

If a levee overtopping were to occur, it is reasonable to assume that the existing drainage patterns would need to be modified to accommodate repairs (a potentially significant impact related to Impact HYDRO-1 and Impact HYDRO-2).

Under the No Project Alternative, there would be no impacts on the CCSB because there would be no modifications to the existing CCSB perimeter levees, the CCSB inlet and outlet weirs, or to flow into or out of CCSB. Similarly, there would be no impacts associated with creation or contribution of runoff that would exceed the capacity of existing or planned storm water drainage systems because there would be no modifications to the drainage system.

Water Quality

Under the No Project Alternative, the proposed flood risk reduction measures would not be implemented. As described for the Proposed Project, a flood event could result in substantial water quality impairments of surface water and groundwater, and associated environmental impacts (e.g., water quality impacts on fish and aquatic resources) as well as public health hazards. If floodwater caused failure of the southern and southwest CCSB levees (levees that would be improved under the

Proposed Project), mercury-laden sediment from the CCSB could spread to areas south and southwest of the CCSB. Further, as occurs under existing conditions, in major flood events under the No Project Alternative, when water ponds against the west levee of the Yolo Bypass south of the CCSB, a relief cut in the levee would be made to allow floodwaters to drain directly to Yolo Bypass. This would potentially facilitate the movement of mercury-laden sediment from Lower Cache Creek directly to Yolo Bypass. In addition, emergency flood-fighting and clean-up actions would require the use of a considerable amount of heavy construction equipment for earthmoving and other activities, and these activities would result in additional potential water quality impacts similar in nature to those described in Section 3.2, *Water Quality*, for the Proposed Project related to ground-disturbing activities and potential accidental release of water pollutants (e.g., fuels, oil). Furthermore, because of the unpredictable nature of an emergency response, emergency construction and repair activities could be implemented without the use of water quality BMPs and could result in release of contaminants into the soil (groundwater) and adjacent surface water, as well as increased erosion, sedimentation and turbidity is surface water bodies. Given this and given that the area potentially affected by a major flood event would be larger than the area affected by the Proposed Project, with or without a flood event, water quality impacts in the project area under the No Project Alternative would be greater than under the Proposed Project.

Absent a major flood event, water quality in Lower Cache Creek would likely remain generally the same as under existing conditions, assuming no significant changes in land use upstream of the project area. The current sources of water quality impairment in Lower Cache Creek, i.e., mercury, boron, and unknown toxicity, would persist. Any future projects planned in or adjacent to the project area could have water quality impacts that are similar in nature to those described for the Proposed Project, specifically erosion, sedimentation and turbidity from ground disturbance, and potential impacts on surface water and groundwater from accidental spills of hazardous materials associated with construction activities. As with the Proposed Project, however, project proponents would comply with federal, state, and local regulations to minimize water quality impacts.

Like the Proposed Project, under the No Project Alternative, the use of groundwater would not change and thus groundwater supplies would not substantially decrease.

Geology, Soils, and Paleontological and Mineral Resources

As described in Section 4.3.1.1, *Alternative Description*, under the No Project Alternative, no levee and associated drainage channel would be constructed. There would be no difference in risk of surface fault rupture because no known faults cross the project area.

Strong seismic ground shaking would have the same effect on existing structures, including the existing Cache Creek levee, as under the Proposed Project. Under the No Project Alternative, no new structures would be constructed that would be susceptible to strong seismic ground shaking. Similar to the Proposed Project, the impact for seismic ground shaking under the No Project Alternative would be less than significant.

The risk of construction-related erosion and sedimentation would be less under the No Project Alternative than under the Proposed Project because no construction is proposed. However, in case of overtopping or failure of the existing Cache Creek levee, the potential for erosion and/or siltation would be spread over a larger area, specifically into Woodland, under the No Project Alternative than under the Proposed Project. This is because such flows would not be contained as they would be by the proposed levee and drainage channel under the Proposed Project. The impact would be significant, which is a greater impact than under the Proposed Project.

As with the Proposed Project, the No Project Alternative would not change current rates of groundwater extraction or substantially change rates of groundwater recharge. Therefore, as with the Proposed Project, there would be no impact resulting from land subsidence.

In contrast to the Proposed Project, the No Project Alternative would not involve excavation. Accordingly, there would be no impact related to potential slope failure during construction of levee walls, drainage channel walls, and floodwalls or impacts on paleontological resources as a result of construction. These impacts would be less than significant and would be less than under the Proposed Project.

Similarly, in contrast to the Proposed Project, the No Project Alternative does not involve construction of a new levee. Therefore, there would be no impact related to placement of the new levee on expansive soils, an impact that would be less than under the Proposed Project.

Because the No Project Alternative does not involve placement of a new levee or associated structures, there would be no impact on mineral or fossil fuel resources. Because the project area is state-designated MRZ-3, the Proposed Project involves a less-than-significant impact on availability of mineral and fossil fuel resources. In addition, because the No Project Alternative would not require large quantities of aggregate, it would also avoid the loss of availability of a known mineral resource as a result of use during construction. Therefore, there would be no impact for the No Project Alternative, which would be less than under the Proposed Project.

Biological Resources

Under the Proposed Project, impacts on sensitive communities and special-status plant and animal species would be less than significant with mitigation. Under the No Project Alternative, the proposed levee and drainage would not be constructed; therefore, there would be no construction impacts on sensitive natural communities and special-status plant and animal species.

As described in Section 4.3.1.1, the CCSB would continue to be maintained under the No Project Alternative to meet sediment trap efficiency requirements, which would include removal of sections of the training levee. Training levee removal would potentially affect adjacent sensitive habitats, including riparian habitat, wetlands, and non-wetland waters. Ultimately, the magnitude of these impacts on sensitive biological resources under the No Project Alternative would be similar to those under the Proposed Project, because CEQA compliance and permits would be performed by the CEQA lead agency (the California Department of Water Resources [DWR]) prior to implementation of measures required in the *CCSB Draft O&M Manual*.

Overall, there would be fewer impacts on biological resources under the No Project Alternative; these impacts would be less than significant.

Land Use and Planning

The No Project Alternative assumes that current conditions and operation and maintenance practices would continue for the foreseeable future. The consequences of levee failure and flooding are described under the No Project Alternative description in Section 4.3.1.1, *Alternative Description*.

The land north of Woodland city limits is zoned by Yolo County for agriculture, with some land identified for low- and medium-density rural land uses. No change in land use designation is expected for this land. The City of Woodland has identified numerous development opportunity sites in the eastern and northern portions of the city bordering the CCSB and unincorporated Yolo County

(City of Woodland 2017:LU 2-7). However, these portions of land are within the FEMA 1 in 100 chance floodplain and, therefore, cannot be developed without a flood management project. The No Project Alternative would not divide an established community because actions would be relegated to the CCSB, which does not include an established community.

Not implementing the Proposed Project would be inconsistent with the goals and policies of the County of Yolo's and City of Woodland's general plans aimed at reducing the local flood hazard. The No Project Alternative would conflict with land use plans, policies, and regulations adopted for the purpose of avoiding or mitigating an environmental effect, which would constitute a potentially significant impact.

Agricultural and Forestry Resources

Under the No Project Alternative, the proposed flood risk–reduction measures would not be implemented. Accordingly, there would be no construction-related effects on agricultural resources in the project area because there would be no conversion of Important Farmland or other agricultural land and no conflicts with agricultural zoning or Williamson Act contracts. Therefore, there would be no impact on agricultural resources under the No Project Alternative and, as such, impacts on agricultural resources under this alternative would be less than under the Proposed Project.

As noted in Section 3.6.2.2, there is no forest land in the project area; therefore, as under the Proposed Project, there would be no impacts on forestry resources.

Air Quality

Under the No Project Alternative, the levee improvement project would not be constructed; therefore, there would be no construction-related effects on air quality in the project area. Existing operation and maintenance (O&M) practices would continue as currently executed by the local maintaining agencies into the foreseeable future. Accordingly, neither construction nor O&M of the No Project Alternative is expected generate criteria pollutant emissions in excess of YSAQMD thresholds or result in significant air quality impacts.

Without the levee construction, there is the continued high risk of severe flooding in Woodland. If a catastrophic flood were to occur, emergency flood fighting and clean-up actions would require the use of a considerable amount of heavy construction equipment. If the flooding event disrupts the power grid, generators may be required as an additional power source, which would also increase emissions. Timing and duration of use would directly correlate with flood fighting needs, but it is likely that pollutants emitted could violate air quality standards for pollutants (including those for which the area is already considered nonattainment) and expose sensitive receptors to TAC. Depending on the magnitude of the flood, flood fighting could last for weeks or even months. Furthermore, because of the unpredictable nature of an emergency response, no best management practices to manage emissions would be in place. However, this type of situation would fit within the definition of emergency provided by CEQA Guidelines Section 15359 as: "…a sudden, unexpected occurrence, involving a clear and imminent danger demanding immediate action to prevent or mitigate loss of, or damage to life, health, property, or essential public services. Emergency includes such occurrences as fire, flood…" Typically, emergency projects are exempt from CEQA if the projects meet certain criteria described in Section 15269, which include: "…maintain, repair, restore, demolish, or replace property or facilities damaged or destroyed as a result of a disaster or in a disaster stricken area in which a state of emergency has been proclaimed by the

Governor…emergency repairs to publicly or privately owned service facilities necessary to maintain service essential to the public health, safety or welfare…" (Section 15269(a)(b)). While the timing, duration, and magnitude of a flood event are speculative and unpredictable, and therefore a precise determination of significance is not possible, it is likely that action(s) taken in response to a flood would fall within the exemption to CEQA. As such, there would be no impact.

Greenhouse Gas Emissions

Under the No Project Alternative, the levee improvement project would not be constructed, therefore, there would be no construction-related effects related to greenhouse gas (GHG) in the project area. Existing O&M practices on the existing levees would continue as currently executed by the local maintaining agencies into the foreseeable future. Accordingly, the No Project Alternative is not expected to generate GHG emissions that would have a significant impact on the environment.

Without the levee construction, there is the continued high risk of severe flooding in the City of Woodland. If a catastrophic flood were to occur, emergency flood fighting and clean-up actions would require the use of a considerable amount of heavy construction equipment. If the flooding event disrupts the power grid, generators may be required as an additional power source, which would also increase emissions from fossil-fuel powered sources, such as generators. Timing and duration of use would directly correlate with flood fighting needs, and depending on the magnitude of the flood, flood fighting could last for weeks or even months. Furthermore, because of the unpredictable nature of an emergency response, no BMPs to manage emissions or requirement of offset GHGs would be in place. However, this type of situation would fit within the definition of emergency provided by CEQA Guidelines Section 15359 as: "…a sudden, unexpected occurrence, involving a clear and imminent danger demanding immediate action to prevent or mitigate loss of, or damage to life, health, property, or essential public services. Emergency includes such occurrences as fire, flood…" Typically, emergency projects are exempt from CEQA if the projects meet certain criteria described in Section 15269, which include: "…maintain, repair, restore, demolish, or replace property or facilities damaged or destroyed as a result of a disaster or in a disaster stricken area in which a state of emergency has been proclaimed by the Governor…emergency repairs to publicly or privately owned service facilities necessary to maintain service essential to the public health, safety or welfare…" (Section 15269(a)(b)). While the timing, duration, and magnitude of a flood event are speculative and unpredictable, and therefore a precise determination of significance is not possible, it is likely that action(s) taken in response to a flood would fall within the exemption to CEQA. As such, there would be no impact.

Noise

The No Project Alternative represents the continuation of existing deficiencies in the project area's flood control structures. The consequences of levee failure and flooding are described under the No Project Alternative description in Chapter 4, *Alternatives Analysis*, including a summary of possible environmental effects. Under the No Project Alternative, no flood risk–reduction measures would be implemented; therefore, no Project-related construction noise or vibration effects would occur.

Without the levee construction, there is the continued high risk of severe flooding in Woodland. If a catastrophic flood were to occur, emergency flood fighting and clean-up actions would require the use of a considerable amount of heavy, and potentially loud, construction equipment. If the flooding event disrupts the power grid, generators may be required as an additional power source, which would also increase noise. Timing and duration of use would directly correlate with flood fighting and emergency repair needs, but it is likely that noise generated could exceed the City's noise limits for noise-sensitive land uses during regulated hours. Depending on the magnitude of the flood, flood fighting and cleanup could last for weeks or even months. Furthermore, because of the unpredictable nature of an emergency response, no best management practices to manage noise would be in place. However, this type of situation would fit within the definition of emergency provided by CEQA Guidelines Section 15359 as: "…a sudden, unexpected occurrence, involving a clear and imminent danger demanding immediate action to prevent or mitigate loss of, or damage to life, health, property, or essential public services. Emergency includes such occurrences as fire, flood…" Typically, emergency projects are exempt from CEQA if the projects meet certain criteria described in Section 15269, which include: "…maintain, repair, restore, demolish, or replace property or facilities damaged or destroyed as a result of a disaster or in a disaster stricken area in which a state of emergency has been proclaimed by the Governor…emergency repairs to publicly or privately owned service facilities necessary to maintain service essential to the public health, safety or welfare…" (Section 15269(a)(b)). While the timing, duration, and magnitude of a flood event are speculative and unpredictable, and therefore a precise determination of significance is not possible, it is likely that action(s) taken in response to a flood would fall within the exemption to CEQA. As such, there would be no impact.

Cultural Resources

Under the No Project Alternative, existing deficiencies along the Cache Creek levees and CCSB would continue. No flood-risk reduction measures would be implemented. Under the No Project Alternative, it is presumed that no unanticipated ground-disturbing activities associated with levee and settling basin construction or alterations would occur and there would be no resulting effect on cultural resources. Studies have shown these anticipated improvements are not adequate. Thus, the potential for levee or settling basin failure are increased in a 200-year flood event under the No Project Alternative. Neither the Central Pacific Railroad or the Camillus Nelson/Hackett Ranch would be affected by the No Project Alternative. They would continue to operate as they currently function, even in the event of a flood, which is likely under the No Project Alternative.

Tribal Cultural Resources

Under the No Project Alternative, current conditions and operation and maintenance practices would continue into the future. Under the No Project Alternative, no additional work would be done to address overtopping, seepage, or levee stability concerns along Lower Cache Creek. The city of Woodland and agricultural and industrial properties south of Cache Creek would continue to flood periodically. Any tribal cultural resources present in the Proposed Project footprint would continue to experience effects of the flooding similar to those that occur now. Where Proposed Project avoidance, minimization, or mitigation measures might preserve or protect any tribal cultural resources that may be identified and encountered if the Proposed Project were built, such preservation or protection would not occur under the No Project Alternative. Accordingly, because there would be no change from existing conditions, there would be no impact.

Transportation

Under the No Project Alternative, the Proposed Project would not be constructed, therefore, there would be no construction-related effects on the transportation network. Specifically, there would be no temporary roadway modifications that could introduce new hazards or restrict emergency access, and there would be no construction-related heavy truck or employee vehicle trips (and vehicle miles traveled [VMT]) added to the local roadway network. Existing O&M practices would continue as currently executed by the local maintaining agencies into the foreseeable future. Accordingly, the No Project Alternative would not result in any construction or O&M-related transportation impacts.

Without the levee construction, there is the continued high risk of severe flooding in Woodland. If a catastrophic 200-year flood event were to occur, roadway access would be limited as it is under existing conditions, with I-5 being largely under water and inaccessible from the City in either direction. State Route (SR) 113 would also experience flooding north of the City, as it would during a 200-year flood event under existing conditions. Under the No Project Alternative, during a 200-year flood event, emergency access would be limited, and hazards related to limited roadway access could be greater than they would be under the Proposed Project. There would be no mitigation to reduce impacts on emergency access and roadway hazards. Therefore, impacts under the No Project Alternative would be significant.

Public Services, Utilities, and Service Systems

Under the No Project Alternative, effects on utilities and service systems would be of a slightly lesser magnitude than under the Proposed Project. Under the No Project Alternative, existing levees and the CCSB would continue to undergo operations and maintenance including the removal of 400-foot sections of the training levee every 5 years. Although the amount of solid waste generated would be less than under the Proposed Project, the training levee removal would result in solid waste disposal at the Yolo County Central Landfill.

However, under the No Project Alternative, building and road demolition and clearing and grubbing would not occur. As a result, less solid waste would be generated requiring disposal at a landfill. There would be no need to temporarily relocate electrical lines resulting in a disruption of service. The No Project Alternative, as with the Proposed Project, would not alter existing stormwater drainage patterns or require wastewater treatment. Overall, the No Project Alternative would result in reduced impacts on utilities and service systems compared to the Proposed Project. The impact would be less than significant.

Energy

Under the No Project Alternative, the levee improvement project would not be constructed; therefore, there would be no construction-related consumption of energy resources in the project area. Existing O&M practices would continue as currently executed by the local maintaining agencies into the foreseeable future and generally would not be expected to result in wasteful, inefficient, or unnecessary usage of energy resources nor conflict with or obstruct renewable energy or energy efficiency plans.

Without the levee construction, there is the continued high risk of severe flooding events to occur in the project area. If a catastrophic flood were to occur, emergency flood fighting and clean-up actions would require the use of heavy construction equipment. If the flooding event disrupts the power grid, generators may be required as an additional power source. The use of the heavy construction equipment and generators would increase energy consumption for the duration of the flood fighting response efforts. However, as discussed in Section 3.8, *Greenhouse Gas Emissions,* if the flood meets the definition of an emergency under CEQA and meets the criteria for an emergency to be exempt, there may be no impact from these activities. But after the emergency declaration is over, there could be an increase in overall energy consumption than would be required to construct the

Proposed Project in order to rebuild areas that might have been damaged as a result of the flood but outside of the timeframe of the declared emergency. Even so, it is likely the additional energy consumption required for these efforts could still be a relatively small fraction of the overall energy consumption in the county and would not require development of new additional energy production facilities. The scale of construction repairs and rebuilding would not be expected to interfere with implementation of renewable energy or energy efficiency plans because service providers would continue to implement their plans for obtaining renewable energy. Furthermore, if newer buildings are constructed, this might result in less energy use as a result of needing to comply with energy efficiency standards at the state and local level. Any substantial construction activity would require reviews and approvals by the City or County to ensure compliance with applicable policies.

Because the nature of flooding events are speculative and unpredictable, it is not possible to make a precise impact determination. Generally, however, these flood response efforts would result in a greater magnitude impact than under the Proposed Project, which would prevent the need for extended flood fighting activities and rebuilding in the project area.

Aesthetics

Under the No Project Alternative, impacts on aesthetic resources would be of lesser magnitude than under the Proposed Project. No new levee would be constructed. The temporary changes in views of and from the study area that would result from construction of the Proposed Project would not take place. As a result, the visual character and quality of the study area would remain unchanged in the short term and there would be no impact on the existing visual character or quality of public views due to construction.

Because no new levee would be constructed under the No Project Alternative, scenic vistas would not change from existing conditions and long-term operation and maintenance effects would not take place. If the Proposed Project were not constructed, trees and vegetation slated to be removed 15 feet beyond the toe of the waterside channel and 20 feet beyond the toe of the landside of the proposed levee, and vegetation in construction access and staging areas, would not be removed. In addition, the new, elevated visual element of the levee would not be introduced into the viewshed of all viewer groups. In particular, residences, recreationists, and industrial viewers in the city of Woodland would not have direct, close views of a new 6- to 14-foot-tall levee, associated seepage berm and RSP, and potential landscape scars at the staging areas. The sweeping pastoral views of agricultural fields to the north and west would be maintained. Therefore, under the No Project Alternative, Proposed Project activities that would degrade the visual quality of and from the study area and adversely affect views of adjacent residents, recreational users, motorists, and businesses would not take place. Under the No Project Alternative, there would be no impacts on scenic vistas or on visual character and quality of the study area.

Under the No Project Alternative, like the Proposed Project, no new source of substantial light or glare that would adversely affect daytime or nighttime views of the area would be introduced.

Under the No Project Alternative, many of the significant and unavoidable aesthetic impacts of the Proposed Project would be avoided. However, under the No Project Alternative, catastrophic failure of the existing levee could occur, which would result in flooding and inundation that could significantly damage existing facilities and infrastructure, uproot and damage vegetation to an unknown extent, and drastically alter the visual landscape of the study area. The likelihood of such flooding would be substantially reduced under the Proposed Project (including implementation of the non-structural measures). Under such circumstances, the impact of the No Project Alternative on the existing visual character or quality of public views due to operations would be significant and unavoidable.

Recreation

Under the No Project Alternative, effects on recreation would be of lesser magnitude than under the Proposed Project. Because no new levee would be constructed, recreational facilities that may currently experience flooding would continue to do so and would not experience a change in use levels. In addition, with no new levee being constructed, any impacts on Velocity Island Park access that could potentially result from the Proposed Project would not take place. Impacts of the No Project Alternative on recreation would be less than significant.

Population and Housing

Under the No Project Alternative, effects on population and housing would be similar to the Proposed Project. The project footprint contains no housing units. The project area does contain some housing units, although the land uses in the project area are primarily agricultural. Therefore, as with the Proposed Project, implementation of the No Project Alternative would not displace any existing housing units or people or necessitate the construction of replacement housing elsewhere. The implementation of the No Project Alternative would not directly or indirectly result in unplanned population growth, and would have no impact related to substantial population growth.

Without the construction of the levee, Woodland would remain at high risk for severe flooding. Because the timing, duration, and magnitude of any future flooding events are unpredictable, any effects these events may have on the displacement of people or housing would be speculative. However, as shown in Figure 3.1-2, the majority of the area that would experience flooding in a 100-year event, particularly in the residential areas of Woodland, would see flood depths between 0 and 3 feet. This would likely result in temporary displacement of residents and would not necessitate the construction of replacement housing elsewhere. Based on this information, this impact would be considered less than significant, though it would be a greater impact than under the Proposed Project.

Hazards, Hazardous Materials, and Wildfire

The impacts related to hazards and hazardous materials under the No Project Alternative would be less than those under the Proposed Project. There would be no ground-disturbing or dewatering activities that would lead to fewer overall construction impacts related to the potential for hazardous material releases compared to the Proposed Project. The risk to construction workers of exposure to soil and/or groundwater contaminants would be less under the No Project Alternative than under the Proposed Project because no construction is proposed. Also, no buildings would be demolished, thereby eliminating the potential for worker exposure to LBP or ACM.

The No Project Alternative would not require temporary traffic controls or detours and would not be expected to result in significant impacts on emergency response or evacuation plans. However, under the No Project Alternative, improved flood protection would not be constructed, which could result in continued, periodic area flooding, thus potentially affecting roadways and evacuation routes more they would be affected under the temporary construction of the Proposed Project. Even though evacuation routes could be affected more than under Proposed Project conditions, it is expected that impacts would still be less than significant because people would be notified via emergency personnel and communications how to orderly evacuate areas that might be or become flooded.

The impacts related to wildfire for the No Project Alternative would be the same as for the Proposed Project because the Proposed Project would be in the same geography as the No Project Alternative. Therefore, there would be no impacts related to wildfires under No Project Alternative conditions. Impacts under the No Project Alternative would be less than significant.

4.3.1.3 Application of Screening Criteria

The City applied the screening criteria described in Section 4.2, *Alternatives Development and Screening Criteria*, to the No Project Alternative. This section describes the results of that analysis and compares the environmental effects of the No Project Alternative to those of the Proposed Project.

Ability to Meet Project Objectives

The City's primary objective for the Proposed Project is to develop and implement a plan that meets California's Urban Level of Protection and the Federal Emergency Management Agency (FEMA) 100 year requirements to reduce the risk of flooding to avoid loss of life, property damage, and economic effects that result from flooding in both the project area and Woodland, while also providing measures to address concerns north of the city in the project area. Although the No Project Alternative would meet two of the City's secondary goals (maintain the functionality of the CCSB and ensure no net loss of native trees), it would not meet the City's primary objective of reducing flood risk for the city of Woodland.

Impact Avoidance

The No Project Alternative would not involve construction or excavation and would, therefore, avoid construction-related air quality, GHG, noise, cultural resources, tribal cultural resources, biological resources, transportation, aesthetics, and hazardous materials impacts relative to the Proposed Project. However, under the No Project Alternative, a major flood event that resulted in overtopping or failure of the Cache Creek levees would cause impacts that would be more widespread than under the Proposed Project and would result in greater impacts related to erosion and siltation, flood hazards, water quality, roadway hazards, and emergency access.

Feasibility

The No Project Alternative is considered feasible because it does not require any action by the City. O&M activities in the CCSB to maintain trap efficiency would be undertaken by DWR as called for in the *Cache Creek Settling Basin Draft O&M Manual* (2007).

4.3.2 Alternative 2C

4.3.2.1 Alternative Description

Alternative 2C generally consists of constructing a new levee along the north side of Woodland and a drainage channel that would divert flood flows into the Yolo Bypass to protect Woodland from Lower Cache Creek flooding. The new levee would be constructed with landside and waterside slopes of 4 to 1 (1 foot of elevation change in every 4 feet of horizontal width). Instead of connecting to the CCSB west levee, as would occur under the Proposed Project, the levee under Alternative 2C would be at an approximately 550-foot offset from the southwest and south levees of the CCSB. In this way, Alternative 2C would provide a floodway to drain floodwaters directly to the Yolo Bypass instead of impounding them and draining them into the CCSB.

Similar to the Proposed Project, Alternative 2C consists of six distinct project reaches (Reaches N through S). A graphical overview of the features of this alternative is provided on Figure 4-1, and Table 4-1 summarizes the alternative's features and improvements.

Table 4-1. Alternative 2C Project Features

Feature	Improvement Description	Applicable Reaches	Quantity
New Levee	4-foot-tall levee	S	1.8 miles
	5-foot-tall levee	R	0.6 mile
	5.5-foot-tall levee	Q	2.0 miles
	11-foot-tall levee	P, O, N	3.8 miles
Drainage Channel	New 550-foot-wide, 5-foot-deep drainage channel that would also serve as borrow source for levee fill	Q, P, O, N	6.1 miles
Box Culverts	Box culverts in proposed drainage channel under crossings of County Roads 99, 101, 102, and 22	S, Q, N	4
Concrete-Lined Undercrossing	Concrete-lined erosion protection for railroad track undercrossing at Interstate 5	R, S	217,000 square feet
Roadway Slab Bridge	Roadway slab bridge where State Route 113 crosses proposed drainage channel	Q	1
Elevated Roadways	Elevate roadway over levee at County Roads 99, 101, and 102	S, Q	3
Gated Roadway Closure Structures	Gates at levee crossing of State Route 113 and County Road 22	R, N	2
Gated Railroad Closure Structures	Gates for railroad track crossings of levee at Interstate 5, east of State Route 113, and near southwest corner of Cache Creek Settling Basin	S, Q, N	3
Trestle Bridges for Railroad Crossings	Trestle bridges for railroad crossings near State Route 113 and adjacent to County Road 22	Q, N	2
Pump Station Relocation	Relocate East Main Drain Pump Station and North Canal Pump Station outside of proposed drainage channel	N	2
Existing Industrial Property	Acquire and demolish existing industrial property	O	NA

Features

New Levee

A new levee with a 20-foot-wide crest would begin near the intersection of County Roads 19B and 98 and extend east to the CCSB, generally following the northern city limit line west of SR 113 and Churchill Downs Avenue east of SR 113 (Figure 4-1). Near the intersection of County Road 102 and Churchill Downs Avenue, the proposed levee would extend southeast (Reaches P and O), paralleling the southwest levee of the CCSB. Reaches O and N of the levee would parallel the southwest and south levee of the CCSB, respectively. Reach N of the proposed levee would tie into the existing levee along the west side of the Yolo Bypass. The height of the proposed levee would vary from 4 feet near County Road 98 to 11 feet at the proposed levee's intersection with the existing west levee of the Yolo Bypass. Because floodwaters would not be impounded west of the CCSB under Alternative 2C, the levees would be several feet shorter than those of the Proposed Project. In addition, there would be no seepage berm or rock slope protection associated with the new levee under Alternative 2C, as is called for under the Proposed Project. A typical cross section of the new levee proposed under Alternative 2C is shown on Figure 4-2. As under the Proposed Project, there would be an all-weather patrol road along the levee crown, and an access road along the landside toe of the levee.

Conveyance Improvements

The trapezoidal drainage channel proposed under Alternative 2C would be approximately three and a half times as wide as the drainage channel under the Proposed Project, and would extend farther east along the levee alignment and not as far west relative to the Proposed Project. The drainage channel under Alternative 2C would be located waterward of the proposed levee in Reaches N through Q and in the easternmost section of Reach R (Figure 4-1). The drainage channel would be approximately 550 feet wide and 5 feet deep. As under the Proposed Project, the drainage channel would be hydroseeded with grass. Under Alternative 2C, water impounded by the proposed levee would be drained directly to the Yolo Bypass by the drainage channel. Because the drainage channel would drain directly to Yolo Bypass, as opposed to the CCSB as under the Proposed Project, no detention basin would be constructed under Alternative 2C.

Although the Alternative 2C drainage channel would not extend west of SR 113, floodwaters are expected to flow under I-5 via an existing freeway overpass at the western railroad track crossing, as described in Chapter 2 for the Proposed Project. As under the Proposed Project, this underpass would be lined with concrete to protect it from high velocities.

In Reach N, where the existing railroad tracks and County Road 22 run parallel to the southern CCSB levee, the 550-foot-wide drainage channel would be excavated around the railroad track and road embankments, leaving them in place. Please see Figure 4-3 for a typical cross section of the drainage channel and levee in Reach N.

Modifications to Existing Levees/Cache Creek Settling Basin

Unlike the Proposed Project, there would be no modifications to the existing CCSB levees, the CCSB inlet or outlet weirs, or to flow into or out of CCSB under Alternative 2C. However, the Yolo Bypass west levee would be degraded within the proposed footprint of the drainage channel to allow conveyance of flows into the bypass.

Closure Structures

There would be a total of five closure structures constructed under Alternative 2C. A railway closure structure would be located where the new levee crosses the railroad tracks near I-5. This closure would be constructed as shown on Figure 2-5 for the Proposed Project. Additional closure structures would be constructed where the levee intersects railroad tracks east of SR 113, and at railroad tracks near the southwest corner of the CCSB. The railway closure structures for these last two crossings would be constructed similarly to what is depicted in "Rail Closure Structure Detail A" on Figure 2-6 for the Proposed Project. Roadway closure structures, similar to what is shown in

"Road Closure Structure Detail B" on Figure 2-6 for the Proposed Project, would be constructed where the new levee crosses SR 113 and County Road 22. These closure structures would be operated as described in Chapter 2 for the Proposed Project.

Other Road- and Railway Improvements

The new levee proposed under Alternative 2C would require raising County Roads 99, 101, and 102 where the roads cross the levee. 550-foot-wide box culverts would be installed where each of these raised crossings intersect with the new levee. A 400-foot-wide culvert would also be installed under County Road 22 where it crosses over the drainage channel (Reach N).

A 550-foot roadway slab bridge would be constructed to facilitate the crossing of SR 113 over the new drainage channel. Additionally, two railroad trestle bridges would be constructed where railroad tracks cross the drainage channel near SR 113 and adjacent to County Road 22.

These roadway improvements are identified in Figure 4-1.

Internal Drainage Improvements

The proposed improvements for Alternative 2C would require the relocation of the City's East Main Drain Pump Station and North Canal Pump Station in Reach N. These are interior drainage pump stations that are operated by the City and are not part of the CCSB. The pump stations currently discharge flows into a ditch that runs parallel to, and south of, the CCSB south levee and empties into the Yolo Bypass. The ditch is within the footprint of the much wider drainage channel proposed under Alternative 2C. These pump stations would be relocated to an area outside of the proposed drainage channel footprint but would discharge into the channel. One of the pump stations would be relocated to an area presently occupied by an industrial complex on East Beamer Street, just west of the CCSB. This industrial complex would need to be acquired and removed prior to construction to provide space for the proposed 11-foot-tall setback levee and drainage channel in that reach (O). The pump station would occupy 1 acre at this new location. The second pump station would be relocated to a location just south of the new levee's access road and would occupy approximate 0.1 acre.

Operations and Maintenance Activities

Operations and maintenance activities would be similar to those described in Chapter 2 for the Proposed Project.

Construction Details

Construction methods, duration, and intensity for Alternative 2C would be similar to what is described in Chapter 2 for the Proposed Project and would require similar equipment. For example, although the Proposed Project calls for a larger levee and seepage berms, Alternative 2C calls for a wider drainage channel and calls for levees in Reaches N and O. While different, the amount of work would be similar.

As part of Alternative 2C, the proposed drainage channel would require excavating approximately 2.2 million cubic yards of material, whereas the proposed levee would only require approximately 1 million cubic yards of material. Therefore, it is assumed that all levee material would come from project excavations. Excavated material that is physically unsuitable for levee embankment fill (approximately 1.2 million cubic yards) would be disposed of at the Yolo County Central Landfill.

Staging, Site Access, and Construction-Related Traffic

Staging areas for Reaches N, O, P, and Q would be located within the proposed drainage channel area. There would be one staging area (approximately 7 acres) in Reach R northeast of the I-5 crossing of the railroad tracks, just south of the proposed levee alignment. There would be two staging areas (each approximately 5 acres) in Reach S—one staging area would be located at the western terminus of the levee alignment, and the other would be located approximately 1 mile from the western terminus the southeast (Figure 4-4). Both staging areas in Reach S would be immediately north of the proposed levee alignment. As described in Chapter 2 for the Proposed Project, staging areas may be used for storage of equipment and materials, project offices, employee parking, and other construction-related uses.

Site access and construction-related traffic would be similar to those of the Proposed Project. Once onsite, haul trucks would use the embankment footprint to transport material between borrow and staging areas and the levee construction area.

Construction Schedule and Labor Force

The project construction schedule and labor force would be similar to those of the Proposed Project.

Additional Features Proposed by City of Woodland

The non-structural measures and oak woodland plantings that would be implemented under the Proposed Project would also be implemented under Alternative 2C. Access to Velocity Island Park would be maintained under Alternative 2C, as under the Proposed Project.

4.3.2.2 Alternative Analysis

Hydrology

Hydraulic Modeling

In 2012, Wood Rogers developed an existing conditions hydraulic model for the City of Woodland using the software planform TUFLOW. The model represents existing conditions for Cache Creek and the adjacent overland floodplain. MBK Engineers' 2016 technical memorandum titled *Hydraulic Analysis for Lower Cache Creek Feasibility Study Alternatives (Draft)* documents the hydraulic analysis of the USACE Alternative 2C and the proposed modifications to the USACE Alternative 2C (MBK Engineers 2016).

Similar to the model developed for the Proposed Project, Wood Rodgers' model used for Alternative 2C is the same coupled one-dimensional and two-dimensional hydraulic model that included Cache Creek, the CCSB, and the adjacent floodplain. The model was developed using TUFLOW and used a range of hydrologic flows, including the 100- and 200-year events based on hydrologic input developed by USACE.

The hydraulic model includes similar features as described above for the Proposed Project (see Exhibit 1 of MBK Engineers 2016).

Existing Conditions

Existing conditions under Alternative 2C are identical to those described above under the Proposed Project. Refer to Figures 3.1-2, 3.1-3, and 3.1-4.

Proposed Conditions

Figure 4-5 shows the differences in water surface elevations with the inclusion of Alternative 2C project elements (i.e., the changes that occur to water surface elevations between existing and proposed conditions) for the 100-year flood. Figure 4-6 shows the differences in water surface elevations with the inclusion of Alternative 2C project elements for the 200-year flood.

As shown in the figures, flooding no longer is present south of the proposed levee (i.e., the City limits); however, water surface elevations increase north of the proposed levee. In general, water surface elevation increases (for the 100-year flood) range from 0.1 to 6.0 feet, with most of the larger increases occurring north of the proposed levee near I-5, and to the east near the CCSB. The modeled increases in depth under Alternative 2C are lower than those under Alternative 2A.

It is noteworthy that a variety of structures (to the immediate west and east of I-5) would experience increases in depth ranging from 0.1 to 2.0 feet under the 100--year flood (Figure 4-5). To the west of I-5 (where increases in depth between 1.0 and 2.0 feet would occur under the 100-year flood), there are two structures – an ARCO am/pm store and a Denny's restaurant. To the east of I-5 (where increases in depth between 0.1 and 1.0 feet would occur under the 100-year flood), there are three structures—all residential.

The structures to the immediate north and south of County Road 18C would experience a decrease in the level of inundation or no change from existing conditions. This decrease ranges from -2.0 to -0.1 feet, with most of the decrease falling into the -1.0 to -0.1 range.

Additional information about water surface elevation changes is presented below.

The modeled velocities under the 100-year event for Alternative 2C are shown in Figure 4-7. Average velocities within the greater floodplain would generally increase on the order of 0.1 to 2.0 fps for the 100-year flood (Figure 3.1-4 and Figure 4-7). Higher velocity values (greater than 2.0 fps) would occur within the project footprint, near roadways and intersections (such as I-5), and along the CCSB levees (the latter few instances akin to the velocity values under exiting conditions). The highest velocities would occur within the new levee toe channel and would be on the order of 3-5 fps. In general, velocities would not significantly change (compared to existing conditions) with the implementation of Alternative 2C.

There is a localized area that would be removed from the floodplain (as shown on Figure 4-7). This represents an area where water would not be present under the 100-year flood with the implementation of Alternative 2C.

Additional information about decreases in velocity is presented below.

Impact Analysis

Similar to the Proposed Project, Alternative 2C also proposes placement of a new levee. Unlike the Proposed Project, there would be no modifications to the existing CCSB levees, the CCSB inlet and outlet weirs, or to flow into or out of CCSB under Alternative 2C. However, the Yolo Bypass west levee would be degraded within the proposed footprint of the drainage channel to allow conveyance of flows into the bypass.

Alternative 2C would have no effect on the frequency or direction of flood flows in Cache Creek and its associated project components would similarly only create minimal new impervious surfaces with limited footprints. Non-structural measures would also be implemented under Alternative 2C. Similar to the Proposed Project, these non-structural measures would not significantly alter the existing drainage pattern of project area.

Under Alternative 2C, impacts associated with alteration of the existing drainage pattern of the project area (Impacts HYDRO-1 and HYDRO-2 as described under the Proposed Project) are of a similar magnitude to those described for the Proposed Project. In general, velocities would not significantly change (compared to existing conditions) with the implementation of Alternative 2C. The highest velocities would occur within the new levee toe channel and would be on the order of 3-5 fps. The design of the Proposed Project elements (which include armoring the drainage channel with concrete at the I-5 undercrossing, rock slope protection on the new levee in Reach P and part of Reach Q, and constructing the inlet weir out of concrete) would ensure that the locations within the project footprint experiencing increased velocities are protected from erosion.

Under Alternative 2C, there are no impacts to the CCSB because there would be no modifications to the existing CCSB levees, the CCSB inlet and outlet weirs, or to flow into or out of CCSB.

Under Alternative 2C, the trapezoidal conveyance channel would be approximately three and a half times as wide as the drainage channel under the Proposed Project and would have a different linear extent. Although the pump station locations would change under Alternative 2C, no flood flows would be released into Woodland's drainage system under this alternative, and Woodland's drainage system would still ultimately flow into the Yolo Bypass. Therefore, under Alternative 2C, impacts associated with creation or contribution of runoff that would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff (Impact HYDRO-4 as described under the Proposed Project) would be of a lesser magnitude to those described for the Proposed Project.

Similar to the analysis under the Proposed Project, the potential for increases in water surface elevations due to impeding or redirecting flood flows was evaluated by comparing with-project and existing conditions within the project area. Figure 4-5 shows the differences in water surface elevations with the inclusion of Alternative 2C project elements for the 100-year flood. Figure 4-6 shows the differences in water surface elevations with the inclusion of Alternative 2C project elements for the 200-year flood. As shown in the figures, flooding no longer is present south of the proposed levee (i.e., the City limits).

However, water surface elevations increase north of the proposed levee. In general, water surface elevation increases (for the 100-year flood) range from 0.1 to 6.0 feet, with most of the largest increases occurring north of the proposed levee near I-5, and in what would be the drainage channel south of the CCSB. The modeled increases in depth under Alternative 2C are lower than those under Alternative 2A. Structures subject to flooding under existing conditions that would be affected by this modeled increase in inundation are described in Section 3.1.2.6, *Alternative 2C*, *Hydraulic Modeling*. As under the Proposed Project, the City would work with the owners of affected parcels to develop a suite of non-structural measures tailored for each parcel to reduce flood damages and losses. This impact would be less than significant and of a lesser magnitude than under the Proposed Project. Under Alternative 2C, impacts associated with impeding or redirecting flood flows or increasing inundation are of a lesser magnitude to those described under Alternative 2A, primarily because the modeled increases in water surface elevations under Alternative 2C are significantly lower than those under Alternative 2A (with the largest increases within the new toe channel at the base of the proposed levee as opposed to the larger area associated with the Proposed Project).

Water Quality

Methods for Analysis

The evaluation of potential water quality impacts is based on review of existing water quality information for the Lower Cache Creek and groundwater quality in the project area (Yolo groundwater subbasin), as described in Section 3.2.1, and the U.S. Geological Survey (USGS) and DWR studies identifying mercury and sediment trap efficiencies for CCSB under existing conditions (California Department of Water Resources 2015). Potential impacts resulting from implementing Alternative 2C were analyzed by comparing existing conditions with conditions during construction and operation of Alternative 2C, as well as by comparing Alternative 2C with the Proposed Project.

Impacts on water quality that could result from construction activities were qualitatively evaluated based on construction designs and practices, construction-related materials and equipment, location of construction activities, and magnitude and duration of construction activities. Operation and maintenance effects on water quality were evaluated qualitatively based on the potential of Alternative 2C to significantly alter surface runoff patterns, increase the quantity of runoff, or generate additional sources of water pollutants (e.g., fuel, oil).

Impacts on groundwater recharge were qualitatively assessed by comparing existing sources of recharge to recharge potential following implementation of Alternative 2C.

Impact Analysis

Under Alternative 2C, the nature and location of potential impacts on surface water and groundwater quality described for the Proposed Project (under Impact WQ-1 in Section 3.2) would be similar. However, there would be some notable differences. The total approximate acreage for ground disturbance (including staging areas) under this alternative (553 acres) would be greater than under the Proposed Project (352 acres). This difference is in part due to the wider drainage channel proposed under this alternative, which would be approximately three and a half times wider than the channel under the Proposed Project. Therefore, the potential for water quality impacts due to ground disturbances (i.e., turbidity and sedimentation with erosive runoff) would be greater over a larger area. However, under Alternative 2C, no construction activities would be conducted within the CCSB or on CCSB levees; therefore, any surface water within the CCSB, including Lower Cache Creek, would not be impacted.

Suspended solids from flows over the floodplain north of the city of Woodland, as well as other pollutants (e.g., pesticides and nutrients from agricultural land in the floodplain) would be directed to the Yolo Bypass with floodwaters. However, when flow is high, travel time over the floodplain may be too short for substantial changes in water quality other than a potential increase in sediment and organic material. In a major flood event, Yolo Bypass would likely be inundated and receive floodwaters from major tributaries and, thus, the incremental contribution of pollutants via the proposed drainage channel would be relatively insubstantial and not likely to affect beneficial uses in the long term.

In 100-year flood events, flood flows would be diverted via the proposed drainage channel directly to the Yolo Bypass under Alternative 2C, instead of to a detention basin that would drain into the CCSB, as would occur under the Proposed Project. Therefore, Alternative 2C would not affect the CCSB sediment trap efficiency because the potential for additional sediment loading and associated potential changes to mercury and sediment loads to Yolo Bypass from the CCSB would not result under this alternative. However, because of the direct diversion of floodwaters to the Yolo Bypass, mercury-laden sediment from Lower Cache Creek could be directed to Yolo Bypass, although it is reasonable to assume that some of this sediment would settle out as floodwaters move across the floodplain north of Woodland prior to reaching the drainage channel. The contribution of mercury-laden sediment in floodwaters directed to Yolo Bypass under this alternative would be expected to contribute to methylmercury production in the bypass. Accordingly, implementation of Alternative 2C could indirectly and incrementally contribute to the existing mercury/methylmercury impairment in Yolo Bypass and the Delta, albeit only on a temporary and periodic basis, i.e., in 100-year flood events. As discussed in Section 3.2.1.1, the Basin Plan identifies methylmercury objectives for fish tissue in the Delta and Yolo Bypass, and under existing conditions at various Delta locations these objectives are exceeded. Although the concentration of methylmercury in fish tissue is directly related to the concentration of methylmercury in the water column, and implementation of Alternative 2C could result in increases in mercury methylation in Yolo Bypass, it is unknown to what degree Alternative 2C would contribute to the exceedance of the methylmercury fish tissue objective. Accordingly, unlike the Proposed Project, Alternative 2C could conflict with the Basin Plan and, therefore, this impact is considered significant. Because the conveyance of flood flows directly to Yolo Bypass is a defining component of this alternative and would protect the City of Woodland from inundation, and because upstream mercury sources currently contribute to the mercury impairment in the Yolo Bypass and Delta, excluding redesigning the project under this alternative, no feasible mitigation is available to reduce this impact to a less-than-significant level. Therefore, this impact is significant and unavoidable.

With regard to the risk of release of pollutants as a result of project inundation under Alternative 2C, the increased depth of flooding north of the proposed levee east of SR 113 would be less than under the Proposed Project; therefore, it is likely that fewer structures would be affected, which may mean a lower risk of pollutant release, at least of stored chemicals. Thus, the magnitude of this impact may be smaller relative to the Proposed Project.

Like the Proposed Project, Alternative 2C would not require the use of groundwater and, thus, would not substantially decrease groundwater supplies. Because the extent of new impervious surfaces would be similar under Alternative 2C and the Proposed Project, impacts on groundwater recharge would be similar.

As under the Proposed Project, potential water quality impacts, excepting the potential contribution of mercury/methylmercury to Yolo Bypass in 100-year flood events, would be minimized through compliance with appropriate federal, state regulations, Yolo County general plan policies, and local ordinances, as well as through implementation of Mitigation Measure WQ-1.

Geology, Soils, and Paleontological and Mineral Resources

Similar to the Proposed Project, Alternative 2C proposes placement of a new embankment. This embankment would be constructed in the same general area as the Proposed Project, an area that does not include any known earthquake faults. However, the area does have low to moderate seismicity. The risk of surface fault rupture would be less than significant and of a similar magnitude to that described under the Proposed Project.

Similar to the Proposed Project, Alternative 2C would introduce a new levee and drainage channel. In addition, Alternative 2C would introduce a roadway slab bridge where SR 113 crosses the proposed drainage channel and two railway trestle bridges where the railroad tracks cross the proposed drainage channel. Alternative 2C would not change the likelihood of seismic ground shaking and associated ground failure. However, it does include new bridge structures not included under the Proposed Project. Construction of the roadway bridge would comply with California Department of Transportation (Caltrans) standards for bridge construction (California Department of Transportation 2019a, 2019b). Construction of the railway bridges would comply with Federal Highway Administration standards. The impact would be greater under Alternative 2C because of the addition of three new bridge structures. However, because of construction requirements, the impact would be less than significant.

Construction activities for Alternative 2C would involve substantial ground disturbance of a similar magnitude as the Proposed Project. Ground disturbances would increase the hazard of erosion and could temporarily increase erosion and sedimentation rates above existing levels. Site-specific measures would be implemented to control erosion. The risk of erosion would be less than significant and of a similar magnitude under Alternative 2C as under the Proposed Project.

As under the Proposed Project, site preparation for Alternative 2C would include excavating approximately 6 to 12 inches of topsoil, which consists of organic material, from the land surface where the levee and drainage channel would be constructed and borrow materials would be excavated. However, similar to Alternative 2A, under Alternative 2C, the topsoil would be stripped from the soil before underlying soil is excavated and stockpiled at the borrow/staging areas and reused for revegetation activities. The magnitude of the impact for Alternative 2C would be less than significant and similar to that for the Proposed Project.

Similar to the Proposed Project, construction of levees wall and channel walls could result in failure of cut slopes. However, as under the Proposed Project, the City of Woodland would ensure that geotechnical design recommendations are included in the design of project facilities and construction specifications to minimize the potential effects from failure of excavations. The City of Woodland would also ensure that the design specifications are properly executed and that all California Division of Occupational Safety and Health regulations are followed during construction. The impact would be less than significant and the magnitude of the risk of slope failure would be similar under Alternative 2C as under the Proposed Project.

As under the Proposed Project, construction under Alternative 2C involves placement of a new levee on soils with moderate to high shrink-swell potential. However, in order to comply with U.S. Army Corps of Engineers and California Department of Water Resources requirements, design specifications for the new levee would consider the characteristics of the materials proposed for levee construction. The impact would be less than significant and similar to the Proposed Project.

Foundations for bridges proposed under Alternative 2C could shift or be damaged by expansive soil. However, construction of the roadway bridge foundation would follow Caltrans requirements for bridge construction and construction of the railway bridges would follow Federal Railway Administration requirements for bridge construction. The magnitude of the impact is greater than for the Proposed Project. However, compliance with standard requirements would result in a less-than-significant impact. Because Alternative 2C involves construction of bridge foundations that are not involved in the Proposed Project, the magnitude of impact would be greater under Alternative 2C. However, compliance with standard requirements would result in a less-than-significant impact.

Similar to the Proposed Project, Alternative 2C would involve excavation in geologic units known to have yielded vertebrate fossils. However, to accommodate construction of the roadway and railway bridges, maximum depth of excavation would be greater under Alternative 2C. Therefore, the risk of damage to significant paleontological resources would be greater under Alternative 2C than under the Proposed Project.

Alternative 2C does not include construction of weirs as does the Proposed Project, nor does it require rock slope protection. However, aggregate may be required for construction of the roadway and railway bridges. Overall, the quantity of aggregate required for Alternative 2C and the Proposed Project would be of a similar magnitude and would be less than significant.

Similar to the Proposed Project, Alternative 2C introduces new structures (levee, drainage channel, bridges) into an area where no structures currently exist. However, this alternative would not be constructed in a state-designated MRZ-2 or a county-designated mineral resource overlay. Fossil fuel reserves that would underlie the eastern portion of the project area for both the Proposed Project and Alternative 2C are regional and cover a large area, so placement of new structures would not reduce availability of this resource. The magnitude of impact would be similar under Alternative 2C and the Proposed Project and would be less than significant.

Similar to the Proposed Project, Alternative 2C would involve pile driving in an area where there are subsurface fossil fuels. However, the depth of excavation would not extend to the depth of the fossil fuel reserves. Therefore, the risk of encountering fossil fuel reserves, resulting in damage, injury, or death, is low. The magnitude of impact would be the same under Alternative 2C as under the Proposed Project. The impact is less than significant.

Biological Resources

The same types of field surveys were conducted for the estimated project footprint of Alternative 2C as those conducted for the Proposed Project, which are described in Section 3.4.1.2, *Environmental Setting, Land Cover Types*. During these surveys, sub-meter GPS was used to map portions of Cache Creek and wetland features in the Alternative 2C levee alignment. Figure 4-8 identifies the location of these land cover types.

Table 4-2 summarizes the acres of land cover types for the estimated footprint of Alternative 2C.

Table 4-2. Estimated Impacts on Land Cover Types for Estimated Alternative 2C Footprint

	Approximate Acreage
Natural Communities	
Sandbar willow riparian scrub[a]	2
Tamarisk riparian scrub[a]	0.4
Valley oak woodland[a]	3
Nonnative annual grassland/ruderal	69
Aquatic Communities	
Cache Creek Settling Basin[a]	0
Pond[a]	0.1
Alkaline seasonal wetland[a]	13
Seasonal marsh[a]	23
Seasonal wetland[a]	2
Irrigation canal[a]	19
Roadside ditch	0
Agricultural Lands	
High-intensity agriculture/fallow	369
Orchard	3
Irrigation ditch	2
Developed/Disturbed Areas	
Developed	48
Disturbed	0.4
Total	553

[a] These are sensitive land cover types and waters of the United States/waters of the state. Impacts on these land cover types could be regulated.

Alternative 2C generally has most of the same natural communities as the Proposed Project (which are described in Section 3.4.1.2, *Environmental Setting, Natural Communities*). These include tamarisk riparian scrub, valley oak woodland, nonnative annual grasslands, and ruderal vegetation. Alternative 2C also has sandbar willow riparian scrub, which occurs along the irrigation canal in the southern portion of Alternative 2C; as noted in Section 3.4.1.2, this community would be classified as sandbar willow thicket (*Salix exigua* Shrubland Alliance) (Sawyer et al. 2009) and might qualify as a wetland.

The following aquatic communities exists with the Alternative 2C footprint, which are similar to those described for the Proposed Project in Section 3.4.1.2, *Environmental Setting, Aquatic Communities*: pond, alkaline seasonal wetland, seasonal wetland, seasonal marsh, irrigation canal.

The following agricultural lands exist within the Alternative 2C footprint, which are similar to those described for the Proposed Project in Section 3.4.1.2, *Environmental Setting, Agricultural lands:* high-intensity agricultural crops/fallowed agricultural fields, orchard, and irrigation ditch. None of the fields within the Alternative 2C footprint appeared to be planted in rice (*Oryza sativa*) during the field survey, although the fields in the southeastern portion of Alternative 2C have historically been planted in rice.

The following developed/disturbed areas exist within the Alternative 2C footprint, which are similar to those described for the Proposed Project in Section 3.4.1.2, *Environmental Setting, Developed/Disturbed Areas*: developed impermeable surfaces, such as roads and buildings; and disturbed areas due to construction or agricultural staging areas.

One sensitive natural community recognized by the CNDDB, valley oak woodland, has been reported in the 7.5-minute USGS quadrangles that overlap the Alternative 2C footprint (California Department of Fish and Wildlife 2019). The alkaline seasonal wetland community is also considered sensitive. No vernal pools were observed in the Alternative 2C footprint during the 2019 field surveys or review of aerial photographs.

Although a delineation of aquatic resources has not been conducted throughout the Alternative 2C footprint, the following land cover types could meet the criteria for waters of the United States and/or waters of the state: riparian woodland and riparian scrub communities, pond, irrigation canal, alkaline seasonal wetland, seasonal marsh, seasonal wetland, and irrigation canal.

The methodology for determining the special-status species for the Alternative 2C footprint is the same as that which was used for the Proposed Project (described in Section 3.4.1.2, *Environmental Setting, Special-Status Species).* Appendix C, *Biological Resources*, Tables C.1 and C.2, identifies the specials-status plant and wildlife species with the potential for occurrence in the Alternative 2C footprint. Those with moderate or high potential for occurrence are as follows.

- A total of 18 special-status wildlife species: vernal pool fairy shrimp, vernal pool tadpole shrimp, valley elderberry longhorn beetle, western pond turtle, giant garter snake, tricolored blackbird, burrowing owl, Swainson's hawk, western yellow-billed cuckoo, Modesto song sparrow, pallid bat, silver-haired bat, hoary bat, northern harrier, white-tailed kite, loggerhead shrike, least Bell's vireo, and western red bat.
- Special-status species, non–special-status migratory birds and raptors.
- A total of 4 special-status plant species: palmate-bracted bird's-beak, brittlescale, San Joaquin spearscale, and California alkali grass.

Thought Alternative 2C consists of the construction of a new levee as does the Proposed Project, instead of connecting to the CCSB west levee, as would occur under the Proposed Project, the levee under Alternative 2C would be at an approximately 550-foot offset from the southwest and south levees of the CCSB. In this way, Alternative 2C would provide a floodway to drain floodwaters directly to the Yolo Bypass instead of impounding them and draining them into the CCSB. Implementation of this alternative would potentially result in effects on wildlife resources that are similar or greater than those described for the Proposed Project. The magnitude of habitat losses would be greater for some species because the footprint of Alternative 2C is larger. Table 4-3 summarizes impacts and mitigation measure requirements for Alternative 2C; see Section3.4, *Biological Resources*, for the text describing these impacts and mitigation measures in addition to a description of Mitigation Measures BIO-1 through BIO-4. Table 4-2 provides a summary of the approximate impacts on land cover types for Alternative 2C.

Alternative 2C would directly affect sandbar willow riparian scrub and tamarisk riparian scrub, both of which would be permanently removed for construction of the proposed drainage channel along the southern border of the CCSB. Temporary construction impacts on adjacent willow riparian scrub and tamarisk riparian scrub could occur at the easternmost end of the proposed levee and drainage channel. Potential indirect impacts during construction could occur in these areas as a result of erosion or sedimentation effects outside of the construction area. This impact would be of a greater magnitude than under the Proposed Project, but implementation of Mitigation Measure BIO-26 would ensure that this impact is reduced to a less than significant level

Mitigation Measure BIO-26: Compensate for temporary effects on and permanent loss of riparian scrub

Unavoidable temporary loss of sandbar willow riparian scrub or tamarisk riparian scrub will be restored onsite. To compensate for the permanent loss of sandbar willow riparian scrub or tamarisk riparian scrub, the City will comply with regulatory requirements determined as part of the lakes and streambed alteration agreement (LSAA) for the work that would occur in or near riparian habitat. The City will compensate for any permanent loss of riparian scrub at a ratio of 2:1 (2 acres restored for every 1 acre permanently affected) or as determined through coordination with the California Department of Fish and Wildlife (CDFW) as part of the permitting process. The City will implement onsite and, if necessary, offsite compensation measures and/or purchase mitigation bank credits to compensate for loss of riparian scrub. Onsite restoration and compensation will be used to the maximum extent practicable. Each of these options is discussed below.

Onsite and/or Offsite Planting. Replacement plantings for riparian scrub may be planted onsite and/or at an offsite location, preferably located within the CCSB. For either onsite or offsite replacement planting, the City will prepare a mitigation planting plan to be approved by CDFW as part of the LSAA. The mitigation plan will include a species list and number of each species to be planted, planting locations, and maintenance requirements. Plantings will consist of cuttings taken from local plants or plants grown from local material. Planted species for riparian scrub mitigation will include native tree species that grow in the onsite area, such as sandbar willow (*Salix exigua*), box elder (*Acer negundo*), and Oregon ash (*Fraxinus latifolia*). All plantings will be fitted with exclusion cages or other suitable protection from herbivory (protection from plant-eating animals, such as rabbits).

Mitigation Bank Credit Purchase. If the City elects to purchase credits from a mitigation bank, the City will purchase riparian habitat credits from an approved mitigation bank with a service area that covers the project area. The final compensation ratio of restored or created willow scrub habitat for each acre of willow scrub removed will be approved by CDFW in order to result in no net loss of willow scrub.

Alternative 2C would have larger impacts than the Proposed Project on valley oak woodland due to a wider footprint at the west end of the levee and at the crossing of North East Street (SR 113).

Alternative 2C would have larger impacts than the Proposed Project on wetlands and non-wetland waters of the United States/waters of the state due to the longer extent of levee at the eastern end and the wider proposed channel.

Alternative 2C would have a similar impact to the Proposed Project with regard to the potential to introduce and spread invasive plant species because of the similar construction activities that would occur between Alternative 2C and the Proposed Project.

Table 4-3. Summary of Alternative 2C Impacts and Mitigation Measures

Impact	Magnitude of Impact[a]	Finding	Mitigation Measure	With Mitigation
Impact BIO-1: Potential Disturbance or Mortality of Vernal Pool Branchiopods and their Habitat	Greater	Significant	MM-BIO-1: Install orange construction fencing between the construction area and adjacent sensitive biological resources MM-BIO-2: Conduct environmental awareness training for construction employees MM-BIO-3: Conduct periodic biological monitoring MM-BIO-4: Avoid and Minimize Impacts on Vernal Pool Branchiopods and their Habitat MM-BIO-5: Avoid impacts on vernal pool branchiopods and their habitat	Less than significant
Impact BIO-2: Potential Disturbance or Mortality of Valley Elderberry Longhorn Beetle and its Habitat	Equal or Greater	Significant	MM-BIO-2: see above. MM-BIO-6: Conduct a Focused Survey for Elderberry Shrubs within 50 Meters of the Project Footprint MM-BIO-7: Implement Avoidance Measures to Protect Valley Elderberry Longhorn Beetle and its Habitat outside Permanent Impact Areas MM-BIO-8: Provide Compensatory Mitigation for Impacts on Valley Elderberry Longhorn Beetle	Less than significant
Impact BIO-3: Potential Disturbance or Mortality of Western Pond Turtle	Greater	Significant	MM-BIO-1 through 3: see above. MM-BIO-9: Conduct Preconstruction Surveys for Western Pond Turtle and Monitor Construction Activities if Turtles are Observed	Less than significant

Impact	Magnitude of Impact[a]	Finding	Mitigation Measure	With Mitigation
Impact BIO-4: Potential Disturbance or Mortality of or Loss of Suitable Habitat for Giant Garter Snake	Greater	Significant	MM-BIO-2: see above. MM-BIO-10: Restore Temporarily Disturbed Giant Garter Snake Aquatic and Upland Habitat to Pre-Project Conditions MM-BIO-11: Compensate for Permanent Loss of Giant Garter Snake Habitat MM-BIO-12: Avoid and Minimize Construction Impacts on Giant Garter Snake MM-BIO-13: Avoid and Minimize Potential Impacts from Operation and Maintenance Activities on Giant Garter Snake and its Habitat	Less than significant
Impact BIO-5: Potential Loss or Disturbance of Nesting Swainson's Hawk and White-tailed Kite and Loss of Nesting and Foraging Habitat	Greater	Significant	MM-BIO-1 through 3: see above. MM-BIO-14: Conduct Vegetation Removal Activities outside the Breeding Season for Birds MM-BIO-15: Conduct Focused Surveys for Nesting Swainson's Hawk prior to Construction and Implement Protective Measures during Construction MM-BIO-16: Compensate for the Permanent Loss of Foraging Habitat for Swainson's Hawk	Less than significant
Impact BIO-6: Potential Mortality or Disturbance of Nesting Special-Status and Non–Special-Status Birds and Removal of Suitable Breeding Habitat	Greater	Significant	MM-BIO-1 through 3: see above. MM-BIO-14: Conduct Vegetation Removal Activities outside the Breeding Season for Birds MM-BIO-17: Conduct Nesting Surveys for Special-Status and Non–Special-Status Birds and Implement Protective Measures during Construction MM-BIO-18: Avoid and Minimize Construction and Operation and Maintenance Impacts on Western Yellow-Billed Cuckoo and Least Bell's Vireo and their habitat	Less than significant

Impact	Magnitude of Impact[a]	Finding	Mitigation Measure	With Mitigation
Impact BIO-7: Potential Injury, Mortality or Disturbance of Tree-Roosting Bats and Removal of Roosting Habitat	Greater	Significant	MM-BIO-1 through 3: see above. MM-BIO-19: Identify Suitable Roosting Habitat for Bats and Implement Avoidance and Protective Measures	Less than significant
Impact BIO-8: Potential Disruption of Wildlife Movement Corridors	Equal or Greater	Less than significant	None required	Less than significant
Impact BIO-9: Potential for construction activities to result in removal of special-status plants	Similar or Greater	Significant	MM-BIO-1 through 3: see above. MM-BIO-20: Conduct special-status plants surveys MM-BIO-21: Avoid or compensate for impacts on special-status plants	Less than significant
Impact BIO-10: Potential for construction activities to result in temporary and permanent loss of riparian woodland	Greater	Significant	MM-BIO-1 through 3: see above. MM-BIO-26: Compensate for temporary effects on and permanent loss of riparian scrub	Less than significant
Impact BIO-11: Potential for construction activities to result in loss of valley oak woodland	Greater	Significant	MM-BIO-1 through 3: see above. MM-BIO-22: Conduct a native tree survey prior to construction MM-BIO-23: Protect native trees during construction	Less than significant
Impact BIO-12: Potential for construction activities to result in fill of non-wetland waters of the United States/waters of the State	Greater	Significant	MM-BIO-1 through 3: see above. MM-BIO-24: Compensate for fill of wetlands and non-wetland waters of the United States/waters of the State	Less than significant
Impact BIO-13: Potential for construction activities to result in fill of wetlands	Greater	Significant	MM-BIO-1 through 3: see above. MM-BIO-24: Compensate for fill of wetlands and non-wetland waters of the United States/waters of the State	Less than significant
Impact BIO-14: Conflict with provisions of an adopted HCP/NCCP or other approved local, regional, or state habitat conservation plan	Similar		None required	Less than significant

Impact	Magnitude of Impact[a]	Finding	Mitigation Measure	With Mitigation
Impact BIO-15: Potential for construction activities to introduce and spread invasive species	Similar	Significant	MM-BIO-1 and -2: see above. MM-BIO-25: Avoid the introduction and spread of invasive plants during construction	Less than significant

[a] Magnitude of impact was determined by comparing the acres of land cover impacted under the Proposed Project with the estimated land cover impacts under Alternative 2C.

Land Use and Planning

Under Alternative 2C, effects on land use would be the same as for the Proposed Project. Similar to the Proposed Project, Alternative 2C would require the construction of a levee that would generally follow the northern city limits of Woodland. As with the Proposed Project, Alternative 2C generally follows the Urban Limit Line, which separates existing and planned urban land uses to the south of Alternative 2C and agricultural and rural land uses to the north. Access to Woodland from the north would be maintained via County Roads 98, 99, 101, and 102, and SR 113 and I-5. As with the Proposed Project, access via these roads would be restricted during times of significant flooding due to the proposed closure structures. These barriers would be temporary, and it is anticipated that they would be used infrequently. As with the Proposed Project, Alternative 2C would not create a significant division in an existing community. Alternative 2C, like the Proposed Project, is consistent with the land use plans, policies, and regulations laid out by Yolo County and the City of Woodland.

Similar to Alternative 2A, the goals, policies, and actions in the Health and Safety Element of Yolo County's general plan seek to reduce death, injuries, and damage to property from natural and human-made hazards and minimize the negative effects of natural disasters such as flooding. Alternative 2C would also provide 200-year flood protection and obtain FEMA certification for the City. In addition, Alternative 2C is consistent with the goals and policies Safety Element of the *City of Woodland General Plan 2035* because it supports proactive solutions to protect areas at risk of flooding.

The effect of Alternative 2C on land use would be the same as the Proposed Project and would be less than significant.

Agricultural and Forestry Resources

Under Alternative 2C, there would be permanent conversion of Farmland (Prime, Unique, and Farmland of Statewide Importance) to nonagricultural use in areas within the permanent footprint (see Figure 4-1). As indicated in Table 4-4, approximately 251 acres of Farmland would be permanently converted to nonagricultural use by implementing Alternative 2C and, of that total, 203 acres would be Prime Farmland.

Table 4-4. Important Farmland in the Alternative 2C Footprint that would be Permanently Converted[a]

Important Farmland Category[b]	Acres[c]
Prime Farmland	203
Farmland of Statewide Importance	39
Unique Farmland	9
Total	251

[a] Acreages assessed includes agricultural land within the Alternative 2C footprint that would be permanently converted by project implementation and, therefore, does not include staging areas.

[b] Only Important Farmland categories that are considered "agricultural land," per Public Resources Code Section 21060.1, are included in this table.

[c] Values have been rounded.

The conversion of Farmland acreage under Alternative 2C would be approximately 31 percent more than that converted under the Proposed Project, i.e., there would be approximately 59 more acres of

Farmland converted to nonagricultural uses under Alternative 2C relative to the Proposed Project. The permanent conversion of Farmland under Alternative 2C would be a significant impact. As discussed in Section 3.6, *Agricultural and Forestry Resources*, Yolo County requires agricultural mitigation for the conversion of land from an agricultural use to a predominantly nonagricultural use; however, public agency facilities and infrastructure that do not generate revenue are exempt from this mitigation program, as determined on a case-by-case basis. Alternative 2C is a flood infrastructure project that would not generate revenue and, as such, is expected to be exempt from the required mitigation. However, if it were determined by the County to not be exempt, Mitigation Measure AG-1 could be implemented to reduce the severity of the impact, but the impact would not be reduced to a less-than-significant level because the Farmland would still be converted. Accordingly, this impact would be significant and unavoidable.

Like the Proposed Project, most of the land within the permanent footprint of Alternative 2C is zoned Agricultural Intensive (A-N) by Yolo County (i.e., approximately 456 acres are zoned A-N). No part of the Alternative 2C footprint is zoned for agriculture by the City of Woodland. As described in Section 3.6, *Agricultural and Forestry Resources*, regarding zoning in Yolo County, the A-N zone allows for land uses that are compatible with agriculture and may include uses that support natural resource management. Alternative 2C would remove approximately 0.1 percent of lands zoned A-N from Yolo County, which is not substantially more than would occur under the Proposed Project. As with the Proposed Project, the construction and operation of a levee would be considered compatible with agricultural uses because it would not prohibit the continued use of agricultural lands or agricultural production north of the proposed levee and would be considered a use that supports natural resource management because it provides flood protection. Therefore, the Alternative 2C would not conflict with existing zoning, and this impact would be less than significant.

There is no land within the Alternative 2C footprint under Williamson Act contract versus approximately 17 acres contracted under the Proposed Project. Therefore, because there is no land in Williamson Act contracts in the Alternative 2C footprint, Alternative 2C would not conflict with Williamson Act lands, and there would be no impact.

Air Quality

The types of short-term air quality impacts under Alternative 2C would be similar to those under the Proposed Project, but of a greater magnitude. The general construction approach for Alternative 2C would be similar to the Proposed Project, but Alternative 2C would excavate approximately 2.2 million cubic yards of material. Of this, 1.2 million cubic yards would be hauled to the Yolo County Landfill, which is significantly more than hauled under the Proposed Project (approximately 92,000 cubic yards). The additional excavation and material hauling under Alternative 2C would require more off-road equipment and haul trucks when compared to the Proposed Project, resulting in the generation of more criteria pollutants and fugitive dust. Based on the emissions estimates for the Proposed Project (Table 3.7-8), it is likely NO_X and PM10 emissions from construction of Alternative 2C would exceed YSAQMD's thresholds, even with implementation of Mitigation Measure AQ-1. Additional mitigation to reduce NO_X and PM10 would be necessary. Such measures may include cleaner equipment engines (e.g., Tier 4 engines), newer haul trucks (e.g., model year 2015 engines), use alternative fuels, and paving of access roads. While these measures would reduce NO_X and PM10 emissions, they may still exceed YSAQMD's thresholds, resulting in a significant regional and localized short-term air quality impact.

Implementation of Alternative 2C would also expose sensitive receptors adjacent to the construction footprint and haul routes to increased health risks from DPM. The additional off-road equipment and haul trucks required to construct Alternative 2C would generate more emissions of DPM when compared to the Proposed Project, which may result in health risks in excess of YSAQMD's thresholds. Additional mitigation implemented to address criteria pollutants would reduce health risks, but they may still exceed thresholds, resulting in a significant health risk impact.

While the additional equipment and vehicles required to construct Alternative 2C would combust more diesel fuel, any odors associated with diesel exhaust would be intermittent and temporary and would dissipate rapidly from the source with an increase in distance. Furthermore, as required by CARB regulation, no in-use off-road diesel vehicles may idle for more than 5 consecutive minutes. Accordingly, like the Proposed Project, construction activities would not result in nuisance odors and the impact would be less than significant.

Following construction, O&M activities under Alternative 2C would be the same as the Proposed Project. Accordingly, like the Proposed Project, long-term O&M activities would not result in emissions in excess of YSAQMD thresholds, and air quality impacts would be less than significant.

Greenhouse Gas Emissions

The types of short-term GHG impacts under Alternative 2C would be similar to those under the Proposed Project, but of a greater magnitude. The general construction approach for Alternative 2C would be similar to the Proposed Project, but Alternative 2C would excavate approximately 2.2 million cubic yards of material. Of this, 1.2 million cubic yards would be hauled to the Yolo County Landfill, which is significantly more than hauled under the Proposed Project (approximately 92,000 cubic yards). The additional excavation and material hauling under Alternative 2C would require more off-road equipment and haul trucks when compared to Alternative 2A, resulting in the generation of more GHGs. Based on the emissions estimates for the Proposed Project (see Table 3.8-3), while hauling emissions would be greater, it is unlikely they would exceed SMAQMD's annual threshold of 1,100 metric tons CO_2e. Alternative 2C would be eligible to tier construction emissions generated in the City and Yolo County from the relevant CAPs. Mitigation Measure GHG-1 would be required to ensure Alternative 2C would not conflict with the City's or County's ability to achieve the GHG emissions reductions outlined in their CAPs. Accordingly, construction emission would be less than significant with implementation of Mitigation Measure GHG-1.

Following construction, O&M activities under Alternative 2C would be the same as for the Proposed Project. Accordingly, like the Proposed Project, long-term O&M activities would not conflict with the City's ability to achieve the GHG emissions reductions outlined in its CAP with implementation of Mitigation Measure GHG-2, and impacts would be less than significant.

Noise

Impacts under Alternative 2C would be similar to those under Alternative 2A. Both alternatives would require three railway closure structures, and although the levee design under Alternative 2C would be shorter in height and would not include a seepage berm, it would be longer and the drainage channel would be wider. Alternative 2C is anticipated to require a similar amount of time to build as Alternative 2A.

Under Alternative 2C, one of the city's pump stations would be relocated to the area presently occupied by an industrial complex on Beamer Street. Another pump station would be relocated just south of the new levee's access road. These pump station relocations would result in new operational sources of noise in places where they do not previously exist. However, the pumps would not result in any permanent long-term noise effects, as the new locations would be in an area of commercial and industrial buildings that are not considered noise-sensitive uses.

Similar to the Proposed Project, construction would not be planned during times of day or night when construction noise is regulated by City of Woodland. As such, construction noise impacts for Alternative 2C would be less than significant. However, best noise control practices described under Impact NOI-1 in Section 3.9, *Noise*, are recommended where feasible to minimize construction noise levels in the community.

Vibration effects under Alternative 2C would be similar to Alternative 2A, and would be less than significant.

Cultural Resources

Direct effects of Alternative 2C on the Central Pacific Railroad and Camillus Nelson/Hackett Ranch would be similar to those described for the Proposed Project in Section 3.10 and would be less than significant. Under Alternative 2C, a railway closure structure would be located where the new levee crosses the railroad tracks near I-5, and would be constructed as described for the Proposed Project. As discussed in section 3.10, although construction of the closure would add features to the Central Pacific Railroad, it would not significantly affect the setting and would not affect the alignment or function of the railroad. Thus, Alternative 2C would have a less-than-significant impact on the Central Pacific Railroad. Alternative 2C does not propose any construction work, new features or staging areas on the parcels that compose the Camillus Nelson/Hackett Ranch. Hydrologic modeling indicates Alternative 2C's operation would have a similar effect on flood depths on those parcels that make up the historic property boundary of the ranch, with less flooding directly adjacent to the parcel on which the residence is situated. As discussed in section 3.10, flooding on the agricultural parcels that compose a portion of the ranch's setting but do not endanger the residence would have a less-than-significant impact on the Camillus Nelson/Hackett Ranch, and therefore Alternative 2C would have a less-than-significant impact on the property.

Direct effects of Alternative 2C on archaeological resources would be identical to those described for the Proposed Project because the underlying archaeological sensitivity of the project area is the same. The potential for buried archaeological resources within the project area under Alternative 2C would be the same as under the Proposed Project, and the same mitigation measures would be warranted.

Direct effects of Alternative 2C on human remains would be identical to those described for the Proposed Project because the underlying archaeological sensitivity of the project area is the same. The potential for human remains within the project area under Alternative 2C would be the same as under the Proposed Project, and the same mitigation measures would be warranted.

Tribal Cultural Resources

Alternative 2C would involve potentially more ground disturbance than the Proposed Project because a larger drainage channel would be constructed and the Yolo Bypass west levee would be degraded within the proposed footprint of the drainage channel to allow conveyance of flows into the bypass. In addition, there would be one more closure structure than under the Proposed Project.

Alternative 2C would result in similar impacts to those described for the Proposed Project in Section 3.11, *Tribal Cultural Resources*. The same avoidance, minimization, and mitigation measures described in Section 3.11.2.3 would apply to Alternative 2C to reduce impacts to a less-than-significant level.

Transportation

As is the case with the Proposed Project, Alternative 2C would not be expected to conflict with any policies from the City and County general plans pertaining to a reduction in long-term VMT and a reduced reliance on the automobile. Similarly, Alternative 2C would also not be expected to conflict with any other policies contained in either general plan because these policies do not specifically pertain to a temporary increase in traffic due to a construction-only project. Alternative 2C would affect an additional rail line that would be protected from flooding under the Proposed Project, the Sacramento River Train operated by the Sierra Northern Railroad Company, and an additional road that would be protected from flooding under the Proposed Project, County Road 22. Under Alternative 2C, a new levee would be constructed to the south of the existing rail line and road so that County Road 22 and the existing rail line would be located within the proposed drainage channel (see the typical cross-section of the drainage channel in Reach N in Figure 4-3). Therefore, this rail line and road would remain at risk of flooding under Alternative 2C, which would not be the case under the Proposed Project.

The types of short-term traffic impacts under Alternative 2C would be similar to those under the Proposed Project. The general construction approach for Alternative 2C would be similar to the Proposed Project, but Alternative 2C would result in the excavation of more material. Therefore, it would require the use of more heavy trucks (for hauling) than would be required under the Proposed Project. Because Alternative 2C may result in a larger temporary increase in VMT (from haul trucks) than would occur under Alternative 2A, temporary VMT impacts in the study area would be similar, but potentially of greater magnitude, under this alternative than those described for the Proposed Project. Mitigation Measure GHG-1, described in Chapter 3.8, *Greenhouse Gas Emissions*, would help reduce project-related VMT during the construction window. However, it is not expected to reduce temporary VMT-related impacts to less-than-significant levels. For this reason, temporary project-generated VMT impacts would still be significant for Alternative 2C after mitigation.

Potential short-term hazards or restrictions to emergency access would be similar under Alternative 2C as they would be under the Proposed Project, and would therefore be significant. However, as is the case with the Proposed Project, implementation of Mitigation Measure TRA-1 would reduce potential impacts related to emergency access or hazards under Alternative 2C to a less-than-significant level.

Following construction, O&M activities under Alternative 2C would be similar to the Proposed Project. Accordingly, like the Proposed Project, long-term O&M activities would not result in the generation of a substantial amount of VMT after the completion of Project construction. In addition, Alternative 2C would require the raising of roadways but would not result in a permanent modification of the footprint or alignment of any area roadways and would, therefore, not result in any long-term hazards or emergency access issues. Impacts related to a potential long-term increase in VMT or the introduction of any long-term hazards or emergency access issues under Alternative 2C would be less than significant.

Public Services, Utilities, and Service Systems

Under Alternative 2C, effects on utilities and service systems would be the same as under the Proposed Project. As with the Proposed Project, no impacts are anticipated on water, wastewater, or stormwater facilities. Likewise, water needs under this alternative would be the same as the Proposed Project and would not result in a need for expanded entitlements. Also, similar to the Proposed Project, Alternative 2C would result in the generation of solid waste in the form of soils, vegetation, and road and structure demolition. Under Alternative 2C, the Truck Mixer Supply building would *not* be acquired and demolished. Rather, a small building located at 2370 East Main Street, just within the alignment and could be impacted and need to be demolished. Also, OA Logistics, located at 2222 East Beamer Street, would be acquired and demolished to accommodate this alternative. The amount of solid waste generated in the form of structure debris would be similar as for the Proposed Project. Therefore, overall, Alternative 2C would result in similar impacts on utilities and service systems compared to the Proposed Project. The impact would be less than significant.

Energy

The types of short-term energy resources impacts under Alternative 2C would be similar to those under the Proposed Project, but of a greater magnitude. The general construction approach for Alternative 2C would be similar to Alternative 2A, but Alternative 2C would involve excavation and hauling of more material, requiring more fuel use by off-road equipment and haul trucks, than under Alternative 2A. Overall, the construction schedule is reported to be similar to that anticipated for Alternative 2A, so no additional electricity use associated with the contractor trailer is expected. The construction activities would consume more fuel due to the additional off-road vehicle and equipment use. Although there would be more fuel use, overall, the anticipated amount energy consumption would still be expected to be a small percentage of use in the region, and not a significant impact.

Following construction, O&M activities under Alternative 2C would be the same as Alternative 2A. Accordingly, long-term O&M activities for Alternative 2C would not result in wasteful, inefficient, or unnecessary use of energy resources nor conflict with renewable energy or energy efficiency plans, and the impacts would be less than significant. O&M impacts of Alternative 2C would be of the same magnitude as the Proposed Project.

Construction and operation of Alternative 2C would have the same potential to conflict with the City of Woodland CAP measures as Alternative 2A. This impact would be of the same magnitude as the Proposed Project. As discussed in Section 3.14, and shown in Tables 3.8-4 and 3.8-5 in Section 3.8, *Greenhouse Gas Emissions*, implementation of Mitigation Measures GHG-1 and GHG-2 or similar measures would reduce impacts related to conflict with or obstruction of local plans that address renewable energy or energy efficiency to a less-than-significant level.

Aesthetics

Under Alternative 2C, effects on aesthetic resources would be similar to those described in Section 3.15 for the Proposed Project.

The proposed levee under Alternative 2C would not extend as far west as under the Proposed Project. Therefore, scenic vista views of the pastoral landscape that are backdropped by the Vaca Mountains would not be blocked as much under Alternative 2C as under the Proposed Project for residents along Pedrick Road/County Road 98. As under the Proposed Project, the impact on scenic vistas under Alternative 2C would be less than significant.

Alternative 2C would be similar to the Proposed Project, but of lesser magnitude, with respect to aesthetic effects on visual character and quality of area views related to construction activities and operation and maintenance activities. Under Alternative 2C, construction activities would be similar to those of the Proposed Project and would require similar equipment and utilize many of the same staging areas for stockpiling excavated soil. These activities and associated equipment would create similar temporary changes in views of and from the study area as under the Proposed Project. The temporary batch plant near the CCSB in the industrial part of Woodland would not be needed because there would be no cutoff walls as part of Alternative 2C; however, industrial viewers would see other construction activities as under the Proposed Project. Overall, the effects of construction on visual character and quality of public views would be temporary and limited in area. However, for highly sensitive residential viewers, the effect would be significant, though of lesser magnitude than under the Proposed Project because the levee under Alternative 2C would not extend as far west and would not cause as much visual impact for the sensitive residential area along Carter Lane and Hanging Oak Way as under the Proposed Project. Implementation of Mitigation Measure AES-1 (described under Impact AES-2 in Section 3.15, *Aesthetics*) would reduce this impact to a less-than-significant level for Alternative 2C. Also as described for the Proposed Project, under Alternative 2C, the levee would undergo regular operation and maintenance, but effects on viewers would be short-term and temporary and activities would appear similar in nature to operations taking place on agricultural lands in the study area. Impacts would be less than significant.

Alternative 2C also would be similar to the Proposed Project with respect to aesthetic effects on visual character and quality of area views related to the drainage channel and flood regime. Alternative 2C would include a 550-foot-wide trapezoidal drainage channel on the waterside of most of the levee. The channel would be 3.5 times as wide as the drainage channel proposed for the Proposed Project. This wider channel would be more visible to viewers north of the project footprint than the narrower channel for the Proposed Project. However, the channel would be mostly visible in the immediate foreground in views that are available from local roadways. The channel generally would not stand out as a prominent feature in the distant foreground or middleground views of the project footprint because the channel would be at a lower elevation than the surrounding ground plane. As described in Section 3.1, *Hydrology*, flood depths under Alternative 2C would be significantly lower than those of the Proposed Project, and the largest increases in depth would be within the new toe channel at the base of the proposed levee embankment due the wider drainage channel. Impacts would be less than significant.

Alternative 2C would be similar to the Proposed Project with respect to aesthetic effects on visual character and quality of area views of sensitive residential viewer in northeastern Woodland. The proposed levee for Alternative 2C would be 4 to 11 feet tall, which would be shorter than 6- to 14-foot tall levee for the Proposed Project. The shorter levee height would mean that the levee would be 4 feet tall instead of 6 feet tall in reach S, which is the part of the project footprint adjacent to sensitive residential viewers in northwestern Woodland. Nonetheless, the presence of a levee near these homes would block pastoral views of agricultural fields to the north, limiting these residents' views to the immediate foreground where they would see the 4-foot-tall levee. Although oak woodland plantings on the north side of the levee would be implemented after construction under Alternative 2C, as under the Proposed Project, to compensate for tree loss, these plantings would not provide visual screening of the new levee for residents located south of and closest to the proposed levee. Also, for the same reasons as described in Section 3.15 for the Proposed Project, the aesthetic qualities of select portions of the study area are likely to be substantially changed where mature vegetation is permanently removed and cannot be replanted. Overall, impacts on visual character and quality of the study area under Alternative 2C would be significant and unavoidable, though of lesser magnitude than under the Proposed Project because the levee under Alternative 2C would not extend as far west as under the Proposed Project.

Impacts related to light or glare under Alternative 2A would be similar to those under the Proposed Project. During construction, effects would be similar to those of the Proposed Project because construction work would generally take place Monday through Sunday during normal working hours and would not require night lighting that could affect nearby residents. During operation, impacts would also be similar because Alternative 2C does not include any lighting features. Design features that would have potentially reflective surfaces (concrete retaining walls, steel supports, and galvanized metal steel plates of the closing structures) would only be located at major road and railroad crossings where existing light and glare is already present. In addition, like the Proposed Project, changes to the flooding regime as a result of Alternative 2C would mean that viewers would see an overall decrease in the size of the areas that would be covered by floodwaters during such events, resulting in a reduction in reflective glare of floodwater surfaces. Impacts related to light and glare would be less than significant.

Recreation

Under Alternative 2C, effects on recreation would similar to those described in Section 3.16 for the Proposed Project. Alternative 2C does not involve construction or expansion of recreational facilities, nor does it involve residential or commercial development that would increase use of existing recreational facilities. The one park in the project area, Nelson's Grove, is not in the project footprint and would not be affected by project construction or operations. Flood depths at the park would not change with implementation of Alternative 2C; therefore, Nelson's Grove would not experience any increased use as a result. Like the Proposed Project, Alternative 2C would reduce flood risk for the recreational facilities in Woodland that are currently susceptible to flooding; however, any increase in usage would be negligible. Flood risk at Velocity Island Park would be reduced with Alternative 2C implementation; however, decreased flood risk would not lead to increased use of the facility. And, as described in Chapter 2, *Project Description*, access to the park would be maintained. Implementation of Alternative 2C would not lead to increased use of existing recreational facilities, resulting in substantial physical deterioration. The effect would be less than significant.

Population and Housing

Under Alternative 2C, effects on population and housing would be the similar to the Proposed Project. As with the Proposed Project, a levee that would not directly or indirectly induce population growth would be constructed under Alternative 2C.

Alternative 2C would not directly displace significant numbers of people or housing because no housing is located within the Alternative 2C footprint. Similar to the Proposed Project, Alternative 2C would result in slightly deeper floodwaters in areas that contain housing than would occur without the implementation of Alternative 2C. Figures 4-5 and 4-6 indicate that, in the event of a 100-year or 200-year flood event, floodwaters in areas north of the Alternative 2C footprint and south of Cache Creek could be slightly deeper after the implementation of Alternative 2C. However, as with the Proposed Project, flooding events on this level are expected to be temporary and very infrequent and are not expected to result in the permanent displacement of residents in these areas or necessitate the construction of replacement housing elsewhere. This impact would be less than significant under Alternative 2C.

Hazards, Hazardous Materials, and Wildfire

Under Alternative 2C, impacts related to hazards and hazardous materials are primarily the same as under the Proposed Project. The main difference between the Proposed Project and Alternative 2C regarding hazards and hazardous materials is the construction footprint. Under Alternative 2C, the Truck Mixer Supply building would not be acquired and demolished. Rather, a small building located at 2370 East Main Street, just within the alignment could be affected. OA Logistics, located at 2222 East Beamer Street, would be acquired and demolished to accommodate this alternative. According to historic aerial photographs, the OA Logistics building and the 2370 East Main Street building were constructed sometime after 1993 (HistoricAerials.com 2019). Therefore, neither building is likely to contain ACM or LBP in their construction materials. As a result, the ACM and LBP surveys required under Mitigation Measure HAZ-2b would not be necessary. Because all other hazards-related impacts under Alternative 2C are similar to those under the Proposed Project, the same mitigation measures (HAZ-1 and HAZ-2) would be still required under Alternative 2C.

Operation-related impacts would also be similar to the Proposed Project. The same applicable laws and regulations enforced by CUPA and Cal-OSHA would be implemented for this alternative. Construction under this alternative would not be expected to cause significant impacts on emergency response or evacuation plans. The same Transportation Management Plan would be developed and implemented.

The impacts on wildfire for the Proposed Project would be the same as Alternative 2C because the Proposed Project would be in the same geography as Alternative 2C. Therefore, there would be no impacts related to wildfires under Alternative 2C.

4.3.2.3 Application of Screening Criteria

The City applied the screening criteria described in Section 4.2, *Alternatives Development and Screening Criteria*, to Alternative 2C. This section describes the results of that analysis and compares the environmental effects of Alternative 2C to those of the Proposed Project.

Ability to Meet Project Objectives

The City's primary objective for the Proposed Project is to develop and implement a plan that meets California's Urban Level of Protection and the Federal Emergency Management Agency (FEMA) 100 year requirements to reduce the risk of flooding to avoid loss of life, property damage, and economic effects that result from flooding in both the project area and Woodland, while also providing measures to address concerns north of the city in the project area. Alternative 2C would achieve this primary objective and meet five of the six objectives.

- Provide 200-Year Flood Protection.
- Obtain FEMA Certification**.**
- Avoid or mitigate for increases to the 100-year flood depth at existing structures north of the city.
- Maintain the functionality of the CCSB.

- Ensure no net loss of native trees.

It would not, however, meet the objective of satisfying USACE planning criteria and federal requirements for investment. USACE found Alternative 2C to be "not economically justified" during the Lower Cache Creek Feasibility Study process (U.S. Army Corps of Engineers 2019).

Impact Avoidance

Relative to the Proposed Project, Alternative 2C would have reduced impacts related to flood depths north of the new levee because the drainage channel would move floodwaters directly into the Yolo Bypass without first requiring the floodwaters to go over a weir into the CCSB. Additionally, because the levee would not extend as far to the west as under the Proposed Project, impacts related to aesthetics and conflicts with Williamson Act contracts would also be reduced. However, Alternative 2C would require a substantially greater amount of excavation and hauling than the Proposed Project, which would generate more criteria pollutants and fugitive dust than the Proposed Project, resulting in significant and unavoidable air quality impacts that would not occur under the Proposed Project. Because Alternative 2C directs water straight into the Yolo Bypass (as opposed to through the CCSB), it would be expected to contribute to methylmercury production in the bypass, resulting in a significant and unavoidable water quality impact that would not occur under the Proposed Project. Additionally, the greater amount of excavation and hauling, as well as the larger footprint under Alternative 2C, would cause increased impacts associated with biological resources, GHG emissions, conversion of Farmland, VMT, and construction-related consumption of energy resources relative to the Proposed Project.

Feasibility

Alternative 2C was identified as having community support through both the FloodSAFE Yolo Pilot Program and in the City's own alternatives analysis (see Appendix A). However, the City would not be able to afford to construct Alternative 2C without federal funding.

4.4 Environmentally Superior Alternative

CEQA requires an EIR to examine a range of feasible alternatives to a proposed project. State CEQA Guidelines Section 15126.6(e)(2) requires that an EIR identify which of those alternatives is the environmentally superior alternative. The "environmentally superior alternative" is considered to be the alternative to the proposed project that has the least environmental impact compared to the proposed project. If, in the course of identifying the environmentally superior alternative, the No Project Alternative is found to be the environmentally superior alternative, then Section 15126.6(e)(2) of the State CEQA Guidelines further requires that an EIR identify which among the other alternatives is the environmentally superior alternative. Consequently, although the No Project Alternative is evaluated and presented for comparison purposes, determination of the environmentally superior alternative in this chapter primarily reflects the differences in impacts among the remaining alternatives. Determination of the environmentally superior alternative uses the impact evaluations of the proposed project and of each alternative in a comparative process. The impacts of each alternative are identified and compared to those of the proposed project. The type and relative magnitude of each alternative's impacts are evaluated, and the alternative found to have the least impact, as compared to the others, is determined to be the environmentally superior alternative.

Table 4-5 provides a comparison of the level of impacts under the alternatives considered in this EIR as compared to the Proposed Project. In many instances, the potential effects would be similar, meaning that the overall outcome of implementing the Proposed Project compared to any one of the alternatives would generally result in the same type and magnitude of effects on a specific resource even though the approach of the alternatives differ in some ways from the Proposed Project.

As shown in Table 4-5, the No-Project Alternative was determined to be environmentally superior. Although the No Project Alternative would cause the fewest environmental impacts, it does not meet the primary objective of the Proposed Project, which is to reduce flood risk for the city of Woodland, as described above in Section 4.3.1.3, *Application of Screening Criteria*. The State CEQA Guidelines require that, if the No-Project Alternative is identified as environmentally superior, the EIR must identify an environmentally superior alternative among the other alternatives (Section 15126.6[e][2]). If the No Project Alternative is not considered, then the Proposed Project is the environmentally superior alternative.

Although Alternative 2C would have reduced flood depth and aesthetic impacts relative to the Proposed Project and would not conflict with any Williamson Act contracts, it would result in more environmental impacts overall. Alternative 2C would require a substantially greater amount of excavation and hauling than the Proposed Project, which would generate more criteria pollutants and fugitive dust than the Proposed Project, resulting in significant and unavoidable air quality impacts that would not occur under the Proposed Project. Because Alternative 2C directs water straight into the Yolo Bypass (as opposed to through the CCSB), it would be expected to contribute to methylmercury production in the bypass, resulting in a significant and unavoidable water quality impact that would not occur under the Proposed Project.

Additionally, because of the Proposed Project's balanced earthwork ratio, which requires a smaller footprint and much less excavation and hauling than Alternative 2C, the Proposed Project results in approximately 41 fewer permanently disturbed acres of sensitive land cover types than Alternative 2C and would require the conversion of approximately 59 less acres of Farmland than Alternative 2C. The Proposed Project would also cause smaller environmental impacts associated with GHG emissions, VMT, and construction-related consumption of energy resources relative to Alternative 2C.

Table 4-5. Comparison of Environmental Impacts of Alternatives to the Proposed Project

Resource Topic	Proposed Project	No Project Alternative	Alternative 2C
Hydrology			
Erosion and Siltation	LTS	S (>)	LTS (=)
Flooding due to Alteration of Existing Drainage	LTS	S (>)	LTS (=)
Flooding due to Impeded/Redirected Flood Flows	LTS	S (>)	LTS (<)
Stormwater Runoff	LTS	NI (<)	LTS (<)
Water Quality			
Water Quality (Surface, Groundwater)	LTS w/mit	S (>)	SU (>)
Groundwater Supply	LTS	LTS (=)	LTS (=)
Geology, Soils, and Paleontological and Mineral Resources			
Geology	LTS	LTS (=)	LTS (=)
Soils	LTS	S (>)	LTS (>)
Paleontological Resources	LTS w/mit	NI (<)	LTS w/mit (>)
Minerals	LTS	NI (<)	LTS (=)
Biological Resources			
Special-Status Wildlife Species	LTS w/mit	LTS (<)	LTS w/mit (>)
Nesting Birds	LTS w/mit	LTS (<)	LTS w/mit (>)
Bats	LTS w/mit	LTS (<)	LTS w/mit (>)
Wildlife Movement Corridors	LTS	LTS (<)	LTS (=/>)
Special-Status Plant Species	LTS w/mit	LTS (<)	LTS w/mit (>)
Sensitive Vegetation Communities	LTS w/mit	LTS (<)	LTS w/mit (>)
Wetlands	LTS w/mit	LTS (<)	LTS w/mit (>)
Conflict with HCP/NCCP	LTS	LTS (<)	LTS (=)
Invasive Species	LTS w/mit	LTS (<)	LTS w/mit (=)
Land Use and Planning			
Divide Community	LTS	LTS (=)	LTS (=)
Conflict with Plan	LTS	S (>)	LTS (=)
Agricultural and Forestry Resources			
Convert Farmland	SU	NI (<)	SU (>)
Conflict with Zoning or Williamson Act	LTS	NI (<)	NI (<)
Air Quality			
Conflict with Plan	LTS	NI (<)	LTS (=)
Increase Criteria Pollutants	LTS w/mit	NI (<)	SU (>)
Expose Sensitive Receptors	LTS w/mit	NI (<)	SU (>)
Other Emissions	LTS	NI (<)	LTS (=)
Greenhouse Gas Emissions			
Generate GHG	LTS w/mit	NI (<)	LTS w/mit (>)
Conflict with Plan	LTS w/mit	NI (<)	LTS w/mit (=)

Resource Topic	Proposed Project	No Project Alternative	Alternative 2C
Noise			
Construction Noise	LTS	NI (<)	LTS (=)
Construction Vibration	LTS	NI (<)	LTS (=)
Cultural Resources			
Historical Resource	LTS w/mit	NI (<)	LTS w/mit (=)
Archaeological Resource	LTS w/mit	NI (<)	LTS w/mit (=)
Native American and Historic-Period Human Remains	LTS w/mit	NI (<)	LTS w/mit (=)
Tribal Cultural Resources			
Change Significance of Tribal Cultural Resource	LTS w/mit	NI (<)	LTS w/mit (=)
Transportation			
Conflict with Plan	LTS	NI (<)	LTS (>)
Additional VMT	SU	NI (<)	SU (>)
Roadway Hazards	LTS w/mit	S (>)	LTS w/mit (=)
Inadequate Emergency Access	LTS w/mit	S (>)	LTS w/mit (=)
Public Services, Utilities, and Service Systems			
Relocation or Construction of Facilities	LTS	LTS (<)	LTS (=)
Water Supply	LTS	LTS (<)	LTS (=)
Solid Waste	LTS	LTS (<)	LTS (=)
Energy			
Consumption of Energy Resources (Construction)	LTS	LTS (<)	LTS (>)
Consumption of Energy Resources (Operation)	LTS	LTS (>)	LTS (=)
Conflict with Plan	LTS w/mit	LTS (<)	LTS w/mit (=)
Aesthetics			
Scenic Vista	LTS	NI (<)	LTS (<)
Visual Character/Quality (Construction)	LTS w/mit	NI (<)	LTS w/mit (<)
Visual Character/Quality (Operation)	SU	NI (<)	SU (<)
Light and Glare	LTS	NI (<)	LTS (<)
Recreation			
Physical Deterioration of Facilities	LTS	LTS (<)	LTS (=)
Population and Housing			
Growth	NI	NI	NI (=)
Displacement	LTS	LTS (>)	LTS (=)
Hazards, Hazardous Materials, and Wildfire			
Routine Transport, Use, or Disposal	LTS	LTS (<)	LTS (=)
Accidental Release	LTS w/mit	LTS (<)	LTS w/mit (=)
Wildfire	NI	NI (=)	NI (=)

Note: shading indicates change in significance level from Proposed Project.

NI = no impact.
LTS = less than significant impact.
LTS w/mit = less than significant impact with mitigation incorporated.
S = significant.
SU = significant and unavoidable impact.

(<) less than Proposed Project.
(=) similar to Proposed Project.
(>) greater than Proposed Project.

4.5 Alternatives Considered but Dismissed from Further Analysis

The City of Woodland, working with USACE, the Central Valley Flood Protection Board (CVFPB) and DWR, has been actively seeking a solution to the flooding in Woodland since the late 1990s. Three previous efforts attempted to develop a project that would prevent or reduce flooding in Woodland: the USACE Lower Cache Creek Feasibility Study (2000–2005), the FloodSAFE Yolo Pilot Program (2011), and the City of Woodland Lower Cache Creek Feasibility Study Alternatives (2012–2016). A summary of these efforts is provided in Appendix A, *Technical Memorandum, City of Woodland, Previous Alternatives Analysis Related to the Lower Cache Creek Feasibility Study*.

In 2011, USACE, the City, and the CVFPB initiated a new Lower Cache Creek Feasibility Study (LCCFS) process, which ultimately led to the development of the alternatives contained in this EIR. Lessons learned throughout the planning processes listed above were incorporated into the LCCFS process. With the project's objectives in mind, several alternatives were evaluated in order to identify implementable solutions that meet local needs and address federal economic development objectives. The LCCFS alternatives screening process required significant evaluation of flood risk reduction benefits and costs for a wide array of alternatives.

An initial array of 11 alternatives (described in Appendix A) were developed and analyzed for the LCCFS. Alternative concepts included structural alternatives (bypasses), containment alternatives (upstream detention, levee raise, setback levees), non-structural alternatives (raising, floodproofing, and buyout of structures in the floodplain). These initial alternatives were further developed into a focused array of alternatives that were considered using the process described in Section 4.2, *Alternatives Development and Screening Criteria*. The alternatives considered but dismissed from detailed evaluation in this EIR are listed below, along with the reason for dismissal of each potential alternative. A more detailed discussion of the entire screening process can be found in Appendix A.

4.5.1 North Bypass—Alternative 1A

Alternative 1A proposes strengthening Lower Cache Creek's existing right bank levees from downstream of I-5 to the CCSB. Alternative 1A also includes a grade control structure and right bank levee extension upstream of I-5. These features would increase the stage upstream of I-5, resulting in floodwaters overtopping the left bank and flowing north toward the Colusa Basin Drain. Alternative 1A also includes seepage mitigation and rock bank protection. It was ultimately dismissed from further consideration because it would not be cost effective.

4.5.2 North Bypass—Alternative 1B

Alternative 1B is similar to Alternative 1A but includes the purchase of flowage easements to ensure that the floodwaters are conveyed to the Colusa Basin Drain. It was ultimately dismissed from further consideration because it would not be cost effective.

4.5.3 North Bypass—Alternative 1C

Alternative 1C is similar to Alternative 1B but includes levee construction to convey floodwaters to the Colusa Basin Drain, which would require flowage easements for fewer properties. It was ultimately dismissed from further consideration because it would not be cost effective.

4.5.4 North Bypass—Alternative 1D

Alternative 1D is similar to Alternative 1A but involves a smaller extension of the right bank of the existing Lower Cache Creek levee, a degrade of the left bank upstream of I-5, and no strengthening of the levees on the right bank downstream of I-5. It was ultimately dismissed from further consideration because it would not be cost effective.

4.5.5 South Bypass—Alternative 2B

Alternative 2B is similar to Alternative 2A but includes additional features to address localized induced stages at I-5 and SR 113 and minimizes impacts on the CCSB by limiting the excavation necessary to move out-of-bank flood waters around to the south of the CCSB and then directly to the Yolo Bypass. It was ultimately dismissed from further consideration because its measures were incorporated into Alternative 2C.

4.5.6 South Bypass—Alternative 2D

Alternative 2D is similar to Alternative 2C, but it strengthens the right and left bank of the existing Lower Cache Creek levees along the town of Yolo. It also includes seepage mitigation and rock bank protection. This alternative was ultimately dismissed from further consideration because there were not enough benefits to economically justify the right bank strengthening.

4.5.7 Strengthen in Place—Alternative 6A

Alternative 6A strengthens the existing right bank levee of Lower Cache Creek and the left bank of the levee along the town of Yolo. This alternative includes seepage mitigation and rock bank protection. Alternative 6A was ultimately dismissed from further consideration because while it reduces the risk of flooding, it does not address overtopping.

4.5.8 Strengthen in Place—Alternative 6B

Alternative 6B increases the height of the existing right and left bank Lower Cache Creek levees near the town of Yolo, improves the right bank levee to the CCSB, and improves CCSB levees. It would significantly reduce the risk of flooding to the south of Cache Creek. This alternative includes seepage mitigation and rock bank protection. Alternative 6B was ultimately dismissed from further consideration due to economic and environmental factors.

4.5.9 Strengthen in Place—Alternative 6C

Alternative 6C strengthens or increases the height of both the left and right levees along their entire lengths. It removes the left bank levee upstream of I-5 and constructs a new levee adjacent to I-5, forcing floodwaters north where they are conveyed under I-5 via culverts. It includes seepage mitigation and rock bank protection. This alternative was ultimately dismissed from further consideration because the left bank raise would not be cost-effective.

4.5.10 Partial Setback Levee—Alternative 7A

Alternative 7A constructs levees along the right bank only, and extends the right bank levee upstream to prevent right bank floodwaters from overtopping the reach upstream of I-5. This alternative would increase inflows to the CCSB. The outlet weir of the CCSB would be modified to a step weir to accommodate these additional flows. This alternative was ultimately dismissed from further consideration because of construction costs.

4.5.11 Partial Setback Levee—Alternative 7B

Alternative 7B is similar to Alternative 7A. However, instead of increasing the weir capacity of the CCSB, this alternative would include a levee or channel that would divert overbank flow to the north of CCSB and purchase of flowage easements. This alternative was ultimately dismissed from further consideration because of construction costs.

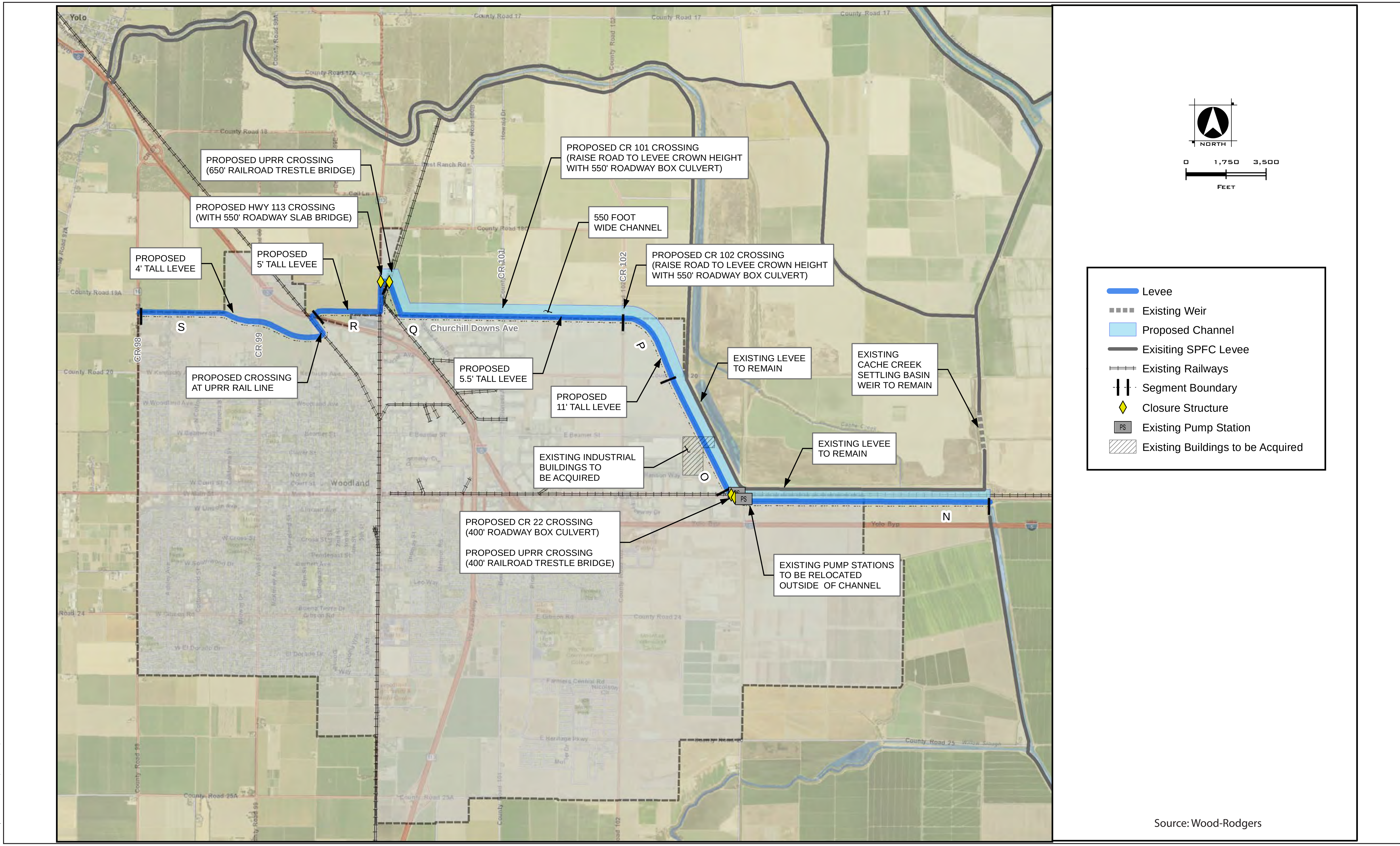

Figure 4-1
Overview of Alternative 2C

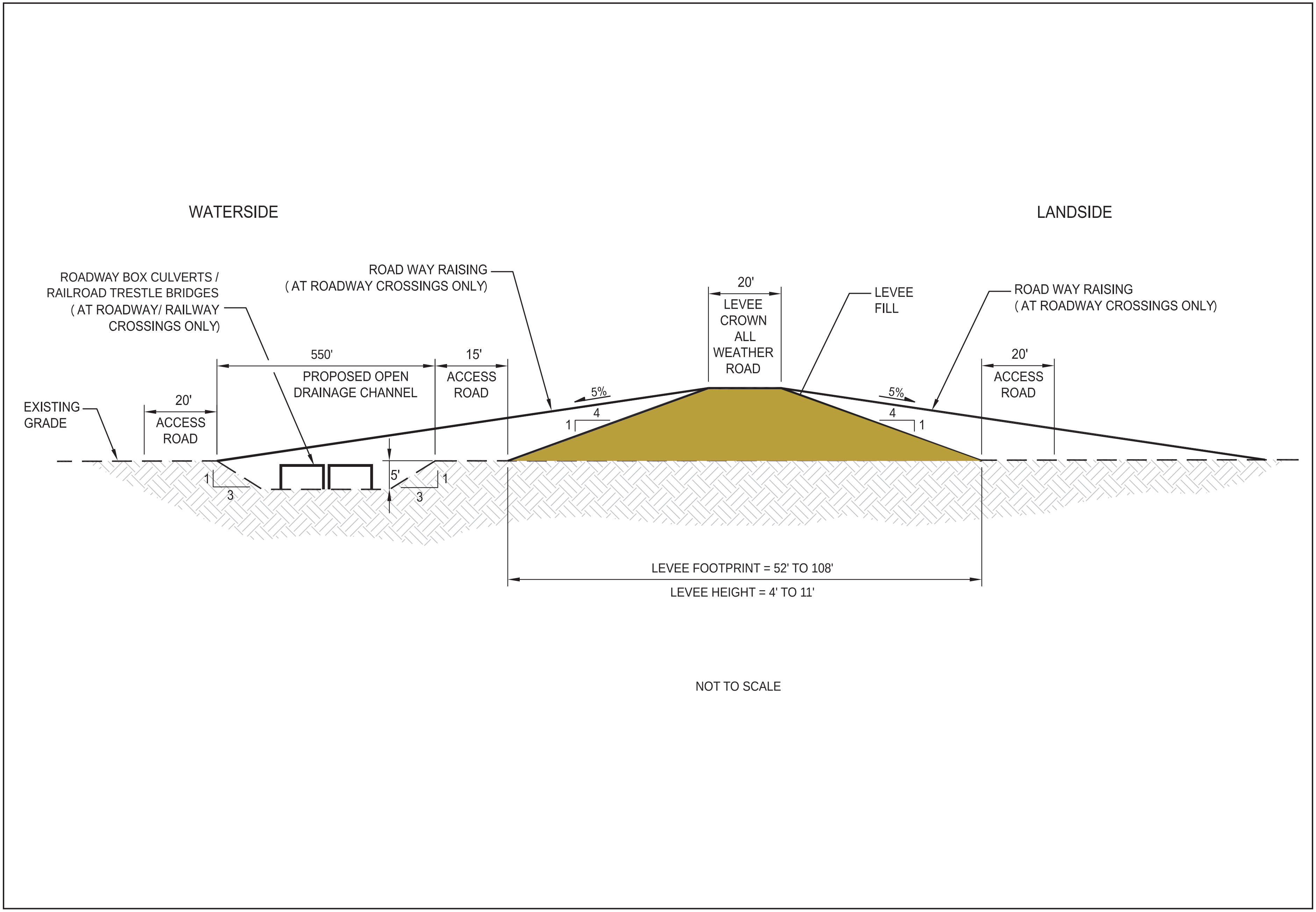

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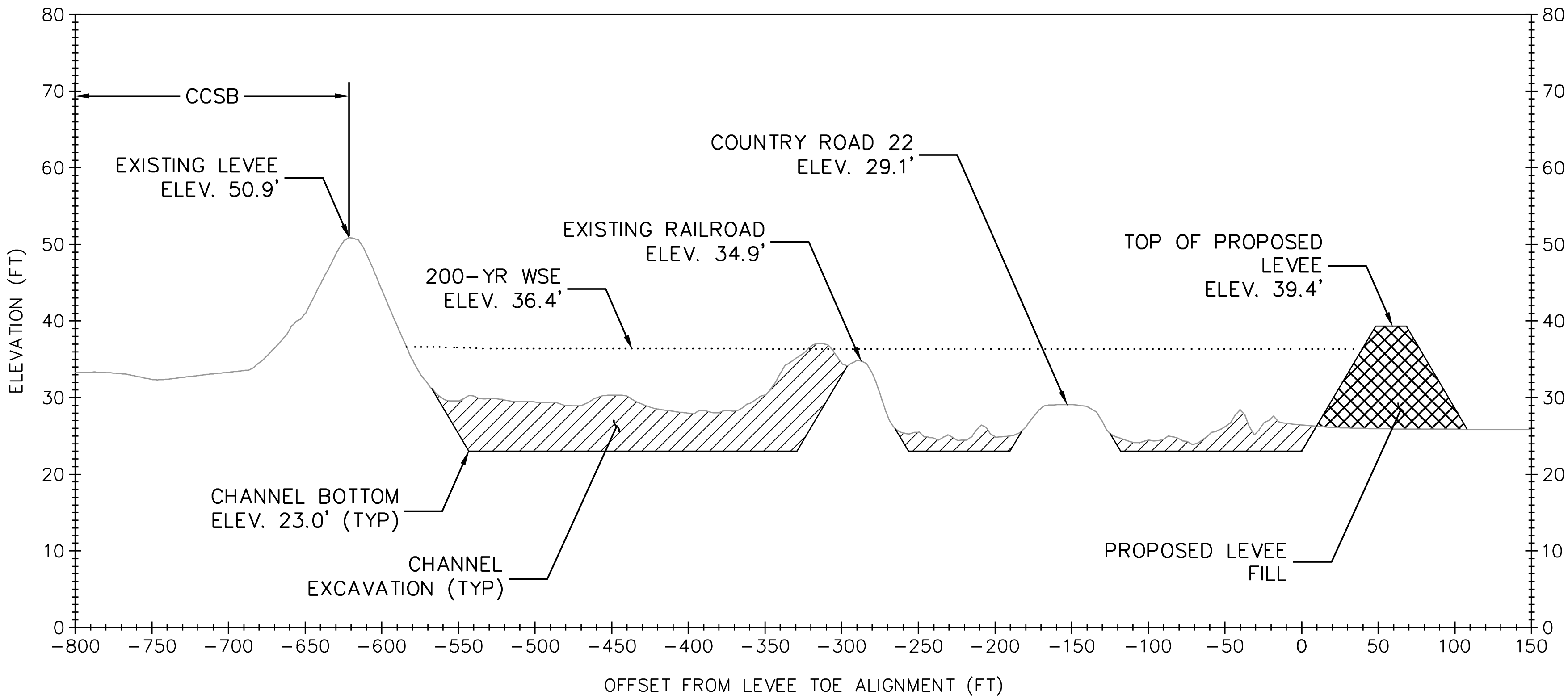
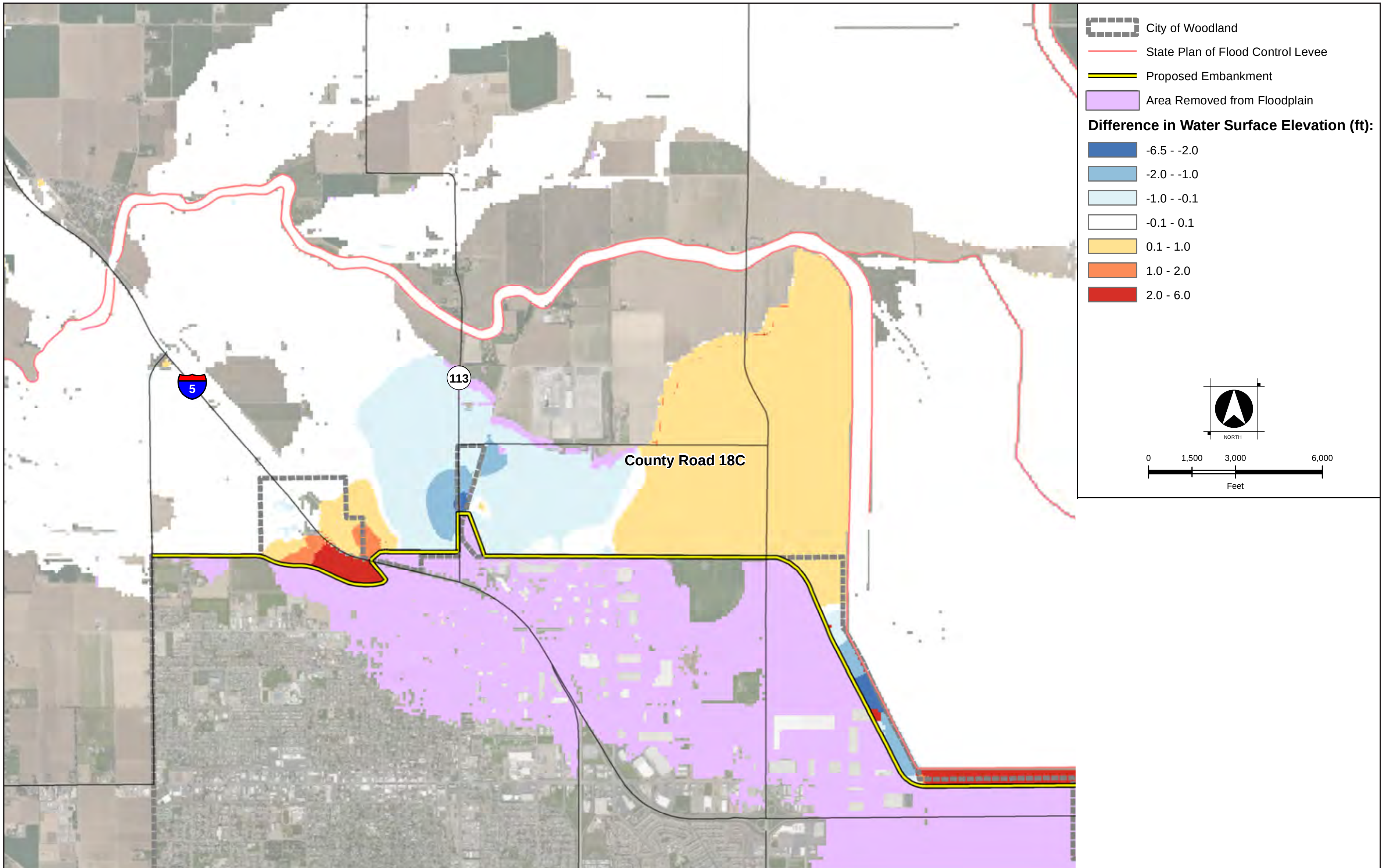
Figure 4-2
Typical Cross-Section of Alternative 2C Proposed Levee



Source: U. S. Army Corps of Engineers, Sacramento District.

Figure 4-3
Typical Cross-Section of Alternative 2C Drainage Channel (Reach N)

Figure 4-4
Alternative 2C Construction Footprint



Source: Wood Rogers, 2020.

ICF Graphics ... 00244.19 (2-24-2020)

Figure 4-5
With Alternative 2C: Difference in Flood Surface Elevation under the 100-Year Event

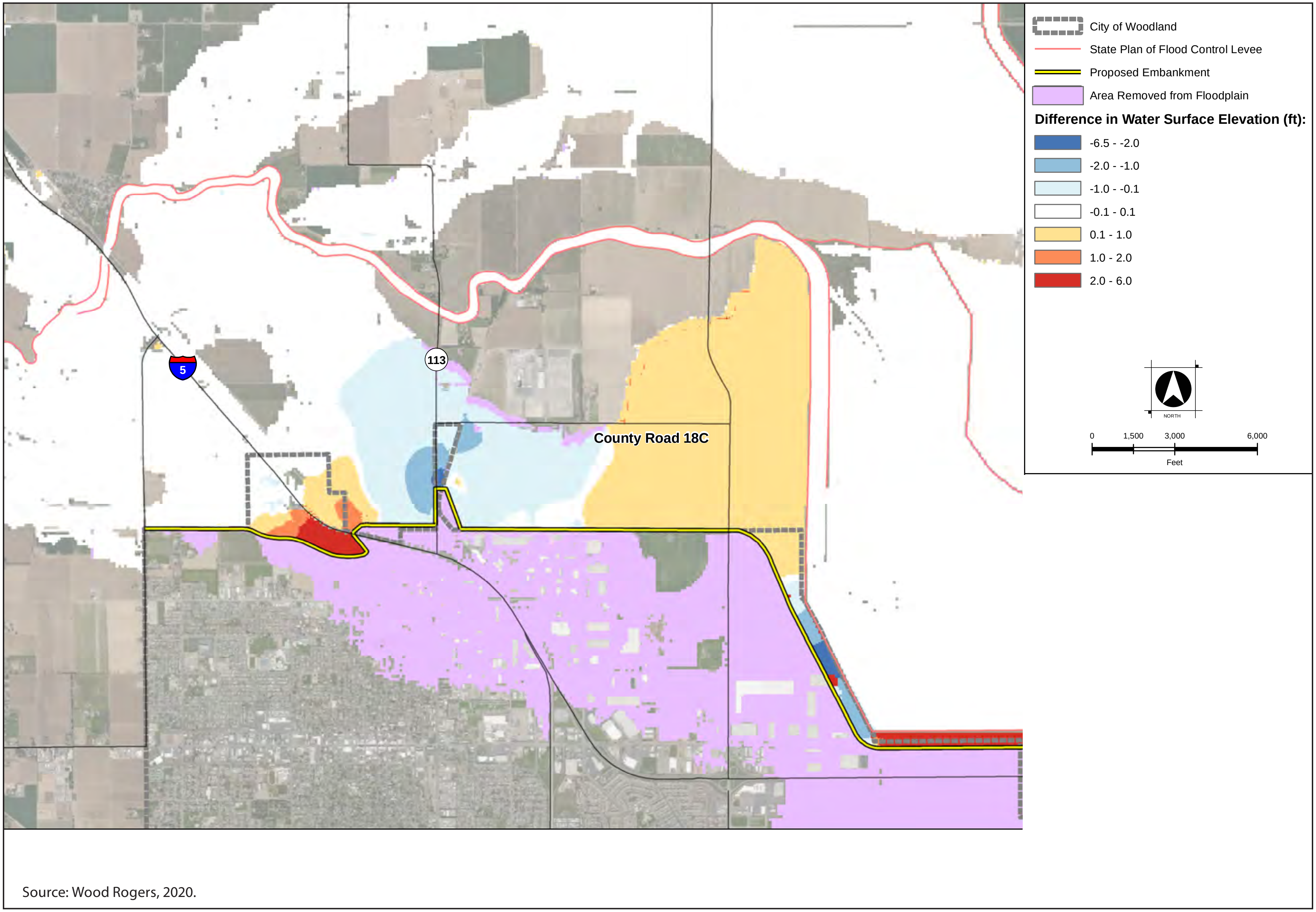


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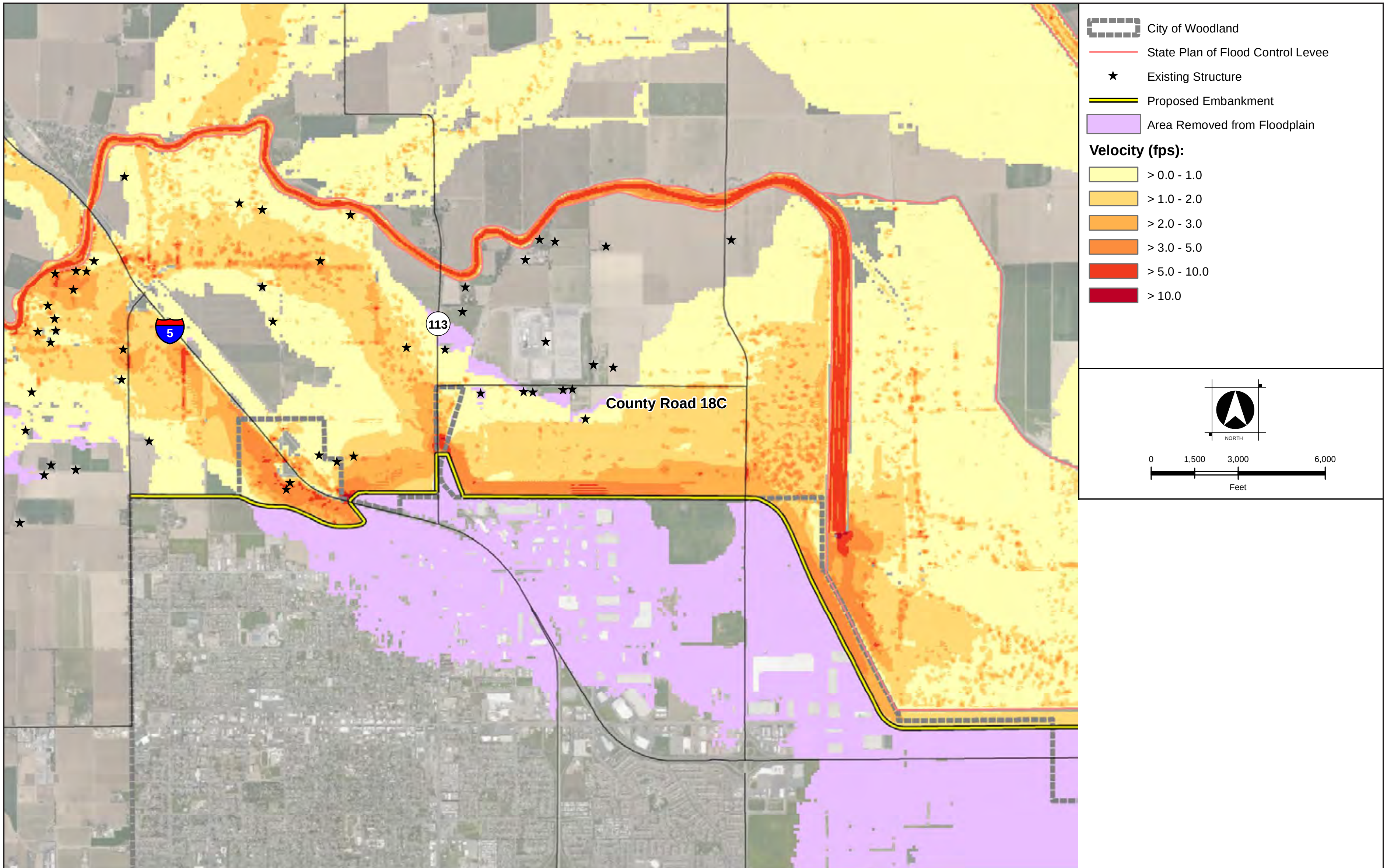
Figure 4-6
With Alternative 2C: Difference in Flood Surface Elevation under the 200-Year Event



Source: Wood Rogers, 2020.

Figure 4-7
With Alternative 2C: Velocities under the 100-Year Flood Event

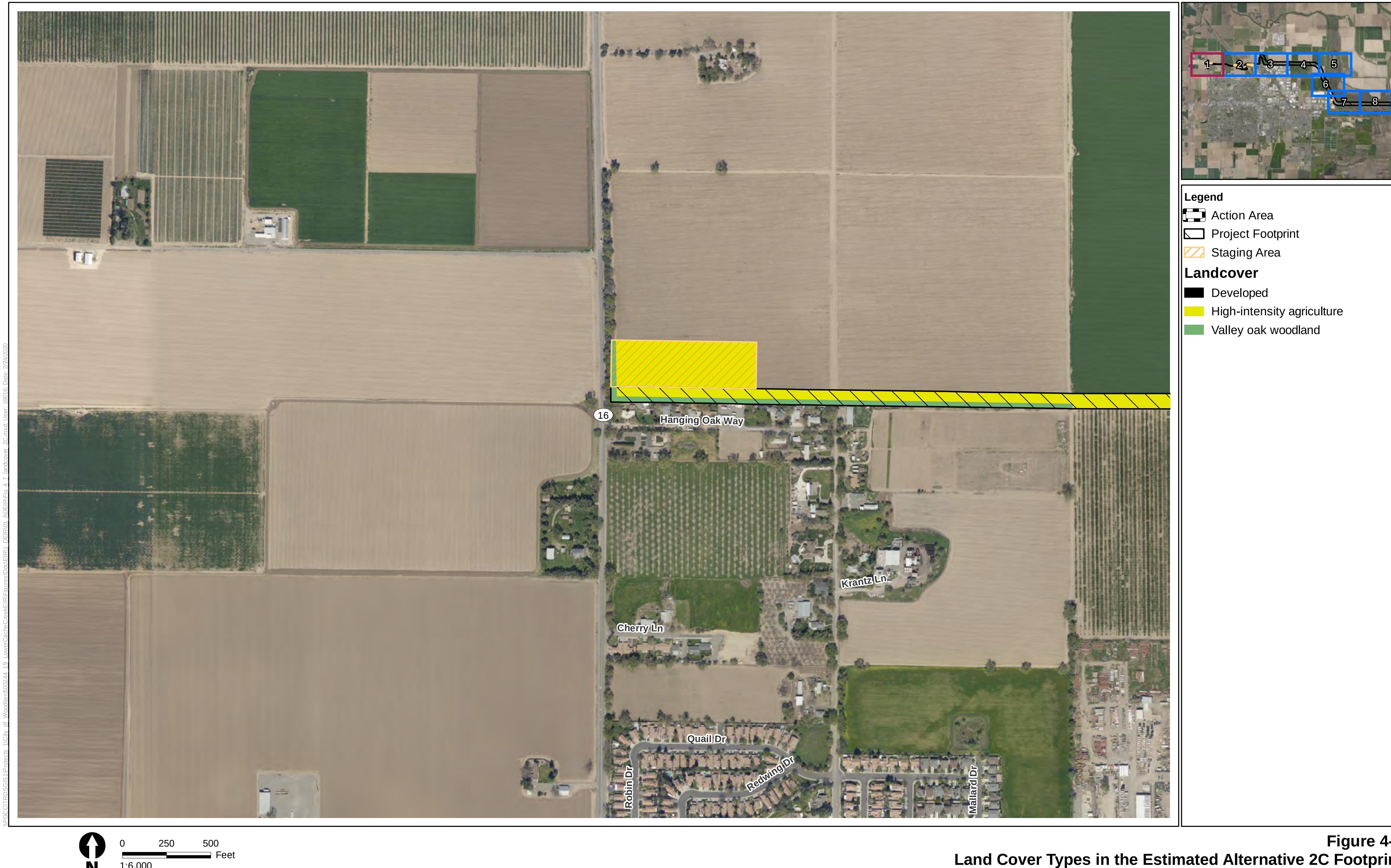
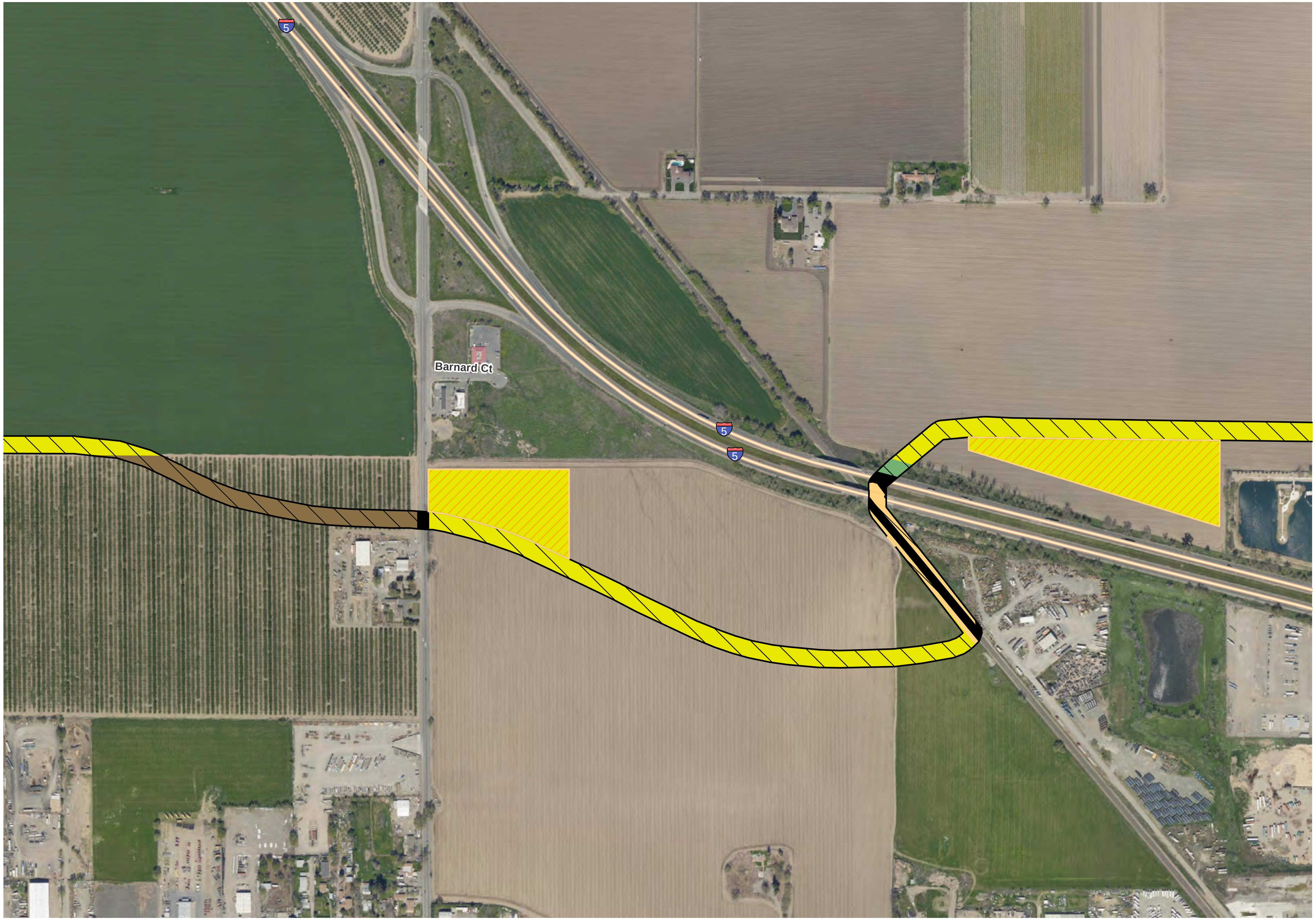
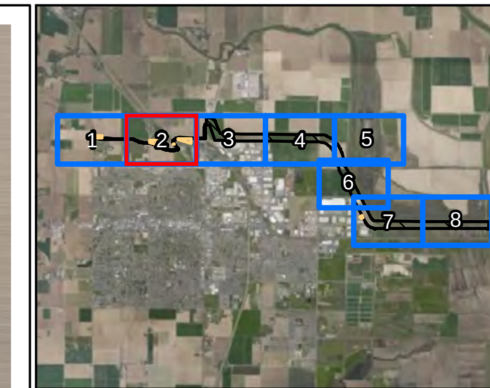


Figure 4-8
Land Cover Types in the Estimated Alternative 2C Footprint
Sheet 1 of 8





Legend

- Action Area
- Project Footprint
- Staging Area

Landcover

- Developed
- High-intensity agriculture
- Non-native annual grassland/Ruderal
- Orchard
- Valley oak woodland

N

0 250 500 Feet

1:6,000

Figure 4-8
Land Cover Types in the Estimated Alternative 2C Footprint
Sheet 2 of 8

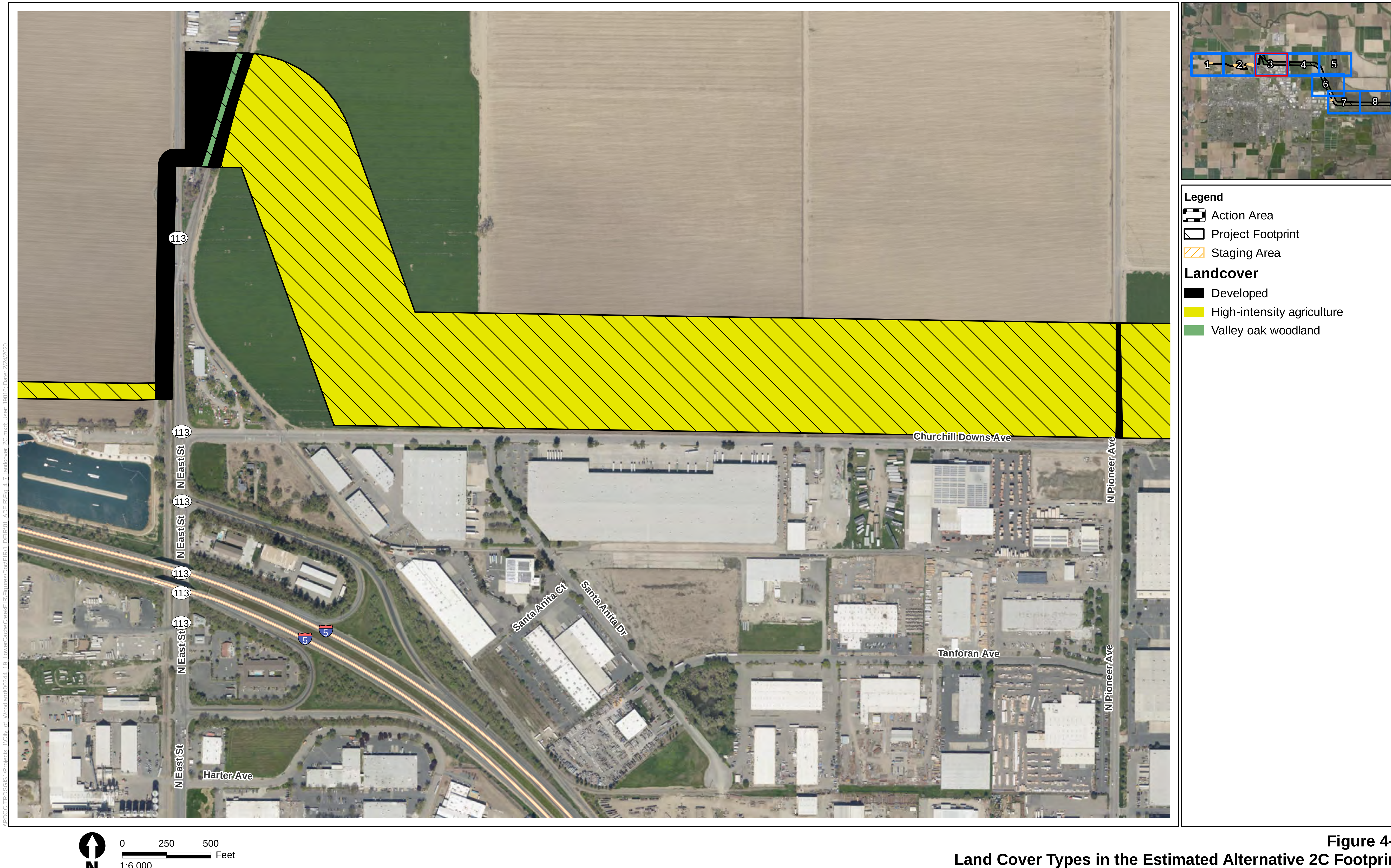


Figure 4-8
Land Cover Types in the Estimated Alternative 2C Footprint
Sheet 3 of 8

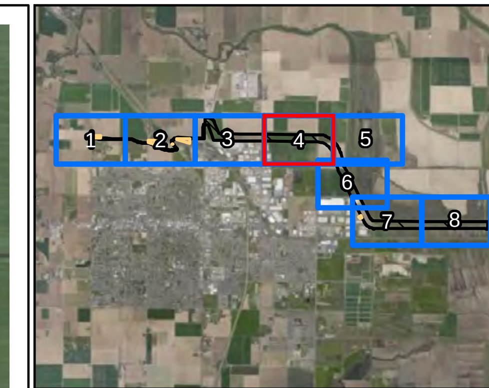


Figure 4-8
Land Cover Types in the Estimated Alternative 2C Footprint
Sheet 4 of 8

Figure 4-8
Land Cover Types in the Estimated Alternative 2C Footprint
Sheet 5 of 8

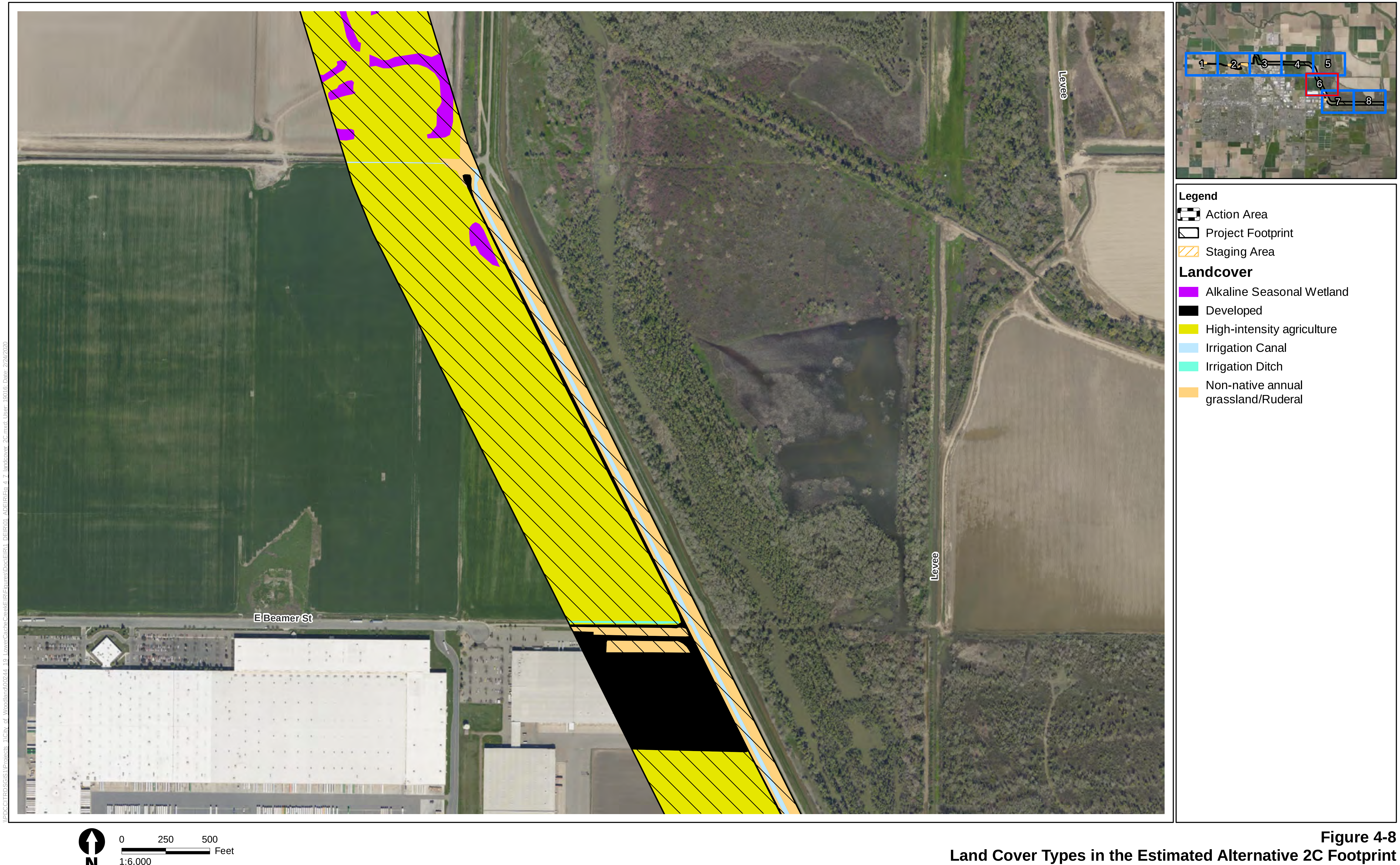


Figure 4-8
Land Cover Types in the Estimated Alternative 2C Footprint
Sheet 6 of 8

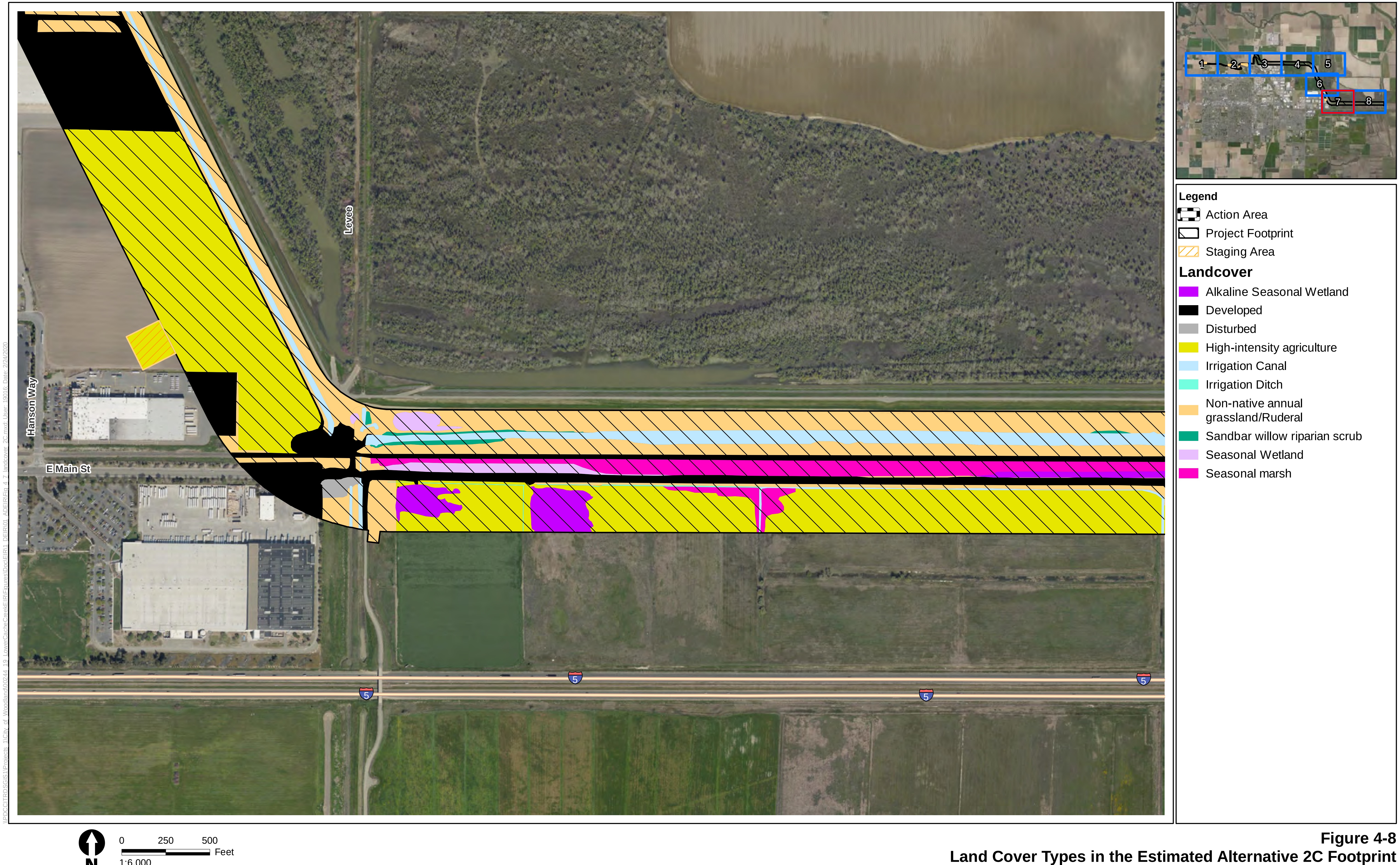


Figure 4-8
Land Cover Types in the Estimated Alternative 2C Footprint
Sheet 7 of 8

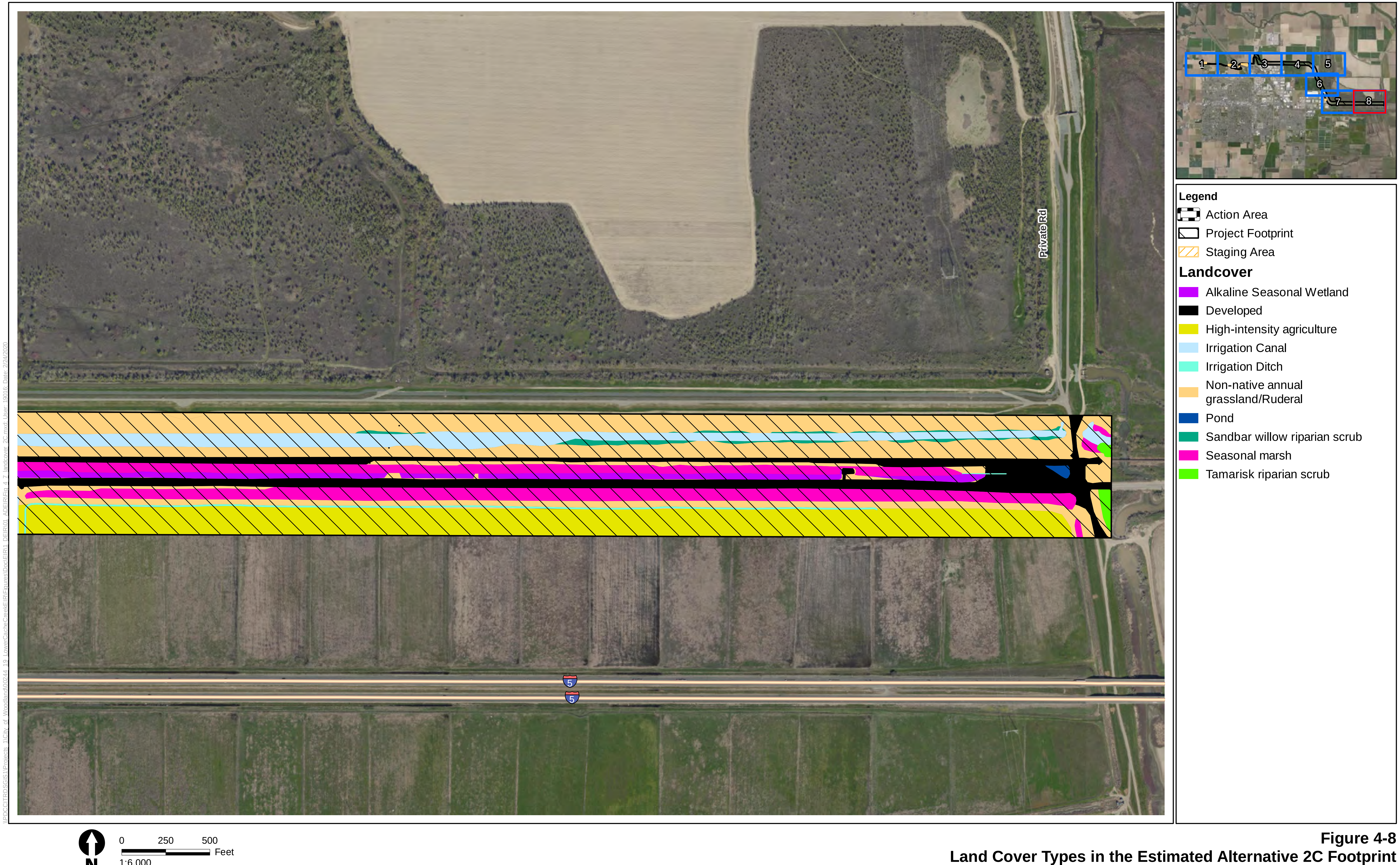


Figure 4-8
Land Cover Types in the Estimated Alternative 2C Footprint
Sheet 8 of 8

Chapter 5
Other CEQA Considerations

5.1 Overview

This chapter includes the following discussions and analyses required by CEQA.

- Cumulative impacts.
- Growth-inducing impacts.
- Significant and unavoidable environmental impacts.
- Significant irreversible environmental impacts.
- Mitigation measures with the potential for environmental effects.

5.2 Cumulative Impacts

5.2.1 Introduction

The State CEQA Guidelines define a "cumulative impact" as two or more individual impacts that, when considered together, are significant or that compound or increase other significant environmental impacts. The incremental impact of a project may be considerable when viewed in the context of other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor, but collectively significant, projects taking place over a period of time (State CEQA Guidelines Section 15355). State CEQA Guidelines Section 15130(b) indicates that an adequate discussion of significant cumulative impacts requires consideration of either of the following.

(A) A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency; or

(B) A summary of projections contained in an adopted local, regional or statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect. Such plans may include: a general plan, regional transportation plan, or plans for the reduction of greenhouse gas emissions. A summary of projections may also be contained in an adopted or certified prior environmental document for such a plan.

This EIR uses a list of past, present, and probable future projects approach, described in further detail in Section 5.2.2, *Approach to Cumulative Impact Analysis*.

5.2.2 Approach to Cumulative Impact Analysis

In reaching a conclusion for each resource area (i.e., the topics analyzed in Sections 3.1 through 3.18 of Chapter 3, *Impact Analysis*), five factors were considered: (i) the geographic scope of the cumulative impact area for that resource, (ii) the timeframe within which project-specific impacts could interact with the impacts of other projects, (iii) whether a significant adverse cumulative condition presently exists to which project impacts could contribute, (iv) the significance of the incremental project-specific contribution to cumulative conditions, and (v) whether any cumulative impact is significant.

For the purpose of this EIR, significant cumulative impacts would occur if impacts related to the implementation of the project, combined with the environmental impacts of the additional projects listed herein, would result in an adverse significant effect. For an impact to be considered cumulative, these incremental impacts and potential incremental impacts must be related to the types of impacts caused by the Proposed Project and evaluated in Chapter 3.

Pursuant to State CEQA Guidelines Section 15130(b)(1)(A), the following projects have been identified as those past, present, and probable future projects producing related or cumulative impacts, including those projects outside the control of the lead agency. These projects (cumulative projects) include flood management projects affecting Cache Creek and the Yolo Bypass (because it is downstream of Cache Creek); restoration and other water-related projects in and near Cache Creek and the Yolo Bypass that could affect fish or vegetation on the waterside of levees; and other nearby infrastructure projects that could result in impacts and benefits similar to those of the Proposed Project. Projects on the Sacramento River are excluded from the cumulative project list because beyond the Yolo Bypass, there are no impacts associated with hydrology from the Proposed Project (Reinhardt pers. comm.) and as such, there would be limited to no potential for projects occurring on the Sacramento River to affect resources, including hydrology, in combination with the Proposed Project.

5.2.2.1 Sacramento River Bank Protection Project

The Sacramento River Bank Protection Project (SRBPP) was authorized to protect the existing levees and flood control facilities of the Sacramento River Flood Control Project. The SRBPP was authorized in 1960 and initially consisted of the construction of 436,397 linear feet of bank protection from 1963 to 1975. In 1974, Congress authorized the SRBPP to continue into a Phase II with an additional 405,000 linear feet of bank protection.

The SRBPP directs the U.S. Army Corps of Engineers (USACE) to provide bank protection to address erosion damage to the Sacramento River Flood Management System, including the Lower Cache Creek levees. This is an ongoing project, and additional sites requiring repair will continue to be identified until the remaining authority of 4,966 linear feet is exhausted. Water Resources Development Act (WRDA) 2007 authorized an additional 80,000 linear feet of bank protection for Phase II, which will be initiated upon approval of the SRBPP Post Authorization Change Report. Construction proposed for 2019 includes a site at river mile 1.0 on the Feather River levee, which is located approximately 7.5 miles to the northeast of the project area.

5.2.2.2 Off-Channel Gravel Mining

There are six off-channel mining operations (Teichert Schwarzgruber, Syar Industries, Teichert Woodland, Teichert Esparto, Granite Capay, and Cemex) that are permitted along Cache Creek (Miller 2018). The gravel mining reach of the Cache Creek Basin extends approximately 14.5 miles along Cache Creek between Capay and Yolo. Facilities include sand and gravel processing plants, asphalt-concrete hot mix plants, concrete batch plants, material stockpiles, settling ponds, water wells, stationary and mobile equipment, and haul roads. Instream mining is permitted by industry only as a flood control measure. The mining began in 1996 and is expected to continue for 30 years.

East of the 95B Bridge at Teichert (Woodland) above Interstate (I-) 5, Yolo County reclaimed its old gravel extraction site previously used for county projects. The area was reclaimed as required in the original mining and reclamation plan. Teichert Materials has requested approval of a new 30-year Mining Permit and Reclamation Plan, currently undergoing environmental review (Teichert Aggregates 2019).

5.2.2.3 Cache Creek Area Plan Update

Yolo County adopted the *Cache Creek Area Plan* in 1996 for the 14.5 miles along Lower Cache Creek, generally from Capay Dam downstream to the town of Yolo. The drafted update to the rivershed management plan is proposing increases to current in-channel material removal limits, modifications to in-channel boundaries, rezoned areas for future aggregate mining, and a 50-year program extension. The plan is comprised of two subplans, the *Off-Channel Mining Plan* and the *Cache Creek Resource Management Plan*. The draft EIR was completed on May 2019 (Yolo County 2019).

5.2.2.4 2018 Water and Sewer Repair and Replacement Project

The City of Woodland created this project as part of an annual program to replace water mains over 60 years old and repair sewer deficiencies. The project consists of repairing water mains and service laterals, as well as replacing sanitary sewer mains and laterals within city limits (City of Woodland 2020; Busch pers. comm.). The project began construction in September 2018 and was completed in spring 2019.

5.2.2.5 Yolo Bypass/Cache Slough Partnership Improvement Projects

The Central Valley Flood Protection Board (CVFPB), USACE, and the California Department of Water Resources (DWR) run a joint program of a plan of flood improvement projects. Yolo Flood Improvements are incorporated into the mid-term (3–7 years) improvements Plan. The Cache Creek Settling Basin Multi-Objective Project is incorporated into the long-term (7+ years) improvements plan of the joint partnership. The series of multi-benefit projects in the Yolo Bypass–Cache Slough Region incorporates Sacramento, Yolo, Solano, and Sutter Counties, with the regional objectives of flood risk reduction, ecosystem restoration, agricultural sustainability, and water supply reliability. The initiation request for project review is dated July 2019 by the CVFPB.

5.2.2.6 EcoRestore

Over the next 5 years, California will pursue more than 30,000 acres of critical Delta restoration under the California EcoRestore program, pursuant to pre-existing regulatory requirements such as those in the 2008 U.S. Fish and Wildlife Service (USFWS) Biological Opinion (BO) and 2009 National Marine Fisheries Service (NMFS) BO of the proposed long-term operations of the Central Valley Project (CVP) and State Water Project (SWP) and various enhancements to improve the overall health of the Delta ecosystem. Some of these activities may occur in the Yolo Bypass.

5.2.2.7 Sacramento River General Reevaluation Study

USACE, CVFPB, and DWR are conducting a general reevaluation of the design and operation of the SRFCP, which includes the Yolo Bypass. These agencies will also prepare a joint draft environmental impact statement (EIS)/EIR to evaluate environmental effects. This is a system-wide flood risk management and ecosystem restoration feasibility study intended to identify opportunities to restore ecosystem function along the Sacramento River and improve flood risk reduction capabilities of the flood conveyance system originally constructed in 1917. A number of alternatives integrating a combination of ecosystem restoration and flood risk management measures will be evaluated. Proposed measures to be considered are widening existing bypasses, modifying existing weirs, optimizing weir operations, construction of setback levees, developing floodplain management plans, restoring riverine aquatic and riparian habitat, removing barriers to fish passage, and restoring natural geomorphic processes. The draft EIS/EIR is scheduled to be available for public review and comment in spring 2017.

5.2.2.8 Yolo Habitat Conservation Plan/Natural Communities Conservation Plan and Yolo Local Conservation Plan

The *Yolo Habitat Conservation Plan* (HCP)/*Natural Communities Conservation Plan* (NCCP) and Yolo Local Conservation Plan are county-wide plans for the 653,817-acre planning area that provides habitat for many special-status and at-risk species found in five dominant habitats/natural communities. The HCP/NCCP will describe the measures that will be undertaken to conserve important biological resources, obtain permits for urban growth and public infrastructure projects, and continue Yolo County's agricultural heritage. The public review draft document is under preparation and is expected to be available later in 2016. The HCP/NCCP will provide coverage to a broad range of activities in Yolo County, including various water supply, flood control, and ecosystem restoration projects.

5.2.2.9 Central Valley Project Biological Opinions

BOs issued by USFWS and NMFS for the CVP and SWP determined that the existing fish passage structure at Fremont Weir was inadequate to allow normal fish passage at most operational levels of the Sacramento River. As a result, the BOs required the U.S. Bureau of Reclamation (Reclamation) and/or DWR to increase inundation of suitable acreage for fish habitat within the Yolo Bypass and to modify operations of the Sacramento Weir or Fremont Weir to increase juvenile rearing habitat. The BOs also require restoration of 8,000 acres of tidal marsh habitat in the Delta to benefit Delta smelt and up to 20,000 acres of salmonid habitat restoration. The operations of the SWP and CVP are currently subject to the terms and conditions of these BOs. Multiple efforts are underway to comply with the BOs, including modifications to Fremont Weir and portions of the Yolo Bypass, to improve fish passage.

5.2.2.10 Central Valley Flood Protection Plan

The Central Valley Flood Management Planning (CVFMP) Program is one of several programs managed by DWR under FloodSAFE California, a multifaceted initiative launched in 2006 to improve integrated flood management in the Central Valley, including the Sacramento River and Yolo Bypass. The CVFMP Program addresses state flood management planning activities in the Central Valley. The *Central Valley Flood Protection Plan* (CVFPP) is one of several documents adopted by CVFPB to meet the requirements of flood legislation passed in 2007 and, specifically, the Central Valley Flood Protection Act of 2008. DWR is currently updating the 2012 CVFPP for review and adoption by CVFPB in 2017, with a focus on Sacramento and San Joaquin Watershed Basinwide Feasibility Studies, Regional Flood Management Planning, and the Central Valley Flood System Conservation Strategy. Results of these efforts would support implementation of future CVFPP actions. The CVFPP contains a broad plan for flood management system improvements, and ongoing planning studies, engineering, feasibility studies, designs, funding, and partnering are required to better define, and incrementally fund and implement, these elements over the next 20 to 25 years.

5.2.2.11 Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project

DWR and Reclamation are jointly planning the Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project to comply with the 2009 NMFS Operations BO Reasonable and Prudent Actions (RPAs) 1.6.1 and 1.7. RPA Action 1.6.1 requires significantly increased seasonal floodplain rearing habitat availability with biologically appropriate frequency and duration from December through April in the lower Sacramento River Basin. The project would construct and operate one or more gated and/or passive diversion channels to improve the connection between the Yolo Bypass and the Sacramento River. A draft EIR/EIS is being prepared to evaluate alternative to meet the BO requirements.

5.2.2.12 Storm Damage DWR Emergency Rehabilitation Project

DWR has implemented the Storm Damage DWR Emergency Rehabilitation Project (SDDER) in response to multiple levee performance problems that have arisen following flooding in the Central Valley and the Delta, which was due to heavy storms that occurred during the 2016–2017 rainy season. Levee performance problems include erosion issues, such as levee slope failure, slip occurrence, and erosion scarps, as well as stability issues such as longitudinal cracking, vertical cuts, and vertical drop in levee slope. Work related to the SDDER is occurring throughout the State Plan of Flood Control area, with a total of 29 sites identified for emergency repair during 2017.

5.2.3 Analysis of Potential Cumulative Impacts by Resource

The following analysis focuses on considering the potential for impacts identified in Chapter 3 to make a considerable contribution to significant cumulative impacts. However, some of the resources have the potential to incur temporary, short-term impacts during the construction period. An initial assessment of potential cumulative impacts indicated that impacts on agricultural and forestry resources have the potential to contribute to cumulative impacts. The potential cumulatively considerable impacts on these resources, in combination with potential impacts from the local projects described in Section 5.2.2, are discussed below.

5.2.3.1 Hydrology

Other projects that could result in localized construction impacts similar to those of the Proposed Project, or could result in operational changes that might result in modifications to local hydrology or the potential for sedimentation, are identified in Section 5.2.2. These include the Sacramento River Bank Protection Project, Sacramento River General Reevaluation Study, the Yolo Habitat Conservation Plan (HCP)/Natural Communities Conservation Plan (NCCP) and Yolo Local Conservation Plan, the Central Valley Flood Management Planning (CVFMP) Program, and the Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project.

The Proposed Project would not alter the geometry of Cache Creek, and therefore it would not cause any changes to water flow in the creek or cause negative hydraulic effects upstream or downstream of the study area. Therefore, the Proposed Project would not result in incremental cumulative contributions associated with changes to water flow in the creek and hydrologic effects and, as a result, would not result in a significant contribution to a cumulative impact.

Project components, such as the concrete inlet weir, the armored portion of the drainage channel at the I-5 undercrossing, and other hard features (e.g., closure structures), would only create minimal new impervious surfaces with limited, localized, footprints. This would not result in a significant reduction in the amount of natural soil surfaces available for infiltration of rainfall and runoff, thereby generating little, if any, additional runoff and associated erosion and siltation during storm events. As such, construction and operation activities would not result in an incremental cumulative contribution to erosion and siltation. Therefore, the Proposed Project would not result in a significant contribution to a cumulative impact.

The Proposed Project would not increase siltation or decrease the existing capacity of the CCSB. Accordingly, there would be no cumulative impacts downstream within the Yolo Bypass or greater system (e.g., the Sacramento River). Furthermore, beyond the Yolo Bypass, there are no impacts associated with hydrology from the Proposed Project (Reinhardt pers. comm.). Therefore, construction and operation activities would not result in an incremental cumulative contribution to siltation or a reduction in the capacity of the CCSB, and the Proposed Project would not result in a significant contribution to a cumulative impact.

The Proposed Project would not create or contribute runoff water that would exceed the capacity of the existing (or planned) stormwater drainage systems, nor provide substantial additional sources of polluted runoff during construction or operation because the construction of a levee north of the City will not affect the existing pattern of flow. In addition, it is unlikely that the other projects as described above would have any effects on the internal drainage or existing pattern of flow in the hydrology study area. Therefore, construction and operation activities would not result in an incremental cumulative contribution to runoff water that would exceed the capacity of existing/planned stormwater drainage systems and the Proposed Project would not result in a significant contribution to a cumulative impact.

Under the Proposed Project, the level of flood protection would increase for the city of Woodland. Beyond the Yolo Bypass, there are no impacts associated with hydrology from the Proposed Project (Reinhardt pers. comm.). As such, the Proposed Project is not expected to contribute to an incremental cumulative contribution related to the redirection of flood flows. The Yolo Bypass and Cache Slough Region Program Development and Improvement Partnership has the potential to alter the hydrology in the greater region. However, since this project also aims to lower flood risk to the greater Woodland area, there would be beneficial cumulative impacts associated with the local hydrology (i.e., a reduction in flood risk).

Overall, the Proposed Project, when considered with other projects, would not result in significant cumulatively considerable impacts.

5.2.3.2 Water Quality

The Proposed Project is not expected to contribute to a significant cumulative effect on surface water or groundwater quality. Most of the potential water quality impacts anticipated with implementation of the Proposed Project are related to construction activities in general, and ground disturbances in particular. Potential construction-related water quality impacts from sedimentation and turbidity and accidental spills (e.g., fuel, bentonite, oil, lubricants) would be temporary and localized. Therefore, it is anticipated that these impacts would not be incrementally cumulatively considerable and would not result in a significant contribution to a cumulative impact. Other projects identified in Section 5.2.2 would entail construction (ground-disturbing) activities in proximity to surface water near the project area (e.g., off-channel gravel mining along Cache Creek) that could result in water quality impacts similar to those of the Proposed Project. However, other projects would follow existing applicable federal, state, and local regulations as required by law (e.g., NPDES permits), and prepare and implement appropriate BMPs (e.g., SWPPPs), to minimize water quality impacts. Therefore, the Proposed Project, when considered with other projects, would not result in a significant cumulative impact.

Future projects within the Cache Creek watershed, such as the Cache Creek Settling Basin Multi-Objective Project, could mobilize mercury-laden sediments, ultimately resulting in an increase in mercury loads (including methylmercury) to the Yolo Bypass and Delta. In 100-year flood events, the Proposed Project could indirectly result in increases in mercury methylation in the floodplain of the Lower Cache Creek due to increases in inundation from creek floodwaters and, as floodwaters recede, some proportion of this could then drain back into Lower Cache Creek, which would contribute to the existing methylmercury load in the creek. However, this would not result in an overall increased load of mercury in Lower Cache Creek and, thus, would not contribute incrementally to a cumulative impact. The Proposed Project would not significantly impact the CCSB trap efficiency or sediment load to the Yolo Bypass. Moreover, results from modeling performed for the Proposed Project predict that sediment trap efficiency (and, thus, potentially mercury trapping) would increase for all flood events modeled. Therefore, the Proposed Project would not significantly contribute to a cumulative water quality impact related to mercury and methylmercury, and when considered with other projects would not contribute to a significant cumulative impact.

5.2.3.3 Geology, Soils, and Paleontological and Mineral Resources

The Proposed Project could result in cumulative impacts related to geology, soils, and paleontological and mineral resources.

Other earth-moving activities in the project area, such as levee construction proposed under the Central Valley Flood Protection Plan, could change the stability of soils, increase erosion and sedimentation, and expose structures to ground shaking, liquefaction, and the effect of expansive soils. Soil stability is addressed through engineering design of structures, including levees, and ground-disturbing activities are required to stabilize soils on completion of construction or even between stages of construction. As such, no significant cumulative effects related to soil stability are anticipated.

A cumulative increase in erosion and sedimentation could occur if other levee improvement projects near Cache Creek take place at the same time. However, the potential for erosion and sedimentation resulting from construction of the Proposed Project and other projects is limited by minimization measures and implementation of a stormwater pollution prevention plan. Any cumulative effect would be temporary and minimal and, therefore, less than significant.

There could be cumulative effects related to construction of structures, such as levee construction proposed under the Central Valley Flood Protection Plan, which could be subject to seismic activity. The affected area is not located in an active seismic area (i.e., no active faults and in an area of relatively low risk of strong ground shaking for California) and, therefore, any cumulative increase in risk related to ground shaking would be less than significant.

Construction of the Proposed Project, combined with proposed construction for reasonably foreseeable future projects, could result in destruction of significant paleontological resources, such as vertebrate fossils, recovered from geologic units that are widespread in the region. However, because the Proposed Project would implement Mitigation Measure GEO-1 (see Section 3.3, *Geology, Soils, and Paleontological and Mineral Resources*), the project's incremental contribution to a cumulative impact would be less than cumulatively considerable.

Construction of the Proposed Project, combined with proposed construction for reasonably foreseeable future projects, could result in diminished availability of aggregate resources. However, the Proposed Project's contribution to the cumulative impact is not considerable.

Overall, the project would not result in a cumulative impact related to geology, soils, or paleontological or mineral resources.

5.2.3.4 Biological Resources

The related projects considered for the cumulative impacts of the Proposed Project are described in Section 5.2.2. In combination, these projects could affect sensitive biological resources within Yolo County. Cumulative impacts for biological resources would occur where a project, when combined with cumulative projects, would contribute to a substantial loss of a sensitive biological resource, including sensitive natural communities, waters of the United States/waters of the state, and special-status species. Substantial loss can occur due to removing vegetation, filling non-wetland waters and wetlands, removing special-status plants, and take of special-status wildlife.

The Proposed Project would result in removal of vegetation and excavation/grading of portions of the project footprint, thereby creating the potential to contribute to the cumulative loss of sensitive biological resources in the region. Therefore, combined with the cumulative projects, construction associated with the Proposed Project could result in a cumulative impact on riparian woodlands, valley oak woodland, waters of the United States/waters of the state, and the 18 special-status wildlife species and their habitats, as well as the 4 special-status plant species in the study area.

Simultaneous construction of other flood management projects and restoration and water-related projects affecting Cache Creek and the Yolo Bypass, as well as other nearby infrastructure projects could result in significant impacts on riparian habitat, which provides habitat for nesting birds, tree-roosting bats, and other native wildlife species. The Proposed Project would not directly remove riparian habitat, but would be constructing in areas abutting riparian habitat. In addition, the Proposed Project would implement measures to avoid and reduce the potential for indirect impacts on riparian habitat. The Proposed Project would not, therefore, have a cumulatively considerable contribution to the loss of riparian woodlands along Cache Creek, Sacramento River, and the Yolo Bypass due to other projects in the region.

The Proposed Project would result in the removal of 1.97 acres of valley oak woodland, which provides habitat for nesting birds, tree-roosting bats, and other native wildlife species; however, avoidance, minimization, and compensatory mitigation for this impact would reduce the Proposed Projects impact to a less-than-significant level. The cumulative projects included in this analysis would not likely affect valley oak woodland and, therefore, there is no cumulative impact anticipated for valley oak woodland.

Projects included in this cumulative analysis could result in the loss of waters of the United States/waters of the state. Direct and indirect impacts on these features are regulated by the U.S.

Army Corps of Engineers and Regional Water Quality Control Board, requiring permits under Clean Water Act Sections 404 and 401, respectively. The Proposed Project would affect up to 17.7 acres of wetlands and non-wetland waters of the United States/waters of the state. Considering the cumulative analysis projects and the expected loss of wetlands and waters of the waters of the United States/waters of the State in and along Cache Creek, Sacramento River, and the Yolo Bypass due to these projects, there would be cumulative impacts on waters of the United States/waters of the state, and the Proposed Project could result in a considerable contribution to cumulative impacts on waters of the United States/waters of the state in the region. However, the Proposed Project would mitigate for its direct temporary and permanent impacts on waters of the United States/waters of the state through implementation of Mitigation Measures BIO-1 through BIO-3, BIO-24, which would ensure no net loss. Therefore, the Proposed Project would not result in a cumulative contribution, and the impact would be less than cumulatively considerable.

Construction of the Proposed Project could affect special-status plants and could result in potential mortality or disturbance of listed vernal pool branchiopods, valley elderberry longhorn beetle, western pond turtle, giant garter snake, special-status and non-special-status nesting birds, and tree-roosting bats. The avoidance and minimization measures and compensatory mitigation for impacts on species and their habitat would reduce these project impacts to a less-than-significant level. Many of the cumulative analysis projects would also result mortality or disturbance of special-status wildlife species, resulting in a cumulative impact. Mitigation Measures BIO-1 through BIO-24 would either avoid or minimize impacts, compensate for impacts, or replace habitat and, therefore, the contribution of the Proposed Project to this cumulative impact would be less than significant. The Proposed Project is located adjacent to existing development and is not adjacent to any designated important biological corridors or ecological preserves, so no impact on migratory corridors for larger wildlife species would occur as a result of project development. The Proposed Project's contributions to a cumulative impact would not be cumulatively considerable. Cumulative biological resources impacts would be less than significant.

5.2.3.5 Land Use and Planning

The Proposed Project is not expected to contribute to a significant cumulative impact on land use and planning. As discussed in Section 3.5, *Land Use and Planning*, the Proposed Project would not divide an established community and would be consistent with all applicable land use policies, plans, and regulations. Therefore, it would not incrementally contribute to a cumulative impact. Furthermore, these impacts are highly localized, so even when combined with other past, present, and reasonably foreseeable future projects, there would be no cumulative impact. Therefore, the incremental contribution of the Proposed Project to impacts on land use and planning would not be cumulatively considerable.

5.2.3.6 Agricultural and Forestry Resources

The cumulative project list includes a number of projects that may have resulted in the conversion of agricultural lands, including those related to levees or restoration. In addition, as noted in Section 3.6, *Agricultural and Forestry Resources*, Section 3.6.1.2, *Environmental Setting*, (Table 3.6-1), Yolo County has experienced a 6 percent decrease in agricultural lands between 2006 and 2016. Therefore, with respect to agricultural resources, particularly the conversation of Farmland to nonagricultural uses, past, present, and reasonably foreseeable future projects have resulted in a cumulatively considerable and significant impact on agricultural resources.

The Proposed Project would not conflict with zoning or Williamson Act contracts; therefore, it would not result in an incremental contribution to a cumulative impact. However, the Proposed Project would result in the conversion of 192 acres of Farmland to nonagricultural uses. This would result in an incremental contribution to a cumulative effect. Given the cumulative context of the overall decline of Farmlands in Yolo County, combined with the projects on the cumulative project list, this would result in a cumulatively considerable impact, and impacts would be significant. While implementation of Mitigation Measure AG-1 would conserve Farmland, it would not reduce impacts to a less-than-significant level. Therefore, impacts would remain cumulatively considerable.

5.2.3.7 Air Quality

As discussed in Section 3.7, *Air Quality*, YSAQMD and SMAQMD have identified project-level thresholds to evaluate criterial pollutant impacts (see Table 3.7-4 and 3.7-5). In developing these thresholds, both air districts considered levels at which project emissions are cumulatively considerable. Similarly, the project-level thresholds of significance for evaluating TACs generated by a project should also be used to determine whether a project's TAC emissions are cumulatively considerable. Consequently, exceedances of YSAQMD's or SMAQMD's project-level criteria pollutant and health risk thresholds would be cumulatively considerable (Yolo Solano Air Quality Management District 2007; Sacramento Metropolitan Air Quality Management District 2019).

As discussed under Impact AQ-2, neither material hauling emissions in SMAQMD nor long-term emissions from O&M activities would exceed air district thresholds. Likewise, construction of the Proposed Project would not generate ROG or NO_X emissions in excess of YSAQMD's numeric thresholds. However, the project would generate PM10 in excess of YSAQMD's daily threshold. Implementation of Mitigation Measure AQ-1 would reduce PM10 emissions to a less-than-significant level (see Table 3.7-8). Accordingly, criteria pollutant emissions generated by the Proposed Project would not be cumulatively considerable with implementation of Mitigation Measure AQ-1.

As discussed under Impact AQ-3, construction of the Proposed Project would not result in a significant increase in cancer risk or chronic health hazards at nearby sensitive receptors. Accordingly, DPM emissions generated by the Proposed Project would not be cumulatively considerable.

Finally, because the Proposed Project would not generate substantial odors, as described in Impact AQ-4, it would not result in an incremental contribution to a cumulatively considerable impact. Therefore, impacts associated with odors would not be cumulatively considerable.

5.2.3.8 Greenhouse Gas Emissions

Climate change is a global problem and GHGs are global pollutants, unlike criteria air pollutants (such as ozone precursors), which are primarily pollutants of regional and local concern. Given the long atmospheric lifetimes of GHGs, GHGs emitted by many sources worldwide accumulate in the atmosphere. No single emitter of GHGs is large enough to trigger global climate change on its own. Rather, climate change is the result of the individual contributions of countless past, present, and future sources. Thus, GHG impacts are inherently cumulative, and the analysis above is inclusive of cumulative impacts.

As discussed under Impact GHG-1, bentonite hauling emissions in Sacramento County would generate roughly 1 metric ton of CO_2e in 2023, which is considerably less than SMAQMD's threshold. Construction activities in the City and County are consistent with all applicable community strategies with implementation of Mitigation Measure GHG-1. O&M activities are consistent with the City's municipal strategies with implementation of Mitigation Measure GHG-2. Accordingly, with implementation of Mitigation Measures GHG-1 and GHG-2, the Proposed Project would not conflict with the City's or County's abilities to achieve the GHG emissions reductions outlined in their CAPs and would therefore not contribute to cumulatively considerable GHG impacts. The cumulative impact is, therefore, less than significant with mitigation.

5.2.3.9 Noise

Construction Noise

Construction noise is a relatively localized impact that reduces as distance from the noise source increases. In addition, intervening features between construction areas and nearby noise-sensitive land uses (e.g., buildings) result in additional noise attenuation by providing barriers that break the line of sight between noise-generating equipment and sensitive receptors. These barriers can block sound wave propagation to somewhat reduce noise levels at a given location and can reduce the likelihood of construction noise from two projects combining to substantially increase overall ambient noise levels. Construction activities for the Proposed Project could coincide with similar activities for other projects in the area. Specifically, several past, present, and reasonably foreseeable projects include the use of construction equipment. The Proposed Project could be under construction at the same time, and in relatively close proximity to, some of these other projects. The simultaneous construction for two nearby projects could, therefore, expose receptors located between the two projects to combined noise levels greater than would occur with a single construction project.

It is unknown at this time which nearby projects could be undergoing construction at the same time as the Proposed Project, and schedules for development projects can change. It is therefore difficult to predict whether construction activities associated with nearby projects would overlap with those for the Proposed Project. However, as is the case with the Proposed Project, construction for other projects located in the City of Woodland would most likely take place during the daytime hours not regulated by the City Municipal Code. People are generally less sensitive to noise during daytime hours than they are during nighttime hours, and there are no restrictions on construction noise levels during daytime hours in the City or the County.

With regard to nighttime construction noise, should nighttime construction work be required for other nearby projects, this nighttime work would likely be somewhat limited in duration and would require a special permit. However, people are generally more sensitive to noise during nighttime hours. In addition, the City of Woodland restricts noise from non-transportation sources outside of the previously mentioned daytime hours of 7:00 a.m. to 6:00 p.m. If work is conducted outside of these hours, noise would be limited to the City daytime threshold for non-transportation sources of 60 dBA L_{eq} between the hours of 6:00 p.m. and 10:00 p.m. and to the nighttime threshold of 45 dBA L_{eq} between the hours of 10:00 p.m. and 7:00 a.m. However, no nighttime work is planned for the Proposed Project, and work would be done during City-regulated hours only on an emergency basis with a permit from the City or County, as applicable.

For these reasons, cumulative impacts related to construction would be less than significant.

Construction Vibration

With regard to the potential for cumulative vibration-related impacts, because vibration impacts are based on instantaneous peak particle velocity (PPV) levels, worst-case ground-borne vibration levels from construction are generally determined by whichever individual piece of equipment generates the highest vibration levels. Unlike the analysis for average noise levels, in which noise levels of multiple pieces of equipment can be combined to generate a maximum combined noise level, instantaneous peak vibration levels do not combine in this way**.** Vibration from multiple construction sites, even if they are located close to one another, would not be expected to combine to raise the maximum PPV. For this reason, cumulative vibration impacts would be less than significant.

5.2.3.10 Cultural Resources

The geographic scope of the cumulative impacts on cultural resources encompasses the project area and surrounding areas. Impacts on the two built historic resources would be less than significant because the impacts would not permanently modify the qualities that support these resources' ability to convey historical significance and, thus, would not result in an incremental contribution to a cumulative effect. Therefore, the Proposed Project when combined with other projects would not have a significant cumulative impact on historic built resources.

All projects that involve ground-disturbing activities have the potential to disturb unknown prehistoric or historic archaeological sites or human remains. However, projects, including the Proposed Project, would have to follow the law regarding human remains and incorporate actions such as those described above in the MOU in development between YDWN and the City and in Mitigation Measure CUL-3. In addition, the implementation of Mitigation Measure CUL-2 would reduce the incremental effect on unknown resources to a less-than-significant level.

5.2.3.11 Tribal Cultural Resources

Other past, present, or reasonably foreseeable future projects are described above in Section 5.2.2. Projects that involve ground disturbance or other modifications to the landscape could adversely affect tribal cultural resources. Where the Proposed Project conducts similar activities in the same or adjacent areas of other cumulative projects (e.g., off-channel gravel mining, water and sewer repair projects, Yolo Bypass/Cache Slough Partnership Improvement Project), it could make an incremental contribution to a cumulatively considerable impact.

Additionally, if the Proposed Project results in taking parts of the project area out of the 100-year floodplain and subsequent zoning changes allow development in those areas, future projects could further contribute to adverse effects on tribal cultural resources. However, with tribal consultation as planned in the prospective MOU and with the implementation of the mitigation measures described in Section 3.11, *Tribal Cultural Resources*, if as-yet unidentified tribal cultural resources are encountered, the Proposed Project would not result in a cumulatively considerable significant impact when combined with other projects listed above in Section 5.2.2.

5.2.3.12 Transportation

Construction of the Proposed Project would be temporary, occurring for approximately 6 to 7 months per year over a 2-year period. For this reason, construction-related impacts, such as an increase in potential hazards or restrictions to emergency access restrictions due to road closures, would be temporary. However, it is possible that construction activities for the Proposed Project could coincide with similar activities for other projects in the area, resulting in more substantial effects. Specifically, several past, present, and reasonably foreseeable projects described in this chapter could also require the closure of roadways and could further reduce emergency access or increase roadway hazards. Therefore, a cumulative contribution to impacts related to emergency access and an introduction of roadway hazards could occur. However, Mitigation Measure TRA-1, described under Impact TRA-3 in Section 3.12, *Transportation*, which includes measures that would minimize roadway and transportation hazards during project construction, would reduce any potential project-related increases in hazards or emergency access restrictions to less-than-significant levels. For this reason, the project would not be expected to have a cumulatively considerable contribution to this potential cumulative impact with implementation of the project-specific mitigation.

With regard to potential cumulative vehicle miles traveled (VMT) impacts, VMT per capita increases in the region could be caused by a number of factors, including the implementation of some projects listed in this chapter. However, due to factors such as the development of new residential or commercial land uses near transit and the improvement of transit, bike, and pedestrian infrastructure, vehicle trip generation and associated trip lengths are expected to decrease in the long-term. For example, although the VMT per service population for Yolo County is currently 36, it is projected to decrease to 29 by 2036 (Choa pers. comm.). Similarly, although the regional VMT per service population for the SACOG region is currently 47, it is projected to decrease to 40 by 2036 (Choa pers. comm.). Therefore, although VMT may fluctuate over time, and even given the expected future projects and growth in the region, VMT per service population in the region is not expected to increase overall. Therefore, the Proposed Project's temporary increase in regional VMT, combined with VMT resulting from projects listed in this chapter, would not be expected to result in a cumulative VMT impact in the region. The Proposed Project's incremental contribution to a cumulative impact related to VMT would be less than significant.

5.2.3.13 Public Services, Utilities, and Service Systems

Water demands for the Proposed Project would be minimal and occur only during construction. In addition, no new or expanded entitlements to supply the Proposed Project during construction or operation are anticipated. Accordingly, the project's incremental contribution on water supply is not cumulatively considerable, and there would be no cumulative impact.

The Proposed Project would not alter existing stormwater drainage patterns or require wastewater treatment. As such, the cumulative impact on these facilities would not contribute to cumulatively considerable impacts.

Some electrical utilities would need to be temporarily relocated during roadwork. Coordination with utility service providers would occur prior to, during, and immediately after construction to manage any necessary temporary service disruptions so the effects would be minimized. It is assumed that other projects requiring construction near existing utilities would also coordinate with utilities to limit potential disruptions in service. Therefore, cumulative impacts would be less than significant, and the Proposed Project's contribution to cumulative impacts on utilities and utility facilities is not considerable.

Construction of cumulative projects and the Proposed Project would result in solid waste generation. As described in Impact PSU-3 in Section 3.14, *Public Services, Utilities*, and *Service*

Systems, the Proposed Project could generate an estimated total of 100,000 cubic yards of solid waste (i.e., unsuitable material, vegetation from clearing and grubbing, and road and structure demolition debris), that would be taken to the Yolo County Central Landfill for disposal. The Yolo County Central Landfill has sufficient remaining capacity (35,171,142 cubic yards) and is not anticipated to expire before 2090. Certain types of waste generated (e.g., green waste, structure and road debris) during project construction, could be disposed of in the Composting and Construction Waste units which have capacity in addition to the solid waste unit of the landfill. Therefore, waste generated by project construction, would not exceed the landfill's capacity. Solid waste generated from the Proposed Project would not result in a significant impact and is not cumulatively considerable when combined with related past, present, and reasonably foreseeable future projects.

5.2.3.14 Energy

Related past, present, and reasonably foreseeable future projects in the region involve such actions as improving levees and dams and other flood-risk management projects, constructing fish passage improvements, restoring ecosystems and conserving habitat, mining gravel, and building reservoirs.

Construction of the cumulative projects and the Proposed Project would result in an increased use of electricity and fuels. As described in Impact EN-1 in Section 3.14, *Energy*, the Proposed Project levee construction would require 367,287gallons of fuel and 14,640 kilowatt hours of electricity total for the two construction seasons (2023 and 2024). The total construction energy use for the proposed levee would be 50,666 million British Thermal Units. Additionally, assuming floodproofing of up to three individual structures would take place in 2024, the total fuel use would be 368,953 gallons (50,894 mmBTUs) over the 2-year construction period. Floodproofing of individual structures from 2025 through 2029 would generate an annual fuel consumption of 1,111 gallons or 152 mmBTUs, assuming up to two floodproofing actions each year. Some fuel would also be required during the intermittent operations activities for the levee. Very little to no new demand for electricity would be anticipated for operation of the Proposed Project. Implementation of Mitigation Measures GHG-1 and GHG-2 would further reduce fuel and electricity consumption during construction and operation. The estimated energy use (electricity and fuel) by the Proposed Project represent a very small percentage of annual energy consumption in Yolo County and would not require construction of new production or distribution systems. The Proposed Project would not result in inefficient, wasteful, or unnecessary consumption of energy and there would be no long-term increase in energy consumption in the project area or region. The Proposed Project would not result in an incremental contribution to a cumulatively considerable impact.

As discussed under Impact EN-2, although the Proposed Project would result in very little energy consumption and would not require development of new energy production facilities, there is potential for conflict with City of Woodland CAP measures that encourage the City implement measures to reduce fuel consumption, increase use of alternative-fuel vehicles, increase energy efficiency and use of renewable energy and reduce employee commute and work trips (see Tables 3.8-4 and 3.8-5 in Section 3.8, *Greenhouse Gas Emissions*). Implementation of Mitigation Measures GHG-1 and GHG-2 would ensure the Proposed Project is in compliance with City's municipal strategies and there would be no long-term conflict with these policies. With implementation of these measures, the Proposed Project would not result in an incremental contribution to a cumulatively considerable impact.

5.2.3.15 Aesthetics

Related past, present, and reasonably foreseeable future projects in the region involve such actions as improving levees and dams and other flood–risk management projects, constructing fish passage improvements, restoring ecosystems and conserving habitat, mining gravel, and building reservoirs. Specifically, the Sacramento River Bank Protection Project, Yolo Bypass/Cache Slough Partnership Improvement Projects, Sacramento River General Reevaluation Study, Central Valley Flood Protection Plan, and Storm Damage DWR Emergency Rehabilitation Project because these projects often include the construction of new levees or maintenance and repair of existing levees. Such levee projects require the removal of mature vegetation to construct projects and that levee slopes be maintained free of woody vegetation in perpetuity, resulting in the loss of a highly valued regional aesthetic landscape component. The mature vegetation along the levees is characteristic of the region and is a striking, distinctive element in the landscape. The existing vegetation that is removed would most often be replaced with herbaceous vegetation. Maintaining the levees devoid of the characteristic riparian vegetation and mature landscaping and replacing it with grass and potentially rock would highly degrade the visual character and quality of the area and increase glare. Projects in the area would combine to slowly transform the agricultural areas with vegetated areas to linear levee structures and vegetated waterways to channel-like water conveyance ways. Although the Proposed Project and projects like Yolo Habitat Conservation Plan/Natural Communities Conservation Plan and Yolo Local Conservation Plan, and Central Valley Project Biological Opinions would replant trees, restore habitat, and offset visual impacts, these projects would not be able to offset the overall loss of mature trees. Therefore, past, present and reasonably foreseeable projects have resulted in significant and cumulative impacts with respect to visual character and quality.

The cumulative projects could interfere with existing scenic vista views. However, these effects would likely be localized to the project's specific geography and not affect views of sensitive viewers in the study area for the Proposed Project. In addition, as discussed in Section 3.15, *Aesthetics*, the Proposed Project would result in a less-than-significant impact on scenic vistas. Therefore, the Proposed Project would not result in an incremental contribution of impacts on scenic vistas and cumulatively considerable impacts would be less than significant.

The Proposed Project would result in temporary changes in the visual quality of construction areas and access roads as a result of construction activities and equipment in affected areas. However, construction areas would be located next to agricultural lands on which heavy equipment already is used. In addition, temporary construction activities resulting from roadway, development, and listed cumulative projects that are under construction or receive regular maintenance actions in and near the study area are common in the visual landscape. Therefore, the Proposed Project would not result in an incremental contribution to scenic vistas and cumulatively considerable impacts would be less than significant because the effect would be temporary, localized, and consistent with other construction and maintenance activities in and near the study area.

The Proposed Project would result in permanent changes to the existing visual character and quality of views of non-urbanized areas due to operations as described under Impact AES-3, and impacts would be significant. Specifically, residences on Hanging Oak Way, Carter Lane, the end of North Ashley Avenue/County Road 98B, Cherry Lane, and Pedrick Road/County Road 98 in northwestern Woodland would experience substantial changes in existing views. Replacement plantings may not be located in the same area where mature landscaping and native trees were removed. Therefore, the aesthetic qualities of portions of the study area where mature vegetation is permanently removed and cannot be replanted are likely to be substantially changed. Furthermore, the levee structure, associated seepage berm, and potential landscape scars from vegetation removal and the staging areas would change the existing visual character and quality of foreground views for these residents. The levee would block the sweeping pastoral views of agricultural fields to the north and west from these homes. Although the levee slopes, seepage berm, and other disturbed areas would be hydroseeded and hence provide residents closest to the levee with foreground views of grassy slopes and a terraced seepage berm, the 6-foot-high structure would replace these residents' existing views of agricultural fields. Although the Proposed Project's effect is significant, the incremental contribution of the Proposed Project, when considered with other past, present, and reasonably foreseeable projects, is less than significant. This is because the Proposed Project's impact is very localized to this particular area of the Proposed Project and these particular primary viewer groups. Because of the localized nature of the impact, and because the other projects on the cumulative project list are geographically related to this impact or the area of the impact, the Proposed Project would not incrementally contribute to a cumulatively considerable impact. Therefore, cumulative impacts related to changes in visual character and quality would be less than significant.

Light and glare impacts under the Proposed Project would be less than significant and would not contribute to an incremental contribution of light and glare when considered with other projects. Other projects in the general vicinity of the project footprint would not have permanent light sources and some may limit construction to daytime activities. In addition, light and glare are relatively localized in the immediate area of their effect and, therefore, would be expected to result in cumulative effects that are less than significant.

Overall, the cumulative impact of the Proposed Project would be less than significant.

5.2.3.16 Recreation

The Proposed Project is not expected to contribute to a cumulatively considerable impact on recreation. As discussed in Section 3.16, *Recreation*, the Proposed Project would not result in any increased use of existing recreational facilities or the construction of any new recreational facilities. Related past, present, and reasonably foreseeable future projects in the region involve such actions as improving levees and dams and other flood–risk management projects, constructing fish passage improvements, restoring ecosystems and conserving habitat, mining gravel, and building reservoirs, and no substantial recreation-related effects are anticipated. Therefore, the incremental contribution of the Proposed Project to impacts on recreation would not be cumulatively considerable.

5.2.3.17 Population and Housing

The geographic scope of the cumulative impacts on population and housing encompasses the project area and surrounding areas. The Proposed Project would result in less-than-significant impacts on population and housing. The projects listed in Section 5.2.2 are mainly infrastructure projects and would not have the capacity to induce population growth. Consequently, it would not result in an incremental contribution to a cumulatively considerable impact. Therefore, when combined with other projects listed above in Section 5.2.2 it would not result in a cumulatively considerable significant impact

5.2.3.18 Hazards, Hazardous Materials, and Wildfire

Hazardous materials to be used during construction are of low toxicity and would consist of fuels, oils, and lubricants. Because these materials are required for operation of construction vehicles and equipment, best management practices (BMPs) would be implemented to reduce the potential for or exposure to accidental spills or fires involving the use of hazardous materials. Impacts from minor spills or drips would be avoided by thoroughly cleaning up minor spills as soon as they occur. While foreseeable projects have the potential to cause similar impacts, it is assumed these projects would also implement similar BMPs and follow all regulations regarding the transport, disposal, and handling of hazardous wastes during construction. In addition, the Proposed Project's impact is less than significant, as discussed in Chapter 3.18, *Hazards and Hazardous Materials*, and its contribution would not create a new cumulative impact, when considered with other projects requiring construction. Furthermore, as the Proposed Project results in the remediation and cleanup of certain hazardous sites and locations within the project area, conditions would improve as a result of the Proposed Project. Therefore, the Proposed Project would not result in an incremental cumulatively considerable impact, and cumulative impacts would not be significant. Because the Proposed Project has no impacts across all thresholds related to wildfire, it would not have an incremental contribution to a cumulatively significant impact and would not result in a cumulatively considerable significant impact on wildfires.

5.3 Growth-Inducing Impacts

Section 21100(b)(5) of CEQA requires an EIR to discuss how a project, if implemented, may induce growth and the impacts of that induced growth (see also State CEQA Guidelines Section 15126). CEQA requires the EIR to discuss specifically "the ways in which the project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment" (State CEQA Guidelines Section 15126.2[d]).

The State CEQA Guidelines do not provide specific criteria for evaluating growth inducement and state that growth in any area is not "necessarily beneficial, detrimental, or of little significance to the environment" (State CEQA Guidelines Section 15126.2[d]). CEQA does not require separate mitigation for growth inducement as it is assumed that these impacts are already captured in the analysis of environmental impacts (see Chapter 3, *Impact Analysis*). Furthermore, Section 15126.2(d) of the State CEQA Guidelines requires that an EIR "discuss the ways" a project could be growth inducing and to "discuss the characteristic of some projects which may encourage and facilitate other activities that could significantly affect the environment."

According to the State CEQA Guidelines, a project would have potential to induce growth if it would do either of the following.

- Remove obstacles to population growth (e.g., through the expansion of public services into an area that does not currently receive those services), or through the provision of new access to an area, or a change in restrictive zoning or general plan land use designation.
- Result in economic expansion and population growth through employment opportunities and/or construction of new housing.

In general, a project could be considered growth inducing if it directly or indirectly affects the ability of agencies to provide needed public services, or if it can be demonstrated that the potential growth significantly affects the environment in some other way. However, the State CEQA Guidelines do not require a prediction or speculation of where, when, and in what form such growth would occur (State CEQA Guidelines Section 15145).

5.3.1 Setting

This section describes the population of Yolo County and the City of Woodland, as well as general plan information that describes the planning of these two jurisdictions.

5.3.1.1 City of Woodland

The population of the city of Woodland has grown from 55,468 people in 2010 to an estimated 60,292 people as of January 1, 2019. The projected population of the city of Woodland in 2035 is 75,000 (City of Woodland 2017a).

As evidenced by the population growth, the city of Woodland has experienced moderate growth over the last decade, but is expected to experience even more growth between 2019 and 2035. The general plan was updated and adopted in 2017 and describes the development anticipated to occur by the year 2035. The general plan characterizes new development and recently completed development, as well as areas of opportunity for development within the city. Specifically, Figure 2-2 in the general plan identifies areas that are vacant land, City-owned property, underutilized land, and farmland that could present an opportunity for growth and development (City of Woodland 2017a). There is no guarantee these sites will be developed or redeveloped (City of Woodland 2017a). However, based on the planning analysis conducted by the City for general plan updating purposes, these sites are most likely to change use and support new populations or jobs (City of Woodland 2017a). It is expected that approximately 7,000 housing units will be developed within the City by 2035, for a total of 27,000 housing units (City of Woodland 2017a). In addition, approximately 17.3 million square feet of non-residential development is anticipated by 2035, for a total of 37.2 million square feet (City of Woodland 2017a).

The general plan specifically identifies areas that are restricted to development due to different characteristics, including the potential for flooding. Chapter 2, *Land Use, Community, Design, and Historic Preservation Element*, identifies Specific Plan Areas that are restricted for development in Land Use Policy 2.B.2, Development in the Floodplain. Specifically, this policy states that

> …no specific plan for SP-1, SP-2 or SP-3 may be processed until the designs for projects to provide necessary 200-year flood protection have been approved and the funding for construction has been secured. Any contemplated sale of the City's 900-acre property within SP-2 will require a four-fifths (4/5th) vote of the City Council.

Section 8.3 of the general plan provides an overview of flood regulations and requirements, flood hazards in the city's defined Planning Area, and flood protection efforts (City of Woodland 2017b). This section identifies that the "City of Woodland and the Central Valley Flood Protection Board are participating with the U.S. Army Corps of Engineers to identify a flood solution to reduce the city's risk of flooding from Cache Creek" (City of Woodland 2017b). This section goes on to identify that:

> Through their Lower Cache Creek Feasibility Study, the Corps has narrowed the alternatives for flood risk reduction to several alternatives which are undergoing further study. The policies in this General Plan support interim solutions and strategies to allow development in Woodland to move forward where it is safe and appropriate, while still actively seeking and advocating for a permanent flood solution for the Planning Area (City of Woodland 2017b).

Chapter 2, Figure 2-5 of the general plan provides the City of Woodland Land Use Diagram, which illustrates the long-term vision of how and where the city will grow through the planning horizon (2035) to accommodate projected population and job growth (City of Woodland 2017a). Flood Study Areas (FS) are identified in this diagram (Figure 2-1 of the general plan) and are areas restricted from urban development due to health and safety concerns related to flood risk (City of Woodland 2017a). Existing structures and businesses in these areas may remain but may not expand. The City will initiate an amendment to the Land Use Diagram to update the adjacent land use designations, as necessary, when the boundaries of a future flood project are determined (City of Woodland 2017a). Some of the Opportunity Sites identified in Figure 2-2 of the general plan are designated as FS. These locations primarily exist in the very northern part within the Woodland Permanent Urban Limit Line designated on Figure 2-1 of this EIR and along the western–southwestern edge of the Cache Creek Settling Basin. Opportunity Sites also include SP-1, SP-2 and SP3. SP-1 is located south of the city primarily along State Route 113; SP-2 is located south of I-5 and east of the Yolo Bypass; and SP-3 is located in the northwest part of the city north of Kentucky Avenue. FS sites and SP-1, SP-2, and SP-3 are designated as Opportunity Sites with a current restriction on the ability to expand until the flood risk is reduced. Furthermore, SP-1, SP-2 or SP-3 cannot be developed until a 200-year flood protection project has been approved and funded.

Section 3.1, *Hydrology*, 3.1.2.2, *Environmental Setting*, of this EIR discusses the Federal Emergency Management Agency (FEMA)-designated floodplain in relationship to the city of Woodland. Figure 3.1-1 identifies the portions of the city of Woodland that are currently located within the FEMA-designated floodplain. In addition, Figures 3.1-2 and 3.1-3 in this EIR show where 100-year and 200-year floodwater depths are located. These areas overlap with most of the FS, SP-1, SP-2, and SP-3 locations identified as Opportunity Sites in Figure 2-2 of the general plan.

5.3.1.2 Yolo County

The population of unincorporated Yolo County has grown from 24,391 people to an estimated 31,200 between 2010 and 2019 (California Department of Finance 2019a). The projected population of Yolo County in 2030 is 259,339 (California Department of Finance 2019b).

The general plan was updated and adopted in 2009 and describes the development anticipated to occur by the year 2030. The general plan characterizes new development and recently completed development, as well as areas of opportunity for development in the county.

Figure HS-4 in the general plan has identified the entire project area (Figure 2-1 in this EIR) as in the FEMA 100-year floodplain (Yolo County 2009). In addition, the community of Yolo and the portions of Woodland north of Highway 16 and generally east of County Road 102 are also designated as within the 100-year floodplain (Yolo County 2009).

5.3.2 Impacts

An action that removes an obstacle to growth is considered to be growth inducing. Thus, where flood risk may be seen as an obstacle to growth in an area, construction of a levee that would reduce that risk may be considered to remove an obstacle to growth and thereby may be growth inducing.

Growth inducement can lead to environmental effects, such as increased demand for utilities and public services, increased traffic and noise, degradation of air or water quality, degradation or loss of plant or animal habitats, and conversion of agricultural and open space to urban uses. Growth within a floodplain area increases the risk to people or property from flooding.

However, if the induced growth is consistent with or provided for by the adopted land use plans and growth management plans and policies for the area affected (e.g., city and county general plans, specific plans, transportation management plans), the secondary effects of such planned growth would have been identified and evaluated through a formal CEQA environmental review process and, as necessary, mitigation would have been adopted to address these effects. In some instances, significant and unavoidable effects would result from implementation of land use plans. All effects associated with this planned growth are the responsibility of the city or county in which the growth takes place, developers, or other entities proposing or approving the development. Local land use plans provide for land use development patterns and growth policies that encourage orderly urban development supported by adequate urban public services such as water supply, roadway infrastructure, sewer services, and solid waste services. This urban development may have environmental effects, as identified in CEQA documents prepared for adoption of local land use plans. If a project would have growth inducement potential that is not consistent with the land use plans and growth management plans and policies for the area affected (e.g., growth beyond that reflected in adopted plans and policies), then additional adverse secondary effects of growth beyond those previously evaluated could result. Thus, it is important to assess the degree to which the growth associated with a project would or would not be consistent with regional and local planning.

The Opportunity Sites currently identified on Figure 2-2 and FS on Figure 2-5 of the City of Woodland general plan would experience a reduction in flood risk once the Proposed Project is implemented because the Woodland would experience an overall reduction in the potential for flooding. As discussed in Impact HYDRO-4 in Section 3.1, *Hydrology*, Figure 3.1-3 shows the differences in depths with the inclusion of Proposed Project elements for the 100-year flood. As shown in this figure, flooding would no longer be present south of the proposed embankment (i.e., the city limits) with implementation of the Proposed Project. Opportunity Sites with FS designations could potentially be developed or expand, if the City amends the Land Use Diagram to remove the FS. The potential removal of the FS designation from certain Opportunity Sites and the potential removal of certain Opportunity Sites from the FEMA-designated 100-year floodplain represent the removal of potential barriers (e.g., flood insurance rates and land use designations) to those Opportunity Sites. In addition, approval of the Proposed Project could result in the removal of development restrictions in the Specific Plan Areas SP-1, SP-2 and SP-3. However, because the Opportunity Sites and Specific Plan Areas are identified in the general plan and, therefore, have been incorporated through local planning process and environmental review, the growth and development that could take place in the Opportunity Sites or Specific Plan Areas is planned and is the responsibility of the City. As such, while the removal of these potential barriers may represent an indirect growth-inducing effect as a result of the Proposed Project, it would not result in additional adverse secondary effects of growth beyond those previously evaluated.

Some of the area in unincorporated Yolo County south of the proposed levee and east of the city would experience a reduction in flood depths (Figure 3.1-5 and 3.1-6). In this area, similar to the City of Woodland, this reduction could remove a potential barrier to growth. However, this area is also subject to flooding from failure or overtopping of the Yolo Bypass west levee, which means that the risk of flooding from the Yolo Bypass would also need to be removed in order for this land to be developed. Additionally, this area is designated as agriculture, and as such, additional barriers (e.g., land use designations) would have to be removed for the land to actually grow and be developed. As such, while the removal of these potential barriers may represent an indirect growth-inducing effect as a result of the Proposed Project, it is unlikely to result in additional adverse secondary effects of growth because additional barriers would also need to be removed.

5.4 Significant and Unavoidable Impacts

Section 21100(b) of CEQA and Section 15126(b) of the State CEQA Guidelines require that an EIR describe any significant impacts, including those that can be mitigated but not reduced to a less-than-significant level. Where there are impacts that cannot be alleviated without imposing an alternative design, their implications and the reasons why the project is being proposed, notwithstanding their effect, should also be described.

A significant and unavoidable impact is one that would cause a substantial adverse effect on the environment and for which no mitigation is available to reduce the impact to a less-than-significant level. Most of the impacts of the Proposed Project would be less than significant or would be mitigated to a less-than-significant level. The impacts below are those that would remain significant and unavoidable after mitigation.

5.4.1.1 Agricultural and Forestry Resources

Impact AG-1: Conversion of Farmland to nonagricultural use

5.4.1.2 Transportation

Impact TRA-2: Conflict or be inconsistent with State CEQA Guidelines Section 15064.3, subdivision (b) by temporarily causing substantial additional VMT or induced automobile travel

5.4.1.3 Aesthetics

Impact AES-3: Substantially degrade the existing visual character or quality of public views in non-urbanized areas due to operations

5.5 Significant Irreversible Environmental Changes

Section 15126.2 (c) of the State CEQA Guidelines requires that an EIR address any significant irreversible changes that would result from a proposed project, and provides the following direction for the discussion of irreversible changes.

> Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to ensure that current consumption is justified.

The State CEQA Guidelines describe three distinct categories of significant irreversible changes, including changes in land use that would commit future generations to specific uses; irreversible changes from environmental actions; and consumption of nonrenewable resources.

The Proposed Project would not change land uses and would not commit future generations to specific uses. The Proposed Project would ensure the City meets the obligation of California Government Code Sections 65302.9 and 65860.1. This section requires every jurisdiction located within the Sacramento–San Joaquin Valley to update its general plan and zoning ordinance in a manner consistent with the CVFPP within 24 months of approval. The Proposed Project is intended to be consistent with the CVFPP, as the state seeks to continue to work with the City of Woodland to develop and implement projects to achieve an urban level of flood protection for Woodland. Urban Levee Design Criteria, set by DWR, requires any urban area to have a 200-year level of flood protection. Consistency with the CVFPP and meeting DWR's design criteria would ensure the city could grow within its sphere of influence. The areas within the sphere of influence have already been identified and designated by Woodland's general plan as it plans for the orderly and reasonable future growth and development of the city. Thus, the existing designated land uses within the city and identified in the general plan would be protected from flooding as a result of the Proposed Project and would only commit future generations to already designated land uses.

The Proposed Project would not result in irreversible changes from environmental actions. The Proposed Project is not an environmental action, rather it is an infrastructure project to protect the city of Woodland from flooding. The Proposed Project incorporates mitigation measures or best management practices related to spills and accidents to minimize the release of hazardous materials (e.g., fuel) during construction and the potential degradation of water quality in receiving waters.

The Proposed Project would consume non-renewable resources, primarily during construction. The following resources could be used such that they cannot be recovered or recycled: energy expended in the form of electricity, gasoline, diesel fuel, oil for construction equipment and transportation vehicles that would be needed; mined materials, such as sand and gravel for cement, steel, lead, copper, or other metals as needed, and other potentially petroleum based products, such as asphalt or plastic. The level of reduction or change to these types of non-renewable resources ultimately depends on the means and methods of the contractor and the final design of the Proposed Project. It is expected the consumption of these resources would not be excessive as the City of Woodland and contractor(s) would seek to ultimately minimize costs of constructing the Proposed Project and, therefore, would only use the minimum amount of non-renewable resources needed to safely and satisfactorily construct the Proposed Project.

Chapter 6
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Chapter 7
References Cited

7.0 Executive Summary

None

7.1 Chapter 1, Introduction

City of Woodland. 2015a. Flood Control Advisory Committee Meeting Minutes. May 26, 2015. Revised.

City of Woodland. 2015b. Flood Control Advisory Committee Meeting Minutes. June 16, 2015. Revised.

City of Woodland. 2015c. Flood Control Advisory Committee Meeting Minutes. July 28, 2015.

City of Woodland. 2015d. Flood Control Advisory Committee Meeting Minutes. August 25, 2015.

City of Woodland. 2015e. Flood Control Advisory Committee Meeting Minutes. September 22, 2015.

City of Woodland. 2015f. Flood Control Advisory Committee Meeting Minutes. December 8, 2015. Revised.

City of Woodland. 2016a. Flood Control Advisory Committee Meeting Minutes. July 18, 2016.

City of Woodland. 2016b. Flood Control Advisory Committee Meeting Minutes. August 15, 2016.

City of Woodland. 2017. Flood Control Advisory Committee Meeting Minutes. June 7, 2017.

City of Woodland. 2018. Flood Control Advisory Committee Meeting Minutes. November 14, 2018.

City of Woodland. 2019a. Flood Control Advisory Committee—Overview. Available: https://www.cityofwoodland.org/672/Flood-Control-Advisory-Committee. Accessed: December 4, 2019.

City of Woodland. 2019b. Flood Control Advisory Committee Meeting Minutes. August 13, 2019.

City of Woodland. 2019c. Flood Control Advisory Committee Meeting Minutes. October 3, 2019.

7.2 Chapter 2, Project Description

Association of State Floodplain Managers. No date. *Nonstructural Flood Risk Management Pamphlet*. Available: https://www.floods.org/ace-files/documentlibrary/committees/floodproofing/Nonstructural_Flood_Risk_Management_Pamphlet_v2.pdf. Accessed: October 28, 2019.

County of Yolo Department of Planning and Public Works. 2008. *County of Yolo Improvement Standards.* Woodland, CA. August 5. Available: https://www.yolocounty.org/home/showdocument?id=6580. Accessed: December 17, 2019.

MBK Engineers. 2020. *Technical Memorandum: Non-Structural Plan Elements for Consideration in Conjunction with the Lower Cache Creek Project.* Prepared by Ric Reinhardt, P.E. February 14.

7.3 Chapter 3, Impact Analysis

7.3.0 Section 3.0, Impact Analysis

None

7.3.1 Section 3.1, Hydrology

7.3.1.1 Printed References

Association of State Floodplain Managers. No date. *Nonstructural Flood Risk Management Pamphlet*. Available: https://www.floods.org/ace-files/documentlibrary/committees/floodproofing/Nonstructural_Flood_Risk_Management_Pamphlet_v2.pdf. Accessed: October 28, 2019.

California Department of Water Resources. 2012. *Urban Levee Design Criteria*. May. https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Urban-Levee-Design-Criteria--2012.pdf.

City of Woodland. 2017. *City of Woodland General Plan 2035*. Woodland, CA. May 16. http://www.cityofwoodland.org/DocumentCenter/View/1180/Final-General-Plan-May-16-2017-PDF. Accessed: October 29, 2019.

City of Woodland. 2019. *Woodland Municipal Code, Title 8 Health and Safety*. http://qcode.us/codes/woodland/. Accessed: October 29, 2019.

Federal Emergency Management Agency. 2012. *Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures. January*. (FEMA P-259.) Available: https://www.fema.gov/media-library-data/20130726-1506-20490-2593/fema259_complete_rev.pdf. Accessed: December 16, 2019.

MBK Engineers. 2016. *Technical Memorandum: Hydraulic Analysis for Lower Cache Creek Feasibility Study Alternatives (Draft)*. Jesse Patchett, P.E., Wood Rodgers, Inc. July 14.

MBK Engineers. 2019. *Technical Memorandum Subject: Flood Risk to Community to Yolo*. Prepared by B. Brown for J. Twitchell of GEI Consultants. March 28.

MBK Engineers 2020. *Technical Memorandum: Non-structural Plan Elements for Consideration in Conjunction with the Lower Cache Creek Project.* Prepared for Tim Busch, P.E., City of Woodland. February 14.

National Oceanic and Atmospheric Administration California and Nevada River Forecast Center. 2019. *CACHE CREEK - YOLO (YLOC1)*. Available: https://www.cnrfc.noaa.gov/graphicalRVF.php?id=YLOC1. Last updated: November 4, 2019. Accessed: November 4, 2019.

National Weather Service. 2019. *Cache Creek at Yolo*. https://water.weather.gov/ahps2/hydrograph.php?wfo=sto&gage=yloc1. Last updated: March 1, 2019. Accessed: November 4, 2019.

University of California, Davis. 2016. *Cache Creek Settling Basin / Yolo Bypass Project, Contract No. 4600010003, Amendment to the Cache Creek Settling Basin Trap Efficiency Study for the City of Woodland's Urban Flood Risk Reduction (UFRR) Study and Preliminary Design, Final Report, January 1, 2016 – August 3, 2016*. Prepared for California Department of Water Resources. UC Davis J. Amorocho Hydraulics Laboratory, Department of Civil and Environmental Engineering. Davis, CA. 113 pp.

U.S. Army Corps of Engineers. 1986. *Overtopping of Flood Control Levees and Floodwalls*. Publication Engineering Technical Letter 1110-2-299. August 22.

U.S. Army Corps of Engineers. 1994. *Structural Design of Closure Structures for Local Flood Protection Projects*. Publication EM 1110-2-2705. March 31.

U.S. Army Corps of Engineers. 1995. *Design of Coastal Revetments, Seawalls, and Bulkheads*. Publication EM 1110-2-1614. June 30.

U.S. Army Corps of Engineers. 1996. *Sacramento River Flood Control Project, California, Mid-Valley Area, Phase III, Design Memorandum, Volume I of II*. Sacramento District, South Pacific Division. June.

U.S. Army Corps of Engineers. 1997. *Design Guidance on Levees*. Publication ETL 1110-2-555. November 30.

U.S. Army Corps of Engineers. 1998. *Conduits, Culverts, and Pipes*. Publication EM 1110-2-2902. March 31.

U.S. Army Corps of Engineers. 1999a. *Guidelines on Ground Improvement for Structures and Facilities*. Publication ETL 1110-1-185. February 1.

U.S. Army Corps of Engineers. 1999b. *Engineering and Design for Civil Works Projects*. Publication ER 1110-2-1150. August 31.

U.S. Army Corps of Engineers. 2000. *Design and Construction of Levees*. Publication EM 1110-2-1913. April 30.

U.S. Army Corps of Engineers. 2001. *Geotechnical Investigations*. Publication EM 1110-1-1804. January 1.

U.S. Army Corps of Engineers. 2003a. *Recommendations for Seepage Design Criteria, Evaluation and Design Practices*. Sacramento District. July 15. http://www.safca.org/documents/2003%20Levee%20Seepage%20Task%20Force%20Report-CESPK.pdf.

U.S. Army Corps of Engineers. 2003b. *Slope Stability. Engineer Manual. Publication EM 1110-2-1902*. October 31. http://140.194.76.129/publications/eng-manuals/em1110-2-1902/entire.pdf.

U.S. Army Corps of Engineers. 2003c. *Lower Cache Creek, Yolo County, CA, City of Woodland and Vicinity Draft Feasibility Report for Potential Flood Damage Reduction Project*. Sacramento, CA. March.

U.S. Army Corps of Engineers. 2003d. *Lower Cache Creek, Yolo County, CA, City of Woodland and Vicinity, Draft Environmental Impact Statement/ Environmental Impact Report for Potential Flood Damage Reduction Project*. Sacramento, CA. March.

U.S. Army Corps of Engineers. 2004. *Geotechnical Levee Practice*. Publication SOP EDG-03. June 28.

U.S. Army Corps of Engineers. 2005. *Engineering and Design—Design Guidance for Levee Underseepage*. Technical Letter ETL 1110-2-569. May 1. http://www.geotechnicalinfo.com/usace_design_guidance_for_levee_underseepage.pdf.

U.S. Army Corps of Engineers. 2006. *Quality Management. Publication ER 1110-1-12*. September 30.

U.S. Army Corps of Engineers. 2009a. *Engineering Technical Letter 1110-2-571*. Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures. Washington, DC. April 10. ftp://ftp.usace.army.mil/pub/rmc/Holden/SPK%20Vegetation%20Variance%20Request%202011-01-24%20For%20FTP/ETL%201110-2-571_10%20April%202009.pdf.

U.S. Army Corps of Engineers. 2009b. *Sacramento River Flood Control Project (SRFCP)*. Sacramento District. http://www.spk.usace.army.mil/projects/civil/sac_river_bank_protection/Fast%20Facts%20of%20the%20Sacramento%20River.pdf. Accessed: March 11.

Wood Rogers. 2016. *City of Woodland Lower Cache Creek Feasibility Study Alternatives Analysis Report*. Prepared for City of Woodland. October.

Wood Rogers. 2020. *Technical Memorandum: Refined Hydraulic Analysis for Alternative 2A*. Prepared for Tim Busch, P.E., City of Woodland. January 20.

Yolo County. 2009. *2030 Countywide General Plan*. Woodland, CA. November 10. https://www.yolocounty.org/general-government/general-government-departments/county-administrator/general-plan/adopted-general-plan. Accessed: October 29, 2019.

7.3.1.2 Personal Communications

Busch, Tim. Principal Utilities Civil Engineer. City of Woodland, Woodland, CA. January 14, 2020—comment response to Jeff Peters, ICF, re: relevance of the *City of Woodland Storm Drainage Facilities Master Plan* to the Proposed Project.

Milligan, Cody. Professional Engineer and Water Resources Associate and Program Manager. Wood Rogers, Sacramento, CA. February 6, 2020—email exchange with ICF and MBK about project flood duration effects.

Reinhardt, Ric. Principal Engineer and Program Manager. MBK Engineers, Sacramento, CA. November 21, 2019—email exchange with Sara Martin at ICF about project effects within the Yolo Bypass.

7.3.2 Section 3.2, Water Quality

Balogh, S. J., E. B. Swain, and Y. H. Nollet. 2006. Elevated Methylmercury Concentrations and Loading during Flooding in Minnesota Rivers. *Science of the Total Environment* 368:138-148. As cited in: Singer, M. B., L. R. Harrison, P. M. Donovan, J. D. Blum, and M. Marvin-Dipasquale. 2016. Hydrologic Indicators of Hot Spots and Hot Moments of Mercury Methylation Potential along River Corridors. *Science of the Total Environment* 568: 697-711.

California Department of Water Resources. 2015. *Report of Findings: Mercury Control Studies for the Cache Creek Settling Basin, Yolo County, California*. Prepared by K. J. Brown, J. Nosacka, and J. Nishida. Division of Flood Management, Flood Maintenance Office, for Central Valley Regional Water Quality Control Board. November 24.

California Department of Water Resources. 2016a. *California's Groundwater—Bulletin 118, Interim Update 2016*. December 22. Available: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/B118-Interim-Update-2016.pdf. Accessed: November 10, 2019.

California Department of Water Resources. 2016b. *5-021-67 Sacramento Valley – Yolo, Basin Boundaries.* Available: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/Groundwater-Management/Bulletin-118/Files/B118-Basin-Boundary-Descriptions-2016/B118-Basin-Boundary-Description-2016---5_021_67.pdf. Accessed: November 10, 2019.

California Department of Water Resources. No date. Sacramento Valley – Yolo (5-021.67). Phase 2 Draft, Component 7 – Impacts identified on the SGMA Basin Prioritization Dashboard. Available: https://gis.water.ca.gov/app/bp-dashboard/p2/#. Accessed: November 10, 2019.

Central Valley Regional Water Quality Control Board. 2004. *Cache Creek, Bear Creek, and Harley Gulch TMDL for Mercury*. Staff Report. Available: https://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/cache_sulphur_creek/cache_nov2004_a.pdf. Accessed: November 8, 2019.

Central Valley Regional Water Quality Control Board. 2010a. *Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Methylmercury and Total Mercury in the Sacramento-San Joaquin Delta Estuary.* Final Staff Report. Report prepared by: M. L. Wood, P. Morris, J. Cooke, and S. J. Louie. April 2010. Available: https://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/archived_delta_hg_info/april_2010_hg_a_hearing/apr2010_bpa_staffrpt_final.pdf. Accessed: November 7, 2019.

Central Valley Regional Water Quality Control Board. 2010b. *Sacramento-San Joaquin Delta Estuary TMDL for Methylmercury*. Staff Report. Report prepared by: M. L. Wood, C. Foe, J. Cooke, and S. J. Louie. April. Available: https://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/archived_delta_hg_info/april_2010_hg_tmdl_hearing/apr2010_tmdl_staffrpt_final.pdf. Accessed: November 15, 2019.

Central Valley Regional Water Quality Control Board. 2011a. *Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Methylmercury and Total Mercury in the Sacramento-San Joaquin River Delta Estuary (Attachment 1 to Resolution No. R5-2010-0043)*. Available: https://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/delta_hg/2011_1020_deltahg_bpa.pdf. Accessed: November 8, 2019.

Central Valley Regional Water Quality Control Board. 2011b. *Mercury Inventory in the Cache Creek Canyon Bear Creek Confluence to Rumsey.* Staff Report. March. Available: https://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/cache_sulphur_creek/cache_crk_rumsey_inventory.pdf. Accessed: November 7, 2019.

Central Valley Regional Water Quality Control Board. 2018. *The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board, Central Valley Region*. Fifth Edition. The Sacramento River Basin and the San Joaquin River Basin. May. Available: https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_201805.pdf. Accessed: October 31, 2019.

City of Woodland. 2011. *City of Woodland Groundwater Management Plan*. Prepared by West Yost Associates. April. Available: https://water.ca.gov/LegacyFiles/urbanwatermanagement/2010uwmps/Woodland,%20City%20of/Appendix%20F_041511%20np1%20R%20GMP.pdf. Accessed: November 12, 2019.

City of Woodland. 2016. *2035 General Plan and Climate Action Plan Public Review Draft Environmental Impact Report.* State Clearinghouse Number 2013032015. Prepared by AECOM.

City of Woodland. 2017. *City of Woodland General Plan 2035*. Woodland, CA. May 16. http://www.cityofwoodland.org/DocumentCenter/View/1180/Final-General-Plan-May-16-2017-PDF. Accessed: November 12, 2019.

County of Yolo. 2009. *Conservation and Open Space Element.* Chapter 7 from the *2030 Countywide General Plan.* November. Available: https://www.yolocounty.org/home/showdocument?id=14464. Accessed: October 30, 2019.

Davis, J. A., W. A. Heim, A. Bonnema, B. Jakl, and D. Yee. 2018. *Mercury and Methylmercury in Fish and Water from the Sacramento-San Joaquin Delta: August 2016 – April 2017*. Delta Regional Monitoring Program. Available: https://www.sfei.org/sites/default/files/biblio_files/Delta%20RMP%20Mercury%20Data%20Report%202016_1.pdf. Accessed: February 22, 2020.

Domagalski, J. L., Alpers, C. N., Slotton, D. G., Suchanek, T. H., and Ayers, S. M. 2004. Mercury and Methylmercury Concentrations and Loads in Cache Creek Basin, California, January 2000 through May 2001: United States Geological Survey Scientific Investigations Report 2004–5037.

Donovan, P. M, J. D. Blum, M. B. Singer, M. Marvin-DiPasquale, and M. T. K. Tsui. 2016. *Methylmercury degradation and exposure pathways in streams and wetlands impacted by historical mining*. Available: https://core.ac.uk/download/pdf/82962153.pdf. Accessed: November 12, 2019.

Singer, M. B., L. R. Harrison, P. M. Donovan, J. D. Blum, and M. Marvin-Dipasquale. 2016. Hydrologic Indicators of Hot Spots and Hot Moments of Mercury Methylation Potential Along River Corridors. *Science of the Total Environment* 568: 697-711.

State Water Resources Control Board. 2017. California 2014 and 2016 303(d) combined list table for Lower Cache Creek. Excel file (includes potential sources). Available: https://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2014_2016.shtml. Accessed: October 31, 2019.

Tompkins, M., P. Frank, and A. P. Rayburn. 2017. *Technical Studies and 20-Year Retrospective for the Cache Creek Area Plan*. Prepared for Yolo County Administrator's Office. Woodland, CA. March. Available: https://www.yolocounty.org/home/showdocument?id=41164. Accessed: November 6, 2019.

University of California Davis (UC Davis). 2016., *Amendment to the Cache Creek Settling Basin Trap Efficiency Study for the City of Woodland's Urban Flood Risk Reduction (UFRR) Study and Preliminary Design, Final Report, January 1, 2016 – August 3, 2016*. Cache Creek Settling Basin / Yolo Bypass Project, Contract No. 4600010003. Prepared for California Department of Water Resources. UC Davis J. Amorocho Hydraulics Laboratory, Department of Civil and Environmental Engineering. Davis, CA. 113 pp.

U.S. Army Corps of Engineers. 2003. *Lower Cache Creek, Yolo County, CA, City of Woodland and Vicinity, Draft Environmental Impact Statement/Environmental Impact Report for Potential Flood Damage Reduction Project*. Sacramento, CA. March.

U.S. Army Corps of Engineers. 2007. *Cache Creek Settling Basin Enlargement—Operation & Maintenance Manual.* Sacramento District. March.

U.S. Bureau of Reclamation and California Department of Water Resources. 2019. *The Yolo Bypass Salmonid Habitat Restoration and Fish Passage Project Final Environmental Impact Statement/ Environmental Impact Report.* Chapter 6, *Water Quality*. State Clearinghouse # 2013032004. May. Available: https://www.usbr.gov/mp/nepa/includes/documentShow.php?Doc_ID=38603. Accessed: November 11, 2019.

U.S. Environmental Protection Agency. 2007. *EPA Staff Report Supporting Approval of TMDLs: TMDLs for Mercury/Methylmercury in Cache Creek, Bear Creek, and Harley Gulch*. Available: https://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/cache_sulphur_creek/2_epa_approve_tmdl.pdf. Accessed: November 8, 2019.

U.S. Environmental Protection Agency. 2013. *Total Nitrogen.* Available: https://www.epa.gov/sites/production/files/2015-09/documents/totalnitrogen.pdf. Accessed: November 7, 2019.

U.S. Environmental Protection Agency. 2015. *Water Quality Progress Report—Sacramento-San Joaquin Delta Estuary, Mercury and Methylmercury.* Approved 2011. Updated June 15, 2015. Available: https://www.epa.gov/sites/production/files/2015-07/documents/14-sac-sjr-mercury-tmdl-implementation-report-2015-06-15.pdf. Accessed: February 28, 2020.

U.S. Environmental Protection Agency. 2017. *How People are Exposed to Mercury.* Available: https://www.epa.gov/mercury/how-people-are-exposed-mercury. Accessed: November 7, 2019.

U.S. Fish and Wildlife Service and Yolo Habitat Conservancy. 2018. Hydrology and Water Quality. Chapter 9 from the *Yolo Habitat Conservation Plan/Natural Community Conservation Plan Final Environmental Impact Statement/Environmental Impact Report*. State Clearinghouse No. 2011102043. Prepared by Ascent Environmental. April. Available: https://627e9b84-c712-4ba2-b935-ad28eb619bc6.filesusr.com/ugd/8f41bd_8dd222ee6609430ba6a2e1010ec7a4f7.pdf. Accessed: November 7, 2018.

U.S. Geological Survey. 2014. *Mercury in the Nation's Streams—Levels, Trends, and Implications*. Circular 1395. Prepared by D. A. Wentz, M. E. Brigham, L. C. Chasar, M. A. Lutz, and D. P. Krabbenhoft.

Woodland-Davis Clean Water Agency. 2019. Regional Surface Water Supply Project overview.

Yolo County. 2009. *Hydrology and Water Quality*. Chapter K from the Yolo County 2030 Countywide General Plan EIR. Prepared by LSA Associates, Inc. April. Available: https://www.yolocounty.org/home/showdocument?id=9174. Accessed: November 10, 2019.

Yolo County Flood Control and Water Conservation District. 2007. *Natural Background Levels of Boron in the Clear Lake – Cache Creek Watershed: A Data Analysis and Literature Review.* Prepared by Max Stevenson. June. Available: http://www.ycfcwcd.org/documents/referenceboron.pdf. Accessed: October 30, 2019.

YoloGroundwater.org. No date. *Yolo Subbasin Groundwater Authority*. Available: https://yologroundwater.org/index.php/yolo-subbasin-groundwater-agency/. Accessed: November 26, 2019.

Yolo Subbasin Groundwater Agency. 2019. *Local Agencies part of the Yolo Subbasin Groundwater Agency*. Map. Updated September 13.

Yu, R-Q, J. R. Flanders, E. E. Mack, R. Turner, M. B. Mirza, and T. Barkay. 2012. Contribution of coexisting sulfate and iron reducing bacteria to methylation production in freshwater river sediments. *Environmental Science & Technology*, 46: 2684-2691.

7.3.3 Section 3.3, Geology, Soils, and Paleontological and Mineral Resources

AECOM. 2016. *Preliminary Borrow Site Investigation Data Report, Phase 2, Lower Cache Creek Feasibility Study*. June 21, 2016. Prepared for City of Woodland, Woodland, CA. Prepared by AECOM, Sacramento, CA.

Branum, D., R. Chen, M. Petersen, and C. Willis. 2016. *Earthquake Shaking Potential for California*. (Map Sheet 48, Revised 2016.) Available: https://www.conservation.ca.gov/cgs/Documents/MS_048.pdf. Accessed: November 20, 2019.

Bryant, W. and E. Hart. 2007. *Special Publication 42 Fault-Rupture Hazard Zones in California, Interim Revision*. California Geological Survey. August. Available: ftp://ftp.consrv.ca.gov/pub/dmg/pubs/sp/SP42_2015.pdf. Accessed: December 2, 2019.

California Department of Water Resources. 2012. *Urban Levee Design Criteria*. May. https://water.ca.gov/LegacyFiles/floodsafe/leveedesign/ULDC_May2012.pdf. Accessed: December 18, 2019.

California Department of Water Resources. 2014. *Geology of the Northern Sacramento Valley, California. June*. Available: https://cawaterlibrary.net/wp-content/uploads/2017/05/Geology-of-the-Northern-Sacramento-Valley.pdf. Accessed: November 19, 2019.

California Department of Water Resources. 2018. *2017 GPS Survey of the Sacramento Valley Subsidence Network. Division of Integrated Regional Water Management, Northern Region Office*. Available: http://www.yolowra.org/documents/2017_GPS_Survey_of_the_Sacramento_Valley_Subsidence_Network.pdf. Accessed: October 29, 2019.

California Geological Survey. 2002. *California Geomorphic Provinces*. (Note 36.) Available: https://www.conservation.ca.gov/cgs/Documents/Note_36.pdf. Accessed: November 19, 2019.

California Geological Survey. 2010. *Fault Activity Map of California*. Available: https://maps.conservation.ca.gov/cgs/fam/app/. Accessed: October 28, 2019.

California Geological Survey. 2015. *CGS Information Warehouse: Regulatory Maps*. Available: https://maps.conservation.ca.gov/cgs/informationwarehouse/. Accessed: October 29, 2019.

California Geological Survey. 2018a. *Aggregate Sustainability in California: Fifty-Year Demand Compared to Permitted Aggregate Reserves (MS 52.)*. Map. Available: https://www.conservation.ca.gov/cgs/Documents/MS_052_California_Aggregates_Map_201807.pdf. Accessed: November 22, 2019.

California Geological Survey. 2018b. *Aggregate Sustainability in California: Fifty-Year Demand Compared to Permitted Aggregate Reserves*. (MS 52.) Available: https://www.conservation.ca.gov/cgs/Documents/MS_052_California_Aggregates_Report_201807.pdf. Accessed: November 22, 2019.

California Geological Survey. 2019. Ground Motion Interpolator. Inputs: -121.7607, 38.7015, vs30: 270 m/sec, 10% in 50 years, PGA. Available: https://www.conservation.ca.gov/cgs/ground-motion-interpolator. Accessed: December 2, 2019.

Cawley, K. M., Hohner, A. K., McKee, G. A. et al. 2018. Characterization and spatial distribution of particulate and soluble carbon and nitrogen from wildfire-impacted sediments. *Journal of Soils and Sediments*: 18: 1314-1326. Available: https://doi.org/10.1007/s11368-016-1604-1.

Central Valley Regional Water Quality Control Board. 2002. Watershed Management Initiative, Central Valley Region Chapter. *State of the Watershed Report for Sacramento River Watershed, Cache Creek and Clear Lake Sub-Watershed*. December. Available: https://www.waterboards.ca.gov/centralvalley/water_issues/watershed_management/07cacher.pdf. Accessed: November 19, 2019.

City of Woodland. 2016. Engineering Standards: *Design Standards, Standard Details, and Construction Specifications*. August. Prepared by Community Development Department, Engineering Division, Woodland, CA. Available:https://www.cityofwoodland.org/DocumentCenter/View/1082/2016-Engineering-Standards-PDF. Accessed: December 18, 2019.

City of Woodland. 2017a. *City of Woodland General Plan 2035*. *08 Safety Element*. Available: https://www.cityofwoodland.org/DocumentCenter/View/1173/08-Safety-Element-PDF. Accessed: November 19, 2019.

City of Woodland. 2017b. *City of Woodland General Plan 2035. 07 Sustainability, Conservation, and Open Space Element*. Available: https://www.cityofwoodland.org/DocumentCenter/View/1172/07-Sustainability-Conservation-and-Open-Space-Element-PDF. Accessed: November 19, 2019.

Division of Mines and Geology. No date. *Guidelines for Classification and Designation of Mineral Lands*. California Department of Conservation. (Special Report 51.) Available: https://www.conservation.ca.gov/smgb/Guidelines/Documents/ClassDesig.pdf. Accessed: October 28, 2019.

Dupras, D. L. 1988. *Mineral Land Classification: Portland Cement Concrete-Grade Aggregate in the Sacramento-Fairfield Production-Consumption Region. California Department of Conservation, Division of Mines and Geology*. (Special Report 156.) Available: ftp://ftp.consrv.ca.gov/pub/dmg/pubs/sr/SR_156/SR_156_Text.pdf. Accessed: October 28, 2019.

Federal Emergency Management Agency. 2012. *Engineering Principles and Practices for Retrofitting Flood-Prone Residential Structures. January*. (FEMA P-259.) Available: https://www.fema.gov/media-library-data/20130726-1506-20490-2593/fema259_complete_rev.pdf. Accessed: December 16, 2019.

Hilton, R. P., Dailey, D. C., and McDonald, H. G. 2000. A late Pleistocene biota from the Arco Arena site, Sacramento, California. *PaleoBios* 20(1):7–12.

Marchand, D. E. and A. Allwardt. 1981. *Late Cenozoic Stratigraphic Units, Northeastern San Joaquin Valley, California.* (Geological Survey Bulletin 1470.) U. S. Department of the Interior. Available: https://pubs.usgs.gov/bul/1470/report.pdf. Accessed: November 19, 2019.

Miller, R. 2018. *Summary of Mining Operations, Approved Mining Operations (West to East along Cache Creek)*. Prepared by R. Miller, Senior Mining Planner for the Yolo County. Available: https://www.yolocounty.org/home/showdocument?id=58661. Accessed: December 18, 2019.

Natural Resources Conservation Service. 2019. *Custom Soil Resource Report for Yolo County*. U.S. Department of Agriculture. Web Soil Survey. Available: https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. Accessed: November 19, 2019.

Society of Vertebrate Paleontology. 2010. *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources. Impact Mitigation Guidelines Revision Committee*. Available: http://vertpaleo.org/Membership/Member-Ethics/SVP_Impact_Mitigation_Guidelines.aspx. Accessed: November 19, 2019.

Soil Conservation Service and University of California Agricultural Experiment Station. 1972. *Soil Survey of Yolo County, California*. Available: https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/california/yoloCA1972/yoloCA1972.pdf. Accessed: November 19, 2019.

Teichert Aggregates. 2019. *Project Description Shifler Mining and Reclamation Project*. Available: https://www.yolocounty.org/general-government/general-government-departments/county-administrator/county-administrator-divisions/natural-resources/mining-projects-and-permits/teichert-shifler-application-applicant-submittal.

U.S. Bureau of Land Management. No date. *Burned Area Emergency Response, Mendocino Complex Fire: Watershed Modeling Report*. Available: https://www.blm.gov/sites/blm.gov/files/uploads/Programs_Fire_California_Watershed_Modeling_Report-Mendocino-Complex-Fire.pdf. Accessed: December 18, 2019.

U.S. Energy Information Administration. 2019. *Average Depth of Crude Oil and Natural Gas Wells*. September 19. Available: https://www.eia.gov/dnav/pet/pet_crd_welldep_s1_a.htm. Accessed: December 16, 2019.

U.S. Geological Survey. No date. *Lateral Spread or Flow*. Available: https://earthquake.usgs.gov/learn/glossary/?term=lateral%20spread%20or%20flow. Accessed: October 29, 2019.

U.S. Geological Survey. 2006. *Quaternary fault and fold database for the United States*. Available: https://earthquake.usgs.gov/hazards/qfaults/. Accessed: October 28, 2019.

University of California Museum of Paleontology. 2019a. *Riverbank Formation*. Available: https://ucmpdb.berkeley.edu/advanced.html. Accessed: November 19, 2019.

University of California Museum of Paleontology. 2019b. *Modesto Formation*. Available: https://ucmpdb.berkeley.edu/advanced.html. Accessed: November 19, 2019.

University of California Museum of Paleontology. 2019c. *Yolo County*. Available: https://ucmpdb.berkeley.edu/advanced.html. Accessed: November 21, 2019.

Wagner, D. L., C. W. Jennings, T. L. Bedrossian, and E. J. Bortugno. 1981. Geologic Map of the Sacramento Quadrangle, California, 1:250,000. California Geological Survey. Available: ftp://ftp.consrv.ca.gov/pub/dmg/pubs/rgm/RGM_001A/RGM_001A_Sacramento_1981_Sheet1of4.pdf. Accessed: October 22, 2019.

Willets, J. C. 2012. *A Brief Review of the Construction Aggregates Market*. Available: http://www.nxtbook.com/nxtbooks/naylor/NSAS0312/index.php?startid=7#/32. Accessed: November 22, 2019.

Yolo County. 1996. *Final Off-Channel Mining Plan for Lower Cache Creek*. July 30. Available: https://www.yolocounty.org/home/showdocument?id=18681. Accessed: November 20, 2019.

Yolo County. 2002. *Revised Final Cache Creek Resources Management Plan for Lower Cache Creek*. Adopted August 20, 1996. Revised August 15, 2002. Available: https://www.yolocounty.org/home/showdocument?id=1119. Accessed: August 28, 2019.

Yolo County. 2008. *County of Yolo Improvement Standards*. Department of Planning and Public Works. August 5. Available: https://www.yolocounty.org/home/showdocument?id=50965. Accessed: December 18, 2019.

Yolo County. 2009a. *2030 Countywide General Plan*. *8 Health and Safety Element*. Available: https://www.yolocounty.org/home/showdocument?id=14463. Accessed: October 28, 2019.

Yolo County. 2009b. *2030 Countywide General Plan*. *Conservation and Open Space Element*. Available: https://www.yolocounty.org/home/showdocument?id=14464. Accessed: October 28, 2019.

Yolo County. 2009c. *2030 Countywide General Plan*. *Land Use and Community Character Element*. Available: https://www.yolocounty.org/home/showdocument?id=14468. Accessed: November 21, 2019.

Yolo County. 2010. *Yolo County City/County Drainage Manual*. Volume 1 of 2. April 2009, Rev., February 2010. Prepared for floodSAFE Yolo. Prepared by Wood Rodgers. Available: https://www.yolocounty.org/home/showdocument?id=11434. Accessed: December 18, 2018.

Yolo County Community Development Agency. 1995. *Cache Creek Streamway Study, in Technical Studies and Recommendations for the Lower Cache Creek Resource Management Plan*. October. Prepared by EIP Associates and Northwest Hydraulic Consultants.

7.3.4 Section 3.4, Biological Resources

Cache Creek Conservancy. 2016. *Lower Cache Creek Invasive Species Mapping and Prioritization Project.* Prepared by Andrew P. Rayburn, Ph.D. August 16, 2016.

Calflora: Information on California plants for education, research and conservation [web application]. 2020. Berkeley, CA. Available: https://www.calflora.org/. Accessed: January 16, 2020.

California Department of Fish and Game. 1994. Staff Report Regarding Mitigation for Impacts to Swainson's Hawk (*Buteo swainsoni*) in the Central Valley of California. Sacramento, CA. November 1.

California Department of Fish and Wildlife. 2018. California Sensitive Natural Communities List. Available: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=153609&inline. Last updated: November 8, 2019.

California Department of Fish and Wildlife. 2019. California Natural Diversity Database (CNDDB). 2019. *RareFind 5*. California Department of Fish and Wildlife. Accesed: September 2019.

California Invasive Plant Council. 2020. *The Cal-IPC Inventory.* Available: https://www.cal-ipc.org/plants/inventory/.

California Native Plant Society. 2019. Inventory of Rare and Endangered Plants (online edition, v8-02). California Native Plant Society, Sacramento, CA. Website http://www.rareplants.cnps.org [accessed: June 2019].

City of Woodland. 2017. *City of Woodland General Plan 2035*: *Sustainability, Conservation, and Open Space Element*. Adopted May 16, 2017. Available: https://www.cityofwoodland.org/1000/Documents. Accessed: February 27, 2020.

Jennings and Hayes. 1994. *Amphibian and Reptile Species of Special Concern in California*. Prepared for the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, CA.

Lindley, S. T., R. Schick, A. Agrawal, M. Goslin, T. E. Pearson, E. Mora, J. J. Anderson, B. May, S. Greene, C. Hanson, A. Low, D. McEwan, R. B. MacFarlane, C. Swanson, and J. G. Williams. 2006. *Historical Population Structure of Central Valley Steelhead and its Alteration by Dams*.

Moyle, P. B. 2002. *Inland Fishes of California*. 2nd edition. Davis, CA: University of California Press.

Moyle, P. B., R. M. Quiñones, J. V. Katz and J. Weaver. 2015. Fish Species of Special Concern in California. Sacramento: California Department of Fish and Wildlife. www.wildlife.ca.gov

National Marine Fisheries Service. 2019a. Online Species list. Available: https://archive.fisheries.noaa.gov/wcr/maps_data/california_species_list_tools.html. Accessed: October 30, 2019.

National Marine Fisheries Service. 2019b. Essential Fish Habitat Mapper. Pacific Salmon. Available: https://www.fisheries.noaa.gov/resource/map/essential-fish-habitat-mapper. Accessed: October 30, 2019.

National Marine Fisheries Service. 2019c. Essential Fish Habitat Mapper. Groundfish. Available: https://www.fisheries.noaa.gov/resource/map/essential-fish-habitat-mapper. Accessed: October 30, 2019.

Natural Resources Conservation Service, United States Department of Agriculture, Soil Survey Staff. 2019. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/.

Sacramento River Watershed Program. 2019. Cache Creek Watershed. Available; http://www.sacriver.org/aboutwatershed/roadmap/watersheds/westside/cache-creek-watershed. Accessed: October 30, 2019.

Sawyer, J. O., T. Keeler-Wolf, and J. M. Evens. 2009. *A Manual of California Vegetation, Second Edition*. California Native Plant Society, Sacramento, CA. 1300 pp.

Spencer, W. D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Strittholt, M. Parisi, and A. Pettler. 2010. *California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California*. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highways Administration.

Stillwater Sciences. 2009. Cache Creek Fisheries Survey. Prepared for the Yolo County Flood Control and Water Conservation District, Woodland, California. Available: https://www.yolocounty.org/home/showdocument?id=18727. Accessed: October 30, 2019.

Swainson's Hawk Technical Advisory Committee. 2000. *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* Swainson's Hawk Technical Advisory Committee, California Department of Fish and Game, Sacramento, CA.

Talley, T. S. and M. Holyoak. 2009. *The Effects of Highways and Highway Construction Activities on Valley Elderberry Longhorn Beetle Habitat*. Final Report FHWA/CA09-0925 Submitted to the California Department of Transportation. Sacramento, CA

U.S. Fish and Wildlife Service. 1996. Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of ESA for the Listed Vernal Pool Branchiopods. April 19, 1996. 11 pp.

U.S. Fish and Wildlife Service. 2017a. Framework for Assessing Impacts to the Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*). U.S. Fish and Wildlife Service; Sacramento, California. 28 pp.

U.S. Fish and Wildlife Service. 2017b. Recovery Plan for the Giant Garter Snake (*Thamnophis gigas*). U.S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, California. vii + 71 pp.

U.S. Fish and Wildlife Service. 2019. IPaC Trust Resource Report for the Project area. Generated from http://ecos.fws.gov/ipac/ on 27 March 2019.

Western Bat Working Group. 2017. *Species Matrix and Species Accounts*. Accessed online: http://wbwg.org/ in January 2020.

Yolo County. 2009. *2030 Countywide General Plan*. November 10. Available: https://www.yolocounty.org/general-government/general-government-departments/county-administrator/general-plan/adopted-general-plan. Accessed: November 4, 2019.

Yolo Habitat Conservancy. 2018. Yolo Habitat Conservation Plan/Natural Community Conservation Plan. April 2018.

Yoshiyama, R. M., F. W. Fisher and P. B. Moyle. 1998. Historical abundance and decline of Chinook salmon in the Central Valley region of California. *North American Journal of Fisheries Management* 18:3.

7.3.5 Section 3.5, Land Use and Planning

7.3.5.1 Printed References

City of Woodland. 2017. *City of Woodland General Plan 2035*. Available: https://www.cityofwoodland.org/DocumentCenter/View/1180/Final-General-Plan-May-16-2017-PDF. Accessed: November 27, 2019.

City of Woodland. 2018. *General Plan Land Use 2035* land use map. Last Revised: May 2018. Available: https://www.cityofwoodland.org/DocumentCenter/View/1183/General-Plan-2035-Map-PDF. Accessed: 2-19-2020.

Yolo County. 2009. *2030 Countywide General Plan*. Available: https://www.yolocounty.org/general-government/general-government-departments/county-administrator/general-plan/adopted-general-plan. Accessed: November 27, 2019.

Yolo County. 2019. *Land Use General Plan*. Last Revised: 06-18-2019. Available: https://yodata-yolo.opendata.arcgis.com/datasets/40849bb0db4e4135ad102acd5b504bae_0. Accessed: February 24, 2020.

7.3.5.2 Personal Communications

Reinhardt, Ric. Principal Engineer and Program Manager. MBK Engineers, Sacramento, CA. May 23, 2019 – email exchange with Sara Martin at ICF comparing features of the 2003 Flood Barrier Alternative to the Proposed Project.

7.3.6 Section 3.6, Agricultural and Forestry Resources

California Department of Conservation. 2006. *2004-2006 Yolo County Land Use Conversion*. Division of Land Resource Protection, Farmland Mapping and Monitoring Program. Accessed: November 14, 2019 from https://www.conservation.ca.gov/dlrp/fmmp/Pages/Yolo.aspx.

California Department of Conservation. 2016. *2014-2016 Yolo County Land Use Conversion*. Division of Land Resource Protection, Farmland Mapping and Monitoring Program. Accessed: November 14, 2019 from https://www.conservation.ca.gov/dlrp/fmmp/Pages/Yolo.aspx.

California Department of Conservation. 2019a. *Farmland Mapping & Monitoring Program.* Available: https://www.conservation.ca.gov/dlrp/fmmp/Pages/Index.aspx. Accessed: December 7, 2019.

California Department of Conservation. 2019b. *Important Farmland Categories.* Available: https://www.conservation.ca.gov/dlrp/fmmp/Pages/Important-Farmland-Categories.aspx. Accessed: December 7, 2019.

City of Woodland. 2017. *City of Woodland General Plan 2035*. Woodland, CA. May 16. Available: https://www.cityofwoodland.org/DocumentCenter/View/1180/Final-General-Plan-May-16-2017-PDF. Accessed: December 8, 2019.

U.S. Department of Agriculture. 2019. *Farmland Conversion Impact Rating for the Lower Cache Creek Feasibility Study.* July 16. California Agricultural LESA. Yolo County. 2009. *Agriculture and Economic Development Element.* Chapter 6 of the *2030 Countywide General Plan.* November. Available: https://www.yolocounty.org/home/showdocument?id=14465. Accessed: December 8, 2019.

Yolo County. 2019. Yolo County Parcels Open Data 2019. Available: https://yodata-yolo.opendata.arcgis.com/search?q=parcel. Accessed: December 2019.

7.3.7 Section 3.7, Air Quality

7.3.7.1 Printed References

California Air Resources Board. 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*. Sacramento, CA.

California Air Resources Board. 2005. *Air Quality and Land Use Handbook*. April.

California Air Resources Board. 2016. *Ambient Air Quality Standards*. Last revised: May 4, 2016. Available: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf. Accessed: October 1, 2019.

California Air Resources Board. 2018. Area Designations Maps. Last revised: December 28, 2018. Available: http://www.arb.ca.gov/desig/adm/adm.htm. Accessed: October 1, 2019.

California Air Resources Board. 2019a. *Carbon Monoxide and Health*. Available: https://ww2.arb.ca.gov/resources/carbon-monoxide-and-health. Accessed: October 1, 2019.

California Air Resources Board. 2019b. iADAM: Air Quality Data Statistics (Top 4 Summary). Available: https://www.arb.ca.gov/adam/topfour/topfour1.php. Accessed: October 1, 2019.

California Air Resources Board. 2019c. *EMFAC Off-Model Adjustment Factors to Account for the SAFE Vehicle Rule Part One*. Available: https://ww3.arb.ca.gov/msei/emfac_off_model_adjustment_factors_final_draft.pdf. Accessed: January 27, 2020.

Office of Environmental Health Hazard Assessment. 2015. *Risk Assessment Guidelines*. February. Available: https://oehha.ca.gov/media/downloads/crnr/2015guidancemanual.pdf. Accessed: October 22, 2019

PennzSuppress. 2017. *Dust Control*. Last Revised: 2017. Available: https://www.pennzsuppress.com/dust-control/. Accessed: November 4, 2019.

Ramboll. 2019. *Draft Guidance to Address the Friant Ranch Ruling for CEQA Projects in the Sac Metro Air District*. December.

Reşitoğlu, Ibrahim. 2018. *NOx Pollutants from Diesel Vehicles and Trends in the Control Technologies*. Available: https://www.intechopen.com/online-first/nox-pollutants-from-diesel-vehicles-and-trends-in-the-control-technologies. Accessed: December 10, 2019.

Sacramento Metropolitan Air Quality Management District. 2013. *PM2.5 Implementation/Maintenance Plan and Redesignation Request for Sacramento PM2.5 Nonattainment Area*. October 24.

Sacramento Metropolitan Air Quality Management District. 2015. SMAQMD Thresholds of Significance Table. Last Revised: May 2015. Available: http://www.airquality.org/LandUseTransportation/Documents/CH2ThresholdsTable5-2015.pdf. Accessed: October 2, 2019.

Sacramento Metropolitan Air Quality Management District. 2019. *Guide to Air Quality Assessment in Sacramento County*. Last Revised; July.

Sacramento Metropolitan Air Quality Management District. 2020. SMAQMD Minor Project Health Screening Tool, version 1. January. Available: http://www.airquality.org/businesses/ceqa-land-use-planning/ceqa-guidance-tools.

Sacramento Metropolitan Air Quality Management District, El Dorado County Air Quality Management District, Feather River Air Quality Management District, Placer County Air Pollution Control District, and Yolo-Solo Air Quality Management District. 2017*. Sacramento Regional 2008 8-Hour Ozone Attainment and Reasonable Further Progress Plan.* Available: http://www.airquality.org/ProgramCoordination/Documents/Sac%20Regional%202008%20NAAQS%20Attainment%20and%20RFP%20Plan.pdf. Accessed: October 1, 2019.

Trinity Consultants. 2017. *Appendix A Calculation Details for CalEEMod and Appendix D Default Data Tables*. October 2017.

U.S. Environmental Protection Agency. 2002. *Health Assessment Document for Diesel Engine Exhaust*. Available: http://nepis.epa.gov/Exe/ZyPDF.cgi/300055PV.PDF?Dockey=300055PV.PDF. Accessed: October 1, 2019.

U.S. Environmental Protection Agency. 2006a. *Compilation of Air Pollutant Emission Factors, Chapter 13.2.2, Unpaved Roads*. Last Revised: November 2006. Available: https://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0201.pdf. Accessed: October 22, 2019.

U.S. Environmental Protection Agency. 2006b. *Compilation of Air Pollutant Emission Factors, Chapter 11.12, Concrete Batching*. Last Revised: June 2006. Available: https://www3.epa.gov/ttn/chief/ap42/ch11/final/c11s12.pdf. Accessed: October 22, 2019.

U.S. Environmental Protection Agency. 2011a. *Compilation of Air Pollutant Emission Factors, Chapter 13.2.1, Paved Roads*. Last Revised: January 2011. Available: https://www3.epa.gov/ttn/chief/ap42/ch13/final/c13s0201.pdf. Accessed: October 22, 2019.

U.S. Environmental Protection Agency. 2011b. *Haul Road Workgroup Final Report*. December 6. Page 5. Available: https://www3.epa.gov/scram001/reports/Haul_Road_Workgroup-Final_Report_Package-20120302.pdf. Accessed: October 31, 2019.

U.S. Environmental Protection Agency. 2015. *Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas, Appendix J*. EPA-420-B-10-040.

U.S. Environmental Protection Agency. 2016. *Health Effects of Ozone in the General Population*. Last updated September 12. Available: https://www.epa.gov/ozone-pollution-and-your-patients-health/health-effects-ozone-general-population. Accessed: October 1, 2019.

U.S. Environmental Protection Agency. 2018. *Health and Environmental Effects of Particulate Matter (PM)*. Last updated June 20. Available: https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm. Accessed: October 1, 2019.

U.S. Environmental Protection Agency. 2019a. *Health Effects of Ozone Pollution*. Last updated October 10. Available: https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution. Accessed: October 1, 2019.

U.S. Environmental Protection Agency. 2019b. *Greenbook*. Last Revised: September 30, 2019. Available: https://www.epa.gov/green-book. Accessed: October 1, 2019.

Yolo Solano Air Quality Management District. 2007. *Handbook for Assessing and Mitigating Air Quality Impacts*. July.

7.3.7.2 Personal Communications

Hilliard, Chuck (a). Engineer. Wood Rodgers, Inc. Sacramento, CA. January 30, 2020—email message to ICF regarding LCC Construction Assumptions for AQ Modeling.

Hilliard, Chuck (b). Engineer. Wood Rodgers, Inc. Sacramento, CA. February 18, 2020—email message to ICF regarding Construction Assumptions for Structure Raises.

7.3.8 Section 3.8, Greenhouse Gas Emissions

7.3.8.1 Printed References

City of Woodland. 2017. *City of Woodland Final 2035 Climate Action Plan*. May.

California Air Resources Board. 2017a. *Short-Lived Climate Pollutant Reduction Strategy*. Available: https://ww3.arb.ca.gov/cc/shortlived/meetings/03142017/final_slcp_report.pdf. Accessed: October 2, 2019.

California Air Resources Board. 2017b. *California's 2017 Climate Change Scoping Plan*. November. Available: https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf. Accessed: October 22, 2019.

California Air Resources Board. 2019a. *GHG Global Warming Potentials*. Last Revised: August 12, 2019. Available: https://ww2.arb.ca.gov/ghg-gwps. Accessed: October 2, 2019.

California Air Resources Board. 2019b. *California Greenhouse Gas Emission Inventory–2018 Edition*. Last Revised: August 12, 2019. Available: https://ww3.arb.ca.gov/cc/inventory/data/data.htm. Accessed: August 20, 2019.

California Natural Resources Agency. 2018. *California's Fourth Climate Change Assessment Statewide Summary Report*. Available: http://www.climateassessment.ca.gov/state/docs/20190116-StatewideSummary.pdf. Accessed: October 2, 2019.

California Governor's Office of Planning and Research. 2018. *Discussion Draft CEQA and Climate Change Advisory.* December. Available: http://opr.ca.gov/docs/20181228-Discussion_Draft_Climate_Change_Adivsory.pdf. Accessed: May 15, 2019.

Intergovernmental Panel on Climate Change. 2007. *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Available: https://www.ipcc.ch/site/assets/uploads/2018/05/ar4_wg1_full_report-1.pdf. Accessed: October 2, 2019.

Intergovernmental Panel on Climate Change. 2013. *Climate Change 2013: The Physical Science Basis*. Available: https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_all_final.pdf. Accessed: January 13, 2020.

Intergovernmental Panel on Climate Change. 2014. *Climate Change Synthesis Report*. Available: https://www.ipcc.ch/site/assets/uploads/2018/02/SYR_AR5_FINAL_full.pdf. Accessed: October 2, 2019.

Intergovernmental Panel on Climate Change. 2018. *Global Warming of 1.5°C. Contribution of Working Group I, II, and III.* Available: https://www.ipcc.ch/sr15/. Accessed: October 2, 2019.

Pacific Gas and Electric. 2018. *Climate Change*. Available: http://www.pgecorp.com/corp_responsibility/reports/2018/en02_climate_change.html. Accessed: October 22, 2019.

Marceau, M., Nisbet, M., and VanGeem. 2007. *Life Cycle Inventory of Portland Cement Concrete*. PCA R&D Serial No. 3007.

Sacramento Metropolitan Air Quality Management District. 2015. *SMAQMD Thresholds of Significance Table*. Last Revised: May 2015. Available: http://www.airquality.org/LandUseTransportation/Documents/CH2ThresholdsTable5-2015.pdf. Accessed: October 2, 2019.

Sacramento Metropolitan Air Quality Management District. 2018. *CEQA Guide*. Chapter 6: Greenhouse Gas Emissions. May.

U.S. Environmental Protection Agency. 2019. *Inventory of U.S. Greenhouse Gas Emissions and Sinks 1990–2017*. Available: https://www.epa.gov/sites/production/files/2019-02/documents/us-ghg-inventory-2019-main-text.pdf. Accessed: October 2, 2019.

U.S. Environmental Protection Agency. 2020a. Emissions & Generation Resource Integrated Database (eGRID). Last Revised: January 28, 2020. Available: https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid. Accessed: January 31, 2020.

U.S. Environmental Protection Agency. 2020b. Greenhouse Gas Equivalencies Calculator. Available: https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator. Accessed: February 20, 2020.

Valley Clean Energy. 2019. *Power Sources*. Available: https://valleycleanenergy.org/power-sources/. Accessed: January 31, 2020.

Yolo County. 2011. *Yolo County Climate Action Plan*. March.

Yolo Solano Air Quality Management District. 2007. *Handbook for Assessing and Mitigating Air Quality Impacts*. July.

7.3.8.2 Personal Communications

Hilliard, Chuck (a). Engineer. Wood Rodgers, Inc. Sacramento, CA. January 30, 2020—email message to ICF regarding LCC Construction Assumptions for AQ Modeling.

Hilliard, Chuck (b). Engineer. Wood Rodgers, Inc. Sacramento, CA. February 18, 2020—email message to ICF regarding Construction Assumptions for Structure Raises.

7.3.9 Section 3.9, Noise

California Department of Transportation. 2013a. *Technical Noise Supplement to the Traffic Noise Analysis Protocol for New Highway Construction, Reconstruction, and Retrofit Barrier Projects*. May. Sacramento, CA.

California Department of Transportation. 2013b. *Transportation and Construction Vibration Guidance Manual.* September. Sacramento, CA.

California Department of Transportation. 2017. *2016 Traffic Volumes on California State Highways*. Sacramento, CA.

Cowan, J. P. 1994. *Handbook of Environmental Acoustics*. New York, NY: Van Nostrand Reinhold.

California Office of Noise Control. 1977. *Model Community Noise Ordinance*. April. Berkeley, CA: California Department of Health.

City of Woodland. 2017. *General Plan 2035*. Adopted May 16, 2017. Woodland, CA.

Federal Transit Administration. 2018. *Transit Noise and Vibration Impact Assessment*. (FTA Report No. 0123.) Available: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf. Accessed: October 10, 2019.

Governor's Office of Planning and Research. 2003. *Guidelines for the Preparation and Content of the Noise Element of the General Plan.* Appendix C in the State of California General Plan Guidelines. Sacramento, CA.

U.S. Environmental Protection Agency. 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* March. Washington, DC: U.S. Environmental Protection Agency, Office of Noise Abatement and Control.

Yolo County. 2009. *2030 Countywide General Plan*. Adopted November 10, 2009. Woodland, CA.

7.3.10 Section 3.10, Cultural Resources

Bennyhoff, J. A. 1977. *Ethnography of the Plains Miwok*. Center for Archaeological Research at Davis Publication Number 5. University of California; Davis.

City of West Sacramento. 2014. *The River Erosion Site Project: Mitigated Negative Declaration/Final Initial Study.* Prepared for the West Sacramento Area Flood Control Agency; West Sacramento, CA.

City of Woodland. 1996. *A Brief History of Woodland*. Excerpted from 1996 Woodland General Plan. Available: https://bit.ly/34S9l3m. Accessed: December 3, 2019.

City of Woodland. 2017. *City of Woodland General Plan 2035.* Adopted May 16. Available: https://www.cityofwoodland.org/DocumentCenter/View/1167/02-Land-Use-Community-Design-and-Historic-Preservation-Element-PDF. Accessed: November 25, 2019.

Crull, S. 2015a. *P-57-000970: California-Pacific Route thru Yolo County*. Department of Parks and Recreation 523-series forms. On file at the CHRIS Northwest Information Center; Rohnert Park, California.

Crull, S. 2015b. *P-57-000977: Central-Pacific RR Route thru Yolo County*. Department of Parks and Recreation 523-series forms. On file at the CHRIS Northwest Information Center; Rohnert Park, California.

Fredrickson, D. A. 1973. *Early Cultures of the North Coast Ranges, California.* Unpublished Ph.D. dissertation. Department of Anthropology, University of California, Davis.

Gregory, T. 1913. *History of Yolo County, California*. Los Angeles, CA: Historic Record Company.

Jackson, W. A. 1851. *Map of the Mining District of California.* Map on file at the Library of Congress, Washington D.C.

Johnson, J. J. 1967. The Archaeology of the Camanche Reservoir Locality, California. *Sacramento Anthropological Society Paper 6.* Sacramento, CA

Johnson, P. J. 1978. Patwin. *Handbook of North American Indians. Volume 8: California.* Smithsonian Institution; Washington, D.C.

Kroeber, A. L. 1925 *Handbook of the Indians of California*. Reprinted. Dover Publications, New York. Originally published in 1925, Bulletin No. 78, Bureau of American Ethnology, Smithsonian Institution, Washington, D.C.

Kroeber, A. L. 1932. The Patwin and their Neighbors. *University of California Publications in American Archaeology and Ethnography* 29(4):253–423.

Kyle, D. E., H. E. Rensch, E. G. Rensch, M. B. Hoover, and W. A. 2002. *Historic spots in California*. Stanford, California: Stanford University Press.

Larky, J. L. and S. Walter. 1987. *Yolo County: Land of Changing Patterns*. Northridge, CA: Windsor Publications.

Mann, C. W., J. F. Warner, H. L. Westover, and James e. Ferguson. 1911. *Soil Survey of the Woodland Area, California.* United States Department of Agriculture. Washington, D.C.: Government Printing Office.

Moratto, M. J. 1984. *California Archaeology.* Academic Press, San Diego, CA.

Ord, E. O. C. 1843. *Topographical Sketch of the Gold and Quicksilver District of California.* Map on file at the Library of Congress, Washington D.C.

Pierce, W. 2014. *NRHP and CRHR Evaluation of Sub-Unit 1 of Unit 126 of the Sacramento River Flood Control Project Levee for the Cache Creek Setback Levee LM2.8L Project, Yolo County, California*. Prepared by the Department of Water Resources of the State of California. June 9.

Powers, S. 1877. Tribes of California. *Contributions to North American Ethnology 3.* United States Geographical and Geological Survey of the Rocky Mountain Region, Washington, D.C.

Robertson, D. B. 1998. *Encyclopedia of Western Railroad History, Volume IV: California*. Caldwell, ID: Caxton Printers, Ltd.

Rosenthal, J. S., G. G. White, and M. Q. Sutton. 2007. The Central Valley: A View from the Catbird's Seat. Pages 147–163 in T. L. Jones and K. A. Klar (eds.), *California Prehistory: Colonization, Culture, and Complexity.* New York, NY: AltaMira Press.

Sacramento Area Flood Control Agency. 2007. *Natomas Levee Improvement Program. Landside Improvements Project Environmental Impact Report.* Sacramento, CA

United States Department of the Interior. 1995. *The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring & Reconstructing Historic Buildings*.

U.S. Geological Survey. 1907a. Woodland Quadrangle. Available: https://ngmdb.usgs.gov/topoview/viewer.

U.S. Geological Survey. 1907b. Dunnigan Quadrangle. Available: https://ngmdb.usgs.gov/topoview/viewer.

U.S. Geological Survey. 1916. Dunnigan Quadrangle. Available: https://ngmdb.usgs.gov/topoview/viewer.

Wilson, N. L. and A. H. Towne. 1978. Nisenan. Pages 387–397 in R. F. Heizer (ed.), *Handbook of North American Indians, Volume 8: California.* Smithsonian Institution, Washington, D.C.

Wyld. 1849. *Map of the Gold Regions of California.* Map on file at the Library of Congress, Washington D.C.

Yolo County. 2009. *2030 Countywide General Plan*. Planning and Public Works Department, Woodland, CA. November 10.

7.3.11 Section 3.11, Tribal Cultural Resources

Yocha Dehe Wintun Nation. No date [a]. *Heritage*. Available: https://www.yochadehe.org/heritage. Accessed: February 15, 2019.

Yocha Dehe Wintun Nation. No date [b]. *Farm & Ranch*. Available: https://www.yochadehe.org/farm-ranch. Accessed: February 15, 2019.

Yocha Dehe Wintun Nation. No date [c]. *Tribal Government*. Available: https://www.yochadehe.org/tribal-government. Accessed: October 29, 2019.

Yocha Dehe Wintun Nation. 2015. *Our Story*. e-brochure. Available: https://issuu.com/yochadehe/docs/f5_rw-981_tribal_brochure/10. Accessed: February 15, 2019.

7.3.12 Section 3.12, Transportation

7.3.12.1 Printed References

California Department of Transportation. 2016. *California Transportation Plan 2040.* June. Available: https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/finalctp2040-report-webready.pdf. Accessed: December 18, 2019.

California Department of Transportation. 2019. *Construction Manual*. July. Available: https://dot.ca.gov/-/media/dot-media/programs/construction/documents/policies-procedures-publications/construction-manual/construction-manual2019.pdf. Accessed: December 18, 2019.

California Transportation Commission. 2019. *State Transportation Improvement Program Guidelines*. Available: https://catc.ca.gov/-/media/ctc-media/documents/ctc-meetings/2019/2019_08/20-4-4-a11y.pdf. August. Accessed: December 18, 2019.

City of Woodland. 2017. *City of Woodland General Plan 2035*. Available: https://www.cityofwoodland.org/DocumentCenter/View/1180/Final-General-Plan-May-16-2017-PDF. Accessed: November 27, 2019.

County of Yolo Department of Planning and Public Works. 2008. *County of Yolo Improvement Standards.* Woodland, CA. August 5. Available: https://www.yolocounty.org/home/showdocument?id=6580. Accessed: December 17, 2019.

Governors Office of Planning and Research. 2016. *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA*. January. Available: http://opr.ca.gov/docs/Revised_VMT_CEQA_Guidelines_Proposal_January_20_2016.pdf. Accessed: December 18, 2019.

Governors Office of Planning and Research. 2018. *Technical Advisory on Evaluating Transportation Impacts in CEQA*. December. Available: http://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf. Accessed: December 18, 2019.

Sacramento Area Council of Governments. 2018. *Metropolitan Transportation Improvement Program 2019-2020*. September. Available: https://www.sacog.org/sites/main/files/file-attachments/final_2019_mtip_10-1-2018.pdf?1538438403 Accessed: December 18, 2019.

Sacramento Area Council of Governments. 2019. *Metropolitan Transportation Plan and Sustainable Communities Strategy (MTP/SCS)*. November. Available: https://www.sacog.org/sites/main/files/file-attachments/2020_mtp-scs_final_draft_for_web.pdf?1574444708. Accessed: December 18, 2019.

Yolo County. 2009. *2030 Countywide General Plan*. Available: https://www.yolocounty.org/general-government/general-government-departments/county-administrator/general-plan/adopted-general-plan. Accessed: November 27, 2019.

7.3.12.2 Personal Communications

Choa, Fred. Principal. Fehr & Peers. Roseville, CA. December 10, 2019—email message to ICF regarding VMT per Service Population for Yolo County and SACOG region.

Hilliard, Chuck [a]. Engineer. Wood Rodgers, Inc. Sacramento, CA. October 17, 2019—email message to ICF regarding Lower Cache Creek Alt 2A Data Request.

Hilliard, Chuck [b]. Engineer. Wood Rodgers, Inc. Sacramento, CA. November 25, 2019—email message to ICF regarding road controls during construction.

7.3.13 Section 3.13, Public Services, Utilities, and Service Systems

7.3.13.1 Printed References

California Department of Resources Recycling and Recovery (CalRecycle). 2019. *Solid Waste Facilities- Yolo County Central Landfill (57-AA-0001)*. Available: https://www2.calrecycle.ca.gov/SWFacilities/Directory/57-AA-0001/Detail/. Accessed: December 2, 2019.

City of Woodland 2011. *City of Woodland Groundwater Management Plan*. Final. Prepared by West Yost Associates. July. Available: https://www.cityofwoodland.org/DocumentCenter/View/995/Urban-Water-Management-Plan-PDF.pdf. Accessed: December 9, 2019.

City of Woodland 2016. *City of Woodland 2015 Urban Water Management Plan*. Prepared by West Yost Associates. Final. June. Woodland. CA.

City of Woodland. 2017. *General Plan 2035. Public Facilities and Services Element*. Available: https://www.cityofwoodland.org/1000/Documents. Accessed: November 27, 2019. Adopted May 16.

City of Woodland. No date. *Community Choice Energy*. Available: https://www.cityofwoodland.org/486/Community-Choice-Energy. Accessed: November 27, 2019. Adopted May 16.

Yolo County. 2009. *2030 Countywide General Plan: Public Facilities and Services Element, Conservation and Open Space Element*. Available: https://www.yolocounty.org/general-government/general-government-departments/county-administrator/general-plan/adopted-general-plan. Accessed: November 14, 2019.

Yolo County Planning and Public Works Department. 2012. *2030 Countywide Siting Element of the Yolo County Integrated Waste Management Plan*. First Amendment August. Woodland, CA.

Woodland Fire Department. No date. *Automatic and Mutual Aid Agreements*. Available: https://www.cityofwoodland.org/faq.aspx?qid=73. Accessed: December 2, 2019.

7.3.13.2 Personal Communications

Busch, Tim. Principal Utilities Civil Engineer. City of Woodland, Woodland, CA. November 19, 2019—email exchange with Sara Martin at ICF about utilities in the Project area.

7.3.14 Section 3.14, Energy

7.3.14.1 Printed References

California Energy Commission. 2016a. *Electricity Consumption by County*. Energy Consumption Data Management System. Available: http://ecdms.energy.ca.gov/elecbycounty.aspx. Accessed: December 10, 2019.

California Energy Commission. 2016b. *Natural Gas Consumption by County*. Natural Gas Consumption Data Management System. Available: http://ecdms.energy.ca.gov/gasbycounty.aspx. Accessed: December 10, 2019.

California Energy Commission. 2019a. U.S. Per Capita Energy Use by State, 2016. Available: https://ww2.energy.ca.gov/almanac/electricity_data/us_per_capita_electricity.html. Accessed: December 10, 2019.

California Energy Commission. 2019b. *California Retail Fuel Outlet Annual Reporting (CEC-A15) Results*. *California. Board of Equalization Taxable Sales.* Available: https://www.energy.ca.gov/almanac/transportation_data/gasoline/piira_retail_survey.html. Accessed: December 7, 2019.

California Energy Commission. 2019c. *2018 California Annual Retail Fuel Outlet Report Results (CEC-A15) Worksheet. Energy Assessments Division.* July 1. Available: https://www.energy.ca.gov/almanac/transportation_data/gasoline/piira_retail_survey.html. Accessed: December 7, 2019.

City of Woodland. 2017a. *City of Woodland Final 2035 Climate Action Plan*. May.

City of Woodland. 2017b. *City of Woodland General Plan 2035*. *Public Facilities and Services* and *Sustainability, Conservation, and Open Space Elements*. Available: https://www.cityofwoodland.org/1000/Documents. Accessed: December 10, 2019.

The Climate Registry. 2019. *Default Emission Factors*. May.

U.S. Energy Information Administration. 2019. *State Profiles and Energy Estimates, State Total Energy Rankings, 2017*. Available: https://www.eia.gov/state/. Accessed: December 7, 2019.

Valley Clean Energy. No date. *How it Works*. Available: https://valleycleanenergy.org/. Accessed: December 7, 2019.

Yolo County. 2009. *2030 Countywide General Plan*: *Public Facilities and Services and Conservation and Open Space Elements*. Available: https://www.yolocounty.org/general-government/general-government-departments/county-administrator/general-plan/adopted-general-plan. Accessed: December 10, 2019.

Yolo County. 2011. *Yolo County Climate Action Plan*. March.

7.3.14.2 Personal Communications

Hilliard, Chuck (a). Engineer. Wood Rodgers, Inc. Sacramento, CA. January 30, 2020—email message to ICF regarding LCC Construction Assumptions for AQ Modeling.

Hilliard, Chuck (b). Engineer. Wood Rodgers, Inc. Sacramento, CA. February 18, 2020—email message to ICF regarding Construction Assumptions for Structure Raises.

7.3.15 Section 3.15, Aesthetics

Bureau of Land Management. 1980. *Visual Resource Management Program*. Stock No. 024-001-31 00116-6. Washington, DC: U.S. Government Printing Office.

California Department of Transportation. 2017. *List of Eligible and Officially Designated State Scenic Highways*. Available: https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways. Last updated: March 22, 2017. Accessed: November 25, 2019.

City of Woodland. 2017a. *City of Woodland General Plan 2035: Land Use, Community Design, and Historic Preservation Element. Sustainability, Conservation, and Open Space Element*. Available: https://www.cityofwoodland.org/1000/Documents. Accessed: November 26, 2019.

City of Woodland. 2017b. *City of Woodland General Plan 2035: Sustainability, Conservation, and Open Space Element*. Available: https://www.cityofwoodland.org/1000/Documents. Accessed: January 24, 2020.

Federal Highway Administration. 2015. *Guidelines for the Visual Impact Assessment of Highway Projects*. (FHWA-HEP-15-029). U.S. Department of Transportation. Washington, DC. January.

Sunrise Sunset Calendars. 2019. *California, USA Locations - Woodland*. Last revised: 2019. Available: http://www.sunrisesunset.com/USA/California/. Accessed: December 3, 2019.

U.S. Forest Service. 1995. *Landscape Aesthetics: A Handbook for Scenery Management*. (Agriculture Handbook Number 701).

U.S. Soil Conservation Service. 1978. *Procedure to Establish Priorities in Landscape Architecture*. (Technical Release No. 65). Washington, DC.

Yolo County. 2007. *Oak Woodland Conservation and Enhancement Plan*. Prepared by Yolo County Parks and Natural Resources Management Division and Planning, Resources, and Public Works Department. Woodland, CA. Available: https://www.yolocounty.org/home/showdocument?id=4040. Accessed: December 3, 2019.

Yolo County. 2009. *2030 Countywide General Plan: Land Use and Community Character Element*. Available: https://www.yolocounty.org/general-government/general-government-departments/county-administrator/general-plan/adopted-general-plan. Accessed: November 26, 2019.

Yolo County. 2018. *Cache Creek Parkway Plan: Open Space Inventory and Baseline Improvements*. Available: https://www.yolocounty.org/general-government/general-government-departments/county-administrator/county-administrator-divisions/natural-resources/cache-creek-area-plan-ccap/cache-creek-parkway-plan. Accessed: November 14, 2019.

Yolo County. 2019. *Cache Creek Area Plan*. Available: https://www.yolocounty.org/general-government/general-government-departments/county-administrator/county-administrator-divisions/natural-resources/cache-creek-area-plan-ccap. Accessed: November 14, 2019.

7.3.16 Section 3.16, Recreation

City of Woodland. 2002. *City of Woodland Bicycle Transportation Plan*. Available: http://www.cityofwoodland.com/DocumentCenter/View/1015/City-Bikeway-Master-Plan-PDF. Accessed: November 14, 2019.

City of Woodland. 2017. *City of Woodland General Plan 2035: Public Facilities and Services Element*. Available: https://www.cityofwoodland.org/1000/Documents. Accessed: November 14, 2019.

Velocity Island Park. 2019. *Velocity Island Park*. Available: Accessed: https://www.velocityislandpark.com/. November 14, 2019.

YMCA of Superior California. 2019. *Nelson's Grove*. Available: https://www.ymcasuperiorcal.org/locations/corporate/nelson-s-grove/. Accessed: November 14, 2019.

Yolo County. 2009. *2030 Countywide General Plan: Public Facilities and Services Element, Conservation and Open Space Element*. Available: https://www.yolocounty.org/general-government/general-government-departments/county-administrator/general-plan/adopted-general-plan. Accessed: November 14, 2019.

Yolo County. 2013. *Yolo County Bicycle Transportation Plan*. Available: https://www.yolocounty.org/home/showdocument?id=2538. Accessed: November 14, 2019.

Yolo County. 2018. *Cache Creek Parkway Plan: Open Space Inventory and Baseline Improvements*. Available: https://www.yolocounty.org/general-government/general-government-departments/county-administrator/county-administrator-divisions/natural-resources/cache-creek-area-plan-ccap/cache-creek-parkway-plan. Accessed: November 14, 2019.

Yolo County. 2019. *Cache Creek Area Plan*. Available: https://www.yolocounty.org/general-government/general-government-departments/county-administrator/county-administrator-divisions/natural-resources/cache-creek-area-plan-ccap. Accessed: November 14, 2019.

7.3.17 Section 3.17, Population and Housing

California Department of Finance. 2019a. *E-1 Population Estimates for Cities, Counties, and the State – January 1, 2018 and 2019*. Available: http://www.dof.ca.gov/Forecasting/Demographics/Estimates/e-1/.Accessed: November 27, 2019.

California Department of Finance. 2019b. *P-1 State Population Projections (2010-2060), Total Population by County (1-year increments)*. March. Available: http://www.dof.ca.gov/Forecasting/Demographics/Projections/. Accessed: November 27, 2019.

City of Woodland. 2017. *City of Woodland General Plan 2035*. Available: https://www.cityofwoodland.org/DocumentCenter/View/1180/Final-General-Plan-May-16-2017-PDF. Accessed: November 27, 2019.

Sacramento Area Council of Governments. 2012. *Regional Housing Needs Plan 2013–2021*. Available: https://www.sacog.org/sites/main/files/file-attachments/adopted_sacog_rhnp_092012.pdf?1444244658. Accessed: November 27, 2019.

Yolo County. 2013. *Yolo County Housing Element, Yolo County General Plan*. Available: https://www.yolocounty.org/home/showdocument?id=14462. Accessed: November 27, 2019.

7.3.18 Section 3.18, Hazards, Hazardous Materials, and Wildfire

California Department of Forestry and Fire Protection. 2012. *Draft Fire Hazard Severity Zones in LRA.* Resources Assessment Program. Sacramento, CA.

California Department of Forestry and Fire Protection (CAL FIRE) Fire and Resource Assessment Program (FRAP). No date. State Responsibility Area Viewer. Available: https://bof.fire.ca.gov/projects-and-programs/state-responsibility-area-viewer. Accessed: November 21, 2019.

California Department of Forestry and Fire Protection (CAL FIRE) Fire and Resource Assessment Program (FRAP). No date. FHSZ County GIS Data. Available: https://frap.fire.ca.gov/frap-projects/fhsz-in-sra-county-data/. Accessed: November 21, 2019.

City of Woodland. 2017. *City of Woodland General Plan 2035*. *Safety Element*. Adopted May 16. Woodland, CA.

Department of Toxic Substances Control. 2010. Site Screening Assessment. Cache Creek Settling Basin. Prepared for the U.S. Environmental Protection Agency. Sacramento, CA

Department of Toxic Substances Control. 2019a. *Envirostor Search Results*. Available: https://www.envirostor.dtsc.ca.gov/public/map/?myaddress=woodland%2C+cs. Accessed: November 22, 2019.

Department of Toxic Substances Control. 2019b. *Envirostor Search Results for estern Wood Treating, Inc. (57240003)*. Available: https://www.envirostor.dtsc.ca.gov/public/profile_report?global_id=57240003 2/. Accessed: November 22, 2019.

HistoricAerials.com. 2019a. 1968 and 1993 Aerial Photographs. Nationwide Environmental Title Research, LLC. Available: https://www.historicaerials.com/viewer. Accessed: November 19, 2019.

HistoricAerials.com. 2019b. 1993 Aerial Photographs. Nationwide Environmental Title Research, LLC. Available: https://www.historicaerials.com/viewer. Accessed: November 19, 2019.

Sacramento-Yolo Mosquito and Vector Control. 2018. *Integrated Pest Management*. Available: https://www.fightthebite.net/programs/integrated-pest-management/. Accessed: November 22, 2019.

State Water Resources Control Board. 2019a. *Geotracker. Case Summary for Agriform Farm Supply Co.* Available: https://geotracker.waterboards.ca.gov/case_summary?global_id=SLT5S0303071. Accessed: November 22, 2019.

State Water Resources Control Board. 2019b. *Geotracker. Case Summary for Western Wood Treating*. Available: https://geotracker.waterboards.ca.gov/case_summary?global_id=SL0611329797. Accessed: November 22, 2019.

U.S. Environmental Protection Agency. 2019. *Wastes—Hazardous Waste.* Last revised: April 26, 2019. Available: https://www.epa.gov/hw/learn-basics-hazardous-waste. Accessed: December 2, 2019.

Yolo County. 2009. *County of Yolo 2030 Countywide General Plan*. Pages 24-26. Available: https://www.yolocounty.org/home/showdocument?id=14463. Accessed: November 25, 2019.

Yolo County. 2018. *Yolo Operational Area Mutual Aid Plan*. Pages 6 and 10. Available: https://www.yolocounty.org/home/showdocument?id=56221. Accessed: November 25, 2019.

Yolo County Office of Emergency Services. 2019. *Know Your Zone*. Available: https://www.yolocounty.org/general-government/general-government-departments/office-of-emergency-services/emergency-preparedness-resources/evacuation. Accessed: December 3, 2019.

7.4 Chapter 4, Alternatives Analysis

California Department of Fish and Wildlife. 2019. California Natural Diversity Database (CNDDB). 2019. *RareFind 5*. California Department of Fish and Wildlife. Accesed: September 2019.

California Department of Transportation. 2019a. *Caltrans Engineering Manuals. Bridge Construction Records and Procedures Manual, Volume 1*. Available: https://dot.ca.gov/programs/engineering-services/manuals. Accessed: December 2, 2019.

California Department of Transportation. 2019b. Caltrans Engineering Manuals. *Bridge Construction Records and Procedures Manual, Volume 2*. Available: https://dot.ca.gov/programs/engineering-services/manuals. Accessed: December 2, 2019.

California Department of Water Resources. 2014. *Summary of Recent, Historical, and Estimated Potential for Future Land Subsidence in California*.

California Department of Water Resources. 2015. *Report of Findings: Mercury Control Studies for the Cache Creek Settling Basin, Yolo County, California*. Prepared by K. J. Brown, J. Nosacka, and J. Nishida. Division of Flood Management, Flood Maintenance Office, for Central Valley Regional Water Quality Control Board. November 24.

City of Woodland. 2017. *City of Woodland General Plan 2035*. Available: https://www.cityofwoodland.org/DocumentCenter/View/1180/Final-General-Plan-May-16-2017-PDF. Accessed: November 27, 2019.

HistoricAerials.com. 2019. 1993 Aerial Photographs. Nationwide Environmental Title Research, LLC. Available: https://www.historicaerials.com/viewer. Accessed: November 19, 2019.

MBK Engineers. 2016. *Technical Memorandum: Hydraulic Analysis for Lower Cache Creek Feasibility Study Alternatives (Draft)*. Jesse Patchett, P.E., Wood Rodgers, Inc. July 14.

Sawyer, J. O., T. Keeler-Wolf, and J. M. Evens. 2009. *A Manual of California Vegetation, Second Edition*. California Native Plant Society, Sacramento, CA. 1300 pp.

U.S. Army Corps of Engineers, Sacramento District. 2007. *Cache Creek Basin, California, Cache Creek Settling Basin Enlargement Operation & Maintenance Manual.* March.

U.S. Army Corps of Engineers. 2019. *Report Summary – Lower Cache Creek Feasibility Study.* January.

7.5 Chapter 5, Other CEQA Considerations

7.5.1 Printed References

California Department of Finance. 2012. *E-8 Historical Population and Housing Estimates for Cities, Counties, and the State, 2000-2010.* November. Available: http://www.dof.ca.gov/Forecasting/Demographics/Estimates/E-8/2000-10/. Accessed: November 7, 2019.

California Department of Finance. 2019a. *E-4 Population Estimates for Cities, Counties, and the State, 2011-2019 with 2010 Census Benchmark*. May. Available: http://www.dof.ca.gov/Forecasting/Demographics/Estimates/e-4/2010-19/. Accessed: November 7, 2019.

California Department of Finance. 2019b. *P-1 State Population Projections (2010–2060), Total Population by County (1-year increments)*. March. Available: http://www.dof.ca.gov/Forecasting/Demographics/Projections/. Accessed: November 7, 2019.

City of Woodland. 2017a. *City of Woodland General Plan 2035*. *Chapter 2: Land Use, Community Design, and Historic Preservation Element*; Figure 2-1: Concept Diagram; Figure 2-2: Opportunity Sites; Figure 2-5: Land Use Diagram; and Table 2-2: Anticipated Growth Through General Plan Horizon (2035). May 16. Available: https://www.cityofwoodland.org/DocumentCenter/View/1167/02-Land-Use-Community-Design-and-Historic-Preservation-Element-PDF. Accessed: November 21, 2019.

City of Woodland. 2017b. *City of Woodland General Plan 2035*, City of Woodland General Plan. Section 8.3: Flood Hazards and Protection. May 16. Available: https://www.cityofwoodland.org/DocumentCenter/View/1173/08-Safety-Element-PDF. Accessed: November 21, 2019.

City of Woodland. 2020. *2018 Water & Sewer Repair & Replacement, CIP 18-09*. Available: https://www.cityofwoodland.org/950/2018-Water-Sewer-Repair-Replacement-Proj. Accessed: March 4, 2020.

Miller, R. 2018. Summary of Mining Operations, Approved Mining Operations (West to East along Cache Creek). Prepared by R. Miller, Senior Mining Planner for the Yolo County. Available: https://www.yolocounty.org/home/showdocument?id=58661. Accessed: December 11, 2019.

Sacramento Metropolitan Air Quality Management District. 2019. *Guide to Air Quality Assessment in Sacramento County*. Last Revised; July.

Teichert Aggregates. 2019. Project Description, Shifler Mining and Reclamation Project. Available: https://www.yolocounty.org/general-government/general-government-departments/county-administrator/county-administrator-divisions/natural-resources/mining-projects-and-permits/teichert-shifler-application-applicant-submittal. Accessed: December 11, 2019.

Yolo County. 2009. *2030 Countywide General Plan*. *Health and Safety Element*. November 10. Available: https://www.yolocounty.org/home/showdocument?id=14463. Accessed: November 21, 2019.

Yolo County. 2019. Notice for Cache Creek Area Plan 20-Year Update Environmental Impact Report. Available: https://www.yolocounty.org/general-government/general-government-departments/county-administrator/county-administrator-divisions/natural-resources/cache-creek-area-plan-ccap/cache-creek-area-plan-20-year-update-eir. Accessed: December 11, 2019.

Yolo Solano Air Quality Management District. 2007. *Handbook for Assessing and Mitigating Air Quality Impacts*. July.

7.5.2 Personal Communications

Busch, Tim. Principal Utilities Civil Engineer. City of Woodland, Woodland, CA. March 11, 2020—email message to Sara Martin, ICF, regarding completion of the City of Woodland 2018 Water & Sewer Repair & Replacement Project.

Choa, Fred. Principal. Fehr & Peers. Roseville, CA. December 10, 2019—email message to ICF regarding VMT per Service Population for Yolo County and SACOG region.

Reinhardt, Ric. Principal Engineer and Program Manager. MBK Engineers, Sacramento, CA. December 20, 2019—Email to Sara Martin regarding Yolo Bypass Hydraulic Effects.

Appendix A

Technical Memorandum, City of Woodland, Previous Alternatives Analysis Related to the Lower Cache Creek Feasibility Study

TECHNICAL MEMORANDUM

TO: Mr. Tim Busch, PE, City of Woodland

FROM: Mr. Jonathan Kors, PE, Wood Rodgers, Inc.

DATE: August 12, 2019

SUBJECT: City of Woodland, Previous Alternatives Analyses Relating to the Lower Cache Creek Feasibility Study (LCCFS)

INTRODUCTION

The City of Woodland (City) is subject to overland flooding from high flows that leave the right bank of Cache Creek during heavy rain events and that have a return frequency of approximately 8 to 10 years (with a 10- to 12-percent chance of flooding each year). The City, working with the US Army Corps of Engineers (USACE), the Central Valley Flood Protection Board (CVFPB) and the California Department of Water Resources (DWR), has been actively seeking a solution to the flooding in Woodland since the late 1990s. With the project's objectives, purpose and need in mind, a number of alternatives have been evaluated in order to identify an implementable solution that meets local needs and addresses the federal objective of water resources and related land resources planning contributing to national economic development consistent with protecting the Nation's environment. The process for identifying a preferred alternative has required significant evaluation of flood risk reduction benefits and costs for a wide array of alternatives. This process has also involved the consideration of public and agency input on potential adverse impacts to the rural areas north of the City, as well as the environmental implications related to modifications to the Cache Creek Settling Basin.

Partnering with the CVFPB and USACE to construct a project that would reduce flood risk has significant financial benefits to the City because the state and federal governments will fund the majority of the costs if the selected alternative meets federal criteria. To this end, USACE criteria and methodology were heavily relied upon as the basis for evaluating the feasibility of alternatives, especially when assessing the economic feasibility of alternatives. Conforming to USACE planning criteria related to economic feasibility is necessary to justify the investment of federal funds in the project, and it also assures that a project is a sound investment of public funds. This is a principle that is shared by the City and the State of California.

A key element to the USACE planning process is the identification of the National Economic Development (NED) Plan. For water resources projects, the NED Plan is used by the federal government to gauge the extent of federal interest in constructing a project and to establish the size of federal investment in a project. By definition, the NED Plan is the alternative that yields the maximum "net benefits" when evaluated and compared to the No Action alternative and other implementable alternatives. The term "net benefits" is defined as the difference between average annual project benefits and average annual project costs.

Although the City is not obligated to partner with the federal government in the construction of a flood risk reduction project, the City lacks the financial capability to construct a project without significant state and federal funding. As described in the Background section below, Lower Cache Creek has a history of flooding and, on several occasions, there has been a very real threat of flooding to the city of Woodland. Development and implementation of a plan to reduce the risk of flooding is a priority for the City in order to avoid loss of life, property damage, and the economic impacts to a community that result from flooding. It would be very difficult for the City of Woodland to carry out a project of the magnitude required to meet California's Urban Level of Protection (ULOP) standard in the absence of federal funds. Adhering to USACE criteria during the planning phase would afford the City with the best opportunity to leverage local resources using federal and state construction funding. As a result, the availability of federal and state construction funds for a given project is a significant consideration when evaluating project feasibility at the local level.

Over the last few years, the City, CVFPB and USACE, working under a cost-sharing agreement for the Lower Cache Creek Feasibility Study (a re-initiation of the joint City-USACE Feasibility Study conducted in the mid-2000s), have formulated a Preferred Alternative ('Tentatively Selected Plan' in USACE terminology) that is considered to be technically implementable, economically justified, and locally supportable.

The purpose of this Technical Memorandum is to present the broad array of alternatives that have been developed and evaluated in the process of identifying a preferred alternative. This includes an overview of the alternatives and the rationale for why any given alternative was screened out. Some of the previous work results have been documented in various reports or technical memoranda, while others were documented in summary spreadsheets, presentation slide decks, or summary report memoranda. A section containing references of all of the analyses performed on the project alternatives to date is included in this Technical Memorandum.

BACKGROUND

Major improvements of the left and right bank levees of Cache Creek last occurred in 1958 and are described within the USACE Sacramento District Design Memorandum (**Reference 1**). Anticipating a separate state and local project to construct a reservoir upstream of the 1958 improvements (Wilson Valley Dam and Reservoir), the design of the levee improvements was set to a target a flow of 30,000 cubic feet per second (cfs) with three feet of freeboard, which is intended to account for uncertainties in water surface elevations and to contain wind-driven waves. This design flow corresponded to a storm recurrence interval of approximately 10 years (0.1% or 1 in 10 chance of flooding in any given year). However, the Wilson Valley Dam and Reservoir project was never constructed. Over time, regional subsidence, as well as other factors currently under investigation, have increased the risk of flood flows overtopping the levees below the design flow of 30,000 cfs.

Based on topographic mapping data gathered in 2008 and the hydraulic analyses performed in the years thereafter, the results show that Cache Creek begins to overtop the levees at a flow of approximately 26,000 cfs. Ongoing subsidence in the region suggests that channel capacity will further diminish in the future (**Reference 2**). Field observations during the high-water events of February 2019 further indicated that the current channel capacity is less than the original design capacity.

Cache Creek has a history of flooding. In 1958 and 1995, Cache Creek rose to the top of both levees and overflowed its banks toward the cities of Woodland and Davis. In 1983, a breach in the Cache Creek South Levee occurred just upstream of the Cache Creek Settling Basin (CCSB), flooding areas in the eastern part of the area that is now within the city limits of Woodland. In 1995, the overland flow came within one block of Woodland. In 2019, flood fighting at multiple locations prevented levee overtopping and failure.

Without a flood damage reduction project, probable damages to property from future Cache Creek flooding are estimated at approximately $12 million annually. Other losses or adverse effects would continue to include the potential for flood-related loss of life, contamination from sanitary sewage and hazardous materials, and the extended closure of portions of Interstate 5 (I-5) and rail infrastructure east of the City.

Ultimately, the City's goals are to: 1) increase public safety; 2) provide an economically-feasible and environmentally-sensitive solution to alleviate flood-related damages; 3) meet state and federal requirements for urban flood protection; and 4) reduce the cost of flood insurance for the City. Consistent with ULOP guidelines, a design flow corresponding to the 200-year flood event has been targeted by the City for the analyses. The 200-year flood event corresponds to a flow of approximately 64,000 cfs (**Reference 3**).

PREVIOUS STUDIES AND ALTERNATIVES CONSIDERED

Alternatives considered can generally be classified into four over-arching planning efforts of the previous analyses:

A. USACE Lower Cache Creek Feasibility Study (2000-2005)

B. FloodSAFE Yolo Pilot Program (2011)

C. City of Woodland Lower Cache Creek Feasibility Study Alternatives (2012-2016)

D. USACE Lower Cache Creek Feasibility Study (2011-Present)

A description of each of these over-arching planning efforts, the alternatives that were analyzed, and the general conclusions and results of each are summarized below.

A. USACE Lower Cache Creek Feasibility Study (2000-2005)

In 2000, the USACE initiated a Feasibility Study to evaluate Lower Cache Creek under a cost sharing agreement between the USACE, the CVFPB, and the City. The study identified five Flood Risk Management (FRM) alternatives for analysis, and are described in the slide deck entitled *"Lower Cache Creek, Yolo County Woodland Area Feasibility Study"* (**Reference 4**).

The five alternatives (excluding the no-action alternative) were as follows:

A1. Channel Clearing

Under this alternative, the USACE proposed clearing 9.3 miles of the Cache Creek Channel and constructing rock slope protection along some segments of the levee system. This alternative was found to increase the level of protection from 1 in 10 years to 1 in 40 years, but would create a substantial environmental impact that would require costly mitigation. In addition, the alternative did not accomplish the City's goal at the time (before ULOP requirements) of meeting Federal Emergency Management Agency (FEMA) 100-year requirements. The net benefits of this alternative in relation to its total cost resulted in its elimination from further analysis.

A2. Raising Existing Levees and Constructing New Levees

This alternative included raising the Cache Creek Levees a total of 1 to 14 feet for a length of 9.3 miles, replacing existing bridges at I-5, County Road 99W, the Union Pacific Railroad (UPRR) tracks, State Route 113 (SR 113), and County Road 102. This alternative would also include the placement of rock slope protection along some segments of the levee system. This alternative would accomplish ULOP requirements, but it would also cause the loss of valuable riparian habitat which would result in significant environmental mitigation costs. The net benefits of this alternative in relation to its total cost resulted in its elimination from further analysis.

A3. Channelization and Constructing New Levees

This alternative would create 9.3 miles of benched channel, as well as 500- to 700-foot-wide benched terraces at the 20-year water surface elevation on alternating sides of the creek. On the side where the terrace is constructed, the existing levee would be removed to accommodate the new overbank area adjacent to the channel. The levee would be reconstructed beyond the new terrace to match the existing levee height. The UPRR Bridge would be replaced with a new railroad bridge at a higher elevation. This alternative would meet ULOP requirements; however, it would also result in the loss of agricultural lands and a significant (but temporary) loss of riparian habitat. The net benefits of this alternative in relation to its total cost resulted in its elimination from further analysis.

A4. Modified Wide Setback Leve Plan

Under Alternative A4, a new setback levee would be constructed on either one side or the other side of Cache Creek, up to a height of 14 feet. The opposite bank levee would be raised by 1 to 7 feet. The UPRR Bridge would be replaced with a new railroad bridge at a higher elevation. This alternative would meet ULOP requirements, but would also cause the loss of agricultural lands and a significant (but temporary) loss of riparian habitat. While this alternative was included in the final array of alternatives, the net benefits of this alternative in relation to its total cost resulted in the alternative being screened out.

A5. Lower Cache Creek Flood Barrier

This alternative would entail construction of approximately 6.7 miles of new levee (flood barrier), from County Road 98 at the western edge of the City to the Cache Creek Settling Basin West Levee, with a height ranging between 4 and 17 feet. The flood barrier would be located at the northern city limit line along Churchill Downs Road. Primary features would also include a new internal drainage canal within the CCSB, a flood warning system, and the removal of a portion of the CCSB West Levee. This alternative would meet ULOP requirements with minimal impacts to agricultural lands. At the conclusion of the evaluation of alternatives, this alternative was identified as the Tentatively-Selected Plan. This alternative received significant public opposition, as formulated, and was ultimately rejected by the City of Woodland because it failed to address impacts to residences located north of the City (where floodplain depth would increase, but where no mitigation was proposed).

B. FloodSAFE Yolo Pilot Program (2011)

In 2011, FloodSAFE Yolo (a cooperative technical partnership between the Yolo County Flood Control and Water Conservation District, the County of Yolo, and the City of Woodland) undertook a community planning process to develop a preferred conceptual plan to address flood risk on Lower Cache Creek. Developed with the support of the community, the conceptual plan included the construction of elements similar to the USACE NED Plan, and additionally included a channel to direct flows east and around the CCSB via a floodway (**Reference 5**). Once around the CCSB, the floodway would deliver the flows to the Yolo Bypass. While this conceptual plan represented a single alternative (and not an analysis of multiple alternatives), it formed the basis for a number of refinements that were captured in subsequent City studies. A primary element for this conceptual plan was an overall solution that would limit the increase of floodplain depth north of the City (therefore reducing public opposition to the project). Problem identification during the FloodSAFE Yolo Pilot Program served to identify a number of issues relating to existing conditions and future no-action alternatives. These issues included the probable de-accreditation of the CCSB levees by FEMA; the potential for mercury deposits within the CCSB to become disturbed and, therefore, to create an environmental impact; the diminishing sediment trapping efficiency of the CCSB; and the impact of CCSB levees and I-5 infrastructure on the existing floodplain.

B1. Floodway Concept Plan

The Floodway Concept Plan consisted of a levee north of the City that would convey floodwaters south around the CCSB and into the Yolo Bypass by way of a dedicated floodway. This concept plan met ULOP requirements without increasing floodwater depth on properties located north of the barrier. An alternative based on the floodway concept was carried forward for more detailed analyses by the City and USACE in subsequent studies, including the alternatives described below in sections C1, C2, C3, C5.2, and D2 (Alternative 2C in **Table 1**).

C. City of Woodland Alternatives Analyses (2012-2016)

In parallel with the USACE efforts, the City, in partnership with the state, initiated supplemental investigations to address issues of local and state concern along Lower Cache Creek and to provide additional engineering detail. This occurred because the USACE study was operating under the 3x3x3 Rule (studies that would be completed within a target goal of 18 months to no more than three years; that would cost no more than $3M; and that would require three levels of vertical coordination), and the City desired more detail than could be provided in the USACE study under the 3x3x3 Rule. These supplemental analyses helped to inform the USACE study and to identify future local cost sharing requirements. Two alternatives were studied in detail for this effort. Modified Alternative 2A was a variation of the USACE Alternative 2A that added elements to make the plan more representative of the community's interests as well as incorporating changes that would reduce costs. The study also evaluated Alternative 2B, which was the bypass plan that was developed during the FloodSAFE Yolo Study. The study team concluded that a variation of this alternative would be more cost effective by realigning a portion of the CCSB levees in order to avoid the high costs associated with purchasing and removing large and operations-specific warehouses. The USACE identified this as a new alternative and labeled it 2C as described below.

FLOOD RISK REDUCTION ALTERNATIVES ANALYSIS

In the November 2012 report entitled: "*City of Woodland, Lower Cache Creek Feasibility Study, Flood Risk Reduction Alternatives Analysis*" (**Reference 6**), the City re-examined several alternatives that had been previously analyzed. This report also expanded on the FloodSAFE Yolo Floodway concept. To better evaluate the alternatives, more detailed two-dimensional hydraulic modeling was performed to identify the 200-year Cache Creek overflow volumes (allowing facilities associated with the plan to be conceptually sized). The full extents of the alternative plans were divided into six segments. Two primary alternatives focused on floodway routing within Segment 6 (an area of limited width between existing industrial development in the City's north area and the CCSB), and associated cost estimates for the primary features.

C1. Floodway Plan with CCSB Levee Relocation

The overall project centered on a small channel section within Segment 1 that collected the overland agricultural flows entering the City from the west and conveyed them north around the City's northern boundary. Segment 2 consists of a larger channel section (550-foot bottom width) that intercepts flows coming from a potential levee breach at Cache Creek and conveying them east beneath I-5 and the UPRR tracks. Large box culverts or a bridge structure would be present to convey flows beneath the highway and railroad embankment. Segment 3 continues the 550-foot channel between the UPRR tracks and SR 113, with a significant bridge or culvert structure beneath SR 113. Segment 4 continues the channel between SR 113 and County Road 102. Segment 5 consists of a new floodway along the western levee of the CCSB and the industrial area of the City's northern boundary. This segment begins at a location that incorporates a relocation of the levee at the southwest corner of the CCSB and continues the floodway due east to the Yolo Bypass West Levee. This alternative includes the removal of one substantial industrial building (Hewlett Packard), and the partial removal of another industrial building (PGP International). The net benefits of this alternative in relation to its total cost resulted in its elimination from further analysis. However, Alternatives C2 and C3 were developed thereafter as sub-alternatives to C1 in an attempt to reduce costs while achieving similar flood risk reduction benefits.

The C1 Floodway Plan is attached to this Technical Memorandum as **Figure 1**.

C2. Floodway Plan with Industrial Building Relocation

As an alternative to Plan C1, Plan C2 is identical to C1 with the exception of the relocation of the levee comprising the CCSB southwest corner. In Plan C2, two other industrial buildings (in addition to the two buildings impacted as noted under Alternative C1) are also relocated, and the length of the CCSB southwest levee to be relocated was minimized.

Key issues, such as the potential impacts of mercury deposits in the CCSB and the substantial costs associated with relocation of significant industrial buildings in the northern area of the City, were evaluated. Subsequent efforts sought to reduce the cost of the alternative through a number of refinements. In addition, other alternatives were developed for a high-level comparison to the floodway concept plan. These alternatives were captured in a comparative cost analysis spreadsheet (**Reference 7**). These alternatives are further described below. A particular shortcoming of the analysis worth noting was the difficultly in estimating, at a high level, the costs associated with increasing flood depths on properties north of the floodway (i.e., the appropriate mitigation for properties where floodplain depths would increase). Another difficulty in assessing project costs was ascertaining the appropriate cost for removal and relocation of large and operations-specific industrial buildings.

The net benefits of this alternative in relation to its total cost resulted in its elimination from further analysis.

C3. Full Removal and Relocation of the CCSB Southwest Levee Segment

Given the high costs related to removing and relocating industrial buildings in the City's northern industrial area, this alternative sought to eliminate any relocation of the industrial buildings. Instead, it relocated the CCSB Levee to accommodate the floodway corridor. Eliminating the removal of industrial buildings, even after considering the increased earthwork associated with relocating larger portions of the CCSB Levee, was found to be much more economical. This alternative was carried forward in City Alternative C6 and Alternative C7 in the Rail Alternatives Fatal Flaws Analysis (described below) and within the USACE 2011 study as Alternative D2, which later evolved to Alternative 2C.

C4. Diversion of Flows North of Cache Creek

Under Alternative C4, flows in excess of the current channel capacity of Cache Creek would be diverted north towards the Knights Landing Ridge Cut. This alternative was not considered feasible due to the significant costs associated with hydraulic mitigation (mitigation for impacts to properties north of Cache Creek) in relation to net benefits received. Alternative C4 was therefore eliminated from further consideration.

C5.1 Release of Flows North and South of Cache Creek

Alternative C5.1 sought to divert flows both north and south of Cache Creek, which would require land acquisition in the north as well as the construction of most of the previously-identified floodway features in the south. This was a substantially more expensive alternative. Given that the diversion point was downstream of the I-5 and UPRR crossings, these facilities could potentially be overtopped (raising of these facilities was not included in the alternative in order to avoid the costs of these relocations). The net benefits of this alternative in relation to its total cost resulted in its elimination from further analysis.

C5.2 Release of Flows North and South of Cache Creek; I-5 and UPRR Structures Built

Alternative C5.2 was identical to Alternative C5.1, with the addition of new structures that would be provided at the I-5 and UPRR corridors to prevent flooding of the facilities. The net benefits of this alternative in relation to its total cost resulted in its elimination from further analysis.

Alternatives C1 through C5.1, consistent with previous City analyses, focused on developing a solution without increasing water surfaces in the northern part of the City. A summary of the Cost Estimates for these Alternatives is attached as **Appendix A**.

<u>RAIL ALTERNATIVES FATAL FLAWS ANALYSIS</u>

Following the above analyses, the City, working with the City of West Sacramento, the City of Davis and Yolo County, embarked on a series of analyses of the economic benefits associated with relocating existing rail facilities within the cities and the county. Segments of the track relocations traverse existing floodplains, and the new rail embankments could potentially be a part of the flood solution at the city of Woodland. Therefore, the City engaged Wood Rodgers, Inc. (Wood Rodgers) to analyze this potential and to further refine the City's preferred flood solution in a manner that incorporates both elements of the Lower Cache Creek Feasibility Study (Alternative C3) and rail relocation. This analysis was identified as the *City of Woodland, Lower Cache Creek Feasibility Study – Rail Alternatives Fatal Flaws Analysis* (**Reference 8**). This analysis served to further define a combined Cache Creek Flood and Yolo Bypass West Levee solution.

C6. Combined Rail Relocation and Flood Protection – Fatal Flaws Analysis Alternative 1

This alternative envisioned a combined Rail Relocation and Flood Protection Project that incorporated a floodway corridor similar to Alternative C3, while constructing an elevated rail embankment through Conaway Ranch that would serve as a setback levee to the Yolo Bypass West Levee. This alternative would not increase flooding depths on properties located north of the city, but this alternative was also considered to be too expensive by the City and the Sacramento Area Flood Control Agency (SAFCA) (SAFCA was assisting the cities and County in this endeavor) and, therefore, was eliminated from further consideration.

A conceptual plan showing Alternative C6 is attached as **Figure 2**.

C7. Combined Rail Relocation and Flood Protection – Fatal Flaws Analysis Alternative 2

This alternative envisioned a combined Rail Relocation and Flood Protection Project that would capture and convey Cache Creek flows directly into the CCSB (similar to the USACE NED Plan). A conceptual plan showing Alternative C7 is attached as **Figure 3**. The net benefits of this alternative in relation to its total cost resulted in its elimination from further analysis.

<u>RAIL ALTERNATIVE 1 SUPPLEMENTAL ANALYSIS</u>

Both of the rail-associated alternatives (C6 and C7) were considered cost prohibitive and, therefore, a series of cost-saving measures were applied to Alternative C7 in a subsequent rail relocation analysis titled *"City of Woodland, Lower Cache Creek Feasibility Study – Rail Alternative 1 Supplemental Analysis"(October 21, 2015)* (**Reference 9**). (See C8 below).

C8. Reduced-Cost Rail Relocation Alternative – Fatal Flaws Analysis Alternative 3

In this alternative, a series of cost-saving measures was applied to Alternative C7 above, including reducing the size of the flood control conveyance channel (assuming that the excavated channel material could be reused as levee fill material), reducing the embankment height of Segments 1 through 6, reducing the anticipated land acquisition cost, reducing the geometry of the rail/flood control embankment, refining the unit cost applied to borrow material, and removing royalty costs for borrow material.

This analysis helped to illustrate how assumptions regarding material availability and real-estate acquisition play a major factor in the cost estimates for a Cache Creek flood solution. This alternative only slightly increased 200-year water surfaces on some parcels north of the City, while other properties saw a decrease in 200-year water surfaces.

An exhibit showing the features of Alternative C8 is attached as **Figure 4**. The net benefits of this alternative in relation to its total cost resulted in its elimination from further analysis.

D. USACE Lower Cache Creek Feasibility Study (2011 – Present)

In 2011, the USACE restarted the earlier Lower Cache Creek Feasibility Study, with the City and the CVFPB co-sponsoring the LCCFS. An Initial Array of 11 alternatives were developed and analyzed in the report entitled: *"Lower Cache Creek Feasibility Study, Yolo County, California, Report Synopsis", May 2014* (**Reference 10**).

A description of the Initial Array of Alternatives analyzed in the 2014 "*Lower Cache Creek Feasibility Study"* follows below.

STRUCTURAL ALTERNATIVES

D1. North Natural Bypass.

This alternative would allow flow over approximately 30,000 cfs to leave the creek and flow north, either by following the natural floodplain or by being somewhat contained by subtle floodplain contouring. This alternative was similar to the City's alternative C4 above. The bypass would require the purchase of rights-of-way for use as flood easements. There were two different possible alignments for this alternative: one alignment followed the natural floodplain into the Colusa Basin Drain, and the other one followed the natural floodplain into the Knights Landing Ridge Cut; both alignments could be used. Further analysis would probably find that new levees were needed along both sides of I-5 to County Road 94B, depending on the alignment of the bypass. This alternative includes the bridging (using large culverts) of I-5 and possibly the UPRR tracks, as well as strengthening portions of the existing Lower Cache Creek and CCSB Levees in order to reduce breach potential. Further analysis would probably find that limited floodproofing, raising, buyouts (floodplain evacuation), or property relocation would be necessary for structures in the bypass that are impacted by additional flood flows.

D2. South Bypass

This alternative consisted of diverting flows over approximately 30,000 cfs from the right overbank by constructing a bypass, with purchase of rights-of-way (probably flood easements), downstream of County Road 94B and a levee north of Woodland. This alternative includes bridging (using large culverts) I-5, county roads, and possibly the UPRR tracks. There were two different alignment possibilities with this alternative. The first alignment possibility would be a wide bypass alignment removing a portion of the existing CCSB (southern portion of basin), rebuilding the south levee, and expanding the basin geographically in order to mitigate for the portion of the basin that was removed. The intent was to continue agricultural production in this bypass. The second alignment possibility would be a narrow bypass located to the south of the CCBS (and thus not impacting the CCSB). The narrow alignment would require relocation of major warehouses. Both alignments included strengthening portions of the existing Lower Cache Creek and CCSB Levees to reduce breach potential. It was noted that further analysis may find that limited floodproofing, property raise, buyout (floodplain evacuation), or property relocation would be necessary for structures in the bypass that are impacted by additional flow.

D3. West Bypass

This alternative consisted of creating a bypass with easements, diverting flows over approximately 30,000 cfs from Cache Creek at a location downstream of I-505 to an outlet at the Yolo Bypass near Willow Slough and north of the city of Davis. The alignment would cross several county roads, and bridge/culvert improvements might be required. It was noted that further analysis may find that limited floodproofing, raising, buyouts (floodplain evacuation), or property relocation might be necessary for structures in the bypass that are impacted by additional flow.

This alternative was excluded from the focused array of alternatives because it contained measures that were inefficient and/or ineffective to achieve the benefits targeted by the study.

D4. North and South Bypass

This alternative includes two bypasses: a south bypass into the Yolo Bypass and a north bypass following one of two possible alignments. The alternative consists of diverting flows over approximately 30,000 cfs from the right overbank and left overbank by constructing two bypasses downstream of County Road 94B. This alternative also includes the bridging of, or adding culverts to, the UPRR tracks, I-5, and various county roads. It was noted that further analysis could find the possibility that limited floodproofing, property raise, buyout (floodplain evacuation), or property relocation might be necessary for structures in the bypass that are impacted by additional flow.

This alternative was excluded from the focused array of alternatives because it contained measures that were inefficient and/or ineffective to achieve the benefits targeted by the study.

CONTAINMENT ALTERNATIVES

D5. Upstream Detention/Retention

This alternative consisted of constructing a new detention basin/reservoir in the upper watershed or one or more retention basins in the mid-watershed to capture and hold large volumes of water which would thus decrease flow and potential flooding in the downstream communities. The detention/retention basin(s) would probably include levees, buyouts, or relocations of structures. Potential sites included: Bear Creek, which is located approximately 11 miles upstream of its confluence with Cache Creek; Wilson Valley; and Blue Ridge, which is located between Rumsey and Clear Lake along SR 16.

This alternative was excluded from the focused array of alternatives because it contained measures that were inefficient and/or ineffective to achieve the benefits targeted by the study.

D6. Levee Fix in Place

The purpose of this alternative was to contain flood flows within the levee system (where possible), primarily by repairing, strengthening and/or raising existing levees. Levee work would consist of the following: levees east of I-5 would be raised, repaired, or strengthened to the northernmost portion of the CCSB on the right and left banks; levees from the northernmost portion of the CCSB to the Yolo Bypass would be repaired and strengthened in order to mitigate and prevent possible seepage; and new levees would be added upstream of I-5 to prevent overtopping in this location. In areas where the existing levees are eroding, the levee would be slightly set back from the existing location. The alternative would also require either a geographic expansion of the CCSB to accommodate increased inflow of water or a controlled overtopping of levees with a small floodway to the Yolo Bypass. Bridging/culverting of I-5 and the UPRR tracks may be required.

D7. Partial Setback Levees

The purpose of this alternative was to contain flood flows within a new levee system. New levees would be built upstream (west) of I-5 in order to prevent overtopping in this location. Setback levees would be added to the right and left banks in advantageous locations in order to prevent flooding due to the overtopping of the existing levee. Levees from the northernmost portion of the CCSB to the Yolo Bypass would be strengthened in order to mitigate and prevent seepage concerns. Lands or rights-of-way would be required (either easement or fee). The alternative would also require either a geographic expansion of the CCSB to accommodate increased inflow of water, or a controlled overtopping of levees with a small floodway to the Yolo Bypass. Bridging/culverting of I-5 and the UPRR tracks would also be required.

D8. Continuous Setback Levees

The purpose of this alternative was to build setback levees to contain flow within the levee system. Different potential alignments were identified. The first alignment would follow the existing river channel on both the right and left banks. This consisted of approximately 19 miles of levees along the creek and would require increasing the capacity of the CCSB. The second alignment would include a continuous right bank setback levee that would closely follow the alignment of the urban area and could extend south to parallel the Yolo Bypass. This would provide a line of defense for the city of Woodland (similar to the NED Plan presented in the 2004 Feasibility Study). Lands or rights-of-way would be required (either easement or fee). This alignment would have an outlet into the Yolo Bypass and would require new levees upstream to the west of I-5 in order to prevent overtopping in that location. Bridging/culverting of the UPRR tracks may also be required.

This alternative was excluded from the focused array of alternatives because it contained measures that were inefficient and/or ineffective to achieve the benefits targeted by the study.

D9. Yolo Flood Risk Reduction

This alternative consisted of 1) strengthening the left bank levees from I-5 to the CCSB in order to reduce breach potential; 2) building new levees where needed in order to reduce the flood risk in Yolo County; and 3) floodproofing structures and property buyout where needed.

It is noted that Yolo County, in working under a grant from DWR, prepared a Small Communities Flood Risk Reduction (SCFRR) Feasibility Study to evaluate alternatives to address flooding in the town of Yolo. This study is ongoing, and Yolo County will implement a project (if feasible) with support from state grant programs.

<u>NON-STRUCTURAL ALTERNATIVES</u>

D10. Raise, Floodproof, Buyout

This alternative was a combination of non-structural measures aimed at removing or reducing the risk to people and property from the floodplain. This alternative included raising and floodproofing structures, where possible, while other structures would be considered for relocation or buyout.

This alternative was excluded from the focused array of alternatives because it contained measures that were inefficient and/or ineffective to achieve the benefits targeted by the study.

D11. Bridging with Raise, Floodproof, Buyout

This alternative was a combination of non-structural measures with structural roadway improvements. The bridging/culverting of known roadway constriction points, I-5, UPRR, and county roads would alleviate some backwater flow into the urban area. Structures that would still be at risk would be considered for floodproofing or raising in place, where possible. Other structures would be considered for relocation or buyout.

This alternative was excluded from the focused array of alternatives because it contained measures that were inefficient and/or ineffective to achieve the benefits targeted by the study.

Exhibits showing the primary features of the primary structural alternatives in the Initial Array of Alternatives is attached as **Appendix B**.

These alternatives were subsequently further developed and screened to a Focused Array of Alternatives in the document entitled: *"Report Summary, Lower Cache Creek Feasibility Study", January 2019* (**Reference 11**). Following the screening of the Initial Array of Alternatives, the Focused Array of Alternatives included Alternative 1, Alternative 2, Alternative 6, and Alternative 7 (with two sub-alternatives) The following table is developed from the summary report and identifies how the alternatives have been screened to a Final Array of Alternatives.

Table 1. Summary Evaluation of Focused Array of Alternative Plans (Study D)

Focused Alternative	Evaluation Summary	Carried Forward?	Reason
No Action	The No Action Plan is the same as the Without Project Condition.	Yes	
North Bypass (NB)1			
1A	Similar to Alternative 6A. Strengthens right bank existing levees from downstream of I-5 to the CCSB. Includes grade control structure and right bank levee extension upstream of I-5. These features increase the stage upstream of I-5 resulting in floodwaters overtopping the left bank and flowing north toward the Colusa Basin Drain. Includes seepage mitigation and rock bank protection.	No	These alternatives produced similar benefits, but at a higher cost.
1B	Similar to Alternative 1A. Includes the purchase of flowage easements to ensure that the floodwaters are conveyed to the Colusa Basin Drain. Includes seepage mitigation and rock bank protection.	No	
1C	Similar to Alternative 1B. Includes levee construction to convey floodwaters to the Colusa Basin Drain. The areas removed from the flowage easements shown in the North Bypass B (Alternative 1B) version would benefit from the proposed levees. Includes seepage mitigation and rock bank protection.	No	
1D	Similar to Alternative 1A. Replaces the grade control structure and a right bank levee extension upstream of I-5 with a smaller extension of the right bank, a degrading of the left bank levee upstream of I-5, and no strengthening of levees on the right bank of the creek downstream of I-5.	No	
South Bypass (SB)2			
2A	Levee construction to reduce risk of floodwaters entering the urban area of the City of Woodland. The floodwaters would pass into the CCSB through a cut in the western levee of the CCSB. Will include a weir at the cut to reduce the probability that Cache Creek flood waters would escape the CCSB to the west during smaller flood events.	Yes	
2B	Similar to Alternative 2A. Includes additional features to address localized induced stages at I-5 and SR 113, and minimizes impacts to the CCSB by limiting the excavation necessary to move out-of-bank flood waters around to the south of the CCSB and then directly to the Yolo Bypass.	No	Measures incorporated into 2C
2C	Similar to Alternative 2A and incorporates measures from 2B. Includes a channel to convey floodwaters south of the CCSB rather than degrading the levee to accommodate excess flows to the west of the CCSB. Moves a portion of the CCSB east levee further to the east to avoid a large industrial complex. Railroad line along the south side of the CCSB would also require extensive modifications.	No	Not economically justified

Table 1. Summary Evaluation of Focused Array of Alternative Plans (Study D)

Focused Alternative	Evaluation Summary	Carried Forward?	Reason
2D	Similar to Alternative 2C. Strengthens right and left bank levees of Cache Creek along the town of Yolo. Includes seepage mitigation and rock bank protection.	No	Right bank strengthening not economically justified (not enough benefits)
Strengthen In Place (SIP)			
6A	Strengthens the right bank levee of Cache Creek and the left bank of levee along the town of Yolo. Reduces risk of flooding but risk of overtopping remains the same. Includes seepage mitigation and rock bank protection.	No	Does not address overtopping
6B	Increases the height of the right and left bank levees near Yolo, and improves the right bank levee to the CCSB, as well as improves CCSB levees. Would significantly reduce the risk of flooding to the south of Cache Creek. Includes seepage mitigation and rock bank protection.	Yes	
6C	Strengthens or increases the height of both left and right levees along their entire lengths. Remove left bank levee upstream of I-5 and construct a new levee adjacent to I-5, forcing floodwaters north where they are conveyed under I-5 via culverts. Includes seepage mitigation and rock bank protection.	No	Left bank raise not economically justified
Partial Setback Levee			
7A	Construct levees along the right bank only, and extend the right bank levee upstream to prevent right bank floodwaters from overtopping the reach upstream of I-5. The alternative would increase inflows to the CCSB. The outlet weir of the CCSB would be modified to a step weir to accommodate these additional flows.	No	Cost of CCSB TMDL (construction costs)
7B	Similar to 7A. However, instead of increasing the weir capacity of the CCSB, this alternative would include a levee or channel that would divert overbank flow to the north of CCSB and purchase of flowage easements.	No	

Following their analyses of the Focused Array of Alternatives, the USACE carried Alternative 2A and Alternative 6B into the Final Array of Alternatives. Based on a close evaluation of benefits and costs, Alternative 2A was identified as the likely NED Plan, and was ultimately chosen as the Tentatively Selected Plan (TSP) based on net benefits. The USACE Vertical Team endorsed Alternative 2A as the TSP on February 28, 2019.

SELECTION OF CALIFORNIA ENVIRONMENTAL QUALITY ACT ALTERNATIVES

Under the California Environmental Quality Act (CEQA), the requirements regarding the selection of alternatives are laid out in State CEQA Guidelines Section 15126.6. Under these principles, alternatives to be included in an Environmental Impact Report (EIR) must: 1) be potentially feasible, 2) attain most of the basic objectives of the project, and 3) avoid or substantially lessen any of the significant effects of the project. State CEQA Guidelines Section 15126.6 (a) also explains that an EIR is not required to consider alternatives that are infeasible. CEQA defines “feasible” as capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors (California Public Resources Code Section 21061.1; State CEQA Guidelines Section 15364). CEQA does not require that the scope of alternatives included in an EIR be exhaustive, and lead agencies need not consider every conceivable alternative to a project or action.

Because CEQA establishes no legal imperative as to the scope of alternatives to be analyzed in an EIR, there is no set number of alternatives that must be analyzed to fulfill the requirements of CEQA.[1] Rather, as stated in the State CEQA Guidelines and supported by abundant CEQA case law, [2] the range of alternatives required in an EIR is governed by the “rule of reason” that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice (State CEQA Guidelines Section 15126.6, subds. (c), (f)).

For purposes of CEQA, the City chose to carry forward three alternatives for further evaluation in in the Environmental Impact Report (EIR). These include:

- The no action alternative;
- Alternative 2A, as the preferred project, because it is identified as the likely NED plan by the USACE; and
- Alternative 2C, because it was identified as having community support in both the FloodSAFE Yolo Pilot Program in and the City of Woodland Alternatives Analyses.

The City considered whether to carry forward Alternative 6B for further evaluation in the EIR. The USACE concluded that hydraulic effects associated with Alternative 6B would include higher channel velocities and increased peak flows entering the settling basin. Requirements for slope protection would result in the significant loss of riparian habitat. The mitigation for the loss of overall habitat would be very extensive. The loss of riparian habitat would also impact critical habitat for both the western yellow-billed cuckoo and the valley elderberry longhorn beetle.

[1] / See, e.g., *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 566; *Save San Francisco Bay Association v. San Francisco Bay Conservation and Development Commission* (1992) 10 Cal.App.4th 908, 919; *Mann v. Community Redevelopment Agency* (1991) 233 Cal.App.3d 1143, 1151.
[2] / See, e.g., *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 566; *In re Bay-Delta Programmatic Environmental Impact Report Coordinated Proceedings* (2008) 43 Cal.4th 1143; *California Native Plant Soc. v. City of Santa Cruz* (2009) 177 Cal.App.4th 957, 980.

Considering that the USACE has determined there is no federal interest in this alternative, with the significant impacts that would occur to federally-listed endangered species, this alternative was screened out from further consideration on the basis of economic and environmental factors.

The other alternatives documented in this memo have been screened out from consideration in the EIR for the reasons cited above, and were determined to: 1) not be feasible; 2) not attain most of the basic objectives; or 3) not avoid or substantially lessen any of the significant impacts of the project.

Figures showing the layout of Alternative 2A and Alternative 2C are attached as **Figure 5** and **Figure 6**, respectively.

REFERENCES

1. *USACE Sacramento District, Cache Creek Yolo Bypass to High Ground Levee Construction, General Design, December 1958.*
2. *State of California, Natural Resources Agency, Department of Water Resources, Division of Integrated Regional Water Management – Northern Region Office, 2017 GPS Survey of the Sacramento Valley Subsidence Network, December 2018.*
3. *Wood Rodgers, Inc., Lower Cache Creek Feasibility Study, Documentation for Hydraulic Modeling, October 28, 2013.*
4. *USACE, Lower Cache Creek Woodland, CA Area Feasibility Study – Slide Presentation (Date unknown).*
5. *FloodSAFE Yolo, Central Valley Flood Protection Plan, Lower Cache Creek Levees and Cache Creek Settling Basin Projects Descriptions, July 28, 2011.*
6. *Wood Rodgers, Inc., City of Woodland Lower Cache Creek Feasibility Study, Flood Risk Reduction Alternatives Analysis, November 2012.*
7. *Wood Rodgers, Inc., City of Woodland, Lower Cache Creek Feasibility Study, Alternative Flood Risk Reduction Projects, Comparative Opinion of Probable Cost, October 2013.*
8. *Wood Rodgers, Inc., City of Woodland, Lower Cache Creek Feasibility Study – Rail Alternatives Fatal Flaws Analysis, June 5, 2014.*
9. *Wood Rodgers, Inc., City of Woodland, Lower Cache Creek Feasibility Study – Rail Alternative 1 Supplemental Analysis, October 21, 2015*
10. *Lower Cache Creek Feasibility Study, Yolo County, California, Report Synopsis, May 2014*
11. *USACE, Report Summary, Lower Cache Creek Feasibility Study, January 2019.*

FIGURES

Legend

- City of Woodland Urban Limit Line
- Channel Segments
- Channel
- Barrier For Protecting City of Woodland

Levee Categories

- (Category 1) SPFC Levee
- (Category 2) Non-SPFC Levee - Connected
- Urban SPFC Levee

Note:
1. Analysis assumes overbank flooding and levee overtopping only; levee is not breached.
2. The raised barrier protects the flooding with the City of Woodland.
3. The proposed channel north of the City and west of CCSB routes the flow to the Yolo Bypass.

Sources:
1. Based upon the Updated Hydrology developed by U.S. Army Corps of Engineers, "Cache Creek Feasibility Study," 2012.
2. California Department of Water Resources, CVFED Program LiDAR and aerial imagery collected in 2008. Vertical datum is North American Vertical Datum of 1988 (NAVD 88).

NORTH

0 2,500 5,000 10,000
FEET

City of Woodland

LOWER CACHE CREEK FEASIBILITY STUDY
FLOOD RISK REDUCTION ALTERNATIVES ANALYSIS

DESIGN CHANNEL LAYOUT

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS

\\Sacfile01\jobs\Jobs\8491_LCCFS\8491.003_Alternatives_Analysis\GIS\Tasks\Report_Figures\F1_Design_Channel_Segments_20121101_V1.mxd 11/2/2012 10:43:45 AM rsubedi

FIGURE 1

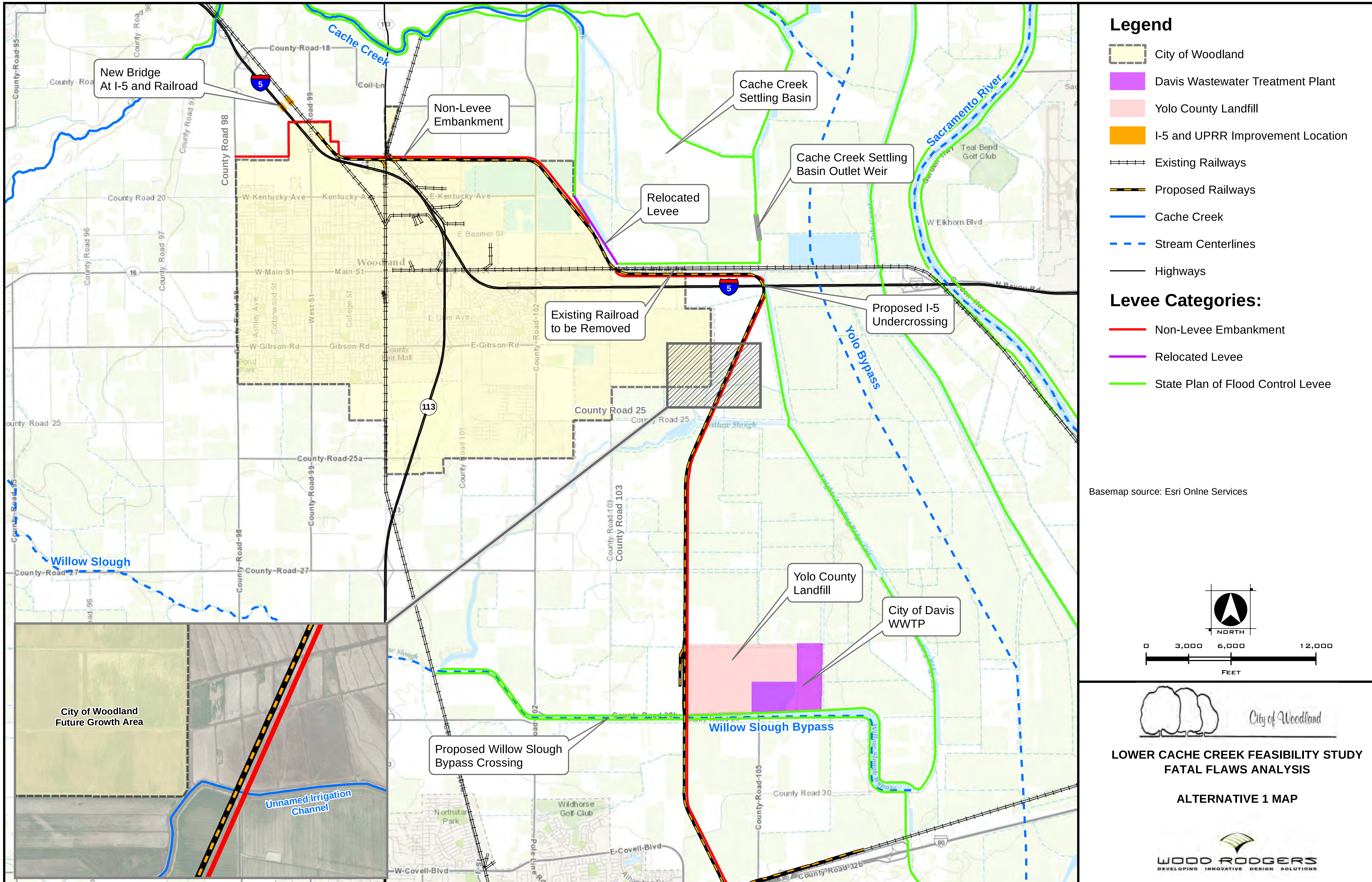

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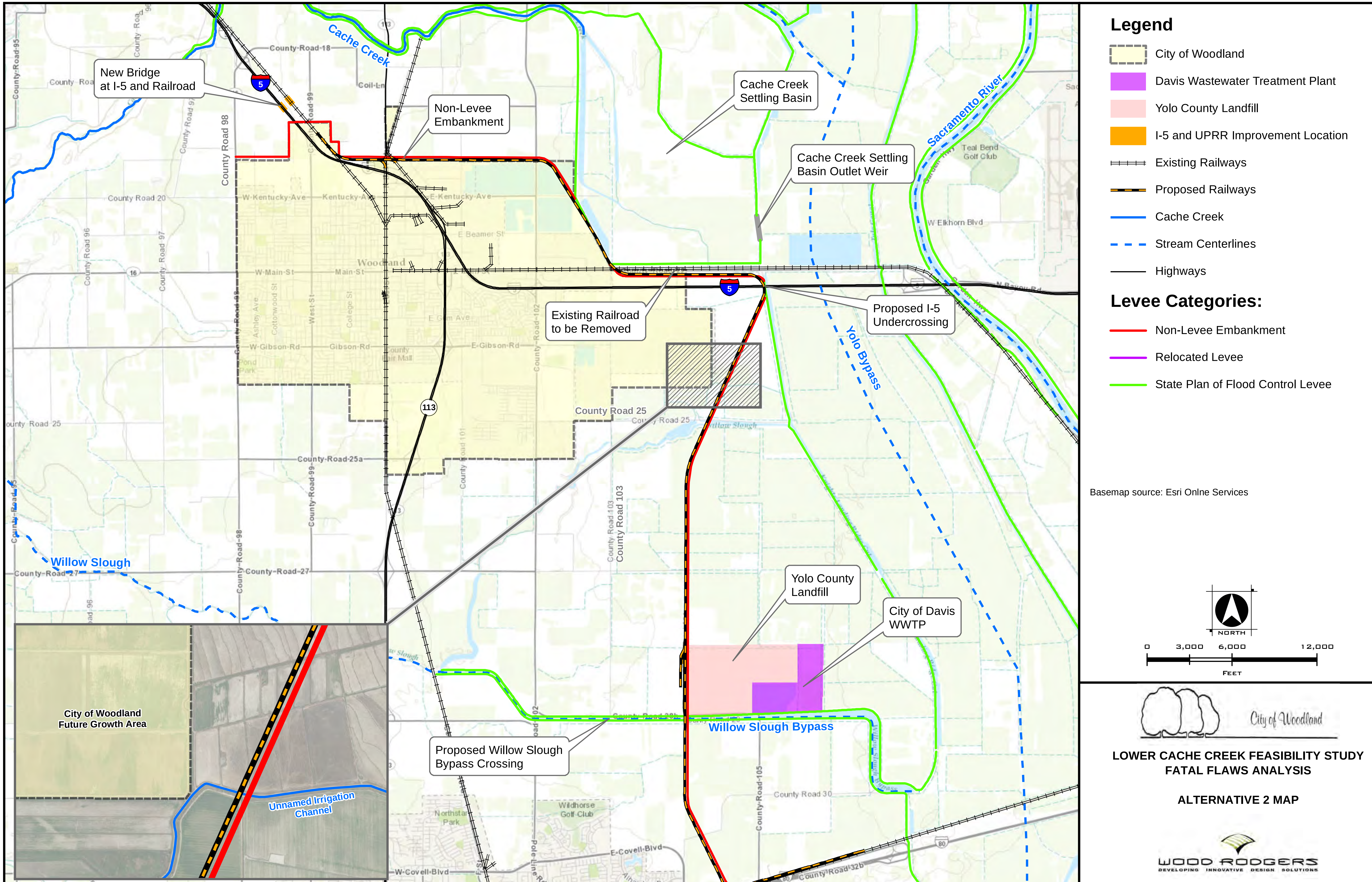
FIGURE 2



City of Woodland

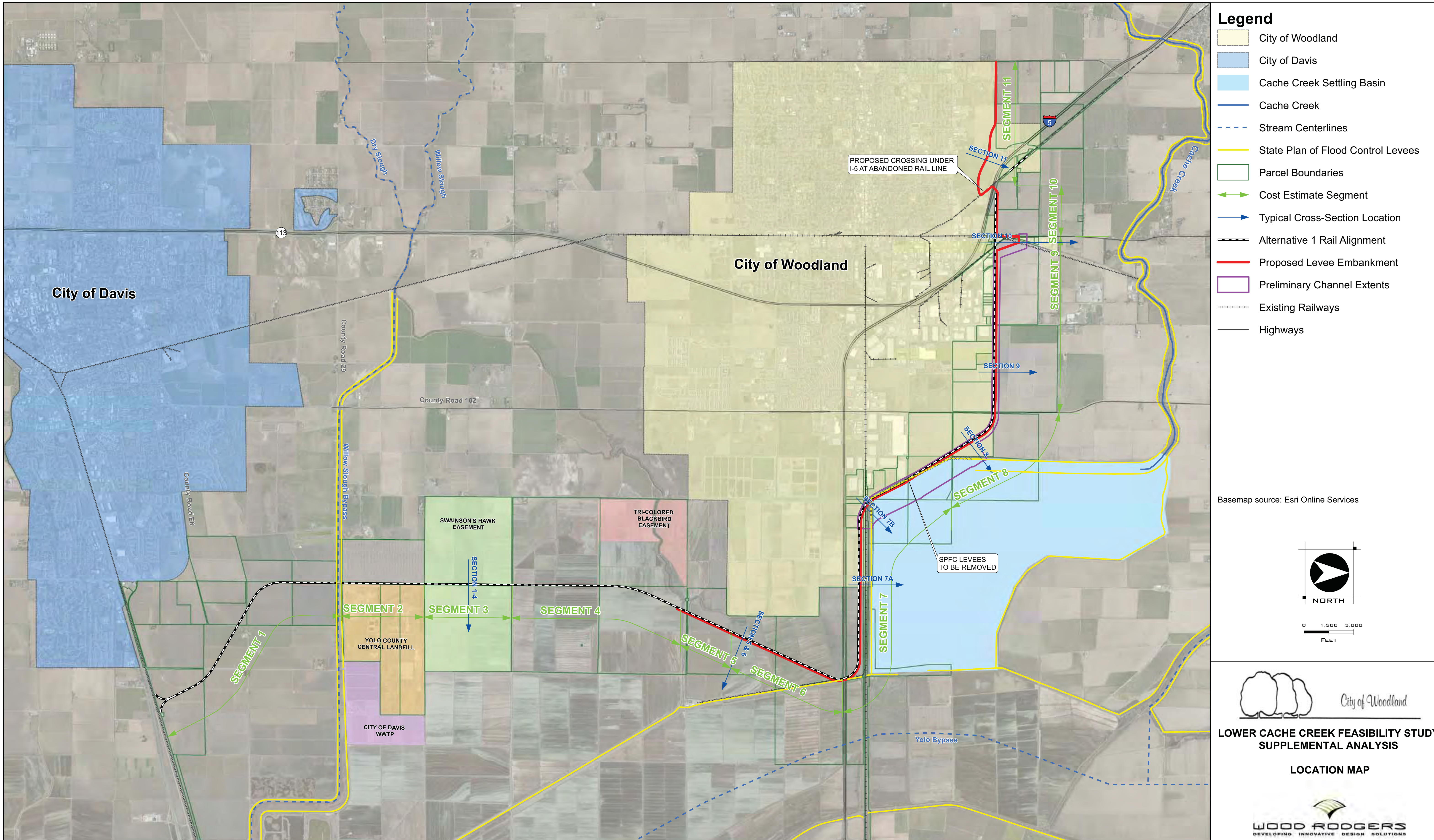
LOWER CACHE CREEK FEASIBILITY STUDY
FATAL FLAWS ANALYSIS

ALTERNATIVE 2 MAP

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS

J:\Jobs\8303\8303.020\GIS\Tasks\Fatal_Flaws_Analysis\Rail_Alignment_Exhibits\Preliminary_Alternative2_Map_20140605_V2.mxd 6/5/2014 12:51:25 PM jpriest

FIGURE 3

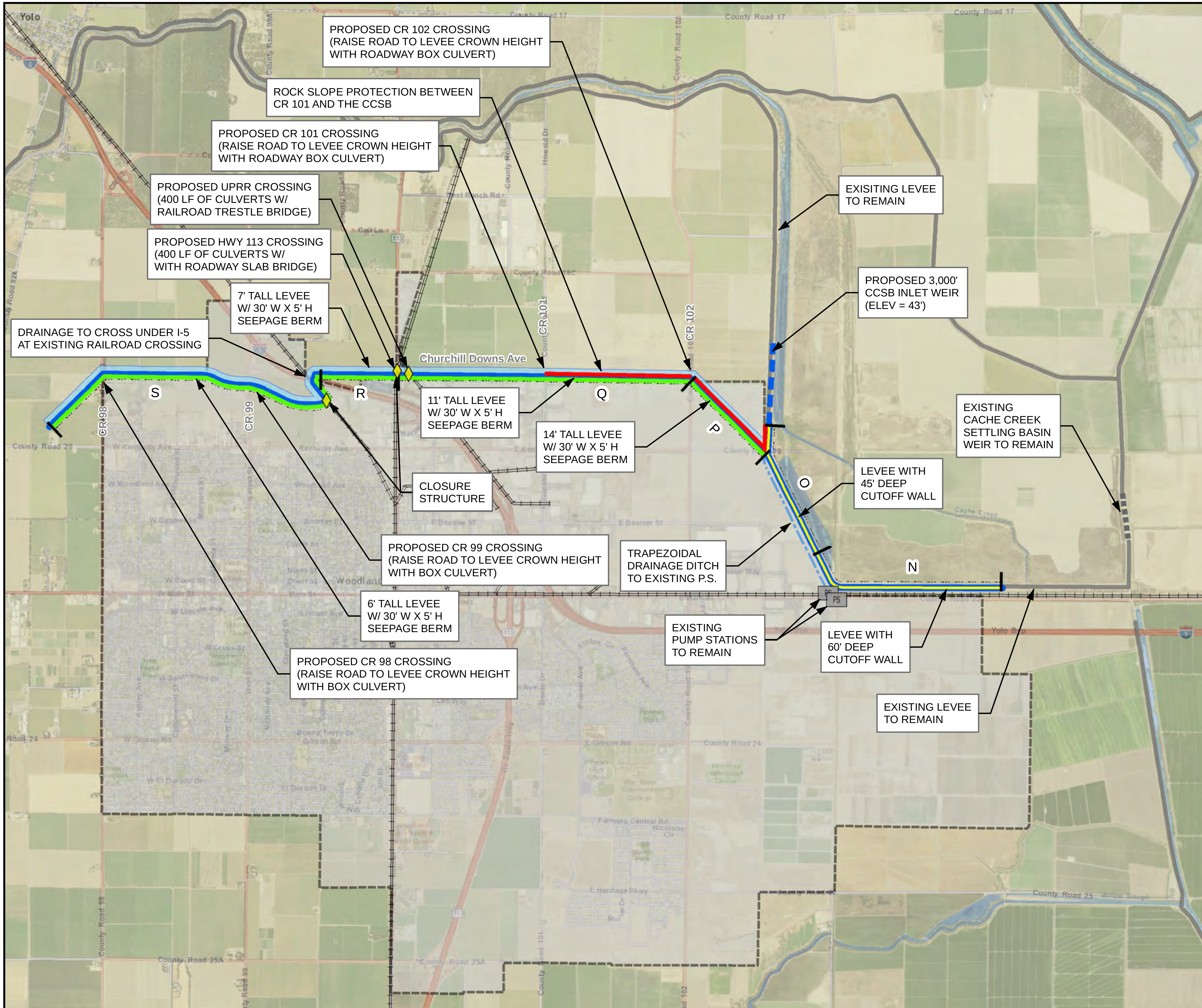


J:\Jobs\8303\8303.020\GIS\Tasks\Supplemental_Analysis_Maps\Figure_2_Alternative1A_Cost_Estimate_Map_20141002_V1.mxd 10/21/2014 9:07:45 AM cmilligan

FIGURE 4

MODIFIED ALTERNATIVE 2A PROJECT MAP

LOWER CACHE CREEK FEASIBILITY STUDY
WOODLAND, CA
AUGUST, 2016



NORTH

0 1,750 3,500
FEET

- Levee
- Cutoff Wall
- Rock Slope Protection
- Seepage Berm
- Proposed Weir
- Existing Weir
- Proposed Drainage Ditch
- Segment Boundary
- Closure Structure
- PS Existing Pump Station
- Proposed Borrow Channel
- Exisiting SPFC Levee
- Existing Railways
- City of Woodland

WOOD RODGERS

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FIGURE 5

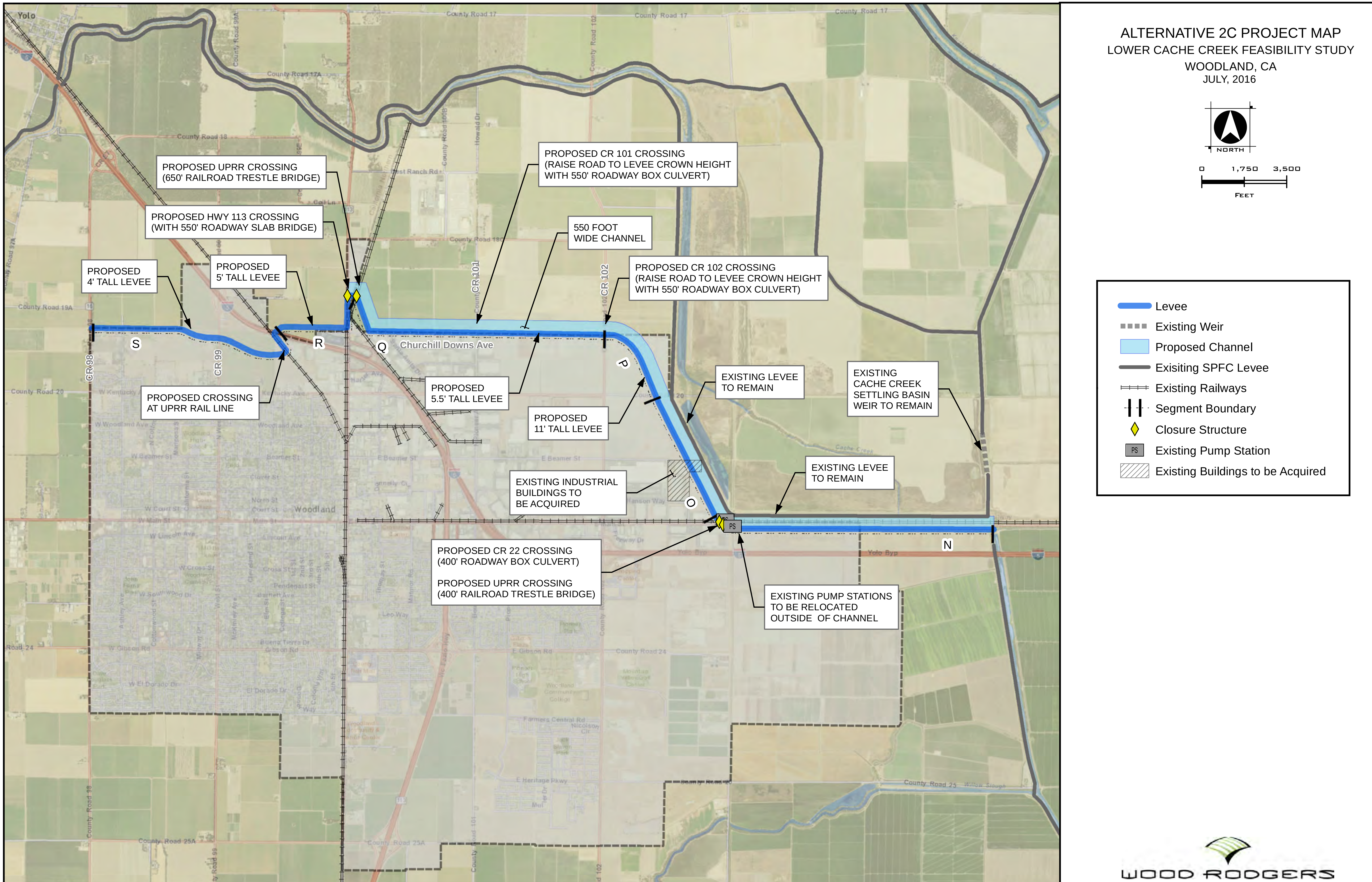

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FIGURE 6

APPENDICES

APPENDIX A

CITY OF WOODLAND
LOWER CACHE CREEK FEASIBILITY STUDY
SUMMARY OF ALTERNATIVES AND PRELIMINARY COSTS

Alternative	Description	Preliminary Total Cost
1	Modify the CCSB southwest levee to accommodate flood control channel, minimize structure and land take at the industrial area located at the exterior southwest corner of the CCSB.	$307,350,000
2	Do not modify the CCSB southwest levee, obtain real estate in the industrial area located at the exterior southwest corner of the CCSB to accommodate flood control channel.	$388,525,000
3	Balance modification of the CCSB southwest levee to minimize land and structure take at the industrial area located at the exterior southwest corner of the CCSB.	$233,234,000
4	Direct all flows in Cache Creek above 30,000 cfs (the bank-full flow) north through a weir at the north levee (36,000 cfs for 200-year flow).	$230,672,000
5	Balance flows above 30,000 cfs to discharge north and south of Cache Creek through weirs at north and south levees (13,000 cfs to north and 26,000 to south for 200-year flow).	$450,704,000

August 2013

Lower Cache Creek Feasibility Study
Alternative Flood Risk Reduction Projects
Comparitive Opinion of Probable Cost

Alternative 1 (Min. Impact to Industrial Area)

Segment	Length	Total Cost (1)	Cost/LF
1	10977	$ 3,125,000	$ 285
2	6399	$ 25,514,000	$ 3,987
3	11272	$ 84,572,000	$ 7,503
4	11752	$ 23,465,000	$ 1,997
5	26300	$ 31,129,000	$ 1,184
6	14859	$ 96,766,000	$ 6,512
7	9510	$ 5,033,000	$ 529
8	-	-	-
9	-	-	-
10	-	-	-
Engineering		$ 21,569,000	
Construction Management		$ 16,177,000	
Total		**$ 307,350,000**	

Major Cost Summary	
Roadways	$ 31,187,000
RailRoads	$ 16,464,000
Earthwork	$ 99,636,000
Land Aquistion	$ 95,245,000
Floodwalls	$ 7,807,000
Environmental	$ 17,265,000
Utilities	$ 2,000,000

Alternative 2 (Min. Impact to Cache Creek Settling Basin)

Segment	Length	Total Cost (1)	Cost/LF
1	10977	$ 3,125,000	$ 285
2	6399	$ 25,514,000	$ 3,987
3	11272	$ 84,572,000	$ 7,503
4	11752	$ 23,465,000	$ 1,997
5	26300	$ 31,129,000	$ 1,184
6	14859	$ 167,973,000	$ 11,304
7	9510	$ 5,033,000	$ 529
8	-	-	-
9	-	-	-
10	-	-	-
Engineering		$ 27,265,000	
Construction Management		$ 20,449,000	
Total		**$ 388,525,000**	

Major Cost Summary	
Roadways	$ 31,187,000
RailRoads	$ 16,464,000
Earthwork	$ 101,896,000
Land Aquistion	$ 184,443,000
Floodwalls	$ 6,821,000
Environmental	$ -
Utilities	$ 2,425,000

Alternative 3 (Max. Impact to Cache Creek Settling Basin. Includes removal of UPRR Shortline)

Segment	Length	Total Cost (1)	Cost/LF
1	13600	$ 2,323,000	$ 171
2	3816	$ 37,020,000	$ 9,701
3	10212	$ 58,399,000	$ 5,719
4	10460	$ 32,288,000	$ 3,087
5	6493	$ 24,932,000	$ 3,840
6	17370	$ 44,595,000	$ 2,567
7	9510	$ 5,033,000	$ 529
8	-	-	-
9	-	-	-
10	-	-	-
Engineering		$ 16,368,000	
Construction Management		$ 12,276,000	
Total		**$ 233,234,000**	

Major Cost Summary	
Roadways	$ 46,227,000
RailRoads	$ 24,039,000
Earthwork	$ 89,890,000
Land Aquistion	$ 31,199,000
Floodwalls	$ 188,000
Environmental	$ 13,047,000
Utilities	$ -

Alternative 4 (36,000 cfs diverted north of City)

Segment	Length	Total Cost (1)	Cost/LF
1	-	-	-
2	-	-	-
3	-	-	-
4	-	-	-
5	-	-	-
6	-	-	-
7	-	-	-
8	-	-	-
9	7750	$ 41,554,000	$ 5,362
10	-	$ 160,789,000	N/A
Engineering		$ 21,569,000	
Construction Management		$ 16,177,000	
Total		**$ 230,672,000**	

Major Cost Summary	
Roadways	$ -
RailRoads	$ -
Earthwork	$ 23,135,000
Land Aquistion	$ 176,489,000
Floodwalls	$ -
Environmental	$ 2,719,000
Utilities	$ -

Alternative 5.1 (13,000 cfs diverted north of City, 26,000 cfs diverted south of City. I-5 and UPRR overtops)

Segment	Length	Total Cost (1)	Cost/LF
1	13600	$ 2,323,000	$ 171
2	3816	$ 37,020,000	$ 9,701
3	10212	$ 58,399,000	$ 5,719
4	10460	$ 32,288,000	$ 3,087
5	6493	$ 24,932,000	$ 3,840
6	17370	$ 44,595,000	$ 2,567
7	9510	$ 5,033,000	$ 529
8	6720	$ 38,355,000	$ 5,708
9	5460	$ 26,633,000	$ 4,878
10	-	$ 125,775,000	N/A
Engineering		$ 31,629,000	
Construction Management		$ 23,722,000	
Total		**$ 450,704,000**	

Major Cost Summary	
Roadways	$ 46,227,000
RailRoads	$ 24,039,000
Earthwork	$ 116,376,000
Land Aquistion	$ 191,223,000
Floodwalls	$ 188,000
Environmental	$ 17,300,000
Utilities	$ -

Alternative 5.2 (13,000 cfs diverted north of City, 26,000 cfs diverted south of City. I-5 and UPPR structures built)

Segment	Length	Total Cost (1)	Cost/LF
1	13600	$ 2,323,000	$ 171
2	3816	$ 37,020,000	$ 9,701
3	10212	$ 58,399,000	$ 5,719
4	10460	$ 32,288,000	$ 3,087
5	6493	$ 24,932,000	$ 3,840
6	17370	$ 44,595,000	$ 2,567
7	9510	$ 5,033,000	$ 529
8	6720	$ 38,355,000	$ 5,708
9	5460	$ 26,633,000	$ 4,878
10	-	$ 267,171,000	N/A
Engineering		$ 42,940,000	
Construction Management		$ 32,205,000	
Total		**$ 611,894,000**	

Major Cost Summary	
Roadways	$ 172,493,000
RailRoads	$ 72,759,000
Earthwork	$ 116,376,000
Land Aquistion	$ 157,633,000
Floodwalls	$ 188,000
Environmental	$ 17,300,000
Utilities	$ -

Note (1): Total Cost value shown includes 25% contingency
Note (2): The same unit costs were applied to all alternatives
Note (3): Preliminary Alternative 5 anaysis uses Alternative 3 design channel values
Note (4): Segment 7 - Slope protection on existing Cache Creek banks
Note (5): Segment 8 - Earthwork and mitigation cost of releases south of Cache Creek
Note (6): Segment 9 - Earthwork and mitigation for Cache Creek north bank cut only
Note (7): Segment 10 - Mitigation costs for increased flooding north of Cache Creek. (Includes I-5 and UPRR as applicable)

SEGMENT IDENTIFICATION EXHIBIT FOR LOWER CACHE CREEK FEASIBILITY STUDY COST ESTIMATE

CITY OF WOODLAND CALIFORNIA

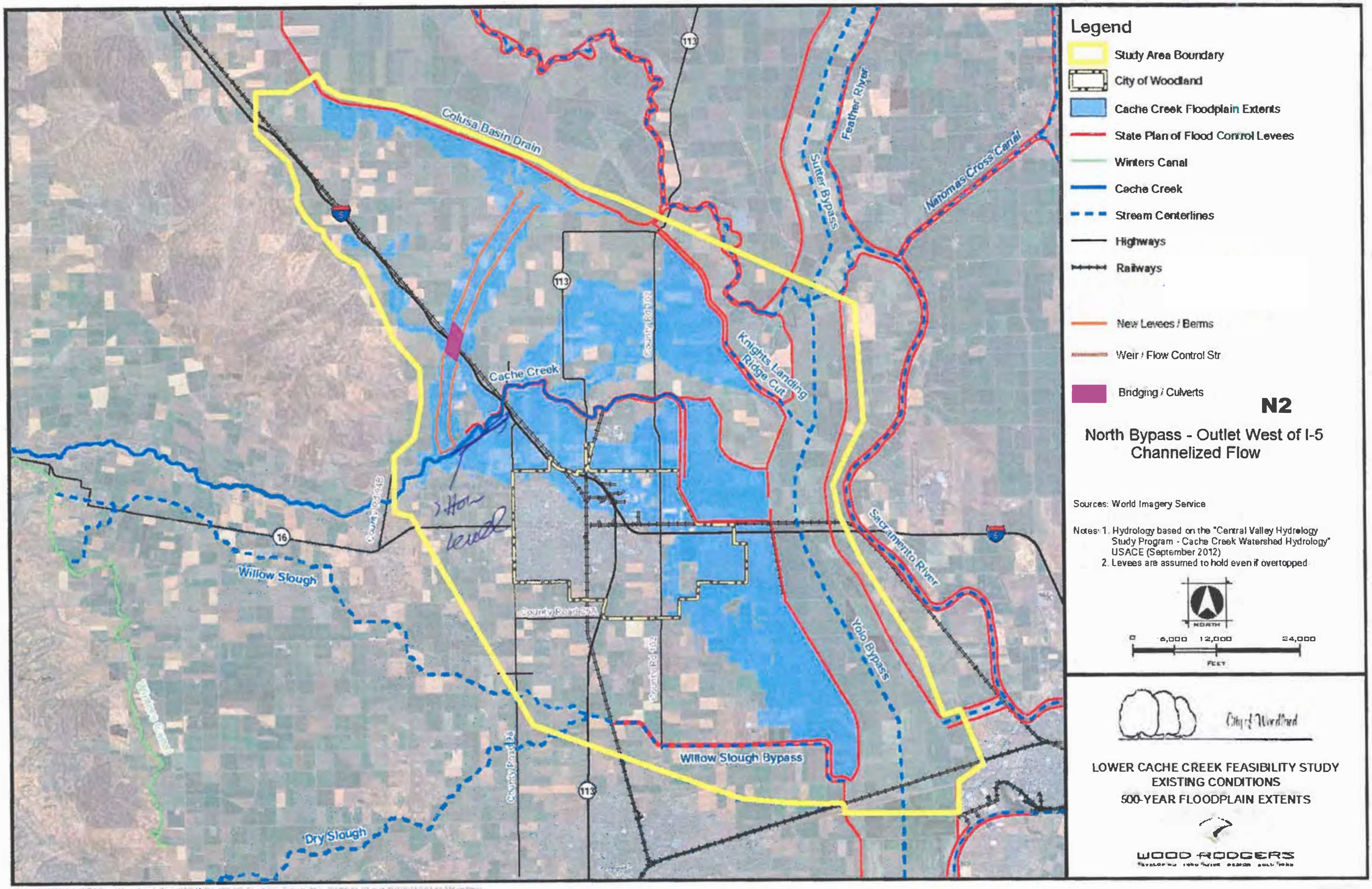
AUGUST 2013

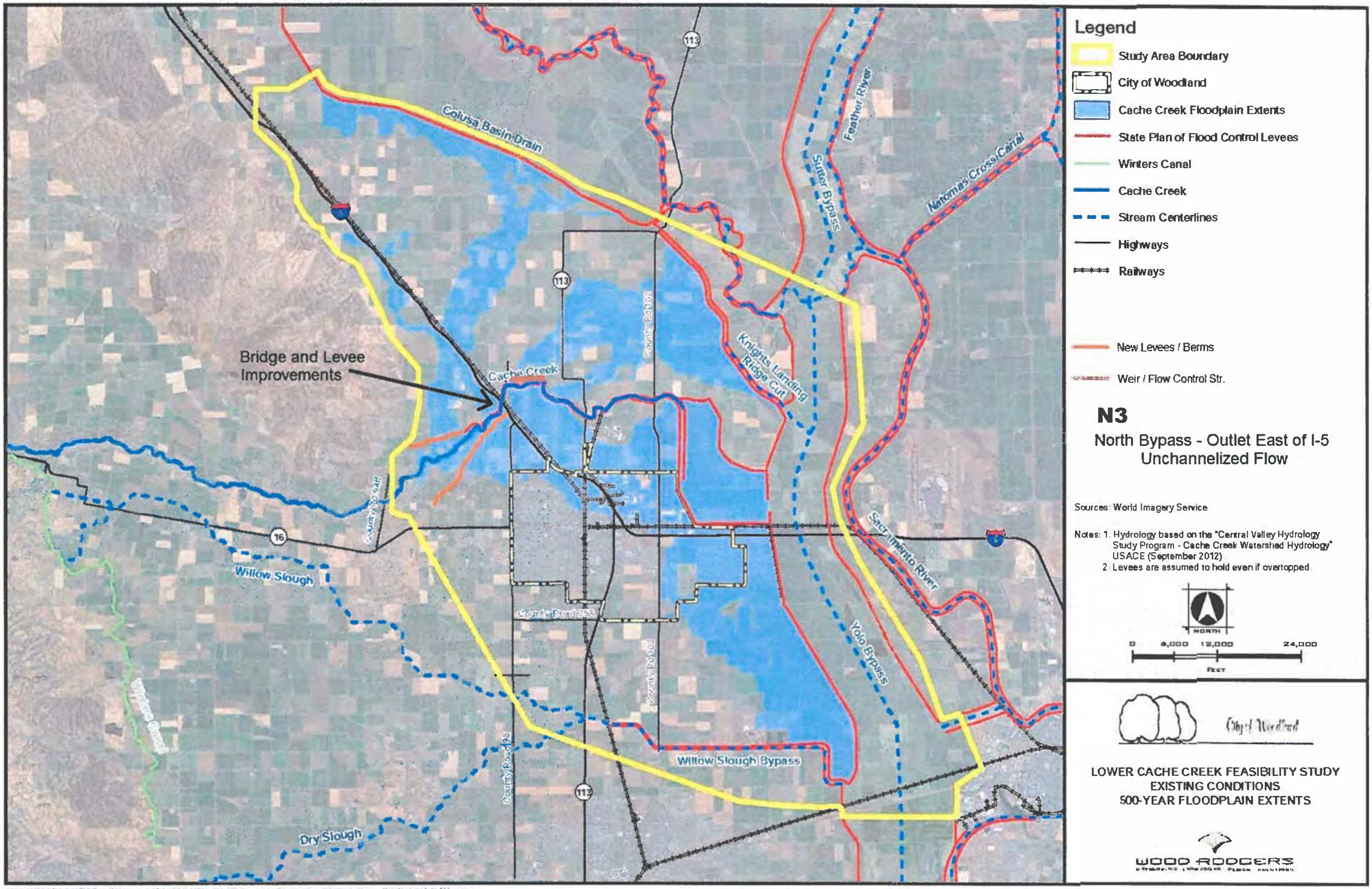
NO SCALE

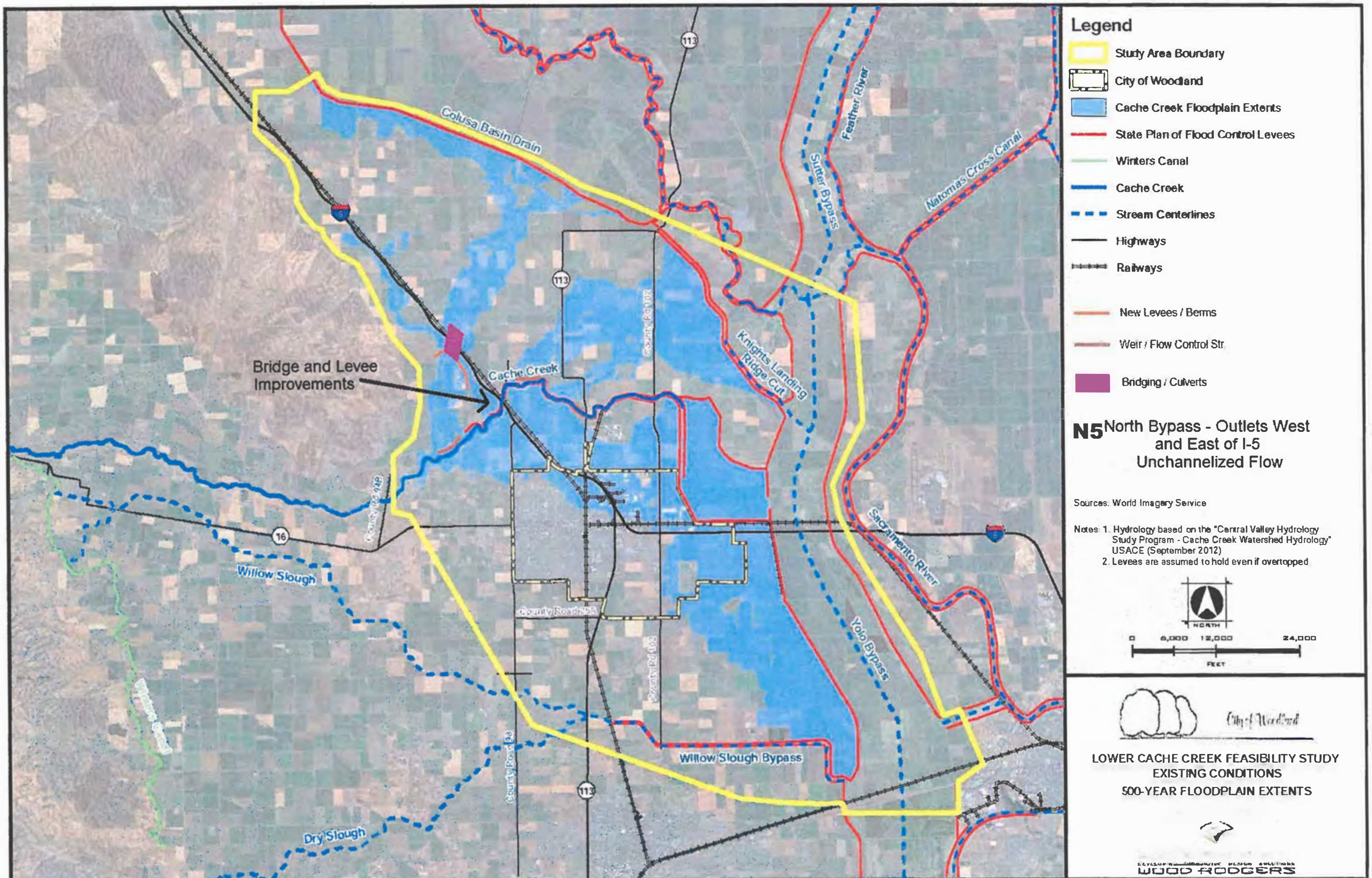
WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS
3301 C St, Bldg. 100-B Tel 916.341.7760
Sacramento, CA 95816 Fax 916.341.7767

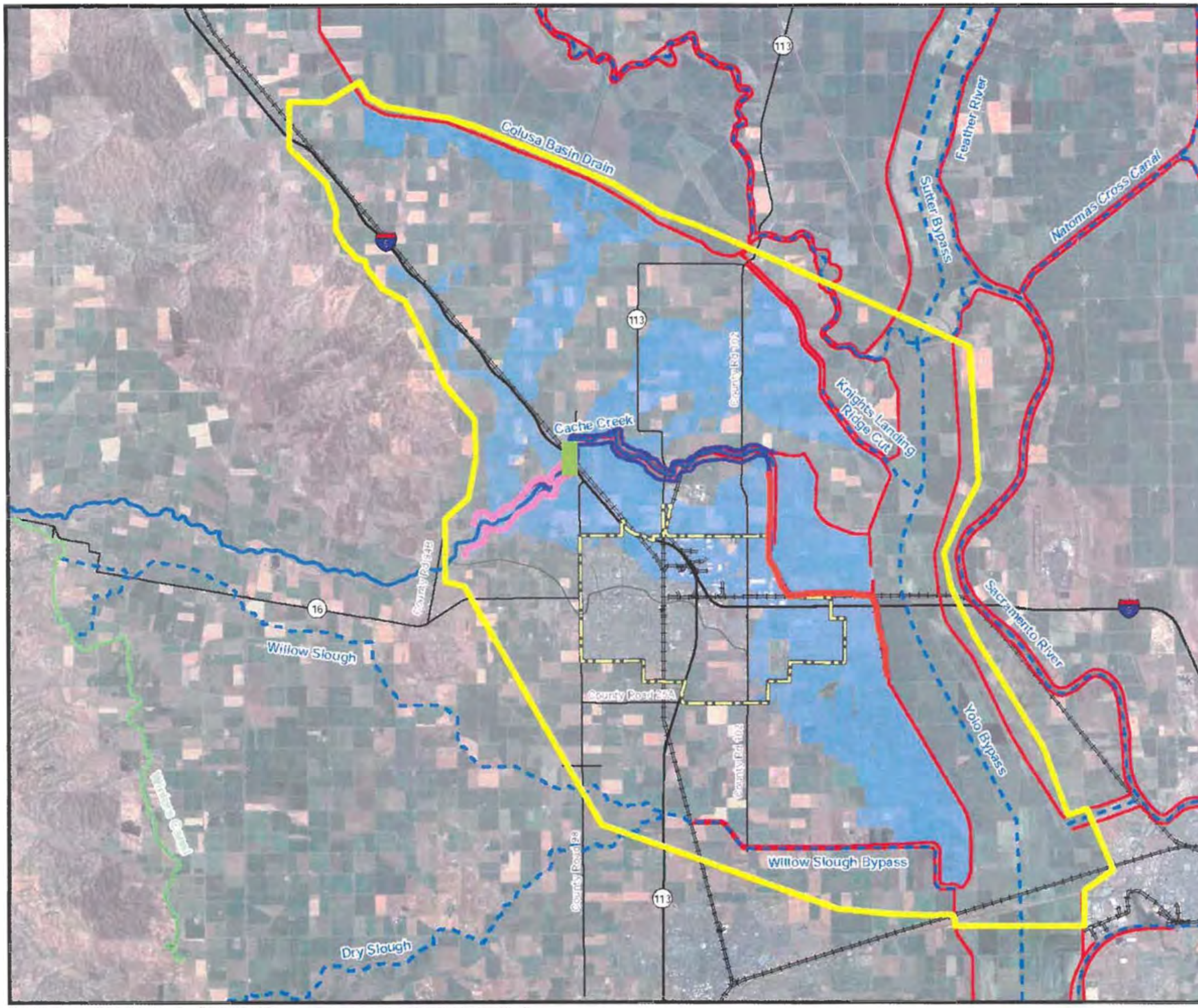
APPENDIX B

APPENDIX B
15 Sheets




Legend
Study Area Boundary
City of Woodland
Cache Creek Floodplain Extents
State Plan of Flood Control Levees
Winters Canal
Cache Creek
Stream Centerlines
Highways
Railways
New Levees / Berms
Weir / Flow Control Str.
N3
North Bypass - Outlet East of I-5
Unchannelized Flow
Sources: World Imagery Service
Notes: 1. Hydrology based on the "Central Valley Hydrology Study Program - Cache Creek Watershed Hydrology" USACE (September 2012)
2. Levees are assumed to hold even if overtopped
NORTH
0 6,000 12,000 24,000
FEET
LOWER CACHE CREEK FEASIBILITY STUDY
EXISTING CONDITIONS
500-YEAR FLOODPLAIN EXTENTS
WOOD RODGERS
Bridge and Levee Improvements
Colusa Basin Drain
Cache Creek
Feather River
Sutter Bypass
Natomas Cross Canal
Knights Landing Ridge Cut
Sacramento River
Yolo Bypass
Willow Slough
Willow Slough Bypass
Dry Slough
County Road 25A
113
16


Legend
Study Area Boundary
City of Woodland
Cache Creek Floodplain Extents
State Plan of Flood Control Levees
Winters Canal
Cache Creek
Stream Centerlines
Highways
Railways
New Levees / Berms
Weir / Flow Control Str.
Bridging / Culverts
N5 North Bypass - Outlets West and East of I-5 Unchannelized Flow
Sources: World Imagery Service
Notes: 1. Hydrology based on the "Central Valley Hydrology Study Program - Cache Creek Watershed Hydrology" USACE (September 2012)
2. Levees are assumed to hold even if overtopped
NORTH
0 6,000 12,000 24,000
FEET
City of Woodland
LOWER CACHE CREEK FEASIBILITY STUDY
EXISTING CONDITIONS
500-YEAR FLOODPLAIN EXTENTS
WOOD RODGERS
Bridge and Levee Improvements
Colusa Basin Drain
Cache Creek
Knights Landing Ridge Cut
Sutter Bypass
Feather River
Natomas Cross Canal
Sacramento River
Yolo Bypass
Willow Slough
Willow Slough Bypass
Dry Slough
County Road 102
County Road 25A
County Road 98
113
16
5



Legend

- Study Area Boundary
- City of Woodland
- Cache Creek Floodplain Extents
- State Plan of Flood Control Levees
- Winters Canal
- Cache Creek
- Stream Centerlines
- Highways
- Railways
- Raise and Repair/Strengthen
- New Levees
- Bridging/Culverts
- Repair/Strengthen Only

L.1 - Fix in Place

Sources: World Imagery Service

Notes: 1. Hydrology based on the "Central Valley Hydrology Study Program - Cache Creek Watershed Hydrology" USACE (September 2012)
2. Levees are assumed to hold even if overtopped.

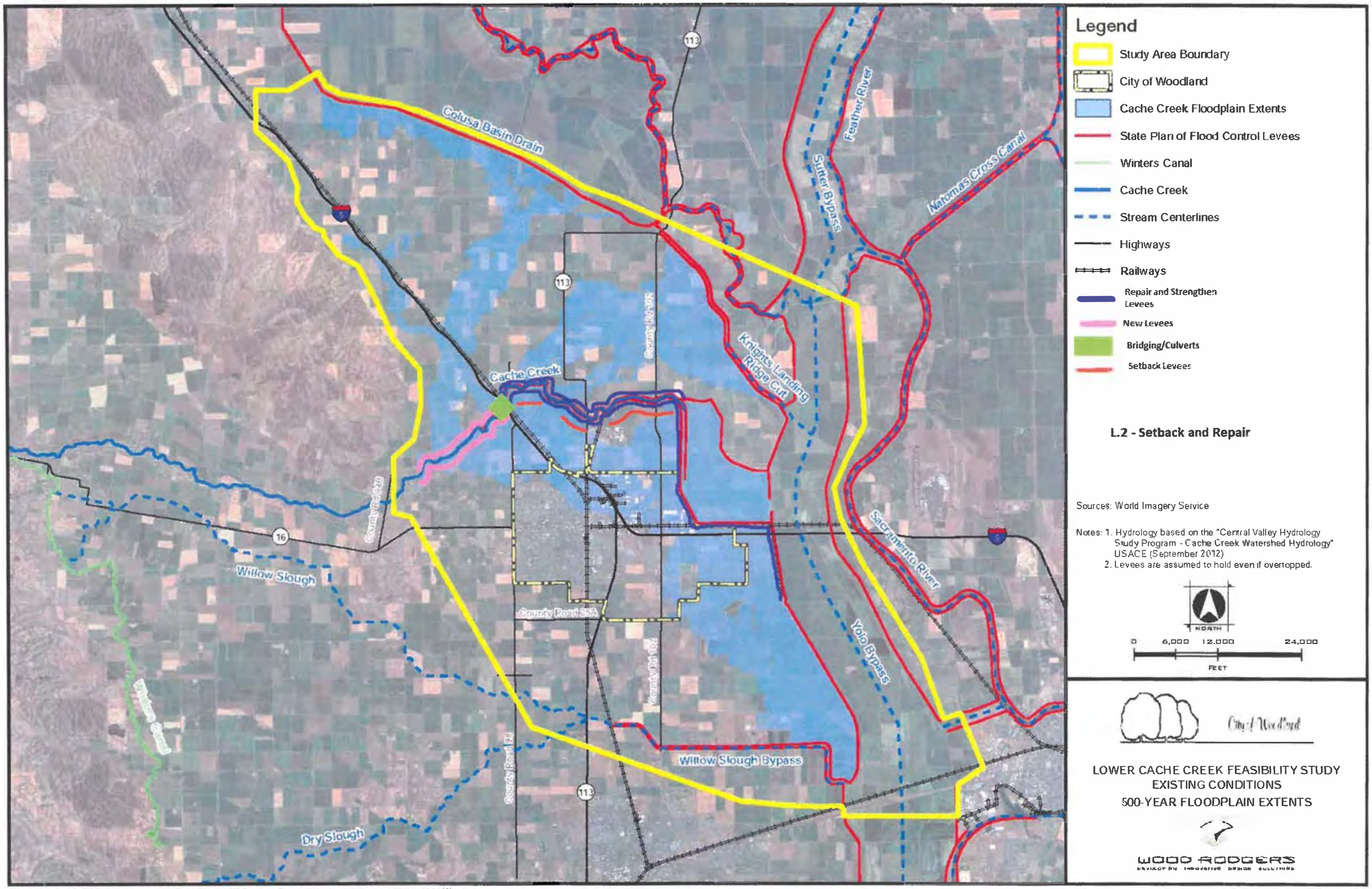
NORTH

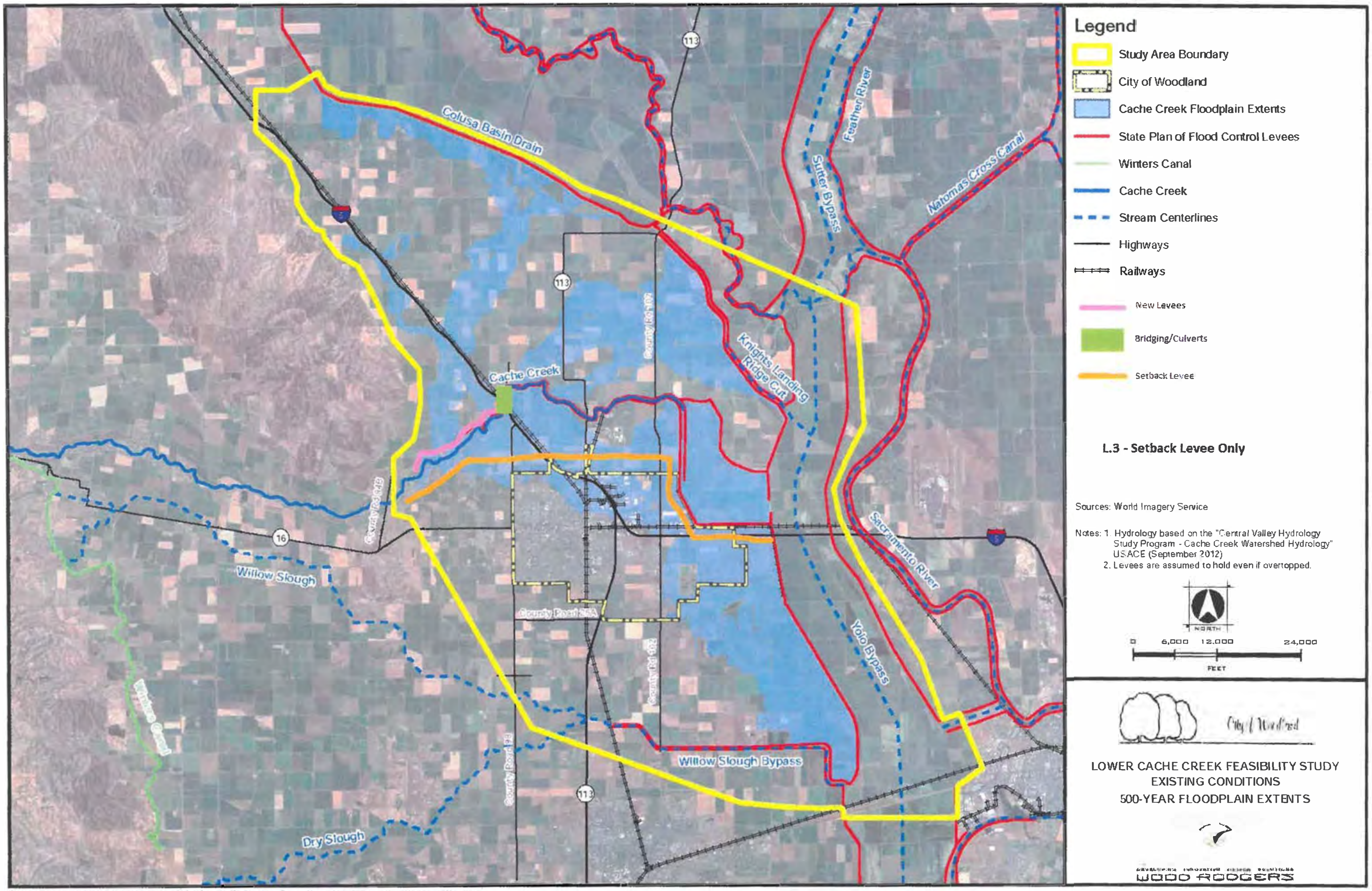
0 6,000 12,000 24,000
FEET

City of Woodland

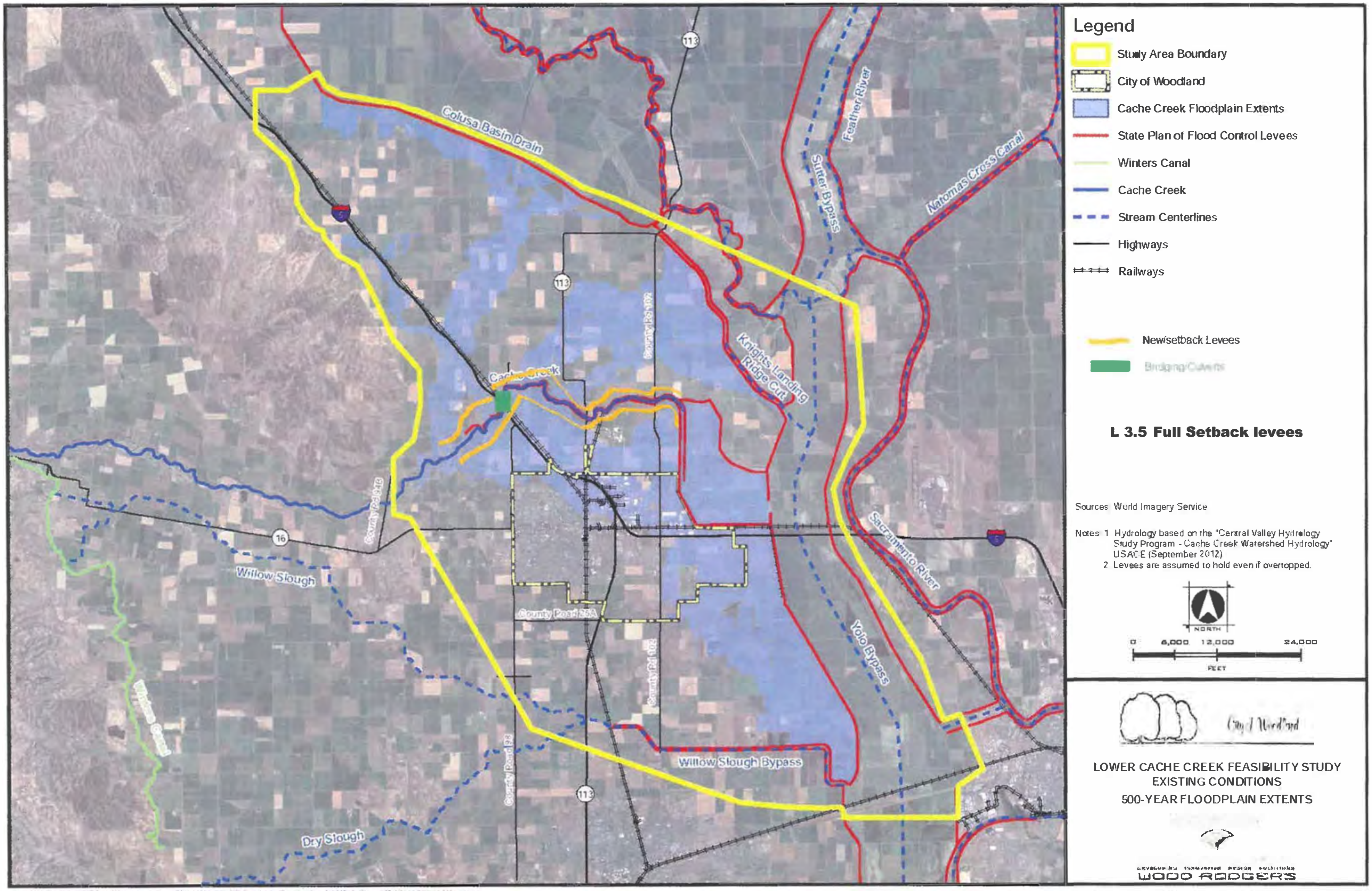
LOWER CACHE CREEK FEASIBILITY STUDY
EXISTING CONDITIONS
500-YEAR FLOODPLAIN EXTENTS

WOOD RODGERS

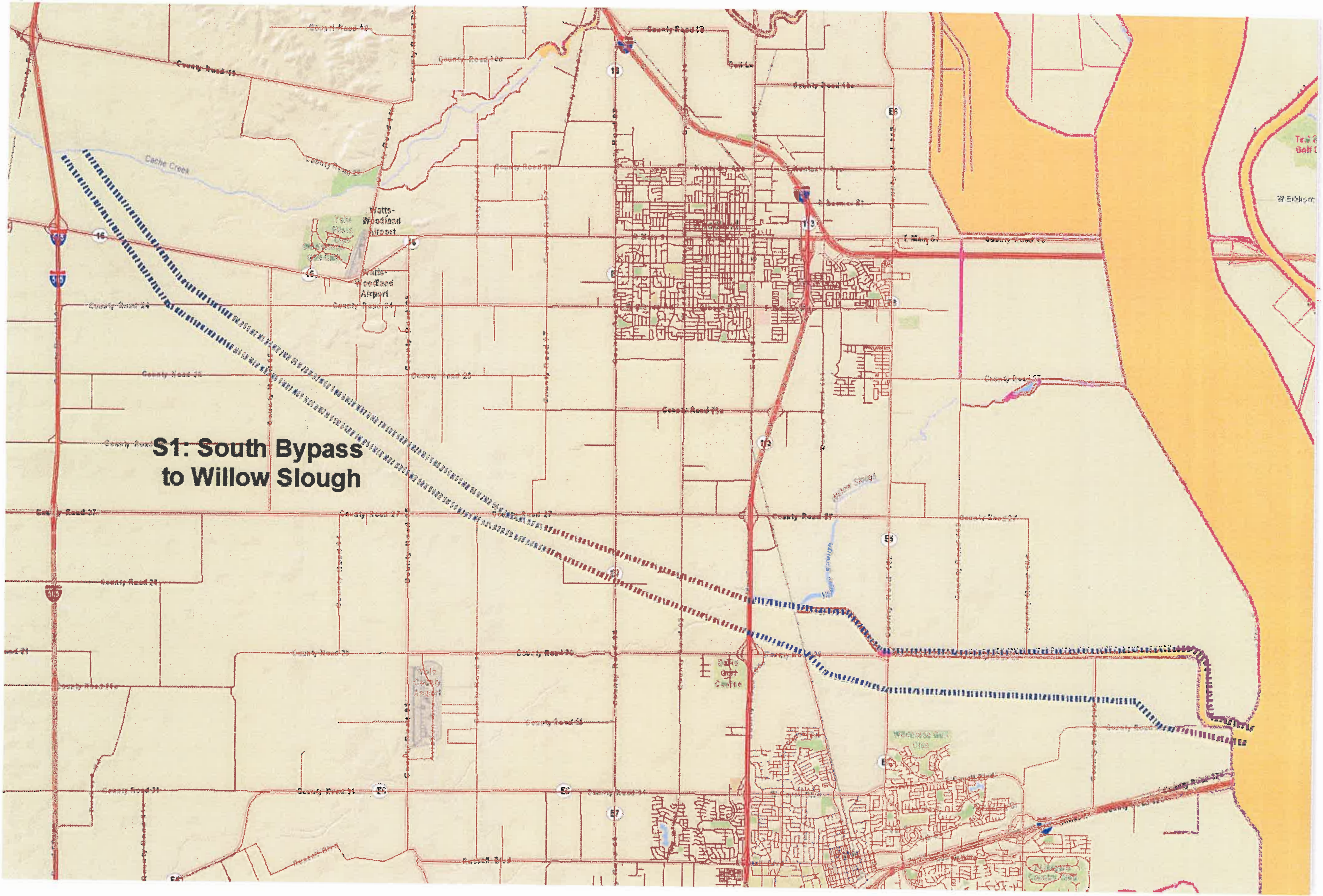

Legend
Study Area Boundary
City of Woodland
Cache Creek Floodplain Extents
State Plan of Flood Control Levees
Winters Canal
Cache Creek
Stream Centerlines
Highways
Railways
Repair and Strengthen Levees
New Levees
Bridging/Culverts
Setback Levees
L.2 - Setback and Repair
Sources: World Imagery Service
Notes: 1. Hydrology based on the "Central Valley Hydrology Study Program - Cache Creek Watershed Hydrology" USACE (September 2012)
2. Levees are assumed to hold even if overtopped.
NORTH
0 6,000 12,000 24,000
FEET
LOWER CACHE CREEK FEASIBILITY STUDY
EXISTING CONDITIONS
500-YEAR FLOODPLAIN EXTENTS
WOOD RODGERS
Colusa Basin Drain
Feather River
Sutter Bypass
Natomas Cross Canal
Knights Landing Ridge Cut
Cache Creek
Willow Slough
County Road 25A
Sacramento River
Yolo Bypass
Willow Slough Bypass
Dry Slough

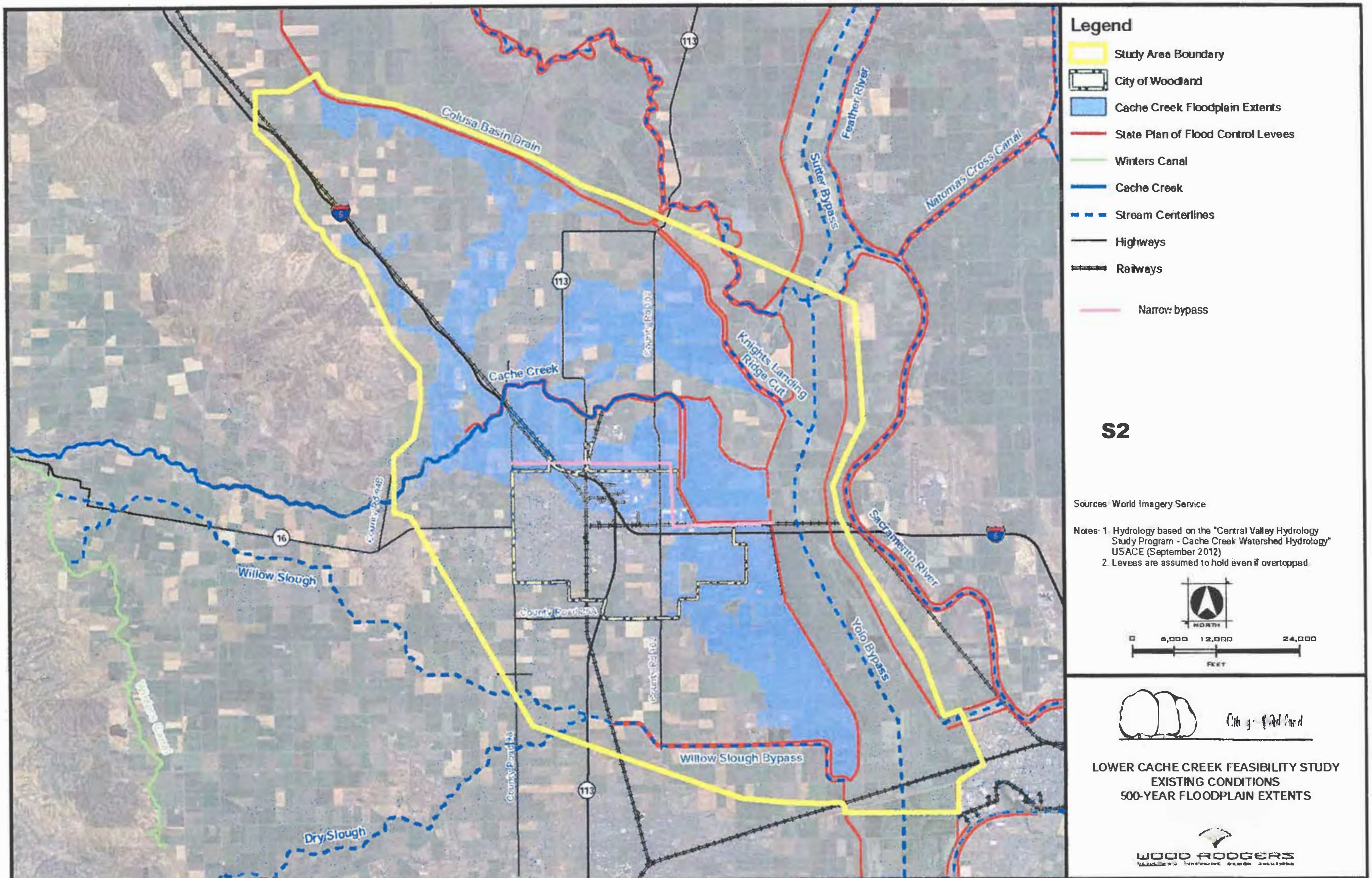


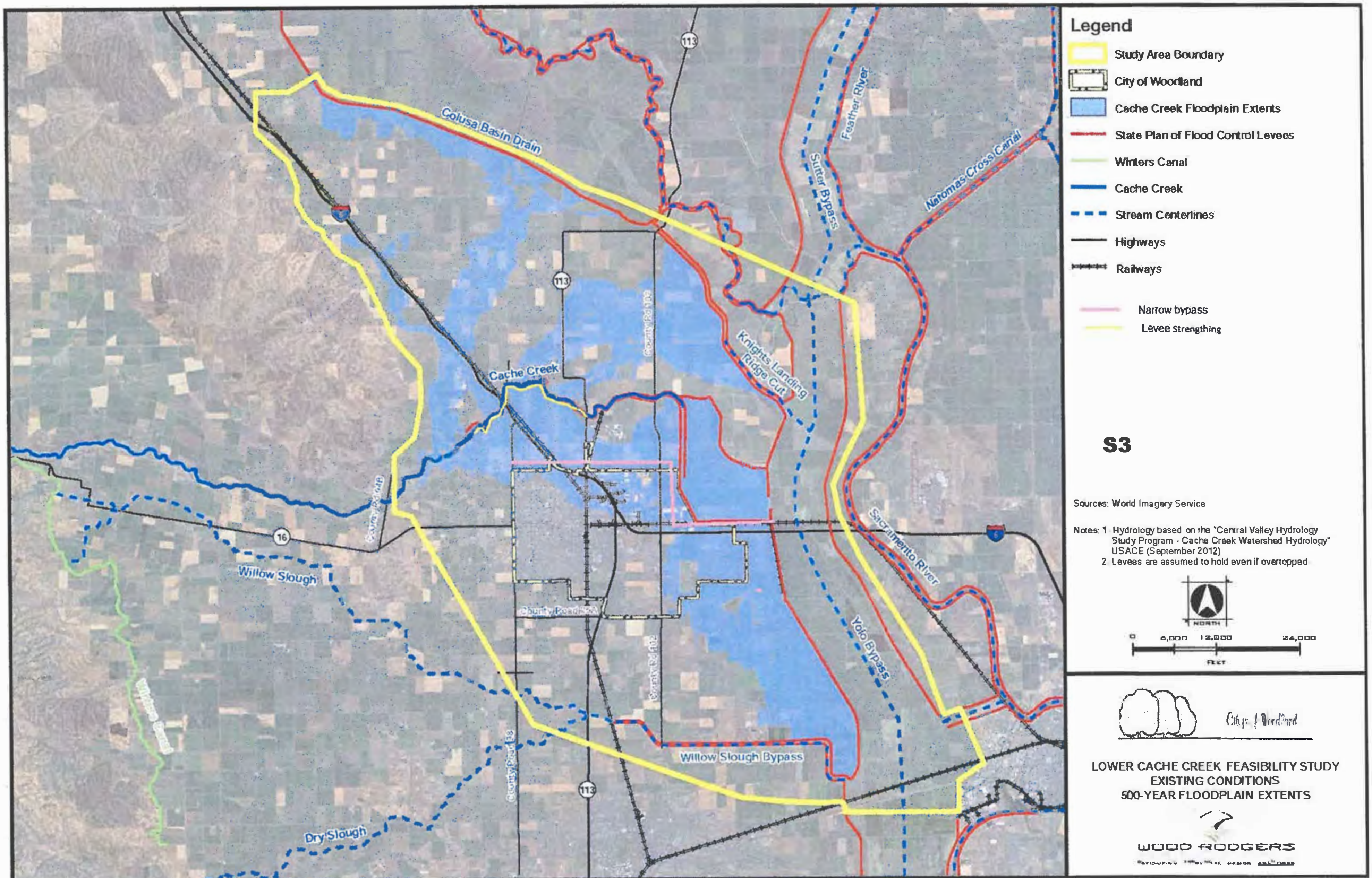
Legend
Study Area Boundary
City of Woodland
Cache Creek Floodplain Extents
State Plan of Flood Control Levees
Winters Canal
Cache Creek
Stream Centerlines
Highways
Railways
New Levees
Bridging/Culverts
Setback Levee
L.3 - Setback Levee Only
Sources: World Imagery Service
Notes: 1. Hydrology based on the "Central Valley Hydrology Study Program - Cache Creek Watershed Hydrology" USACE (September 2012)
2. Levees are assumed to hold even if overtopped.
NORTH
0 6,000 12,000 24,000
FEET
LOWER CACHE CREEK FEASIBILITY STUDY
EXISTING CONDITIONS
500-YEAR FLOODPLAIN EXTENTS
WOOD RODGERS
Colusa Basin Drain
Feather River
Sutter Bypass
Natomas Cross Canal
Knights Landing Ridge Cut
Cache Creek
Willow Slough
Sacramento River
Yolo Bypass
County Road 25A
Willow Slough Bypass
Dry Slough



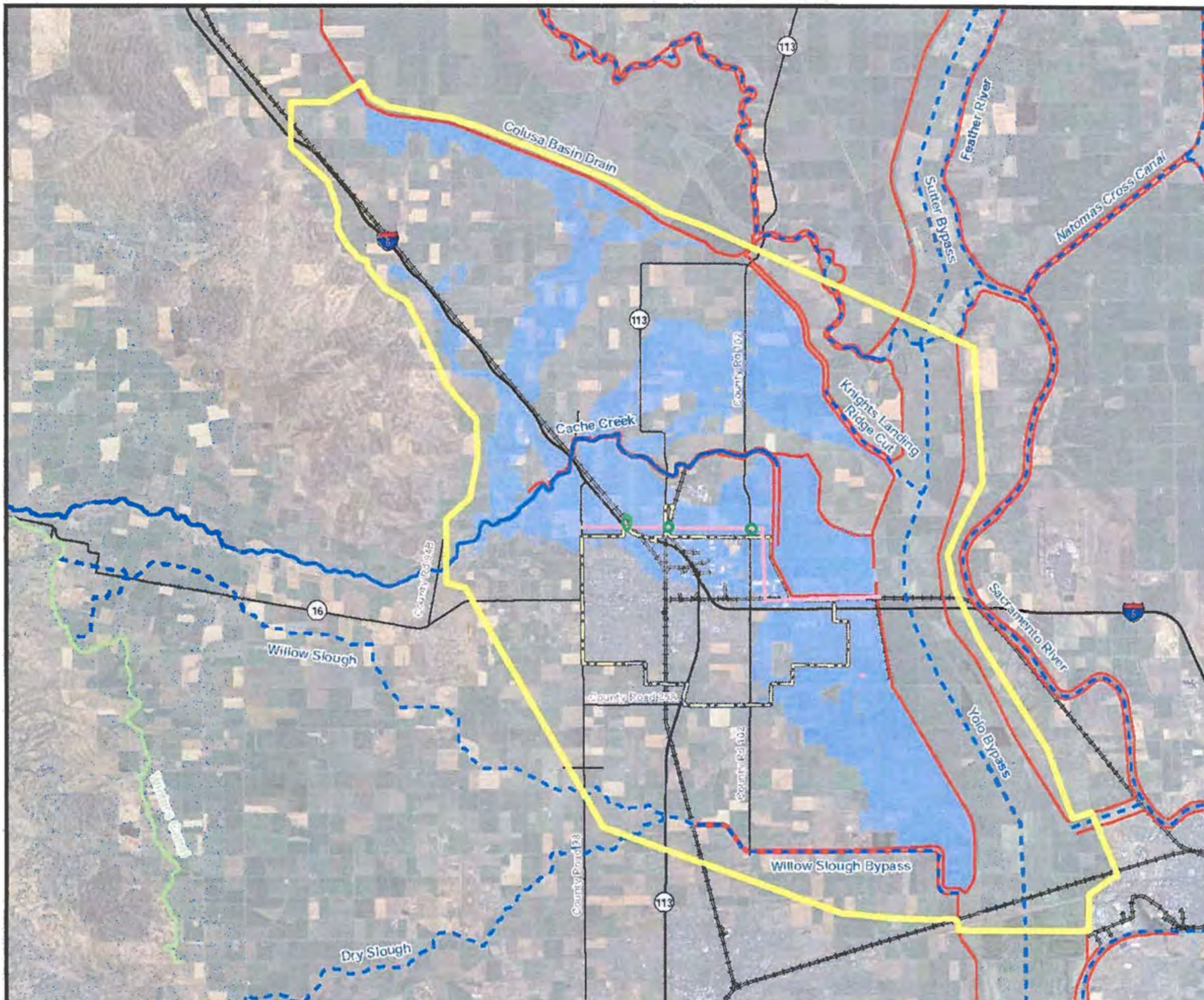
Legend
Study Area Boundary
City of Woodland
Cache Creek Floodplain Extents
State Plan of Flood Control Levees
Winters Canal
Cache Creek
Stream Centerlines
Highways
Railways
New/setback Levees
L 3.5 Full Setback levees
Sources: World Imagery Service
Notes: 1. Hydrology based on the "Central Valley Hydrology Study Program - Cache Creek Watershed Hydrology" USACE (September 2012)
2. Levees are assumed to hold even if overtopped.
NORTH
0 6,000 12,000 24,000
FEET
LOWER CACHE CREEK FEASIBILITY STUDY
EXISTING CONDITIONS
500-YEAR FLOODPLAIN EXTENTS
WOOD RODGERS
Colusa Basin Drain
Sutter Bypass
Feather River
Natomas Cross Canal
Knights Landing Ridge Cut
Cache Creek
County Rd 102
County Rd 98
County Road 25A
County Road 98
Willow Slough
Willow Slough Bypass
Dry Slough
Sacramento River
Yolo Bypass


S1: South Bypass
to Willow Slough
Cache Creek
Watts-Woodland Airport
County Road 24
County Road 25
County Road 27
County Road 28
County Road 31
Russell Blvd
Davis Golf Course


Legend
Study Area Boundary
City of Woodland
Cache Creek Floodplain Extents
State Plan of Flood Control Levees
Winters Canal
Cache Creek
Stream Centerlines
Highways
Railways
Narrow bypass
S2
Sources: World Imagery Service
Notes: 1. Hydrology based on the "Central Valley Hydrology Study Program - Cache Creek Watershed Hydrology" USACE (September 2012)
2. Levees are assumed to hold even if overtopped
NORTH
0 6,000 12,000 24,000
FEET
LOWER CACHE CREEK FEASIBILITY STUDY
EXISTING CONDITIONS
500-YEAR FLOODPLAIN EXTENTS
WOOD RODGERS
Colusa Basin Drain
Feather River
Sutter Bypass
Natomas Cross Canal
Knights Landing Ridge Cut
Cache Creek
Willow Slough
Yolo Bypass
Sacramento River
Willow Slough Bypass
Dry Slough
113
16
5



Colusa Basin Drain
Feather River
Sutter Bypass
Natomas Cross Canal
Cache Creek
Knights Landing Ridge Cut
Willow Slough
County Road 25A
Sacramento River
Yolo Bypass
Willow Slough Bypass
Dry Slough
Legend
Study Area Boundary
City of Woodland
Cache Creek Floodplain Extents
State Plan of Flood Control Levees
Winters Canal
Cache Creek
Stream Centerlines
Highways
Railways
Narrow bypass
Levee Strengthing
S3
Sources: World Imagery Service
Notes: 1 Hydrology based on the "Central Valley Hydrology Study Program - Cache Creek Watershed Hydrology" USACE (September 2012)
2 Levees are assumed to hold even if overtopped
NORTH
0 6,000 12,000 24,000
FEET
LOWER CACHE CREEK FEASIBILITY STUDY
EXISTING CONDITIONS
500-YEAR FLOODPLAIN EXTENTS
WOOD RODGERS



Legend

- Study Area Boundary
- City of Woodland
- Cache Creek Floodplain Extents
- State Plan of Flood Control Levees
- Winters Canal
- Cache Creek
- Stream Centerlines
- Highways
- Railways
- Narrow bypass
- Roadway Improvements

S4

Sources: World Imagery Service

Notes: 1. Hydrology based on the "Central Valley Hydrology Study Program - Cache Creek Watershed Hydrology" USACE (September 2012)
2. Levees are assumed to hold even if overtopped.

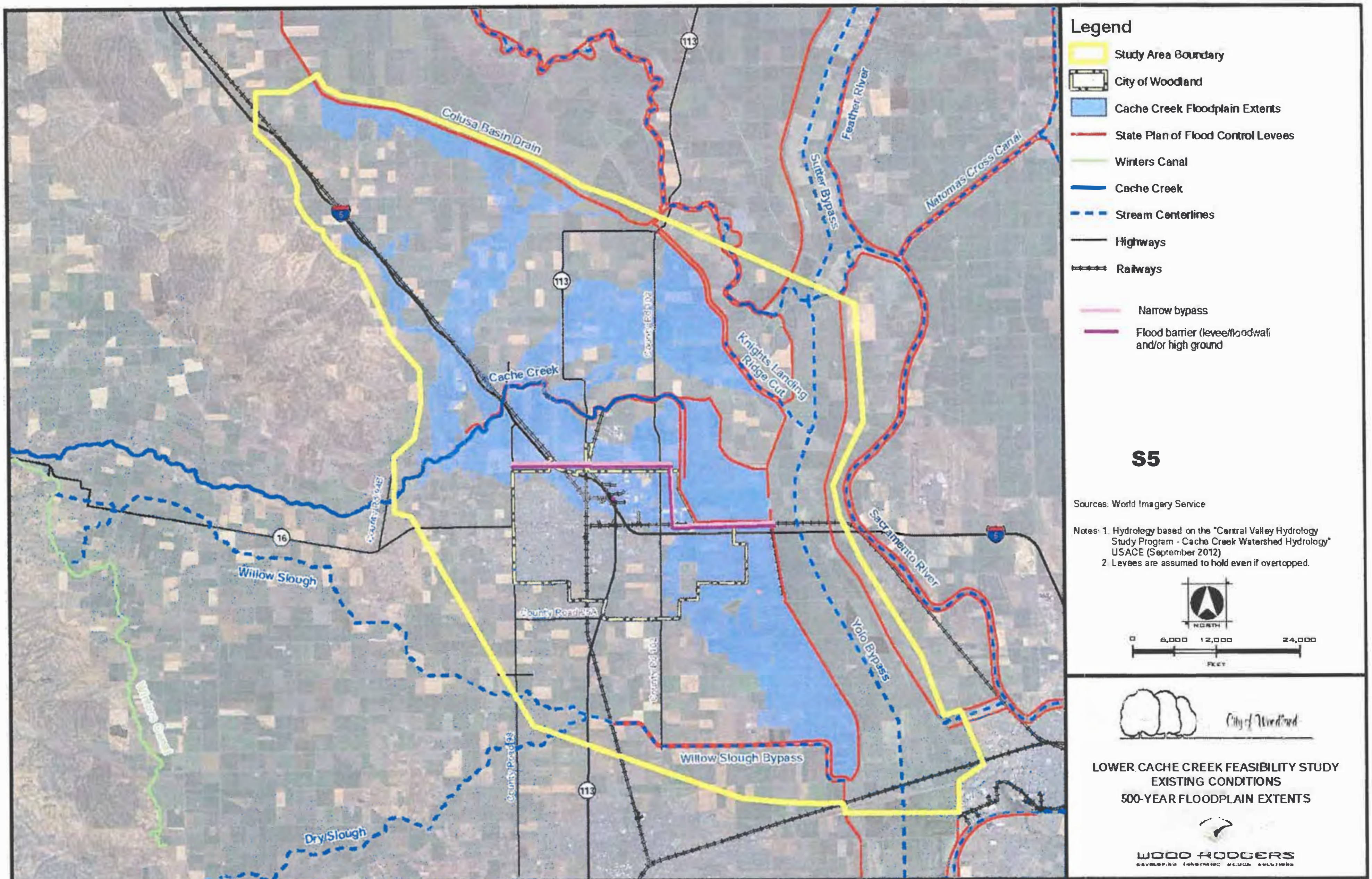
NORTH

0 6,000 12,000 24,000
FEET

City of Woodland

LOWER CACHE CREEK FEASIBILITY STUDY
EXISTING CONDITIONS
500-YEAR FLOODPLAIN EXTENTS

WOOD RODGERS


Legend
Study Area Boundary
City of Woodland
Cache Creek Floodplain Extents
State Plan of Flood Control Levees
Winters Canal
Cache Creek
Stream Centerlines
Highways
Railways
Narrow bypass
Flood barrier (levee/floodwall and/or high ground
S5
Sources. World Imagery Service
Notes: 1. Hydrology based on the "Central Valley Hydrology Study Program - Cache Creek Watershed Hydrology" USACE (September 2012)
2. Levees are assumed to hold even if overtopped.
NORTH
0
6,000
12,000
24,000
FEET
City of Woodland
LOWER CACHE CREEK FEASIBILITY STUDY
EXISTING CONDITIONS
500-YEAR FLOODPLAIN EXTENTS
WOOD RODGERS
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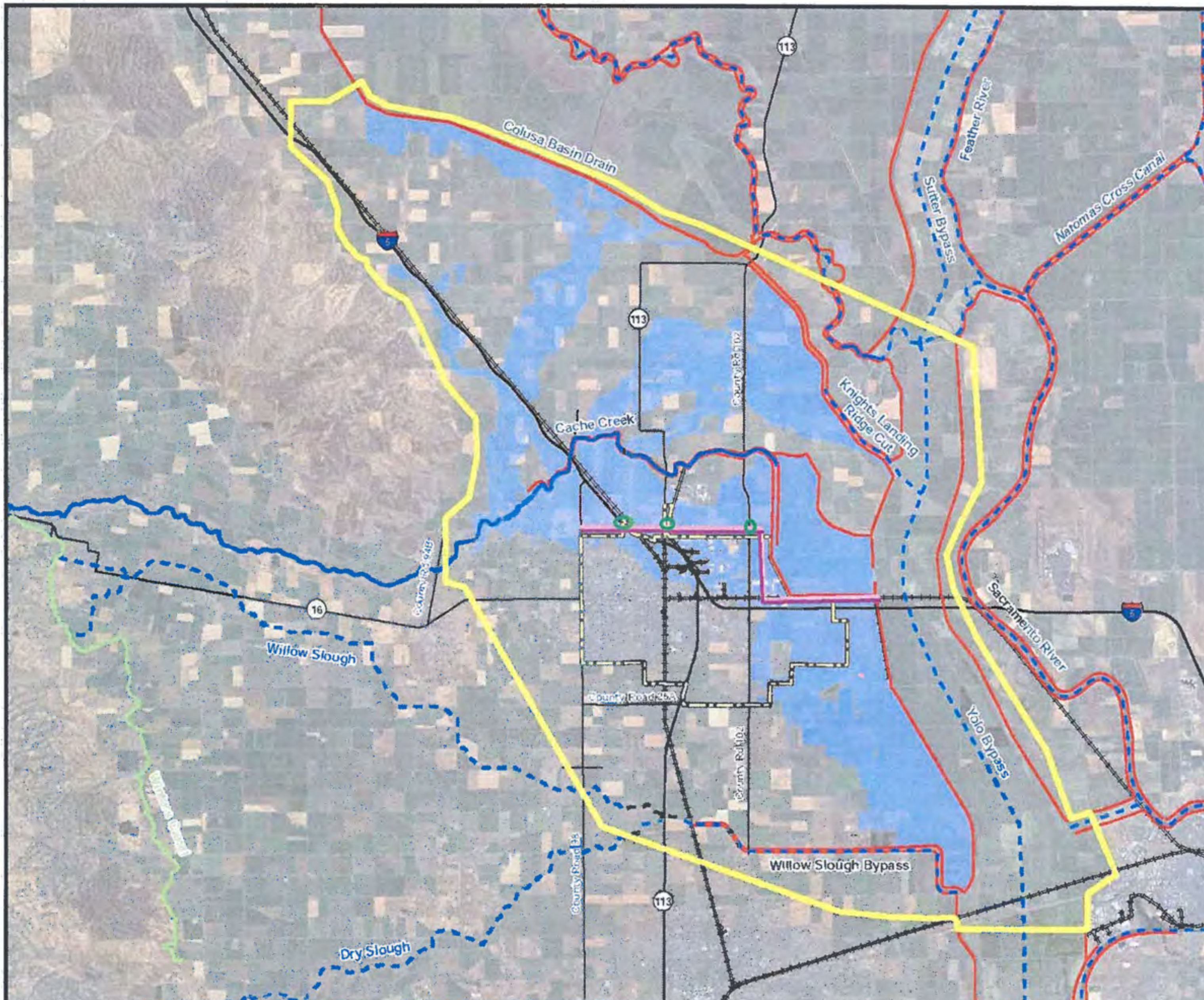
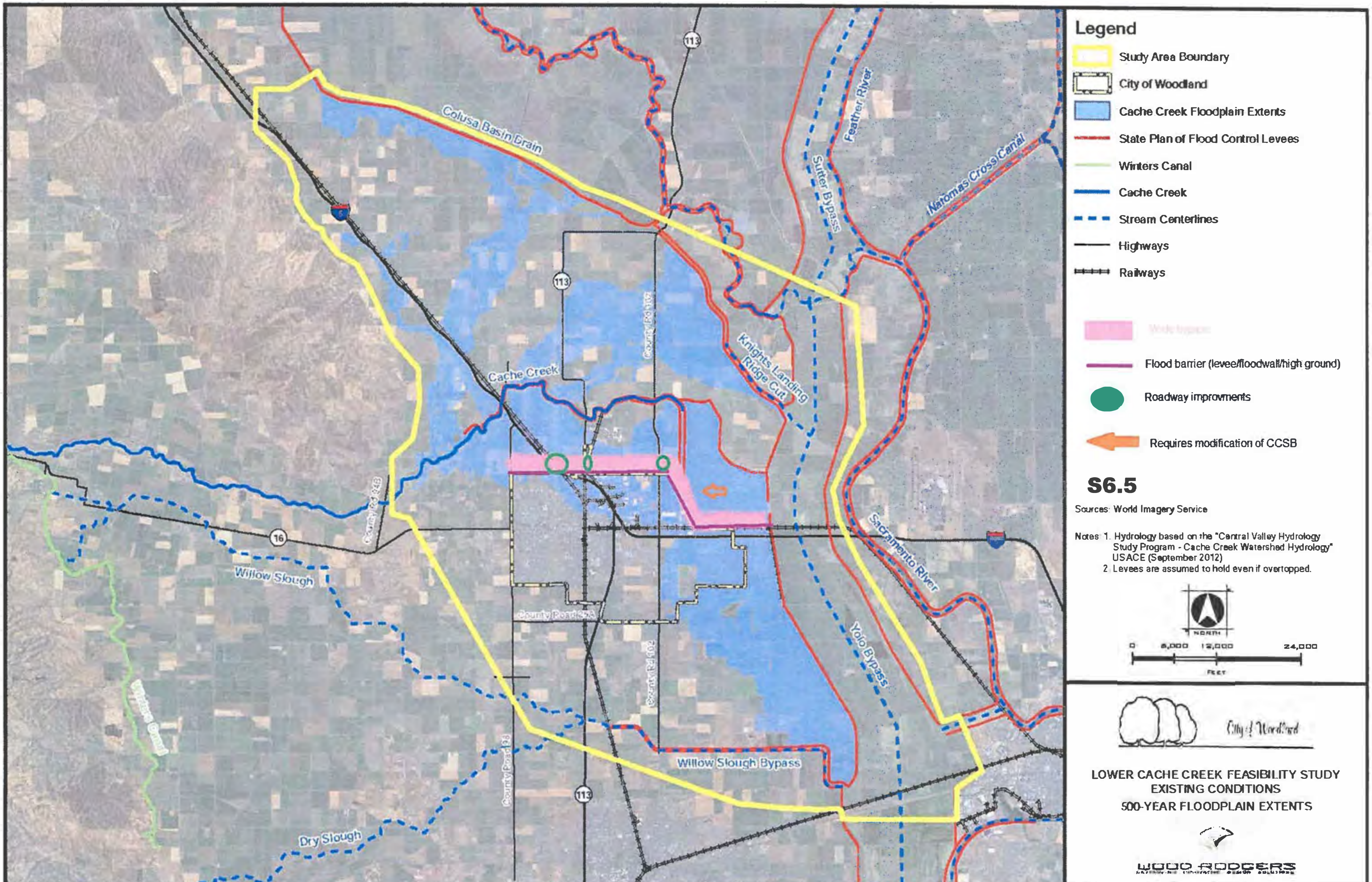
Cache Creek
Sacramento River
Yolo Bypass
Willow Slough
Willow Slough Bypass
Dry Slough
County Road 25A
113
16
5

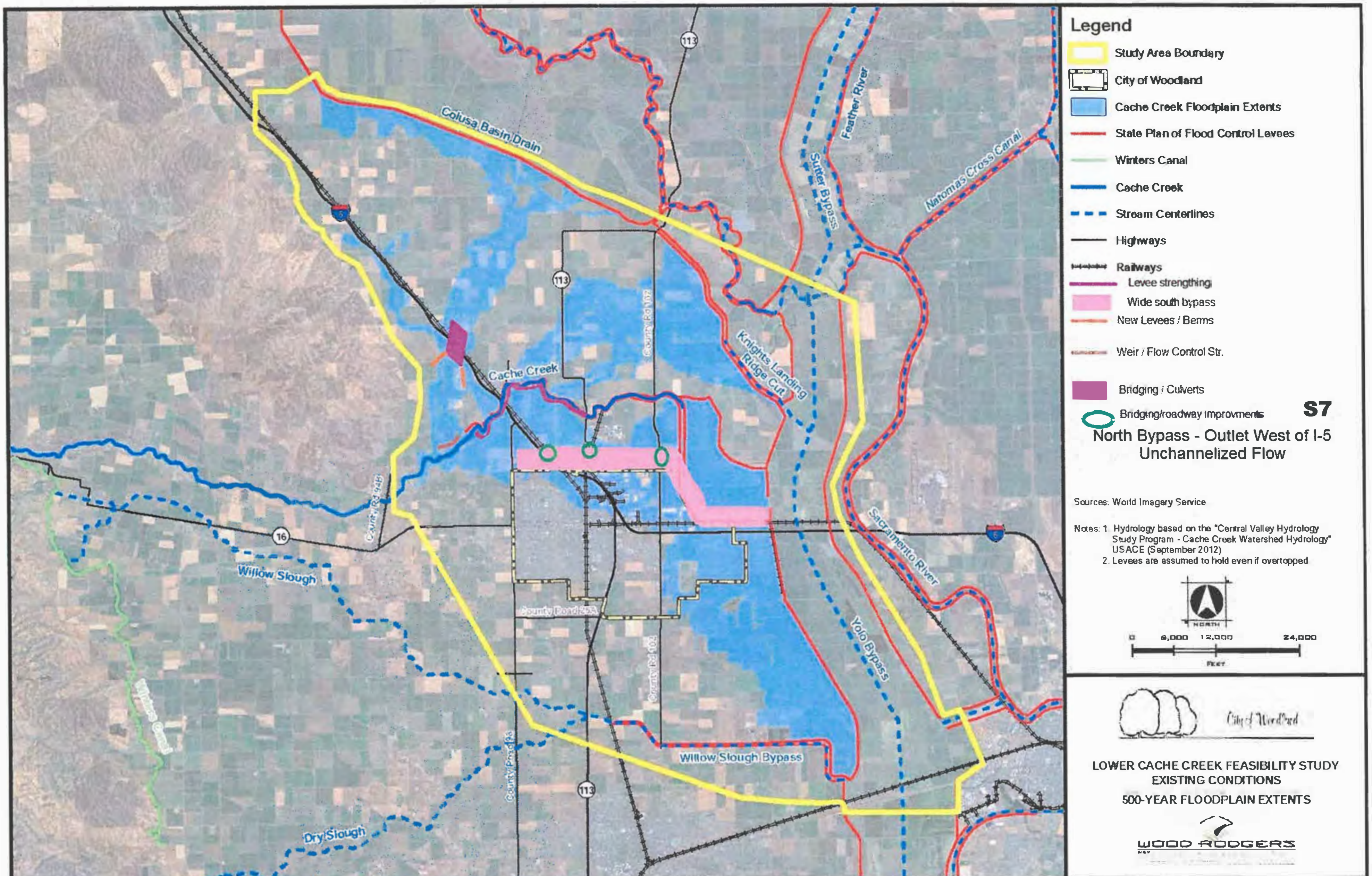


City of Woodland

LOWER CACHE CREEK FEASIBILITY STUDY
EXISTING CONDITIONS
500-YEAR FLOODPLAIN EXTENTS

WOOD RODGERS


Legend
Study Area Boundary
City of Woodland
Cache Creek Floodplain Extents
State Plan of Flood Control Levees
Winters Canal
Cache Creek
Stream Centerlines
Highways
Railways
Flood barrier (levee/floodwall/high ground)
Roadway improvments
Requires modification of CCSB
S6.5
Sources: World Imagery Service
Notes: 1. Hydrology based on the "Central Valley Hydrology Study Program - Cache Creek Watershed Hydrology" USACE (September 2012)
2. Levees are assumed to hold even if overtopped.
NORTH
0 6,000 12,000 24,000
FEET
City of Woodland
LOWER CACHE CREEK FEASIBILITY STUDY
EXISTING CONDITIONS
500-YEAR FLOODPLAIN EXTENTS
WOOD RODGERS
Colusa Basin Drain
Feather River
Sutter Bypass
Natomas Cross Canal
Knights Landing Ridge Cut
Cache Creek
Sacramento River
Yolo Bypass
Willow Slough
Willow Slough Bypass
Dry Slough
County Road 25A
113
16
5


Legend
Study Area Boundary
City of Woodland
Cache Creek Floodplain Extents
State Plan of Flood Control Levees
Winters Canal
Cache Creek
Stream Centerlines
Highways
Railways
Levee strengthing
Wide south bypass
New Levees / Berms
Weir / Flow Control Str.
Bridging / Culverts
Bridging/roadway improvments
S7
North Bypass - Outlet West of I-5
Unchannelized Flow
Sources: World Imagery Service
Notes: 1. Hydrology based on the "Central Valley Hydrology Study Program - Cache Creek Watershed Hydrology" USACE (September 2012)
2. Levees are assumed to hold even if overtopped
NORTH
0 6,000 12,000 24,000
FEET
LOWER CACHE CREEK FEASIBILITY STUDY
EXISTING CONDITIONS
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Cache Creek
Willow Slough
Sacramento River
Yolo Bypass
County Road 25A
Willow Slough Bypass
Dry Slough
113
16
5

Appendix B

Notice of Preparation and Scoping Comments

Appendix B.1

Notice of Preparation, June 2015

NOTICE OF PREPARATION

To: Agencies and Interested Parties

From: City of Woodland
300 First Street
Woodland, CA 95695

Date: June 2015

Subject: Notice of Preparation of a Draft Environmental Impact Report for the Woodland Flood Risk Management Project

The City of Woodland (City), as the Lead Agency, will prepare an environmental impact report (EIR) for the Woodland Flood Risk Management Project ("Project"). The City requests the views of each responsible and trustee agency, and each Federal agency involved in approving or funding the Project, as to the scope and content of the environmental information that is germane to the agency's statutory responsibilities in connection with the proposed project. The City also accepts comments from members of the public as to the scope and content of the EIR, as well as suggested project alternatives that may be considered.

INTRODUCTION

The California Environmental Quality Act (CEQA) specifies that a public agency must prepare an EIR on any project it proposes to carry out or approve that may have a significant direct or indirect effect on the physical environment.

The City is proposing to implement flood system improvements to the Lower Cache Creek in the vicinity of Woodland; see Figure 1. The proposed project would reduce the risk of flooding from Cache Creek and could potentially be integrated with flood control system improvements being considered by the U.S. Army Corps of Engineers (USACE), Central Valley Flood Protection Board (CVFPB) and the Lower Sacramento River/Delta North Regional Flood Management Team. The City has determined that a flood risk management project may result in significant effects on the physical environment. Therefore, acting as the lead agency for CEQA compliance, the City will prepare a draft EIR that evaluates the significant environmental effects of the proposed project.

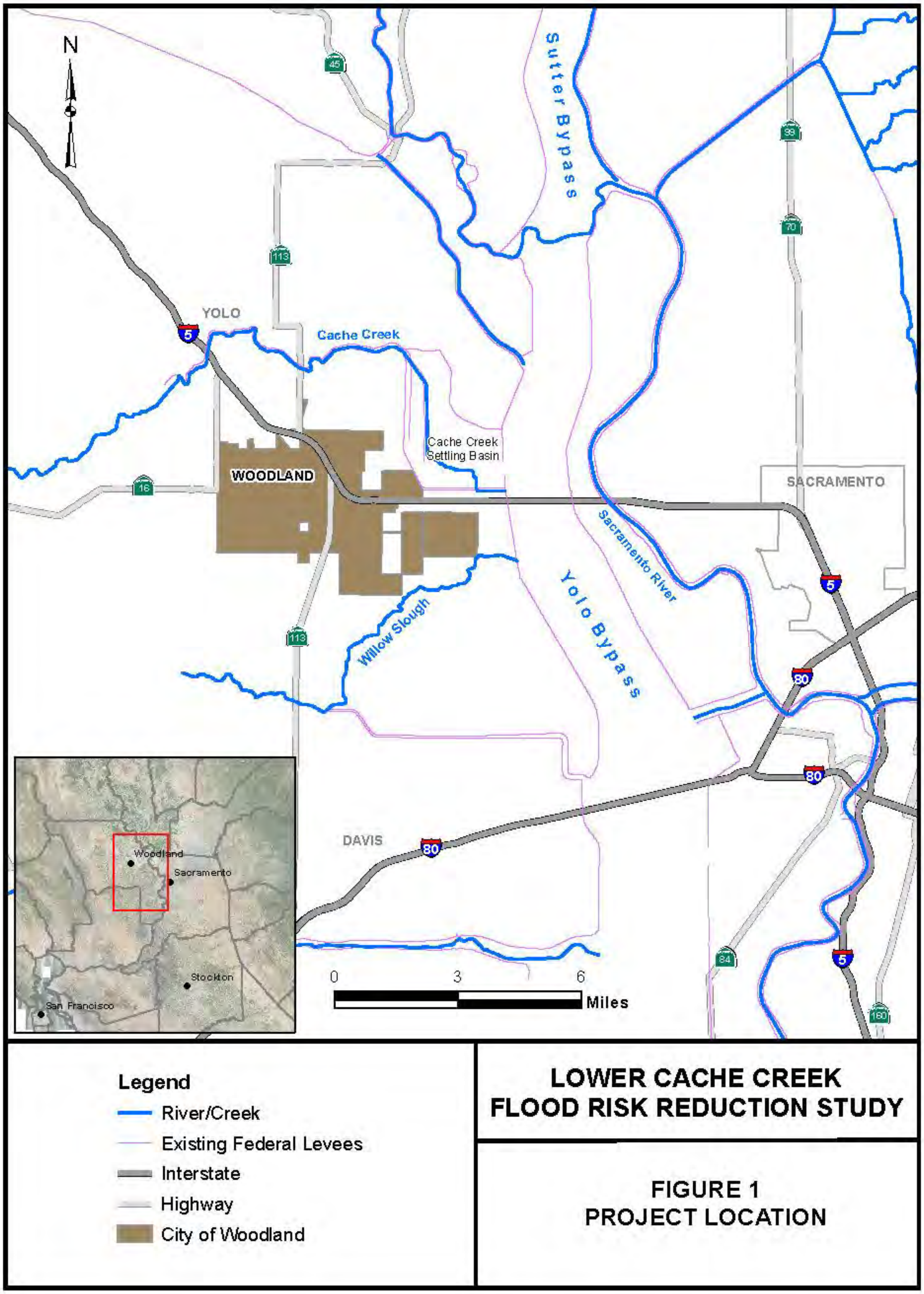


Figure 1. Project Location Map

PURPOSE OF THE NOTICE OF PREPARATION

The purposes of this notice is to:

- Provide background information, describe the range of flood control improvements that may be implemented, and summarize the probable environmental effects of these proposals.
- Advise that a scoping meeting will be scheduled at a future date; notice of the scoping meeting will be provided in accordance with CEQA requirements.
- Solicit input by July 31, 2015 from public agencies, interested organizations and individuals about the content and scope of the EIR, including alternatives to be considered, potentially significant environmental effects on the physical environment to be addressed, and identification of responsible and/or trustee agencies.

PROJECT DESCRIPTION

Background

The City of Woodland is subject to flooding from a failure of the existing levee along the right (south) bank of Cache Creek during a storm frequency of approximately 25 to 30 years. The flood threat to life and property in the study area is increased by Interstate 5 (I-5) as well as the levees that make up the Cache Creek Settling Basin (CCSB) and Yolo Bypass. The Lower Cache Creek levees were constructed by the USACE in 1958 as part of the federally authorized Sacramento River Flood Control Project (SRFCP) and are part of the State Plan of Flood Control (SPFC). In anticipation of the construction of the Wilson Valley Reservoir project by the State and local interests, the Lower Cache Creek levees were designed to contain a flow of 30,000 cubic feet per second (cfs) with 3 feet of freeboard. A flow of this magnitude is estimated to have an annual exceedance probability of 0.10 (1 in 10 years). Historically, the existing levees have conveyed larger flood flows by encroaching into the freeboard. The Wilson Valley Reservoir project has not been constructed due to seismic and sediment concerns, and over time, subsidence of the levee has reduced the amount of freeboard available for passing the 10-year-design flood event. Cache Creek discharges into the CCSB, a component of the SRFCP and a SPFC facility. Cache Creek has historically carried a large sediment load. The settling basin was constructed by the USACE in 1937 to prevent sediment carried by Cache Creek from entering the Yolo Bypass and diminishing its flood conveyance capacity; it currently covers 3,600 acres and is bounded by levees on all sides with an outlet weir to the Yolo Bypass. The CCSB is designed to convey a flow of 30,000 cfs, the same as the Cache Creek levee system. The 100-year flow rate is approximately 56,000 cfs and the 200-year flow rate is approximately 65,000 cfs.

In 1990 the USACE initiated a feasibility study to evaluate potential improvements to the Cache Creek system. A tentatively selected plan was identified and a draft Environmental Impact Statement/Environmental Impact Report (EIS/EIR) was released for public review in 2003. Because of public opposition to the plan, the study was deferred. In 2009, the CVFPB and the City, the non-Federal cost-sharing sponsors, requested that the USACE restart the feasibility study to evaluate viable and publicly acceptable alternatives. The study is underway and scheduled to be completed in 2017.

In addition to the USACE study, the City has participated in a regional partnership to evaluate the feasibility of a larger plan of improvements, the Yolo Bypass/Cache Slough Integrated Water Management Plan (IWMP) as presented in the Lower Sacramento River/Delta North Regional Flood Management Plan dated July 2014.

Proposed Project

The City is partnering with DWR through its Urban Flood Risk Reduction Program to identify and implement a flood risk reduction project to meet the State's urban level of protection (ULOP) requirements in a cost-effective manner that would be compatible with and supportive of elements of the IWMP. The proposed project is being formulated to be compatible with alternatives currently being evaluated by the USACE as part of the ongoing feasibility study.

Project improvements are expected to include:

- Construction of approximately 10 miles of secondary earthen levee and a diversion channel along the northern boundary of the City to redirect overland flood flows from the right bank of Cache Creek into a diversion channel to be conveyed to the Yolo Bypass.
- Modification/realignment of a segment of the existing CCSB to allow conveyance of flood flows into the Yolo Bypass.
- Construction of a bridge or culvert improvements at County Road 102, State Highway 113, and County Road 99 (West Street) to facilitate conveyance of flood flows in the diversion channel.

PROBABLE ENVIRONMENTAL IMPACTS

The project-level EIR analysis will focus on potential environmental impacts associated with construction of the proposed project and measures that can minimize or avoid such impacts.

On the basis of preliminary evaluations, the City has determined that the proposed improvements could have the following potentially significant environmental effects:

► **Aesthetics**. Temporary, short-term, and long-term changes in scenic views or visual character of project sites.

► **Agriculture and Forest Resources**. Potential temporary and long-term conversion of farmland for weir/bypass improvements, use of borrow material, or creation of habitat.

► **Air Quality**. Temporary and short-term increases in pollutant emissions associated with construction activities.

► **Cultural Resources**. Potential disturbance or destruction of known or unknown historic or archaeological resources during construction.

- ► **Biological Resources**. Potential temporary and short-term construction impacts on special-status species or their habitats; modification of habitat at erosion treatment sites; and potential disturbance or loss of riparian vegetation, jurisdictional wetlands, or other sensitive natural communities or special-status species habitats.
- ► **Greenhouse Gas Emissions**. Temporary and short-term increases in greenhouse gas emissions associated with construction activities.
- ► **Hazards and Hazardous Materials**. Potential introduction of contaminants into watercourses as a result of construction activities.
- ► **Hydrology and Water Quality**. Potential temporary and short-term effects on water quality during construction; long-term local drainage effects; and hydraulic and water quality effects on the Yolo Bypass and Bay Delta.
- ► **Noise**. Temporary and short-term increases in noise levels near sensitive receptors during construction.
- ► **Population and Housing**. Potential to increase growth.
- ► **Recreation**. Temporary and short-term disturbance of land- and water-based recreational activities in areas adjacent to construction sites.
- ► **Transportation and Traffic**. Potential temporary and short-term disruption of traffic circulation or emergency access during construction and traffic effects of haul routes, including haul routes via barge.
- ► **Utilities and Service Systems**. Potential disruption of service during construction and need for the relocation of utilities within the project footprint.

PROVIDING SCOPING COMMENTS

Interested parties may provide written comments on the proposed content and scope of the environmental information for the draft EIR. Because of time limits mandated by State law, **written comments must be provided to The City of Woodland at the earliest possible date, but no later than July 31, 2015**. Agencies that will use the draft EIR when considering permits or other discretionary approvals for the proposed project should provide the City with the name of a contact person. Comments provided by email should include the name and address of the sender, with the subject line "Comments on Notice of Preparation of a Project Environmental Impact Report." Please send all written comments to:

Mr. Tim Busch, Principle Utilities Civil Engineer
City of Woodland
300 First Street
Woodland, CA 95695
email: TimBusch@cityofwoodland.org

Appendix B.2

Scoping Letters Received during 2015 Scoping Period

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
North Central Region/Region 2
1701 Nimbus Road
Rancho Cordova, CA 95670
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

July 17, 2015

Mr. Tim Busch
Principle Utilities Civil Engineer
City of Woodland
300 First Street
Woodland, CA 95695

Dear Mr. Busch:

The Department of Fish and Wildlife (CDFW) has reviewed the Notice of Preparation of a draft Environmental Impact Report (DEIR) for the Woodland Flood Risk Management Project (proposed project; SCH # 2015062075). The City of Woodland (City) is partnering with the California Department of Water Resources (DWR), and proposes to identify and implement a flood risk reduction project to meet the State's urban level of protection requirements in a cost-effective manner that would be compatible with and supportive of elements of the Yolo Bypass/Cache Slough Integrated Water Management Plan. The proposed project is being formulated to be compatible with alternatives currently being evaluated by the U.S. Army Corps of Engineers as part of the ongoing Lower Cache Creek feasibility study. Project improvements are expected to include: construction of approximately 10 miles of a secondary earthen levee and a diversion channel along the northern boundary of the City, modification and realignment of segments of the existing Cache Creek Settling Basin to allow conveyance of flood flows into the Yolo Bypass, and construction of a bridge or culvert improvements to facilitate conveyance of flood flows in the diversion channel.

The CDFW recommends that the DEIR discuss and provide adequate mitigation for the following:

1. The project's impact upon fish and wildlife and their habitat. The CDFW recommends that the DEIR identify habitats and provide a discussion of how the proposed project will affect their function and value;

2. The project's impact upon significant habitat such as wetlands and riparian habitat. The project should be designed so that impacts to wetlands and riparian habitat are avoided. Mitigation should be provided for unavoidable impacts based upon the concept of no net loss of wetland or riparian habitat values or acreage;

3. The project's impact to special status species including species that are state and/or federal listed as threatened or endangered. We are particularly concerned with the project's impacts on the giant garter snake *(Thamnophis gigas)*, and the Swainson's hawk *(Buteo swainsoni);*

4. The project's growth inducing and cumulative impacts upon fish, wildlife, water quality, and vegetative resources; and

5. The DEIR should provide an analysis of specific proposed project alternatives which reduce impacts to fish, wildlife, water quality, and vegetative resources.

In addition, the DEIR should analyze if the proposed project may affect the developing Yolo Habitat Conservation Plan and Natural Community Conservation Plan.

The DEIR should also consider and analyze whether implementation of the proposed project will result in reasonably foreseeable potentially significant impacts subject to regulation by the CDFW under Section 1600 et seq. of the Fish and Game Code. In general, such impacts result whenever a proposed project involves work undertaken in or near a river, stream, or lake that flows at least intermittently through a bed or channel, including ephemeral streams and water courses. Impacts triggering regulation by the CDFW under these provisions of the Fish and Game Code typically result from activities that:

- Divert, obstruct, or change the natural flow or the bed, channel, or bank of any river, stream, or lake;
- Use material from a streambed; or
- Result in the disposal or deposition of debris, waste, or other material where it may pass into any river, stream, or lake.

In the event implementation of the proposed project involves such activities, and those activities will result in reasonably foreseeable substantial adverse effects on fish or wildlife, a Lake or Streambed Alteration Agreement (LSAA) will be required by the CDFW. Because issuance of a LSAA is subject to review under the California Environmental Quality Act (CEQA), the DEIR should analyze whether the potentially feasible mitigation measures set forth below will avoid or substantially reduce impacts requiring a LSAA from the CDFW.

This project will have an impact to fish and/or wildlife habitat. Assessment of fees under Public Resources Code Section 21089 and as defined by Fish and Game Code Section 711.4 is necessary. Fees are payable by the project applicant upon filing of the Notice of Determination by the lead agency.

Pursuant to Public Resources Code Sections 21092 and 21092.2, the CDFW requests written notification of proposed actions and pending decisions regarding this project. Written notifications should be directed to this office.

Thank you for the opportunity to review this project. If the CDFW can be of further assistance, please contact Mr. Todd Gardner, Senior Environmental Scientist

(Specialist), at (209) 745-1968 or, Ms. Jennifer Nguyen, Senior Environmental Scientist (Supervisor), at (916) 358-1340.

Sincerely,

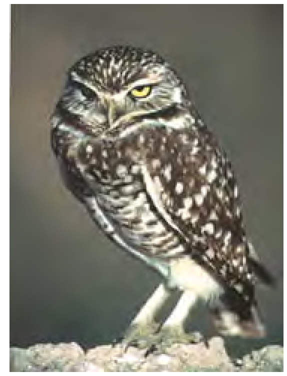
Kath D Hill

for Tina Bartlett
Regional Manager

ec: Jeff Drongesen, Jeff.Drongesen@wildlife.ca.gov
Jennifer Nguyen, Jennifer.Nguyen@wildlife.ca.gov
Todd Gardner, Todd.Gardner@wildlife.ca.gov
Department of Fish and Wildlife

Yolo Audubon Society

P.O. Box 886 Davis, CA 95617



21 July 2015

Mr. Tim Busch
Principal Utilities Civil Engineer
City of Woodland
300 First Street
Woodland, CA 95695
timbusch@cityofwoodland.org

Subject: Comments on Notice of Preparation for Project Environmental Impact Report, Woodland Flood Risk Management Project

Dear Mr. Busch:

The following comments are provided on behalf of the Board of Directors of the Yolo Audubon Society (YAS), a 501(c)(3) nonprofit educational corporation that functions as a chapter of the National Audubon Society for Yolo County. The YAS generally supports the development of flood risk management solutions for citizens of the City of Woodland, as we have similarly supported the development of flood risk management solutions for the City of West Sacramento. In a general way we support the proposed drainage conveyance project identified as the subject of the Environmental Impact Report (EIR) in the Notice of Preparation (NOP).

However, as the NOP did not include any maps or other detailed identification of the physical location of the proposed structure, the specific environmental resources that would be affected by the project, or any mitigation measures that the City will include to avoid, reduce, or offset those impacts (and no depiction of the proposed project exists on any City of Woodland websites that we have been able to locate), our support can only be considered as general support for the project. We believe that the NOP does not conform with the requirements for notice included in the California Environmental Quality Act (CEQA), and that the NOP requires more detailed project information in order to support informed participation by Yolo County citizens. The CEQA Guidelines [§15082(a)(1)] requires sufficient information to allow responsible and trustee agencies and other affected parties to make informed comments:

> "(1) The notice of preparation shall provide the responsible and trustee agencies and the Office of Planning and Research with sufficient information describing the project and the potential environmental effects to enable the responsible agencies to make a meaningful response. At a minimum, the information shall include:
>
> "(A) Description of the project,
>
> "(B) Location of the project (… by attaching a specific map, preferably a copy of a U.S.G.S. 15' or 7½' topographical map identified by quadrangle name) …"

Because we can't tell what the actual project elements are, we're limited in our ability to respond to the NOP. Further, we may find in the future that we can't support some elements because of currently unanticipated environmental effects.

Specific Comments Regarding the Proposed Project

The NOP project synopsis identifies three elements in the proposed project, summarized:

1. A new diversion channel and an associated earth levee about 10 miles long, to be located somewhere north of the city, which would route possible flood overflows from Cache Creek eastward toward the Cache Creek Settling Basin (CCSB) and the Yolo Bypass;
2. Modifications (of unknown type) within or adjacent to the CCSB to accommodate the increased flows within the CCSB and their delivery to the Bypass; and
3. Alterations in local surface transportation routes and disturbances of local transportation, to accommodate the construction and operation of the new diversion channel.

As a regional conservation organization our concerns for the proposed project are generally related to environmental resources in two potential impact categories, (a) *Biological Resources* and (b) *Hydrology and Water Quality*. The two categories are closely interrelated for this project.

Surface Transportation Effects. In considering the three basic project elements summarized above, the YAS Board is neutral about effects on surface transportation (element 3); this comment does not identify significant concerns for element 3 that should be addressed in the EIR.

Diversion Channel and Levee Effects. Because we don't know where the diversion channel and levee will be located we're not able to address specific issues that may be raised by these elements. However, in general the Board would be concerned about the environmental effects of having those elements cross, intersect, or remove existing stream alignments, residual oak trees or groves, or other natural features that have developed significant habitat values. Such habitat types in the area north of Woodland are used by a number of environmentally sensitive species, including Swainson's Hawk and giant garter snake, among others. Any impacts to such habitats need to be identified on the basis of adequate biological studies, with mitigation measures provided that avoid, reduce, and/or offset the impacts according to the requirements of state and federal law. Similarly, if the channel and levee affect water flows or amounts in natural water features that could affect existing habitat values, these effects need to be identified in the EIR and suitable mitigation provided.

Cache Creek Settling Basin Effects. The Board's most significant environmental concerns for the proposed project are related to impacts to habitat values and hydrology in the CCSB. The proposed project includes "modification/realignment of a segment of the existing CCSB," but there's no description of what this includes, where the modifications or realignments would occur, or what the anticipated effects would be on the habitat values in the CCSB. This represents a potentially significant impact to one of the major areas of "riparian"[1] habitat in Yolo County, an area that has shown promise of hosting Yellow-billed Cuckoos (YBCU), a federally listed bird species that is very uncommon in the Central Valley. Any changes in habitat values in the CCSB need to be fully identified on the basis of sufficient biological studies to categorize effects throughout the annual cycle, as the habitat is also valuable for numerous migratory and wintering species.

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[1] The meaning of "riparian" extends well beyond the woody vegetation that is typically identified as "riparian habitat." See the *Appendix* for additional considerations. The concepts incorporated into this definition are intended by the YAS Board to be invoked in full whenever this term is mentioned in this letter, although for CEQA purposes the majority of the comments in this letter refer to the narrower meaning of "habitat," given the primary focus of the YAS as a conservation organization.

Broader Questions of Habitat Issues and Flood Management in Yolo County

The YAS Board's members recall the earlier discussion of flood management options for the City of Woodland. At one time an option was identified that addressed flood protection from Cache Creek flooding north of the city by the construction of setback levees adjacent to Cache Creek that would constrain flows within an enlarged channel system with expanded riparian zones. This option would be highly beneficial for a variety of habitat purposes, and would help address water quality concerns in Cache Creek in addition to flood issues. The Board believes that this alternative needs full evaluation in the EIR, including consideration of the relative impacts and required mitigation in parallel with those of the proposed project.

The Board also has questions as to the timing of the current proposal, as the NOP acknowledges that the Corps of Engineers has been re-engaged in studying the feasibility of flood management options for Cache Creek. The NOP will need to explain fully why the current project is proposed prior to the completion of the Corps' feasibility study in 2017. (We note in passing that any mitigation measures enacted for the current project must be considered as "permanent" changes in conditions, to be maintained in perpetuity even if the Corps study recommends a different approach.)

The YAS Board is aware that the CCSB is an element in a larger flood-management framework for the Central Valley pursuant to the Central Valley Flood Protection Plan, including potentially rerouting flood flows in the Sacramento River system, with possibly significant alterations to the Yolo Bypass. In addition the YAS Board is aware that modifications in the Bypass are required in order to comply with the Biological Opinion for Central Valley salmonids, which could also affect the CCSB. The YAS Board is aware of the elements included in the "Yolo Bypass/Cache Slough Integrated Water Management Plan" as an element of the Regional Flood Management Plan for the lower Sacramento River and the northern part of the Delta (the LSDN RFMP), which considers necessary modifications to local flood management elements in Yolo County, including the CCSB and the Yolo Bypass.

Given the potential inclusion of the CCSB in these several broadly focused planning efforts involving state and federal flood and water management agencies, the Board is unclear precisely how the proposed changes in the CCSB for the City's project fit into the larger framework. The Board believes that it would be environmentally inappropriate for the City to pursue a project within the CCSB that adversely affects or prejudices decisions made for the Sacramento River system, the Delta, and the Bypass, and requests that the City's EIR fully address coordination among these planning efforts as part of the required consideration of alternatives.

The YAS Board is not intrinsically opposed to alterations in the CCSB, even to the extent of abandoning the CCSB entirely and changing the flow patterns in lower Cache Creek and the Bypass. The Board is aware of the water quality (mercury) issues related to the CCSB, and of the ultimate limitation on sediment storage available in the CCSB. The Board recommends that the City, other local planning agencies, the Department of Water Resources, and the Corps jointly and severally consider alternative options for the long-term future of the CCSB that address the plethora of issues known to exist about this facility. The Board would be concerned that the City not adopt a short-term solution inconsistent with the achievement of longer-term goals.

The Board's primary concerns in any such considerations will continue to be focused on the habitat values associated with flood management options in eastern Yolo County. The Board will want to see a clear demonstration in the EIR that any impacts to the "riparian" habitat in the CCSB are fully offset by whatever project is approved. This will need to include the "temporal" loss of habitat values involved by the destruction of higher-quality existing habitat and its replacement by habitat that requires a period of development to show similar value, and the "area mitigation ratio" will need to exceed 1:1.

In the larger framework of flood planning for the Yolo Bypass, the YAS Board would consider supporting a project that resulted in enhancing the overall habitat values in this region. In previous discussions of these topics we've considered what it would take to enhance riparian habitat within the Bypass region, perhaps by doing extraordinary things like moving the levees in order to increase conveyance capacity and add habitat values. Alternatively this habitat result could be achieved by creating additional protected habitat areas outside of and immediately adjacent to the Bypass. The YAS Board could consider supporting options that do all of the following three things, if they can be assembled from the various agency elements:

1. Abandons/removes the settling basin.
2. Enhances/expands the area of riparian habitat, and the degree of protection afforded to it, along Cache Creek north of Woodland, with the same kinds of habitat benefits noted in the next item.
3. Increases the amount/quality of riparian habitat within or immediately adjacent to the Bypass, as mitigation for project-related impacts and as a separate habitat enhancement for riparian-dependent species in Yolo County. In addition to YBCU, that would include Least Bell's Vireo, Yellow-breasted Chat, Modesto Song Sparrow, and other riparian-related species that we didn't even know have occurred here.

Thank you for considering Yolo County's environmental resources in your planning for flood protection for the City. If you have questions about the comments in this letter, please don't hesitate to get back to us.

Sincerely,

Chad Roberts

Chad Roberts
Conservation Chair

Copies: Stefan Lorenzato, FESSRO, Department of Water Resources
Bill Marble, Yolo Water Resources Association
Petrea Marchand, Yolo Habitat Conservancy

APPENDIX

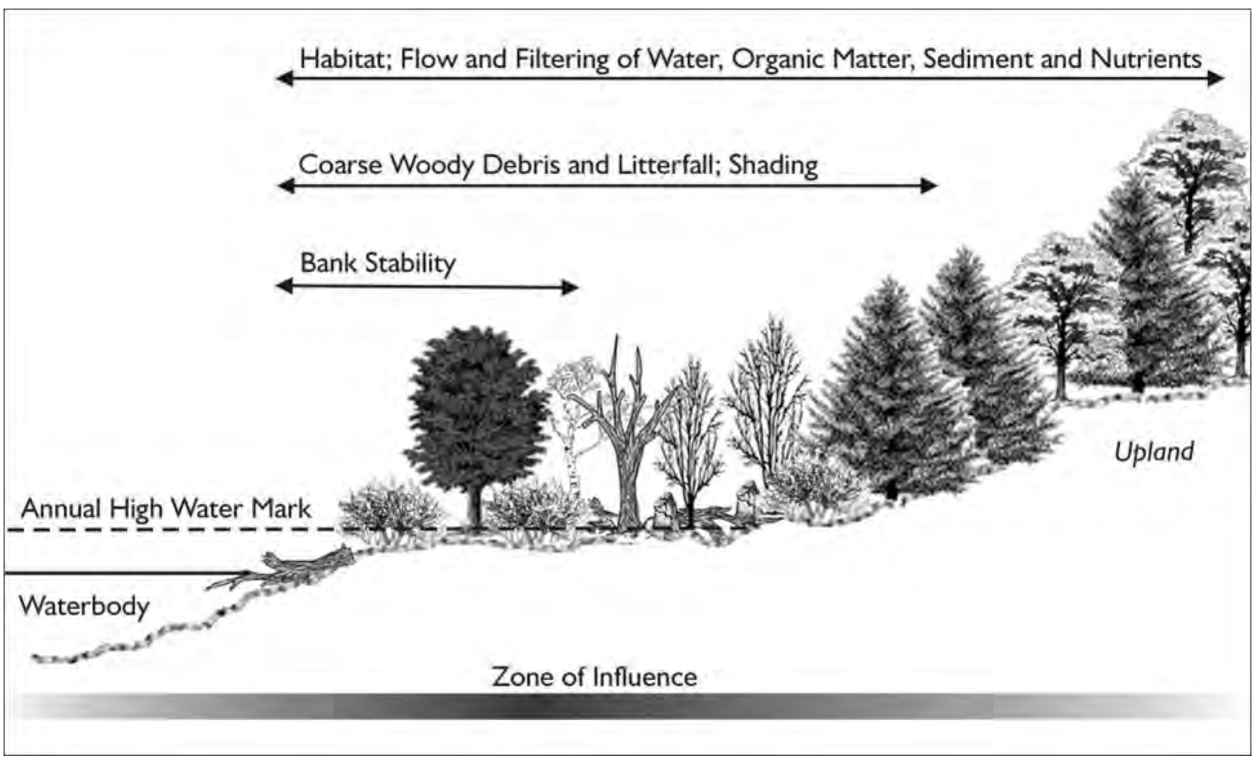
Interpreting "Riparian" for Cache Creek and the Yolo Bypass

The term "riparian" as used in this comment letter is explicitly intended to apply to habitats associated with aquatic features, primarily streams, in Yolo County. In a larger sense, the term includes a variety of additional functions and the associated services provided to society.

The following glossary term from the 2012 Central Valley Flood Protection Plan (see URL: http://www.water.ca.gov/cvfmp/docs/CVFPP_VolI_Att4_Glossary_201201.pdf) restates the definition developed in 2002 by the National Research Council:

> "Riparian areas are transitional between terrestrial and aquatic ecosystems and are distinguished by gradients in biophysical conditions, ecological processes, and biota. They are areas through which surface and subsurface hydrology connect water bodies with their adjacent uplands. Riparian areas include portions of terrestrial ecosystems that significantly influence exchanges of energy and matter with aquatic ecosystems (i.e., a zone of influence). Riparian areas are adjacent to perennial, intermittent, and ephemeral streams, lakes, and estuarine-marine shorelines."

The following diagram illustrates the extent of the functions and services provided by riparian areas (note that the illustrated aquatic feature is not restricted to being a stream, and ponds, lakes, and vernal pools all have riparian areas, which differ in dimensions as well as in functions and services provided).



In this context it should be noted that "riparian habitat" includes influences from both the aquatic features and adjacent non-aquatic or "upland" areas. In consequence of this, riparian areas intrinsically require considerations of buffers along the margins of aquatic features. At the present time there is no adopted "standard" riparian buffer in California,[2] and environmental evaluations must consider the *functions* (i.e., ecological, hydrological, water quality-related, and geomorphological relationships among the aquatic areas and other ecosystem elements) and *services* (attributes valuable to people, such as sensitive species habitat, water quality enhancement, and bank stabilization) in arriving at appropriate buffer identification.

At the current time it's an open question as to the nature of the riparian habitat types that are most historically relevant for the region including the CCSB and the Yolo Bypass. Historical

Photograph of vegetation clearing in an area identified as "West Sacramento" in approximately 1910. The cleared forest was dominated by willow trees approximately 20 meters (65 feet) tall; most likely these were all Goodding willows (*Salix gooddingii*), a dominant willow species in the Central Valley. California State Library 26 2010-1853_000066935.

ecology treatments (e.g., the SFEI Delta Historical Ecology Study, found at URL: http://www.sfei.org/DeltaHEStudy) indicate that a large part of the historical Bypass region was a basin dominated by tule (*Schoenoplectus acutus* var. *occidentalis*). However, there is

[2] A commonly adopted riparian buffer setback adopted by many local agencies is 100 feet from the "transition line" marking the edge of the aquatic feature. This is a "default" approach, as it does not consider actual functions or services. However, a variety of studies have indicated that many riparian functions are adequately addressed by 100-foot riparian buffers.

substantial evidence that large areas of willow forest occurred in higher parts of what's now the Bypass. The photo above is identified as having been taken in "West Sacramento;" other photos from the same source indicate that this likely shows the area of what is today Bryte. To the extent that the region in Yolo County including lower Cache Creek (i.e., near the Sacramento River in the northern Bypass) exhibited similar elevations and hydrology in 1910, the extensive willow forest that was present in this photo is a valid historical model for riparian forests in the vicinity of the CCSB today.

A similar conclusion results from considering the forest in the following photograph, also from the West Sacramento album. This photo depicts a road along the shore of Lake Washington leading to a commercial campground then present at the lake. Lake Washington is a meander scroll of the Sacramento River, located just west of the Port in West Sacramento about a half-mile from the present channel. As above, the photo illustrates a nearly closed canopy (except where cleared for the road) of tall willows, suggesting again the nature of the willow riparian forest present at higher ground surface elevations in the vicinity of the Bypass during the settlement era.

Photograph of riparian forest along west shore of Lake Washington, West Sacramento, approximately 1910 (note man standing by road for scale). California State Library 26 2010-1671_000066818.

LOCAL AGENCY FORMATION COMMISSION OF YOLO COUNTY

625 Court Street, Suite 203
Woodland CA 95695

(530) 666-8048
lafco@yolocounty.org

www.yololafco.org

July 23, 2015

Tim Busch
Principle Utilities Civil Engineer
City of Woodland
300 First Street
Woodland, CA 95695

Re: Comments on the Notice of Preparation of a Project Environmental Impact Report for the Woodland Flood Risk Management Project

Dear Mr. Busch:

Thank you for the opportunity to review the Notice of Preparation (NOP) for the Woodland Flood Risk Management Project. Staff has reviewed the NOP and has the following comments:

- Agriculture Mitigation: As you may already be aware, one of the core purposes of LAFCo is preserving prime agricultural lands. The NOP indicates that the proposed improvements may result in the potential temporary and long-term conversion of farmland. Please see the attached Yolo County LAFCo Agricultural Conservation Policy, which recommends mitigation at not less than a 1:1 replacement ratio.
- Responsible Agency: Staff requests clarification if Yolo County LAFCo is a responsible and/or trustee agency for the proposed Project.

Thank you for the opportunity to comment on this NOP.

Sincerely,

Christine M. Crawford, AICP
Executive Officer

Cc: LAFCo Commission

Yolo County
Local Agency Formation Commission

Agricultural Conservation Policy
6-25-07


Sunflower Field, Yolo County, California

LAFCO

Yolo County Local Agency Formation Commission
625 Court Street, Suite 107, Woodland, CA 95695
530.666.8048(office) 530.662.7383(fax)
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COUNTY OF YOLO
LOCAL AGENCY FORMATION COMMISSION
AGRICULTURAL CONSERVATION POLICY
(Adopted by Minute Order 94-4 Amended by Minute Orders 2002-25, 2003-03, 2003-41, 2005-05, 2005-56, 2006-02, and 2007-25)

I Legislative Mandate

A. California Government Code §56377 mandates LAFCO consider the following factors:

1. In reviewing and approving or disapproving proposals which could reasonably be expected to induce, facilitate, or lead to the conversion of existing open-space lands to uses other than open-space uses, the commission shall consider all of the following policies and priorities:

a. Development or use of land for other than open-space uses shall be guided away from existing prime agricultural lands in open-space use toward areas containing non-prime agricultural lands, unless that action would not promote the planned, orderly, efficient development of an area.

b. Development of existing vacant or non-prime agricultural lands for urban uses within the existing jurisdiction of a local agency or within the sphere of influence of a local agency should be encouraged before any proposal is approved which would allow for or lead to the development of existing open-space lands for non-open-space uses which are outside of the existing jurisdiction of the local agency or outside of the existing sphere of influence of the local agency.

B. Given the direction outlined by the California Legislature in Government Code section 56377, the Yolo County LAFCO adopts the following policies in respect to the conversion of agricultural land to urban uses. This policy is meant to apply both to city and special district changes of organization when urban development is the ultimate goal.

II. Policy Statement

A. Agriculture is a vital and essential part of the Yolo County economy and environment. Agriculture shapes the way Yolo County residents and visitors view themselves and the quality of their lives. Accordingly, boundary changes for urban development should only be proposed, evaluated, and approved in a manner which, to the fullest extent feasible, is consistent with the continuing growth and vitality of agriculture within the county.

III. Policy Guidelines

A. To promote the policy statement, proposals shall be reviewed based on the following considerations:

1. Existing developed areas should be maintained and renewed.

2. Vacant land within developed areas should be developed before agricultural land is annexed for non-agricultural purposes.

3. Land substantially surrounded by existing agency boundaries should be annexed before other lands.

4. Urban development should be restricted in agricultural areas. For example, agricultural land should not be annexed for non-agricultural purposes when feasible alternatives exist.

5. The continued productivity and viability of agricultural land surrounding existing communities should be promoted, by preventing the premature conversion of agricultural land to other uses and, to the extent feasible, minimizing conflicts between agricultural and other land uses.

6. Development near agricultural land should not adversely affect the economic viability or constrain the lawful, responsible practices of the agricultural operations.

B. In considering the completeness and appropriateness of any proposal, the Executive Officer and this Commission may require proponents and other interested parties to provide such information and analysis as, in their judgment, will assist in an informed and reasoned evaluation of the proposal in accordance with this policy.

C. No change of organization shall be approved unless it is consistent with the Spheres of Influence of all affected agencies.

D. Where feasible, non-prime land should be annexed before prime land.

E. A land's current zoning, pre-zoning or land use designation is one of the factors the Commission will consider in determining whether mitigation will be required for the loss of agricultural land. A land's zoning, pre-zoning or designation in the city's or County's general plan does not automatically exempt it from mitigation.

F. The Commission encourages local agencies to adopt policies that result in efficient, coterminous and logical growth patterns within their general plan and sphere of influence areas and that encourage protection of prime agricultural land in a manner that is consistent with this Policy.

G. The Commission encourages the maintenance of agricultural inter-city buffers between the cities. The Commission encourages the cities and the County to formalize and strengthen existing, but non-binding, agreements maintaining agricultural buffers

H. The Commission encourages local agencies to identify the loss of prime agricultural land as early in their processes as possible, and to work with applicants to initiate and execute plans to mitigate for that loss, in a manner that is consistent with this Policy, as soon as feasible. Local agencies may also adopt their own agricultural conservation policies, consistent with this Policy, in order to better meet their own circumstances and processes.

I. Unless otherwise provided in this Policy, the provisions of this Policy shall apply to all proposals requiring approval by the Yolo County Local Agency Formation Commission, including but not limited to, any proposal for approval of a change of organization, reorganization, or out-of-agency service agreement.

J. This Policy applies to proposals of both public agencies and private parties. However, the Commission recognizes that there are significant differences between public agencies and private parties. In light of those differences, in some circumstances it may not be appropriate to require mitigation for the loss of prime agricultural land as would otherwise be required by this Policy.

A fundamental difference is that public agencies are generally responsible to the electorate, while private parties are not. Public agencies are also generally required to provide Constitutionally or statutorily (or both) mandated services. In addition, a public agency is generally required, by law or policy considerations, to locate its facilities within its boundaries, while a private party has no such constraints.

Public agencies are also generally subject to Constitutional or statutory constraints (or both) on their ability to raise revenues. Public agencies often experience increases in demand for services that are not (and often cannot) be accompanied by equivalent increases in revenues. In light of these and other fiscal constraints that are currently imposed upon public agencies, a mitigation requirement could result in an additional cost to a public agency that it is unable to recoup by increasing its revenues, which in turn could impair the agency's ability to provide its Constitutionally and statutorily mandated services.

In addition, unlike private parties, public agencies are often exempt from the land use controls and regulations of other public agencies, despite the fact that the activities of the former occur within the boundaries of the latter. Although a public agency might request input from other local agencies, it is not necessarily bound by or required to follow their local planning requirements. As a result, a public agency's development or construction activities may not be subject to the same degree of control as a private party, and it might not learn of a mitigation requirement until after it has completed significant portions of the planning processes that are required by law.

Based upon the foregoing factors, the Commission concludes that, in the case of proposals that are undertaken exclusively for the benefit of a public agency, the Commission should review the applicability of the mitigation requirements set forth in this Policy on a case-by-case basis to determine the appropriateness of requiring mitigation in any particular case.

IV. Policy Standards and Implementation

A. Detachment of prime agricultural lands and other open space lands shall be encouraged if consistent with the sphere of influence for that agency.

B. Annexation of prime agricultural lands shall not be approved unless the following factors have been considered:

1. There is insufficient marketable, viable, less prime land available in the subject jurisdiction for the proposed land use.

2. The adoption and implementation of effective measures to mitigate the loss of agricultural lands, and to preserve adjoining lands for agricultural use to prevent their premature conversion to other uses. Such measures may include, but need not be limited to: the acquisition and dedication of farmland, development rights, open space and conservation easements to permanently protect adjacent and other agricultural lands within the county; participation in other development programs (such as transfer or purchase of development rights); payments to responsible, recognized government and non-profit organizations for such purposes; the establishment of open space and similar buffers to shield agricultural operations from the effects of development.

C. Annexation for land uses in conflict with an existing agricultural preserve contract shall be prohibited, unless the Commission finds that it meets all the following criteria:

1. The area is within the annexing agency's sphere of influence.

2. The Commission makes findings required by Government Code Section 56856.5.

3. The parcel is included in an approved city specific plan.

4. The soil is not categorized as prime.

5. Mitigation for the loss of agricultural land has been secured at least at a 1:1 ratio of agricultural easements for the land lost.

6. There is a pending, or approved, rescission for the property that has been reviewed by the local jurisdictions and the Department of Conservation.

7. The property has been non-renewed if still awaiting rescission approval.

D. Less prime agricultural land generally should be annexed and developed before prime land is considered for boundary changes. The relative importance of different parcels of prime agricultural land shall be evaluated based upon the following (in a descending order of importance):

   1. Soil classification shall be given the utmost consideration, with Class I or II soil receiving the most significance, followed by the Storie Index Rating.

   2. Consideration shall also be given to the land's economic viability for continued agricultural use.

E. LAFCO will approve a change of organization which will result in the conversion of prime agricultural land in open space use to other uses only if the LAFCO finds that the proposal will lead to planned, orderly, and efficient development. The following factors shall be considered:

   1. Contiguity of the subject land to developed urban areas.

   2. Receipt of all other discretionary approvals for changes of boundary, such as prezoning, environmental review, and service plans as required by the Executive Officer before action by LAFCO. If not feasible before LAFCO acts, the proposal can be made contingent upon receipt of such discretionary approvals within not more than one (1) year following LAFCO action.

   3. Consistency with existing planning documents of the affected local agencies, including a service plan of the annexing agency or affected agencies.

   4. Likelihood that all or a substantial portion of the subject land will develop within a reasonable period of time for the project's size and complexity.

   5. The availability of less prime land within the sphere of influence of the annexing agency that can be developed, and is planned and accessible, for the same or a substantially similar use.

   6. The proposal's effect on the physical and economic viability of other agricultural operations. In making this determination, LAFCO will consider the following factors:

      a. The agricultural significance of the subject and adjacent areas relative to other agricultural lands in the region.

      b. The existing use of the subject and adjacent areas.

      c. Whether public facilities related to the proposal would be sized or situated so as to facilitate the conversion of adjacent or nearby agricultural land, or will be extended through or adjacent to, any other agricultural lands which lie between the project site and existing facilities.

d. Whether natural or man-made barriers serve to buffer adjacent or nearby agricultural land from the effects of the proposed development.

e. Provisions of the General Plan's open space and land use elements, applicable growth management policies, or other statutory provisions designed to protect agriculture. Such provisions may include, but not be limited to, designating land for agriculture or other open space uses on that jurisdiction's general plan, adopted growth management plan, or applicable specific plan; adopting an agricultural element to its general plan; and acquiring conservation easements on prime agricultural land to permanently protect the agricultural uses of the property.

f. The establishment of measures to ensure that the new property owners shall recognize the rights of adjacent property owners conducting agricultural operations and practices in compliance with the agricultural zone in accordance with the Right to Farm Ordinance adopted by the Yolo County Board of Supervisors.

F. Agricultural Mitigation

1. Except as expressly noted in subsection 8 and 9 below, annexation of prime agricultural lands shall not be approved unless one of the following mitigations has been instituted, at not less than a 1:1 replacement ratio:

   a. The acquisition and dedication of farmland*,* development rights, and agricultural conservation easements to permanently protect adjacent and other agricultural lands within the County.

   b. The payment of fees that are sufficient to fully fund the acquisition and maintenance of such farmland, development rights or easements. The per acre fees shall be specified by a Fee Schedule or Methodology, which may be periodically updated at the discretion of the Commission (Refer to the Yolo County LAFCO "Payment In Lieu Fee Methodology").

   c. Any such measures must preserve prime agricultural property of reasonably equivalent quality and character that would otherwise be threatened, in the reasonably foreseeable future, by development and/or other urban uses.

2. The loss of fewer than twenty (20) acres of prime agricultural land generally shall be mitigated by the payment of in lieu fees as mitigation rather than the dedication of agricultural conservation easements. The loss of twenty (20) acres or more of prime agricultural land generally may be mitigated either with the payment

of in lieu fees or the dedication of agricultural conservation easements. In all cases, the Commission reserves the right to review such mitigation on a case-by-case basis.

3. If an applicant provides agricultural easements to satisfy this requirement, the easements must conform to the following characteristics:

   a. The land used to mitigate the loss of prime agricultural land must also be prime agricultural land as defined in this Policy and the Cortese-Knox-Hertzberg Act (Government Code 56000 et. seq.).

   b. In addition, it must also be of reasonably equivalent quality and character as the mitigated land as measured using both of the following methodologies:

      (i). Average Storie Index – The USDA calculation methodology will be used to calculate the average Storie Index score. The mitigating land’s average Storie Index score shall be no more than 10% less than the mitigated land’s average Storie Index score.

      (ii). Land Equivalency and Site Assessment ("LESA") Model – The LESA calculation shall be in accordance with the methodology adopted by this Commission. The mitigating land’s LESA score shall be no more than 10% below the mitigated land’s LESA score

4. As a general rule, the Commission will not accept, as mitigation required by this Policy, an agricultural conservation easement or property that is "stacked" or otherwise combined with easements or property acquired for habitat conservation purposes, nor for any other purposes that are incompatible with the maintenance and preservation of economically sound and viable agricultural activities and operations. The Commission retains the discretion to make exceptions on a case-by-case basis, based upon the following criteria:

   a. Whether the applicant made a good-faith effort to mitigate separately for the loss of habitat in accordance with the Yolo County Habitat/Natural Community Conservation Plan process but such efforts were infeasible, and

   b. Whether the proposed "stacked" mitigation for the loss of prime agricultural land and habitat involves one of the following, whichever results in the greatest acreage of preserved land:

      (i). Mitigation at a ratio of no less than 2:1 for the loss of prime agricultural soils; or (ii). Mitigation at a ratio of no less than 1:1 for the loss of all agricultural lands in the proposal area; or

(iii). The property subject to the agricultural conservation easement is larger than the proposal area, meets the conditions specified in this Policy, and encompasses a complete field, legal parcel, or farm line.

5. The presence of a home on land that is subject to an agricultural conservation easement is generally incompatible with the maintenance and preservation of economically sound and viable agricultural activities and operations on that land. The presence or introduction of a home may diminish the value of the agriculture conservation easement as mitigation for the loss of prime agricultural land. Consequently, an agricultural conservation easement will generally not be accepted as mitigation for the loss of prime agricultural land if the easement permits the presence of a home, except an existing home that has been present on the proposed easement for at least twenty-five (25) years, or construction of a comparable replacement for such a home.

   Exceptions to this section of the Policy may be granted by the Commission on a case-by-case basis if the homesite is less than two acres and if the applicant can provide sufficient evidence that a homesite on the agriculture conservation easement is necessary to further the goals of maintaining and preserving economically sound and viable agricultural activities and operations on that easement.

6. LAFCO favors the use of a local non-profit agricultural conservation entity or the regional branch of a nationally recognized non-profit agricultural conservation entity as the easement holder.

   The Commission will use the following criteria when approving the non-profit agricultural conservation entity for these purposes:

   a. Whether the entity is a non-profit organization that is either based locally or is a regional branch of a national non-profit organization whose principal purpose is holding and administering agricultural conservation easements for the purposes of conserving and maintaining lands in agricultural production;

   b. Whether the entity has a long-term proven and established record for holding and administering easements for the purposes of conserving and maintaining lands in agricultural production;

   c. Whether the entity has a history of holding and administering easements in Yolo County for the foregoing purposes;

d. Whether the entity has adopted the Land Trust Alliance's "Standards and Practices" and is operating in compliance with those Standards; and

e. Any other information that the Commission finds relevant under the circumstances.

A local public agency may be an easement co-holder if that agency was the lead agency during the environmental review process.

LAFCO also favors that applicants transfer the easement rights or in lieu fees directly to the recognized non-profit agricultural conservation entity in accordance with that entity's procedures.

The Commission retains the discretion to determine whether the agricultural conservation entity identified by the applicant and the local lead agency has met the criteria delineated above.

7. The Commission prefers that mitigation measures consistent with this Policy be in place at the time that a proposal is filed with the Commission. The loss of prime agricultural land may be mitigated before LAFCO action by the annexing city, or the County of Yolo in the case of a district annexation, provided that such mitigation is consistent with this Policy. LAFCO will use the following criteria in evaluating such mitigation:

   a. Whether the loss of prime agricultural land was identified during the project's or proposal's review process, including but not necessarily limited to review pursuant to the California Environmental Quality Act;

   b. Whether the approval of the environmental documents included a legally binding and enforceable requirement that the applicant mitigate the loss of prime agricultural land in a manner consistent with this Policy; and

   c. Whether, as part of the LAFCO application, an adopted ordinance or resolution was submitted confirming that mitigation has occurred, or requiring the applicant to have the mitigation measure in place before the issuance of either a grading permit, a building permit or final map approval for the site.

8. As noted in III(J) of this Policy, the Commission has concluded that, in the case of proposals that are undertaken exclusively for the benefit of a public agency, the Commission should review the applicability of the mitigation requirements set forth in this Policy on a case-by-case basis to determine the appropriateness of requiring mitigation in any particular case.

In making such a determination, the Commission will consider all relevant information that is brought to its attention, including but not limited to the following factors:

a. Whether the public agency had any significant, practical option in locating its project, including locating the project on non-prime or less prime agricultural land.

b. Whether the public agency is subject to or exempt from the land use regulations of another public agency.

c. Whether the public agency identified the loss of agricultural land as an environmental impact during the project's review, including but not limited to California Environmental Quality Act review, and, if so, whether it adopted a "Statement of Overriding Considerations" for that impact.

d. When the public agency learned of the agricultural conservation mitigation requirements of the Commission's Policy or that of another public agency (whether or not it was subject to that agency's land use control).

e. Whether the public agency could reasonably have allocated or obtained sufficient revenues to provide for some or all of the mitigation required by this Policy if it had learned of that requirement before submitting its proposal to this Commission.

f. Whether the public good served by the public agency's proposal clearly outweighs the purposes served by this Policy and its mitigation requirements.

g. Whether the proposal is necessary to meet the immediate needs of the public agency.

If the Commission determines that it is not appropriate to require mitigation for the loss of agricultural land resulting from a public agency's proposal, or to require less mitigation than otherwise prescribed by this Policy, it shall adopt findings, and a statement of overriding considerations if applicable, supporting that determination.

9. Mitigation shall not be required for the annexation of less than five (5) acres of land if the Commission finds that the land:

a. scores in the fourth tier of the Yolo LAFCO Land Evaluation and Site Assessment (LESA) Model; and

b. is "infill" as defined in this Policy; and

c. has not been used for active agriculture purposes in the previous 20 years.

V. DEFINITIONS - Except where noted, the following definitions are not defined in the California Government Code Sections 56000 et seq.

AFFECTED LOCAL AGENCY - any agency which contains, or would contain, or whose sphere of influence contains, any territory within any proposal or study to be reviewed by LAFCO (Government Code Section 56014).

AGRICULTURAL LAND - areas within which the primary zoning or general plan designation is AG, AP, or AE, or any other agricultural zone.

FEASIBLE - capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, legal, social, and technological factors (Government Code Section 56038.5).

INFILL LAND - property surrounded, or substantially surrounded, by urban uses or incorporated or special district boundaries.

PRIME AGRICULTURAL LAND - "land, whether a single parcel or contiguous parcels, which has not been developed for a use other than an agricultural use and which meets any of the following qualifications:

a. Land that qualifies, if irrigated, for rating as Class I or Class II in the USDA Natural Resources Conservation Service land use capability classification, whether or not land is currently irrigated, provided that irrigation is feasible.

b. Land that qualifies for rating 80 - 100 Storie Index rating.

c. Land that supports livestock used for the production of food and fiber and that has an annual carrying capacity equivalent to at least one animal unit per acre as defined by the United States Department of Agriculture in the National Handbook on Range and Related Grazing Lands, July, 1967, developed pursuant to Public Law 46, December, 1935.

d. Land planted with fruit or nut-bearing trees, vines, bushes, or crops that have a nonbearing period of less than five years and that will return during the commercial bearing period on an annual basis from the production of unprocessed agricultural plant production not less than four hundred dollars ($400) per acre.

e. Land that has returned from the production of unprocessed agricultural plant products an annual gross value of not less than four hundred ($400) per acre for three of the previous five calendar years.

(Government Code Section 56064)

URBAN DEVELOPMENT - a change of organization that contemplates or is likely to lead to the conversion of land from agricultural use to a primarily nonagricultural related use, generally resulting in the need for services such as sewer, water, fire protection, schools, drainage systems, and police protection.

COUNTY OF YOLO
LOCAL AGENCY FORMATION COMMISSION
AGRICULTURAL CONSERVATION POLICY

PAYMENT IN LIEU FEE METHODOLOGY

In lieu of the dedication of agricultural conservation easements that would otherwise be required by the Agricultural Conservation Policy, the Commission may permit the payment of fees as set forth in this Schedule to fully fund the acquisition and maintenance of farmland, development rights or agricultural conservation easements.

Per Acre Mitigation Fee

No less than 35% of the average per acre price for full and unencumbered fee title price in the last five (5) unimproved land purchases plus a five percent (5%) endowment of the cost of the easement, and the payment of the estimated transaction costs associated with acquiring an easement. The purchases must be within the general vicinity of the annexing entity and of a size equal to or greater than the total acreage of prime soils within the subject territory.

Payment of the In Lieu Fee is to be made directly to an agricultural conservation entity that meets the criteria set forth in Section IV(F)(6) of the Yolo County Local Agency Formation Commission's Agricultural Conservation Policy. The agricultural conservation entity receiving these funds must present to the Commission a letter stating its intention to use these funds for the acquisition of farmland, development rights or agricultural conservation easements in Yolo County whose prime soils are reasonably equivalent to the proposal area's soils and that the location of the easements will be within the general vicinity of the annexing entity and in an area within the County of Yolo that would otherwise be threatened, in the reasonably foreseeable future, by development and/or other urban uses.

Prepared by Yolo County LAFCO Staff
Updated by Yolo County LAFCO – January 23, 2006

DEPARTMENT OF TRANSPORTATION
DISTRICT 3 – SACRAMENTO AREA OFFICE
2379 GATEWAY OAKS DRIVE, STE 150 – MS 19
SACRAMENTO, CA 95833
PHONE (916) 274-0635
FAX (916) 263-1796
TTY 711

Serious drought.
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July 24, 2015

032015-YOL-0030
03-YOL-5 / 1.69
SCH# 2015062075

Mr. Tim Busch, Principal Utilities Engineer
City of Woodland
300 First Street
Woodland, CA 95695

Woodland Flood Risk Management Project – Notice of Preparation of a Draft Environmental Impact Report (NOP)

Dear Mr. Busch:

Thank you for including the California Department of Transportation (Caltrans) at the NOP phase of the environmental review process for the project referenced above. Caltrans also appreciates the opportunity of involvement, since 2009, in a related United States Army Corps of Engineers led Cache Creek Feasibility Study (CCFS) that is also evaluating potential improvements to the Cache Creek system. The CCFS was deferred in 2003 until 2009 and is now scheduled for completion in 2017. The City of Woodland is proposing to implement flood system improvements to Lower Cache Creek, near the City of Woodland, to reduce the risk of flooding from Cache Creek. The NOP references the project site as being near the City of Woodland, and further proposes:

- Construction of approximately 10 miles of secondary earthen levee and diversion channel along the northern boundary of the City of Woodland;
- Construction of a bridge or culvert improvements at County Road (CR) 102, State Route (SR) 113, and CR 99; and
- Modification of a segment of Cache Creek Settling Basin adjacent the Interstate 5 (I-5) structure spanning the Yolo Bypass.

Caltrans' new mission, vision, and goals signal a modernization of our approach to California's transportation system. We review this local development for impacts to the State Highway System in keeping with our mission, vision and goals for sustainability/livability/economy, and safety/health. We provide these comments consistent with the State's smart mobility goals that support a vibrant economy, and build communities, not sprawl. The following comments are based on the NOP.

Transportation Management Plan (TMP)

Potential temporary and short-term disruption of traffic circulation or emergency access during construction and traffic effects of haul routes are environmental impacts likely to occur through project implementation as discussed at the bottom of page 4 of the NOP. If it is determined that traffic restrictions and detours are needed on or affecting State highways, a TMP or construction Traffic Impact Study may be required of the developer for approval by Caltrans prior to construction. TMPs must be prepared in accordance with Caltrans' *Manual on Uniform Traffic Control Devices.* Further information is available for download at the following web address: http://www.dot.ca.gov/hq/traffops/engineering/mutcd/pdf/camutcd2014/Part6.pdf.

Transportation Permit

Project work that requires movement of oversized or excessive load vehicles on State highways requires a transportation permit that is issued by Caltrans.

Not all permit vehicles/loads requiring pilot cars are authorized travel during the hours of darkness on green, blue, brown, and red color coded routes. See the following website for more information: http://www.dot.ca.gov/hq/traffops/permits/pcmaps.htm.

To apply, a completed transportation permit application with the determined specific route(s) for the shipper to follow from origin to destination must be submitted to the Caltrans Transportation Permits Office located at 1823 14th Street in Sacramento, CA 95811-7119

See the following website for more information: http://www.dot.ca.gov/hq/traffops/permits/.

Right of Way Engineering

Caltrans requests project proponents contact Arthur Murray prior to development of the DEIR to determine right of way issues throughout project implementation. Please provide specific coordinates of project construction locations at the time of contact with the District 3 Transportation Planning Office (South).

Encroachment Permit

Please be advised that any work or traffic control that would encroach onto the State Right of Way (ROW) requires an encroachment permit that is issued by Caltrans. To apply, a completed encroachment permit application, environmental documentation, and five sets of plans clearly indicating State ROW must be submitted to the address below.

Charles Laughlin
California Department of Transportation
District 3 Office of Permits
703 B Street
Marysville, CA 95901

Traffic-related mitigation measures should be incorporated into the construction plans prior to the encroachment permit process. See the website link below for more information. http://www.dot.ca.gov/hq/traffops/developserv/permits/.

Hydraulics

On page 3 of the NOP, at the beginning of the Project Description – Background, the second sentence states, "The flood threat to life and property in the study area is increased by Interstate 5..." Please clarify and quantify the "threat" created by I-5.

Further down on page 3, in the same section it states, "In anticipation of the construction of the Wilson Valley Reservoir project by the State and local interests, the Lower Cache Creek levees were designed to contain a flow of 30,000 cubic feet per second (cfs) with 3 feet freeboard." The proposed project would construct a new levee, a diversion channel, and new bridges and/or culverts on CR 102, SR 113, and CR 99 to facilitate conveyance of flood waters. These proposed improvements imply that capacity of Lower Cache Creek would be increased. Please explain whether the capacity of the Cache Creek Settling Basin will be increased to accommodate potentially higher flows.

Please study and provide mitigation for any impacts of the proposed project on upstream facilities, i.e. the I-5 bridges (BN22007L, BN2207R) near the town of Yolo, the railroad bridge adjacent to I-5 near Yolo, and the SR 113 bridge (BN220038) just north of the City of Woodland.

Please clarify whether the proposed levee improvements result in removing a segment of I-5 near the Cache creek settling Basin.

Please provide our office with copies of any further actions regarding this project. We would appreciate the opportunity to review and comment on any changes related to this development.

If you have any questions regarding these comments or require additional information, please contact Arthur Murray, Intergovernmental Review Coordinator at (916) 274-0616 or by email at: arthur.murray@dot.ca.gov.

Sincerely,

Eric Fredericks

ERIC FREDERICKS, Branch Chief
Regional Planning – South

c: Scott Morgan, State Clearinghouse

980 NINTH STREET, SUITE 1500
SACRAMENTO, CALIFORNIA 95814
HTTP://DELTACOUNCIL.CA.GOV
(916) 445-5511

DELTA STEWARDSHIP COUNCIL

A California State Agency

July 24, 2015

Tim Busch
City of Woodland
300 First Street
Woodland, California 95695
Email: tim.busch@cityofwoodland.org

RE: Notice of Preparation of a Draft Environmental Impact Report for the Woodland Flood Risk Management Project, SCH# 2015062075

Dear Mr. Busch:

The Delta Stewardship Council (Council) appreciates the opportunity to submit the following comments on the Notice of Preparation (NOP) for the Draft Environmental Impact Report for the Woodland Flood Risk Management Project. This project proposes to identify and implement flood risk reduction measures in order to meet the State's urban level of flood protection requirements that would be compatible with and supportive of elements of the Yolo Bypass/Cache Slough Integrated Water Management Plan. Proposed activities include the construction of approximately 10 miles of secondary earthen levee and a diversion channel, modifications to segments of the existing Cache Creek Settling Basin, and construction of a bridge or culvert to facilitate conveyance of flood flows.

As you may know, the Council is a state agency that was created by the California Legislature in 2009 to develop and implement a legally enforceable long-term management plan for the Delta. The Delta Plan (Plan), adopted on May 16, 2013, coordinates state and local actions to achieve the coequal goals of protecting and enhancing the Delta ecosystem and providing for a more reliable water supply for California. The Plan applies a common sense approach based on the best available science to restore habitat, increase the diversity and efficiency of California's water supplies, enhance floodplains, improve the Delta's risk management, and preserve the Delta's agricultural values. Given the scope of our mission and goals, we are interested in an evaluation of the proposed project's potential impacts to the Delta. Council staff offer the following comments related to the scope and environmental information that should be considered in the Environmental Impact Report (EIR).

Environmental and Regional Setting

According to the California Environmental Quality Act (CEQA) Guidelines Section 15125, an EIR must include a description of the environment in the vicinity of the project as it exists before the commencement of the project. The EIR should clearly describe the key physical conditions related to this project. This would include: the Cache Creek watershed, the Cache Creek Settling Basin and the Yolo Bypass. Each of these elements may be impacted by this project and these impacts (e.g. water quality and loss of agricultural land, etc.) should be addressed in the EIR.

The EIR should reference the Delta Plan as one of the regional frameworks for establishing the baseline of the environmental and regional settings. The project is outside the Delta and not subject to the Council's regulatory authority. Nevertheless, impacts to Delta resources downstream of the project should be considered and mitigated. Information on the Delta Plan can be found at http://deltacouncil.ca.gov/delta-plan-0. Council staff encourage the project team to consider applicable feasible mitigation measures consistent with those identified in the Delta Plan EIR. These mitigation measures can be found in the Delta Plan Mitigation and Monitoring Reporting Program document available at http://deltacouncil.ca.gov/sites/default/files/documents/files/Agenda%20Item%206a_attach%202.pdf.

The Scope of the EIR

Agency Coordination

The NOP indicates that the proposed project would reduce the risk of flooding from Cache Creek and could potentially be integrated with flood control system improvements being considered by the U.S. Army Corps of Engineers, Central Valley Flood Protection Board, and Lower Sacramento River/Delta North Regional Flood Management Team. In addition to the aforementioned integration between the identified agencies, plans, and programs, the process of developing the scope of the EIR and the project alternatives should include consulting with other agencies such as the California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, and the National Marine Fisheries Service. This agency coordination would be to explore the potential ecosystem restoration opportunities that may be included as a part of the proposed project, to ensure integration with existing restoration efforts, especially in the Yolo Bypass, and to identify impacts to fish and wildlife. Project planning should be coordinated carefully with multi-agency initiatives to enhance the Yolo Bypass's value to provide better habitat for fish, avoid conflicts, and seek synergies with that important effort.

The Department of Water Resources' Urban Flood Risk Reduction Program (UFRRP) recently announced that the Woodland Integrated Flood Risk Reduction project is being recommended for funding and it proposed to provide $5 million for the feasibility and preliminary design activities of the project. If the City of Woodland decides to accept the UFRRP grant, when conducting the feasibility study and developing the preliminary design, the project team should consider system-wide alternatives that meet multiple objectives such as flood risk management and ecosystem restoration. The EIR should evaluate potential positive and negative impacts to the region's level of flood risk and ecosystem for both upstream and downstream areas of the project site.

Modification and Realignment of the Existing Cache Creek Settling Basin

As the NOP indicates, one of the expected project components is to modify and realign the existing Cache Creek Settling Basin. According to the 2004 Cache Creek Total Maximum Daily Load (TMDL)[1], "Cache Creek is a major source of mercury to the Delta and loads of total methylmercury exiting Cache Creek should be reduced.... Reductions in total mercury loads to the inactive mines in Harley Gulch and the Bear Creek watershed assigned by this TMDL and proposed changes to the Cache Creek Settling Basin, which would increase the mass of mercury retained in the basin, would create significant reductions in loads from Cache Creek." The project team should work with the Central Valley Regional Water Quality Control Board staff and reference the 2010 Sacramento-San Joaquin Delta Methylmercury TMDL[2] to develop the details for modifications of the existing Cache Creek Settling Basin to reduce the methylmercury loading to the system given the scenarios with or without the expected flood events.

In addition, we ask that in planning the project, the City considers Delta Plan Recommendation **WQ R8** which recommends that proponents of projects that may impact methylmercury loading in the Delta or Suisun Marsh should participate in control studies or implement site-specific study plans that evaluate practices to minimize methylmercury discharges. If the proposed project includes floodplain restoration activities, the project team should include investigation and implementation of Best Management Practices (BMPs) to control methylmercury production and transport because periodic wetting and drying of floodplains makes these areas prone to methylation of mercury.

Adaptive Management and Best Available Science

Council staff encourages the City of Woodland to consider applying the principles of adaptive management and best available science to the project features that will help manage mercury. Adaptive management is a strategy that provides for making management decisions under uncertain conditions using the best available science rather than repeatedly delaying action until more information is available. This also is an approach to resource management that increases the likelihood of success in obtaining goals in a manner that is both economical and effective because it provides flexibility and feedback to manage natural resources in the face of considerable uncertainty. Delta Stewardship Council staff, including staff from the Delta Science Program, can provide consultation and assistance in the use of best available science

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1 Regional Water Quality Control Board Central Valley Region (2004), "Cache Creek, Bear Creek, and Harley Gulch TMDL for Mercury":http://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/central_valley_projects/cache_sulphur_creek/cache_nov2004_a.pdf

2 Regional Water Quality Control Board Central Valley Region (2010), "Sacramento-San Joaquin Delta Methylmercury TMDL" :http://www.waterboards.ca.gov/rwqcb5/water_issues/tmdl/central_valley_projects/delta_hg/april_2010_hg_tmdl_hearing/apr2010_tmdl_staffrpt_final.pdf

and adaptive management in your preparation of the EIR, project management plan, and long-term monitoring plan.

If you have questions or would like to discuss the comments presented here, please feel free to contact me or my staff, You Chen (Tim) Chao at YouChen .Chao@deltacouncil.ca.gov or (916) 445-0143. We look forward to working with your agency and other local, state, and federal agencies on this project as well as on other activities that may have effects to the Delta.

Sincerely,

Cindy Messer

Cindy Messer
Deputy Executive Officer
Delta Stewardship Council

TULEYOME
607 North Street • Woodland, CA 95695
phone: (530) 350-2599 • fax: (530) 350-2729
DEEP HOME PLACE™

July 27, 2015

Mr. Tim Busch
Principal Utilities Civil Engineer
City of Woodland
300 First Street
Woodland, CA 95695
timbusch@cityofwoodland.org

Subject: Comments on Notice of Preparation for Project Environmental Impact Report, Woodland Flood Risk Management Project

Dear Mr. Busch:

The following comments are provided on behalf of the Board of Directors of Tuleyome, a 501(c)(3) not-for-profit regional conservation organization based in Woodland California.

Tuleyome would like to incorporate by reference the comments of Chad Roberts, Conservation Chair of the Yolo Audubon Society as stated in his letter to you dated July 21, 2015. These comments substantively represent the views of Tuleyome.

In particular, we note the concerns about ensuring full compliance with the California Environmental Quality Act (CEQA) as discussed in Mr. Roberts's letter.

Thank you for your consideration of these comments. Please include Tuleyome on your contact list with respect to this project and all relevant communications.

Sincerely,

Bob Schneider

Bob Schneider
Senior Policy Director
530-304-6215
bschneider@tuleyome.org

Appendix B.3

Notice of Scoping Meeting, August 2019

NOTICE OF SCOPING MEETING

To: Agencies and Interested Parties

From: City of Woodland
300 First Street
Woodland, CA 95695

Date: August 2019

Subject: Notice of Public Scoping Meeting for the Preparation of a Draft Environmental Impact Report for the Woodland Flood Risk Management Project

The City of Woodland (City), as the Lead Agency, will prepare an environmental impact report (EIR) for the Woodland Flood Risk Management Project ("Project"). The City published a Notice of Preparation (NOP) for the EIR in June 2015, noting that a scoping meeting would be held at a future date. Subsequently, the City paused work on the preparation of the EIR and is resuming the process at this time. The City will hold the scoping meeting on Wednesday, September 11, 2019 at Woodland City Hall.

Scoping Meeting
Wednesday, September 11, 2019
6:30 – 8:00 p.m.
Woodland City Hall
300 First Street, Woodland, CA 95695

The City will accept public comments regarding the scope and content of the EIR. See additional details regarding submitting public comments below.

INTRODUCTION

The California Environmental Quality Act (CEQA) specifies that a public agency must prepare an EIR on any project it proposes to carry out or approve that may have a significant direct or indirect effect on the physical environment.

The City is proposing to implement flood system improvements to the Lower Cache Creek in the vicinity of Woodland; see Figure 1. The proposed project would reduce the risk of flooding from

Cache Creek and could potentially be integrated with flood control system improvements being considered by the U.S. Army Corps of Engineers (USACE), Central Valley Flood Protection Board (CVFPB) and the Lower Sacramento River/Delta North Regional Flood Management Team. The City has determined that a flood risk management project may result in significant effects on the physical environment. Therefore, acting as the lead agency for CEQA compliance, the City will prepare a draft EIR that evaluates the significant environmental effects of the proposed project.

NOTICE OF PREPARATION

The City filed an NOP with the State Clearinghouse on June 25, 2015 for the EIR. Notification was sent to agencies and interested parties, and comments were accepted through July 24, 2015. At that time, the City noted that a scoping meeting would be scheduled at a future date. Subsequently, the City paused work on the preparation of the EIR and is resuming the process at this time.

PROJECT DESCRIPTION

Background

The City of Woodland is subject to flooding from a failure of the existing levee along the right (south) bank of Cache Creek during a storm frequency of approximately 8 to 10 years. The flood threat to life and property in the study area is increased by Interstate 5 (I-5) as well as the levees that make up the Cache Creek Settling Basin (CCSB) and Yolo Bypass. The Lower Cache Creek levees were constructed by the USACE in 1958 as part of the federally authorized Sacramento River Flood Control Project (SRFCP) and are part of the State Plan of Flood Control (SPFC). In anticipation of the construction of the Wilson Valley Reservoir project by the State and local interests, the Lower Cache Creek levees were designed to contain a flow of 30,000 cubic feet per second (cfs) with 3 feet of freeboard. A flow of this magnitude is estimated to have an annual exceedance probability of 0.10 (1 in 10 years). Historically, the existing levees have conveyed larger flood flows by encroaching into the freeboard. The Wilson Valley Reservoir project has not been constructed due to seismic and sediment concerns, and over time, subsidence of the levee has reduced the amount of freeboard available for passing the 10-year-design flood event. Cache Creek discharges into the CCSB, a component of the SRFCP and a SPFC facility. Cache Creek has historically carried a large sediment load. The settling basin was constructed by the USACE in 1937 to prevent sediment carried by Cache Creek from entering the Yolo Bypass and diminishing its flood conveyance capacity; it currently covers 3,600 acres and is bounded by levees on all sides with an outlet weir to the Yolo Bypass. The CCSB is designed to convey a flow of 30,000 cfs, the same as the Cache Creek levee system. The 100-year flow rate is approximately 56,000 cfs and the 200-year flow rate is approximately 65,000 cfs.

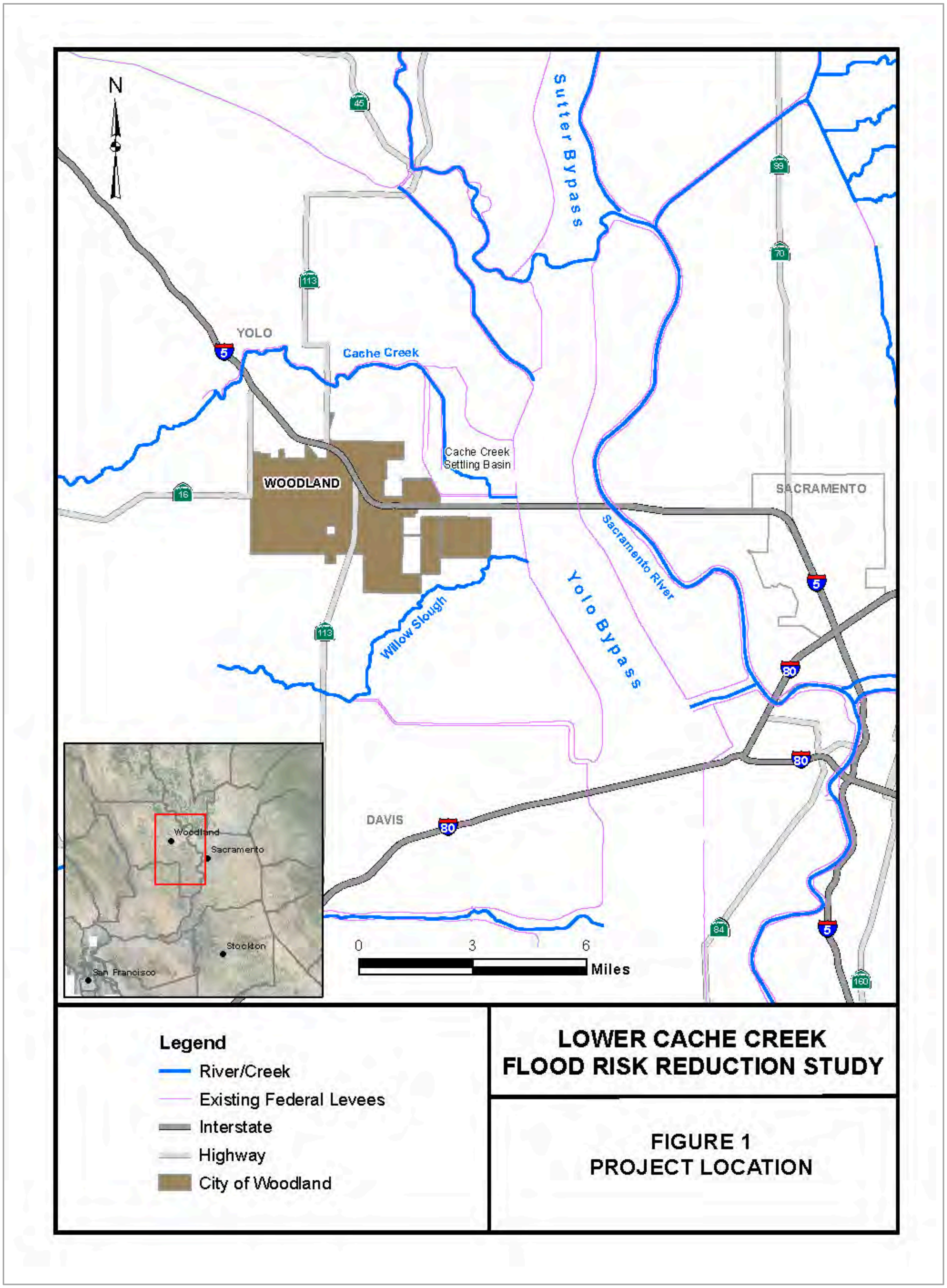

Figure 1. Project Location Map

In addition to the USACE study, the City has participated in a regional partnership to evaluate the feasibility of a larger plan of improvements, the Yolo Bypass/Cache Slough Integrated Water Management Plan (IWMP) as presented in the Lower Sacramento River/Delta North Regional Flood Management Plan dated July 2014.

Proposed Project

The City is partnering with DWR through its Urban Flood Risk Reduction Program to identify and implement a flood risk reduction project to meet the State's urban level of protection (ULOP) requirements in a cost-effective manner that would be compatible with and supportive of elements of the IWMP. The proposed project is being formulated to be compatible with alternatives currently being evaluated by the USACE as part of the ongoing feasibility study.

Project improvements are expected to include:

- Construction of approximately 7 miles of secondary earthen levee and a diversion channel along the northern boundary of the City to redirect overland flood flows from the right bank of Cache Creek into a diversion channel to be conveyed to the CCSB and City of Woodland North Drainage Canal.
- Modification/realignment of a segment of the existing CCSB to allow conveyance of flood flows into the CCSB.
- Construction of a bridge or culvert improvements at County Road 102, State Highway 113, and County Road 99 (West Street) to facilitate conveyance of flood flows in the diversion channel.

PROBABLE ENVIRONMENTAL IMPACTS

The project-level EIR analysis will focus on potential environmental impacts associated with construction of the proposed project and measures that can minimize or avoid such impacts.

On the basis of preliminary evaluations, the City has determined that the proposed improvements could have the following potentially significant environmental effects:

► **Aesthetics**. Temporary, short-term, and long-term changes in scenic views or visual character of project sites.

► **Agriculture and Forest Resources**. Potential temporary and long-term conversion of farmland for weir/bypass improvements, use of borrow material, or creation of habitat.

► **Air Quality**. Temporary and short-term increases in pollutant emissions associated with construction activities.

► **Cultural Resources**. Potential disturbance or destruction of known or unknown historic or archaeological resources during construction.

► **Biological Resources**. Potential temporary and short-term construction impacts on special-status species or their habitats; modification of habitat at erosion treatment sites; and potential disturbance or loss of riparian vegetation, jurisdictional wetlands, or other sensitive natural communities or special-status species habitats.

- ► **Greenhouse Gas Emissions**. Temporary and short-term increases in greenhouse gas emissions associated with construction activities.
- ► **Hazards and Hazardous Materials**. Potential introduction of contaminants into watercourses as a result of construction activities.
- ► **Hydrology and Water Quality**. Potential temporary and short-term effects on water quality during construction; long-term local drainage effects; and hydraulic and water quality effects on the Yolo Bypass and Bay Delta.
- ► **Noise**. Temporary and short-term increases in noise levels near sensitive receptors during construction.
- ► **Population and Housing**. Potential to increase growth.
- ► **Recreation**. Temporary and short-term disturbance of land- and water-based recreational activities in areas adjacent to construction sites.
- ► **Transportation and Traffic**. Potential temporary and short-term disruption of traffic circulation or emergency access during construction and traffic effects of haul routes, including haul routes via barge.
- ► **Utilities and Service Systems**. Potential disruption of service during construction and need for the relocation of utilities within the project footprint.

PROVIDING SCOPING COMMENTS

Interested parties may provide written comments on the proposed content and scope of the environmental information for the draft EIR. W**ritten comments must be provided to the City of Woodland no later than Wednesday, September 25, 2019.** Comments provided by email should include the name and address of the sender, with the subject line "Scoping Comments on the Woodland Flood Risk Management Project." Please send all written comments to:

Mr. Tim Busch, Principal Utilities Civil Engineer
City of Woodland
300 First Street
Woodland, CA 95695
email: TimBusch@cityofwoodland.org

Appendix B.4

Scoping Letters Received during 2019 Scoping Period

California Water Boards

Gavin Newsom
Governor

Jared Blumenfeld
Secretary for Environmental Protection

Central Valley Regional Water Quality Control Board

5 September 2019

Tim Busch
City of Woodland
300 First Street
Woodland, CA 95695

CERTIFIED MAIL
7019 0700 0002 0112 0064

COMMENTS TO REQUEST FOR REVIEW FOR THE NOTICE OF PUBLIC SCOPING MEETING, WOODLAND FLOOD RISK MANAGEMENT PROJECT, YOLO COUNTY

Pursuant to the City of Woodland's 29 August 2019 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Request for Review for the Notice of Public Scoping Meeting* for the Woodland Flood Risk Management Project, located in Yolo County.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore our comments will address concerns surrounding those issues.

I. Regulatory Setting

<u>Basin Plan</u>

The Central Valley Water Board is required to formulate and adopt Basin Plans for all areas within the Central Valley region under Section 13240 of the Porter-Cologne Water Quality Control Act. Each Basin Plan must contain water quality objectives to ensure the reasonable protection of beneficial uses, as well as a program of implementation for achieving water quality objectives with the Basin Plans. Federal regulations require each state to adopt water quality standards to protect the public health or welfare, enhance the quality of water and serve the purposes of the Clean Water Act. In California, the beneficial uses, water quality objectives, and the Antidegradation Policy are the State's water quality standards. Water quality standards are also contained in the National Toxics Rule, 40 CFR Section 131.36, and the California Toxics Rule, 40 CFR Section 131.38.

The Basin Plan is subject to modification as necessary, considering applicable laws, policies, technologies, water quality conditions and priorities. The original Basin Plans were adopted in 1975, and have been updated and revised periodically as required, using Basin Plan amendments. Once the Central Valley Water Board has adopted a Basin Plan amendment in noticed public hearings, it must be approved by the State Water Resources Control Board (State Water Board), Office of Administrative Law (OAL) and in some cases, the United States Environmental Protection Agency (USEPA). Basin Plan amendments only become effective after they have been approved by the OAL and in some cases, the USEPA. Every three (3) years, a review of the Basin Plan is completed that assesses the appropriateness of existing standards and evaluates and prioritizes Basin Planning issues. For more information on the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins*, please visit our website: http://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/

Antidegradation Considerations

All wastewater discharges must comply with the Antidegradation Policy (State Water Board Resolution 68-16) and the Antidegradation Implementation Policy contained in the Basin Plan. The Antidegradation Implementation Policy is available on page 74 at: https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_201805.pdf

In part it states:

> *Any discharge of waste to high quality waters must apply best practicable treatment or control not only to prevent a condition of pollution or nuisance from occurring, but also to maintain the highest water quality possible consistent with the maximum benefit to the people of the State.*
>
> *This information must be presented as an analysis of the impacts and potential impacts of the discharge on water quality, as measured by background concentrations and applicable water quality objectives.*

The antidegradation analysis is a mandatory element in the National Pollutant Discharge Elimination System and land discharge Waste Discharge Requirements (WDRs) permitting processes. The environmental review document should evaluate potential impacts to both surface and groundwater quality.

II. Permitting Requirements

Construction Storm Water General Permit

Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction Activities (Construction General Permit), Construction General Permit Order No. 2009-009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). For more information on the Construction General Permit, visit the State Water Resources Control Board website at: http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml

Phase I and II Municipal Separate Storm Sewer System (MS4) Permits[1]
The Phase I and II MS4 permits require the Permittees reduce pollutants and runoff flows from new development and redevelopment using Best Management Practices (BMPs) to the maximum extent practicable (MEP). MS4 Permittees have their own development standards, also known as Low Impact Development (LID)/post-construction standards that include a hydromodification component. The MS4 permits also require specific design concepts for LID/post-construction BMPs in the early stages of a project during the entitlement and CEQA process and the development plan review process.

For more information on which Phase I MS4 Permit this project applies to, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/

For more information on the Phase II MS4 permit and who it applies to, visit the State Water Resources Control Board at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml

Industrial Storm Water General Permit
Storm water discharges associated with industrial sites must comply with the regulations contained in the Industrial Storm Water General Permit Order No. 2014-0057-DWQ. For more information on the Industrial Storm Water General Permit, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/index.shtml

Clean Water Act Section 404 Permit
If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed from the United States Army Corps of Engineers (USACE). If a Section 404 permit is required by the USACE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration Permit requirements. If you have any questions regarding the Clean Water Act Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACE at (916) 557-5250.

[1] Municipal Permits = The Phase I Municipal Separate Storm Water System (MS4) Permit covers medium sized Municipalities (serving between 100,000 and 250,000 people) and large sized municipalities (serving over 250,000 people). The Phase II MS4 provides coverage for small municipalities, including non-traditional Small MS4s, which include military bases, public campuses, prisons and hospitals.

Clean Water Act Section 401 Permit – Water Quality Certification

If an USACE permit (e.g., Non-Reporting Nationwide Permit, Nationwide Permit, Letter of Permission, Individual Permit, Regional General Permit, Programmatic General Permit), or any other federal permit (e.g., Section 10 of the Rivers and Harbors Act or Section 9 from the United States Coast Guard), is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. There are no waivers for 401 Water Quality Certifications. For more information on the Water Quality Certification, visit the Central Valley Water Board website at: https://www.waterboards.ca.gov/centralvalley/water_issues/water_quality_certification/

Waste Discharge Requirements – Discharges to Waters of the State

If USACE determines that only non-jurisdictional waters of the State (i.e., "non-federal" waters of the State) are present in the proposed project area, the proposed project may require a Waste Discharge Requirement (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation. For more information on the Waste Discharges to Surface Water NPDES Program and WDR processes, visit the Central Valley Water Board website at:https://www.waterboards.ca.gov/centralvalley/water_issues/waste_to_surface_water/

Projects involving excavation or fill activities impacting less than 0.2 acre or 400 linear feet of non-jurisdictional waters of the state and projects involving dredging activities impacting less than 50 cubic yards of non-jurisdictional waters of the state may be eligible for coverage under the State Water Resources Control Board Water Quality Order No. 2004-0004-DWQ (General Order 2004-0004). For more information on the General Order 2004-0004, visit the State Water Resources Control Board website at: https://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2004/wqo/wqo2004-0004.pdf

Dewatering Permit

If the proposed project includes construction or groundwater dewatering to be discharged to land, the proponent may apply for coverage under State Water Board General Water Quality Order (Low Risk General Order) 2003-0003 or the Central Valley Water Board's Waiver of Report of Waste Discharge and Waste Discharge Requirements (Low Risk Waiver) R5-2013-0145. Small temporary construction dewatering projects are projects that discharge groundwater to land from excavation activities or dewatering of underground utility vaults. Dischargers seeking coverage under the General Order or Waiver must file a Notice of Intent with the Central Valley Water Board prior to beginning discharge.

For more information regarding the Low Risk General Order and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2003/wqo/wqo2003-0003.pdf

For more information regarding the Low Risk Waiver and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/waivers/r5-2013-0145_res.pdf

Regulatory Compliance for Commercially Irrigated Agriculture
If the property will be used for commercial irrigated agricultural, the discharger will be required to obtain regulatory coverage under the Irrigated Lands Regulatory Program.

There are two options to comply:

1. **Obtain Coverage Under a Coalition Group.** Join the local Coalition Group that supports land owners with the implementation of the Irrigated Lands Regulatory Program. The Coalition Group conducts water quality monitoring and reporting to the Central Valley Water Board on behalf of its growers. The Coalition Groups charge an annual membership fee, which varies by Coalition Group. To find the Coalition Group in your area, visit the Central Valley Water Board's website at: https://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/regulatory_information/for_growers/coalition_groups/ or contact water board staff at (916) 464-4611 or via email at IrrLands@waterboards.ca.gov.
2. **Obtain Coverage Under the General Waste Discharge Requirements for Individual Growers, General Order R5-2013-0100**. Dischargers not participating in a third-party group (Coalition) are regulated individually. Depending on the specific site conditions, growers may be required to monitor runoff from their property, install monitoring wells, and submit a notice of intent, farm plan, and other action plans regarding their actions to comply with their General Order. Yearly costs would include State administrative fees (for example, annual fees for farm sizes from 11-100 acres are currently $1,277 + $8.53/Acre); the cost to prepare annual monitoring reports; and water quality monitoring costs. To enroll as an Individual Discharger under the Irrigated Lands Regulatory Program, call the Central Valley Water Board phone line at (916) 464-4611 or e-mail board staff at IrrLands@waterboards.ca.gov.

Limited Threat General NPDES Permit
If the proposed project includes construction dewatering and it is necessary to discharge the groundwater to waters of the United States, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. Dewatering discharges are typically considered a low or limited threat to water quality and may be covered under the General Order for *Limited*

Threat Discharges to Surface Water (Limited Threat General Order). A complete Notice of Intent must be submitted to the Central Valley Water Board to obtain coverage under the Limited Threat General Order. For more information regarding the Limited Threat General Order and the application process, visit the Central Valley Water Board website at:
https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2016-0076-01.pdf

NPDES Permit
If the proposed project discharges waste that could affect the quality of surface waters of the State, other than into a community sewer system, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. A complete Report of Waste Discharge must be submitted with the Central Valley Water Board to obtain a NPDES Permit. For more information regarding the NPDES Permit and the application process, visit the Central Valley Water Board website at:
https://www.waterboards.ca.gov/centralvalley/help/permit/

If you have questions regarding these comments, please contact me at (916) 464-4812 or Jordan.Hensley@waterboards.ca.gov.

Jordan Hensley
Environmental Scientist

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FAX COVER SHEET

FROM: Nancy F. Lea

FAX # 530-662-7087

TO: Tim Busch
Principal Utilities Civil Engineer
City of Woodland, CA
FAX #: 530.406.0832

DATE: September 11, 2019

RE: Scoping Comments on the Woodland Flood Risk Management Project

3 Pages (including this page)

Dear Mr. Busch,

I tried to email these comments to you at the email address you provided on the letter requesting comments (TimBusch@cityofwoodland.org) but the emails were returned as "address not found". Would you please ensure that my comments are made part of the record of the scoping session.

Thank you.

Nancy F Lea

Preliminary Comments: Scoping Session: COW Flood Barrier Project

Scoping Comments on the Woodland Flood Risk Management Project

Nancy F. Lea
PO Box 8667
Woodland CA 95776

September 11, 2019

These comments are offered in response to the CEQA that requires any agency to prepare an EIR on any project that may have a significant direct or indirect effect on the physical environment. I note specifically that the EIR must cover the impacts that are indirectly caused by the project.

I first point out that the Project proposed by COW creates a bypass out of the lands north of its proposed levee. It is directing sheet flows which would otherwise spread out and dissipate over a very large area into a much smaller specific area, deepening that water, holding that water, and directing that water. In an engineering analysis sent out by email to members of the Citizen's Advisory Committee on or about August 13, 2019, the land north of the barrier is even described as a "bypass". However, the COW's "Highest and Best Use Study that concludes there is no difference in the value of ag lands north and south of the barrier claims, at page 18, that the land north of the barrier is not a bypass because it "does not introduce new or additional waters from this existing flood source [Cache Creek] and divert it through the study area". Although it does not introduce waters other than those from Cache Creek, the "flood source", the Project does concentrate, divert and hold those flood waters on land north of the barrier, thereby increasing the flood risk, damage to and duration of any flooding on those lands.

In the enumerated list of the City's delineation of possible environmental effects caused by the Project it is stated: "Agricultural and Forest Resources. Potential temporary and long-term conversion of farmland for weir/bypass improvements, use of borrow material, or creation of habitat."

I believe that the Project proponents do not choose to recognize the impact that it will have on the approximately 6,000 acres of farmland that lies north of the flood control levee. The Project, as stated, will obviously convert substantial acreage to bypass, levee construction and habitat development. However, it will also marginalize the balance of the acreage for ag purposes and will limit the flexibility of the owners of that land to maximize the return on their investments. This limitation of flexibility will materially impact the ability of farmers and landowners to manage and fund their operations over the next decades and family generations. A list of some impacts which due to time constraints not intended to be complete, but is intended to apprise Project proponents of some ag related issues about which they exhibit little knowledge, is as follows:

(a) The Project proponents agree that the Project will take land out of agriculture. Viable Yolo County agriculture depends on sufficient ag acreage and capital base to support the required ag infrastructure (such as tractor and equipment dealers, ag suppliers, seed dealers, custom repair shops, etc.) Any reduction of land in agriculture or marginalization of it presents a potential challenge to the continued profitability of this sector of the economy. Without an ag supply and support base, Yolo County ag will become more expensive and thus more marginalized, leading to more individuals, families and companies leaving our area and/or the business of farming/ranching.

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(b) Farmers and rural landowners have, as a matter of right, the ability to construct a second house on their parcels. What will the ramifications be on that ability if these lands are included within an institutionalized floodplain? What will be the ramifications on these landowners if they wish to do any ag improvements - such as installation of nut processing or other farm produce handling facilities? What about additional equipment or product storage, or farm stores? These landowners need to be compensated for the additional future costs that they may incur due to this Project.

(c) The proponents have offered a theoretical appraisal in which it is stated that the levee will not reduce the value of ag lands on the north (wet) side: that their values moving forward will be the same as ag lands on the south (dry) side of the flood levee for ag purposes. It defies belief that a buyer for ag properties will pay the same amount of money for ag land north of the barrier as ag land south of it. This is especially true since the proponents of Measure S, in 2004, had letters from recognized farm lending agencies that the position of the ground with reference to flood safety is a valuation issue. Landowners and farmers north of the proposed flood barrier need to be compensated for this loss of value.

(d) Aligned with the above statement, farmers and ranchers know that an additional opportunity that may provide them and their family with operating flexibility is the ability to sell a conservation easement or a mitigation easement for urban development. Much of this land is within one mile of the city limits (or the urban limit line of the COW) so in the absence of any consideration of this flood barrier, the opportunities to sell such an easement would logically be available at some point in time. The obvious question is whether any agency will purchase an easement if it can assume, since the land is on the wet side of a flood levee, that it will never develop beyond isolated farm structures in any event. If this assumption is correct, the placement of the flood barrier has stripped those landowners of value for which they must be compensated.

(e) The Project basically recognizes that the land north of the barrier will become subject to flooding. Flood waters bring pathogens and encourage latent ones already onsite which damage orchards and other permanent plantings: floodwaters bring debris and silt which damage installations of all types and must be disced, chiseled in or removed before the land or installation can again be used. Pathogens, such as phytophthora, cannot be removed successfully from permanent plantings. These flood consequence possibilities are factors on ag land valuations, and management of flood encroachment damage will be an ongoing expense to the owners and operators of that farm ground.

Additionally, we note other impacts which are not mentioned in the letter advising us of the Project scoping session. An obvious one is the permanent impairment of transportation routes along CR 102, State Highway 113, CR 99 (West Street) and Interstate 5. Shutdowns caused by impounded waters, although intermittent, will render CR 102, State Highway 113, Interstate 5 and CR 99 impassable. The communities of Knights Landing and Yolo, which have a high percentage of minority and low income residents, will be less able, and in some instances unable, to access the necessary medical, educational, recreational and other services in Woodland. There is no mention in the enumeration of "Probable Environmental Impacts" that the Project design will create permanent and continuing transportation disruptions that will unfairly marginalize these minority and low income populations.

This is not intended to be our complete assessment of the Project's direct and indirect environmental impacts. Please anticipate further submissions.

Very truly yours,

Nancy F. Lea

Nancy F. Lea

Martin, Sara

From: Tim Busch <Tim.Busch@cityofwoodland.org>
Sent: Wednesday, September 25, 2019 8:30 AM
To: Martin, Sara
Cc: Ric Reinhardt
Subject: FW: Woodland Flood Risk Management Project Scoping for DEIR

From: Boyd, Ian@Wildlife [mailto:Ian.Boyd@Wildlife.ca.gov]
Sent: Tuesday, September 24, 2019 4:09 PM
To: Tim Busch <Tim.Busch@cityofwoodland.org>
Subject: FW: Woodland Flood Risk Management Project Scoping for DEIR

Hello Mr. Busch,

I sent out the following comment (below) today, but incorrectly entered your email address.

Thank you,

Ian Boyd
CDFW-NCR
(916) 358-1134

From: Boyd, Ian@Wildlife
Sent: Tuesday, September 24, 2019 3:19 PM
To: timbusch@cityofwoodland.org
Cc: Wildlife R2 CEQA <R2CEQA@wildlife.ca.gov>
Subject: Woodland Flood Risk Management Project Scoping for DEIR

Hello Mr. Busch,

The California Department of Fish and Wildlife (CDFW) received and reviewed the Notice of Public Scoping Meeting for the preparation of a draft Environmental Impact Report (DEIR) from the City of Woodland for the Woodland Flood Risk Management Project (Project) [State Clearinghouse No. 2015062075] in Yolo County.

CDFW had provided comments in 2015 regarding the initial Notice of Preparation (NOP) and wanted to provide additional clarification and comments regarding the Project that is described in the 2019 Notice of Public Scoping. CDFW appreciates the opportunity to provide comments regarding those aspects of the project that CDFW, by law, may need to exercise its own regulatory authority under the Fish and Game Code (Fish & G. Code).

CDFW ROLE

CDFW is California's **Trustee Agency** for fish and wildlife resources, and holds those resources in trust by statute for all the people of the State. (Fish & G. Code, §§ 711.7, subd. (a) & 1802; Pub. Resources Code, § 21070; CEQA Guidelines § 15386, subd. (a)) CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species. (*Id.*, § 1802.) Similarly, for purposes of CEQA, CDFW provides, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources.

CDFW may also act as a **Responsible Agency** under CEQA. (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381.) The project may be subject to CDFW's lake and streambed alteration regulatory authority. (Fish & G. Code, § 1600 et seq.) Likewise, to the extent implementation of the project as proposed may result in "take" as defined by State law (Fish & G. Code, § 86) of any species protected under the California Endangered Species Act (CESA) (Fish & G. Code, § 2050 et seq.), related authorization as provided by the Fish and Game Code will be required. CDFW also administers the Native Plant Protection Act, Natural Community Conservation Program, and other provisions of the Fish and Game Code that afford protection to California's fish and wildlife resources.

PROJECT DESCRIPTION SUMMARY

The City of Woodland is partnering with DWR implement flood system improvements to the Lower Cache Creek in the vicinity of Woodland, CA. The project proposes to construct approximately 7 miles of secondary earthen levee and a diversion channel along the northern boundary of the city to redirect flood flows to the Cache Creek Settling Basin (CCSB) and North Drainage Canal. The project also proposes to modify or realign a segment of the existing CCSB to allow the conveyance of flood flows into the CCSB. In order to facilitate conveyance of flood flows in the diversion channel the project proposes to construct bridges of improve culverts at County Road 102, State Highway 113, and County Road 99.

The project description should include the whole action as defined in the CEQA Guidelines § 15378 and should include appropriate detailed exhibits disclosing the project area including temporary impacted areas such as equipment stage area, spoils areas, adjacent infrastructure development, staging areas and access and haul roads if applicable.

As required by § 15126.6 of the CEQA Guidelines, the EIR should include appropriate range of reasonable and feasible alternatives that would attain most of the basic project objectives and avoid or minimize significant effects of the project.

ENVIRONMENTAL SETTING

CDFW recommends three progressive steps in project impact evaluations: habitat assessment, detection surveys and impact assessment in evaluating whether projects will have impacts to special-status species. The information gained from these steps will inform any subsequent avoidance, minimization and mitigation measures. The steps for project impact evaluations are: 1) habitat assessment, 2) surveys, and 3) impact assessment. Habitat assessments are conducted to evaluate the likelihood that a site supports wildlife species and their habitats. Detection surveys provide information needed to determine the potential effects of proposed projects and activities on those species and habitats, Impact assessments evaluate the extent to which wildlife species and their habitat may be impacted directly or indirectly, on and within a reasonable distance of proposed CEQA project activities. CDFW recommends that the EIR include a complete environmental assessment of the existing biological conditions within the project area including but not limited to the type, quantity and locations of the habitats, flora and fauna. Maps and information regarding the habitat assessment and survey efforts should be included within the EIR. Any surveys of the biological conditions and related environmental analysis should be completed by qualified personnel with sufficient experience in the wildlife and habitats associated with the project.

To identify a correct environmental baseline, the EIR should include a complete and current analysis of endangered, threatened, candidate, and locally unique species with potential to be impacted by the project. CEQA guidelines § 15125, subdivision (c) requires lead agencies to provide special emphasis to sensitive habitats and any biological resources that are rare or unique to the area. This includes, but is not limited to vernal pools, streambeds, riparian habitats, and open grasslands that are known to be present within the project boundaries or its vicinity. CDFW recommends that the environmental documentation identify natural habitats and provide a discussion of how the proposed project will affect their function and value.

CDFW recommends that the California Natural Diversity Database (CNDDB), as well as previous studies performed in the area, be consulted to assess the potential presence of sensitive species and habitats. Although the CNDDB is one tool that may identify potential sensitive resources in the area, the dataset should not be regarded as complete for the elements or areas with the potential to be impacted. Other sources for identification of species and habitats near or adjacent to the project area should include, but may not be limited to, State and federal resource agency lists, California Wildlife Habitat Relationship (CWHR) System, California Native Plant Society (CNPS) Inventory, agency contacts, environmental documents for other projects in the vicinity, academics, and professional or scientific organizations. In addition, CNDDB is not a comprehensive database. It is a positive detection database. Records in the database exist only where species were detected and reported. This means there is a bias in the database towards locations that have had more development pressures, and thus more survey work. Places that are empty or have limited information in the database often signify that little survey work has been done there. A nine United States Geologic Survey (USGS) 7.5-minute quadrangle search is recommended to determine what may occur in the region (see Data Use Guidelines on the Department webpage https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data).

Recent surveys for the different species that have the potential to be present within the project limits and its vicinity shall be included within the EIR. Additional information regarding survey protocols can be found on our website here https://www.wildlife.ca.gov/Conservation/Survey-Protocols or by contacting CDFW.

Species-specific surveys should be conducted in order to ascertain the presence of species with the potential to be directly, indirectly, on or within a reasonable distance of the project activities. CDFW recommends the lead agency rely on survey and monitoring protocols and guidelines available at: https://www.wildlife.ca.gov/Conservation/Survey-Protocols and that any assessments for rare plants and rare natural communities follow CDFW's 2018 *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities*. Alternative survey protocols may be warranted; justification should be provided to substantiate why an alternative protocol is necessary.

IMPACT ASSESSMENT AND MITIGATION MEASURES

Based on habitat assessments and survey results, the EIR should clearly identify and describe all short-term, long-term, permanent, or temporary impacts to biological resources, including all direct and foreseeable indirect impacts caused by the proposed project.

The EIR should define the threshold of significance for each impact and describe the criteria used to determine whether the impacts are significant (CEQA Guidelines, § 15064, subd. (f).) The EIR must demonstrate that the significant environmental impacts of the project were adequately investigated and discussed, and it must permit the significant effects of the project to be considered in the full environmental context. CDFW also recommends that the environmental documentation provide scientifically supported discussion regarding adequate avoidance, minimization, and/or mitigation measures to address the project's significant impacts upon fish and wildlife and their habitat. For individual projects, mitigation must be roughly proportional to the level of impacts, including cumulative impacts, in accordance with the provisions of CEQA (Guidelines Section 15126.4(a)(4)(B), 15064, 15065, and 16355). In order for mitigation measures to be effective, they must be specific, enforceable, and feasible actions that will improve environmental conditions.

The EIR should discuss the project's cumulative impacts to natural resources and determine if that contribution would result in a significant impact. The EIR should include a list of present, past, and probable future projects producing related impacts to resources under CDFW's jurisdiction or shall include a summary of the projections contained in an adopted local, regional, or statewide plan, that consider conditions contributing to a cumulative effect. The cumulative analysis shall include impact analysis of vegetation and habitat reductions within the area and their potential cumulative effects.

The EIR should incorporate mitigation performance standards that would ensure that significant impacts are reduced as expected. Mitigation measures proposed in the EIR should be made a condition of approval of the project. Please note that obtaining a permit from CDFW by itself with no other mitigation proposal may constitute mitigation deferral.

Threatened, Endangered, Candidate Species

The project area as shown in the Scoping document includes habitat for State and/or federally listed species. If during the environmental analysis for the project, it is determined that the project may have the potential to result in "take", as defined in the Fish & G. Code, section 86, of a State-listed species, the EIR shall disclose an Incidental Take Permit (ITP), consistency determination (Fish & G. Code, §§ 2080.1 & 2081) or coverage under the Yolo HCP/NCCP may be required prior to starting construction activities. In order to receive authorization for "take", the EIR must include all avoidance and minimization measures to reduce the impacts to a less than significant level. If impacts to listed species are expected to occur even with the implementation of these measures, mitigation measures shall be proposed to fully mitigate the impacts to State-listed species (Cal. Code Regs., tit. 14, § 783.2, subd.(a)(8)). CDFW encourages early consultation with staff to determine appropriate measures to offset project impacts, facilitate future permitting processes and to coordinate with the U.S. Fish and Wildlife Service to coordinate specific measures if both State and federally listed species may be present within the project vicinity.

Lake and Streambed Alteration Agreement Program

The EIR shall identify all perennial, intermittent, and ephemeral rivers, streams, lakes, other features, and any associated biological resources/habitats present within the entire project footprint (including access and staging areas). The environmental document should analyze all potential temporary, permanent, direct, indirect and/or cumulative impacts to the above-mentioned features and associated biological resources/habitats that may occur because of the project. If it is determined that the project will result in significant impacts to these resources the EIR shall propose appropriate avoidance, minimization and/or mitigation measures.

Notification to CDFW is required, pursuant to Fish and Game Code section 1602 if the project proposes activities that will substantially divert or obstruct the natural flow of water; substantially change or use any material from the bed, channel or bank of any river, stream, or lake; or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. CDFW approval of projects subject to Notification under Fish and Game Code section 1602, is facilitated when the EIR discloses the impacts to and proposes measures to avoid, minimize, and mitigate impacts to perennial, intermittent, and ephemeral rivers, streams, and lakes, other features, and any associated biological resources/habitats present within the vicinity of the project.

Please note that other agencies may use specific methods and definitions to determine impacts to areas subject to their authorities. These methods and definitions often do not include all needed information for the CDFW to determine the extent of fish and wildlife resources affected by activities subject to Notification under Fish and Game Code section1602.

CDFW recommends lead agencies to coordinate with us as early as possible, since potential modification of the proposed project may avoid or reduce impacts to fish and wildlife resources and expedite the project approval process.

CDFW relies on the lead agency environmental document analysis when acting as a responsible agency issuing a Lake or Streambed Alteration Agreement. Addressing CDFW's comments ensures that the EIR appropriately addresses project impacts facilitating the issuance of an Agreement.

Migratory Birds and Birds of Prey

Migratory nongame native bird species are protected by international treaty under the Federal Migratory Bird Treaty Act (MBTA) (16 U.S.C., §§ 703-712). CDFW implemented the MBTA by adopting the Fish and Game Code section 3513. Fish and Game Code sections 3503, 3503.5 and 3800 provide additional protection to nongame birds, birds of prey, their nests and eggs. Potential habitat for nesting birds and birds of prey is present within the project area. The proposed project should disclose all potential activities that may incur a direct or indirect take to nongame nesting birds within the project footprint and its close vicinity. Appropriate avoidance, minimization, and/or mitigation measures to avoid take must be included in the EIR. Measures to avoid the impacts should include species specific work windows, biological monitoring, installation of noise attenuation barriers, etc.

ENVIRONMENTAL DATA

CEQA requires that information developed in environmental impact reports and negative declarations be incorporated into a database which may be used to make subsequent or supplemental environmental determinations (Pub. Resources Code, § 21003, subd. (e)). Accordingly, please report any special-status species and natural communities detected during project surveys to the California Natural Diversity Database (CNDDB). The CNNDB field survey form can be found at the following link: https://www.wildlife.ca.gov/Data/CNDDB/Submitting-Data. The completed form can be submitted online or mailed electronically to CNDDB at the following email address: CNDDB@wildlife.ca.gov.

FILING FEES

The project, as proposed, would have an impact on fish and/or wildlife, and assessment of filing fees is necessary. Fees are payable upon filing of the Notice of Determination by the Lead Agency and serve to help defray the cost of environmental review by CDFW. Payment of the fee is required in order for the underlying project approval to be operative, vested, and final. (Cal. Code Regs, tit. 14, § 753.5; Fish & G. Code § 711.4; Pub. Resources Code, § 21089.)

CONCLUSION

Pursuant to Public Resources Code §21092 and §21092.2, the Department requests written notification of proposed actions and pending decisions regarding the proposed project. Written notifications shall be directed to: California Department of Fish and Wildlife North Central Region, 1701 Nimbus Road Suite A, Rancho Cordova, CA 95670.

CDFW appreciates the opportunity to comment on the NOP for the EIR to assist in identifying and mitigating project impacts on biological resources. CDFW personnel are available for consultation regarding biological resources and strategies to minimize impacts. Questions regarding this letter or further coordination should be directed to Ian Boyd, Environmental Scientist at (916) 358-1134 or ian.boyd@wildlife.ca.gov.

Sincerely,

Ian Boyd
Environmental Scientist
Habitat Conservation Program
North Central Region (Region 2)
1701 Nimbus Rd., Suite A
Rancho Cordova, CA 95670
P: 916-358-1134
ian.boyd@wildlife.ca.gov

CALIFORNIA DEPARTMENT OF
FISH and WILDLIFE

HERBERT E. & LYNNEL POLLOCK
P.O. BOX 468
YOLO, CA 95697

September 24, 2019

Mr. Tim Busch, Principal Utilities Civil Engineer
City of Woodland
300 First Street
Woodland, CA 95695

Via email: TimBusch@cityofwoodland.org

Re: Scoping Comments on the Woodland Flood Risk Management Project

Dear Mr. Busch;

Thank you for considering the following comments to be addressed in the City of Woodland Flood Risk Management Project EIR.

1) Agriculture and Forest Resources: Please discuss the loss of productive agricultural land and the need to mitigate this loss. An additional detail to address is the loss of any land that may be encumbered with an agricultural and/or habitat conservation easement.

2) Population and Housing: This project, by removing land from a flood plain designation, has the potential to be growth inducing. A significant acreage could be developed to urban uses and the impacts of this land use change needs to be considered.

3) Aesthetics (not sure this is the right category for these concerns): Please address adverse effects that can develop along the berm and floodway such as trespass, camping, off-road vehicle use, and litter.

Thank you for the opportunity to help develop the scope of impacts to be addressed in the EIR. We look forward to following this process and seeing the City of Woodland gain needed flood protection.

Sincerely;

Herbert E. Pollock

Herbert E. Pollock

Lynnel Pollock

Lynnel Pollock

PHONE: 530 662-3570 E-MAIL: yoloranch@yolo.net

YOLO COUNTY FARM BUREAU

Yolo County Farm Bureau

69 W Kentucky Avenue, Woodland CA 95695
P O Box 1556, Woodland CA 95776
530.662.6316 O * 530.662.8611 F
www.yolofarmbureau.org

PRESIDENT
Joe F. Martinez
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Garrett Driver
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Mike Hall
SECRETARY/TREASURER
Denise Sagara

September 25, 2019

City of Woodland
ATTN: Tim Busch
300 First Street
Woodland, CA 95695

RE: Scoping Comments on the Woodland Flood Risk Management Project

Dear Tim;

PREFACE: Initially, we point out that the City in its advocacy for this Project has abandoned the premise of Regional Flood Protection for the greater City of Woodland area, incorporated and unincorporated. And, we also comment that, as we have been informed by comments and dialogue through the Citizens Flood Advisory Committee process, and meetings our staff and YCFB members have had with the City, it has continually taken the position that being placed on the north, or "wet" side of a levee, the agricultural land north of town will not be negatively devalued for agricultural purposes unless it is directly flooded within the newly created conveyance bypasses and/or subject to areas of ponding especially near the Cache Creek Settling Basin. Thus, the City apparently has taken the position that owners of lands without those direct impacts will not be compensated. Water will be allowed – even directed -to flood through this area, creating negative impacts for the existing and planned agricultural operations in addition to negatively impacting the individuals who live and work there. We also note that much of this land has never flooded in its recorded history. The decisions made by the City will, for use and valuation purposes, turn this entire acreage from the right bank of Cache Creek south to the levee itself into bypasses, water holding areas or what we describe as an "institutionalized flood plain". We conclude that it diminishes the magnitude of the issues to even argue that this land is not devalued for agricultural purposes as we discuss below.

We direct our comments to aspects of the proposed project which clearly impact the agricultural operations north of the "approximately 7 miles of secondary earthen levee and a diversion channel along the northern boundary of the City to redirect overland flood flows from the right bank of Cache Creek into a diversion channel to be conveyed to the CCSB and the COW North Drainage Channel." We also note that since a substantial amount of very prime farm acreage, which is located close to freeway, air and rail transport, is impacted there is a much broader effect on the Yolo County agricultural economy than the mere acreage numbers represent, and the agricultural infrastructure needed to support Yolo County's agricultural economy will also be impacted. Each of these impacts we single out will impact the agriculture on the wet side of the levee and thus must be addressed in environmental documents.

Agriculture
The scoping document appears to limit the impacts to conversion of agricultural acreage to "weir/bypass improvements, use of borrow material, or creation of habitat." This summary ignores: the permanent conversion of land to levees and bypass; the loss of agricultural land to higher and deeper water at the east end of the proposed project and the impact for agricultural purposes on the approximately 6,000 acres north and west of this proposed flood levee system.

Obviously, once the levees and canals are installed the land consumed by them is permanently lost to agriculture. Ornamental plantings or habitat installation along these levees and bypasses for which expressions of support were made at public meetings often bring additional hardship to adjacent and neighboring ag: habitat next door is not a positive for agriculture since it brings with it the increased possibility of “threatened” or “endangered” species and related “takings”, and, agriculture is not benefitted by anything that will introduce individuals unrelated to agriculture into a farming area.

The increasing number of homeless in the Woodland area is a matter of record (number of Homeless increased 63% since 2017: 8/30/19/Daily Democrat): the residents, farmers and property owners north of the levee will have their persons and property increasingly at risk if opportunities are created for these individuals to relocate into this essentially under policed agricultural area.

The flows on the land north of the levee (the “wet” side) are going to be deeper and last longer than even possible before its construction. Before construction, any Cache Creek overflows would not be confined but typically would be an overland, shallow short term sheet flow. But henceforth, these flows if they occur will now be directed and held onto these lands: Higher velocities may result that can cause scour and deposit of debris and importation of pathogens. The damage caused to the land north on the wet side by this scouring and import of debris/pathogens are part of the cost of the project. These factors devalue the land. Project proponents must recognize that Project funding must pay for that diminution of value.

The importation of weed seeds and spores, since it comes with additional costs for cleanup and weed control, will present an undue burden to agricultural operators on the wet side. There are organic farmers north of the levee who have organic certifications and may not use typical pesticides. The burden of manually or mechanically removing imported noxious weeds could as a practical matter limit this entire area for new or all organic farming and/or challenge the viability of organic operations currently in place. The study needs to include analysis as to increased costs of production including additional pesticides, debris removal, releveling, etc. These factors are relevant to any discussion of the Project’s impact on specific farmland, its relative value pre-and post- project, or impact on the agricultural sector of Yolo County’s economy. These factors devalue the land. Project proponents must recognize that project funding must pay for that diminution of value.

We comment that the City has introduced another element of risk: assuming there is a flood event that puts water on the wet side of the levee late in the season farmers may be limited in their ability to get on the ground in a timely fashion. In our area the land has been typically “bedded” before winter sets in: thus, the farmer has already expended costs getting ready for spring planting. Crop loans, etc. are predicated on an assumption that the farmer will have the ability to actually farm the ground. This late season rain risk factor devalues the property, and can increase costs or cause crop loss. Project proponents must recognize that project funding must pay for that diminution of value.

Additionally, we note that this area does not have the benefit of surface water for irrigation or domestic purposes. Residents, landowners and farmers depend upon ground water. Since the proposed project abandons the concept of regional protection, some added attention has to be directed to well head protection for both agricultural and domestic wells which serve those who live, own or farm north of the levee. Project proponents must recognize that Project funding must pay for that cost and/or diminution of value.

We also point out that agriculture and the individuals who live on the land occasionally require additions to the constructed infrastructure relevant to their lives and businesses: farmers are entitled as a matter of right to build a second house on agricultural parcels. This recognized right to improve to accommodate changing needs applies also to land on the wet side of the Project levee. What will be the added costs or even possibilities of doing so with the institutionalization of this area into a flood plain? Will the City step up to defray the added costs of site preparation and construction? Will it assume the costs of flood insurance? And, a casual drive through this area shows extensive plantings to permanent crops. These crops benefit by immediately available processing: will this new classification limit the ability to fund or build these installations? The placement on the wet side of a flood control levee has devalued this area for agricultural purposes. The Project proponents must recognize that Project funding must pay for that cost and/or diminution of value.

Farmers and ranchers know that an additional opportunity that may provide them and their family with operating flexibility is the ability to sell a conservation easement or a mitigation easement for urban development. Much of this land is within one mile of the city limits (or the urban limit line of the COW) so in the absence of any consideration of this flood barrier, the opportunities to sell such an easement would logically be available at some point in time. The obvious question is whether any agency will purchase an easement if it can assume, since the land is on the wet side of a flood levee, that it will never develop beyond isolated farm structures in any event. Yolo County Farm Bureau is exploring the continued availability of this option for land which is located on the wet side of a levee. If our assumption that selling a conservation easement is no longer a viable option for these farmers is correct, the placement of the flood barrier has stripped those landowners of value. The Project proponents must recognize that Project funding must pay for that cost and/or diminution of value.

Despite the fact that the COW has produced an appraiser's valuation that claims there is no difference for agricultural purposes for identical land located north or south of the levee, as our comments illustrate, the ag land on the wet side will be devalued by the installation of the proposed project. That appraiser valuation is perhaps theoretically arguable. However, the real world gets in the way. When a farmer or rancher is asked if s/he would choose to purchase one of two identical parcels of land for the same price, one parcel on the wet side of a levee and its identical partner on the dry side, s/he, without exception, will choose to purchase the land on the dry side. A factor in the purchase of farmland is the risk involved in the operation of the property. Risk impacts land price. No grower or landowner would pay the same for acreage that is subject to the risk of flooding as s/he would for identical land that does not have a flood risk. Additionally, the value of farmland is based on potential limitations. We have enumerated potential limits on allowed uses above. Thus, the costs for the impacts to landowners and farmers north of the levee must be calculated. The loss of value of this entire acreage must be part of the Project cost analysis. Project proponents must recognize that project funding must pay for that diminution of value.

We have concerns about impacts on road transportation. Useable roads are obviously critical for agricultural and rural residents/families. The scoping list of topics refers to "Potential temporary and short-term disruption of traffic circulation or emergency access during construction". However, interruptions in road use are a characteristic of this Project. Project proponents basically concede that County Road 102, the major transportation corridor between the Sutter Basin, the Town of Knights Landing and the City of Woodland and all of the farmland encompassed in that area, will be shut down for extended periods of time when the area at the east end of the bypass will be flooded at substantial depths. Periods of high rainfall can occur at any time between November and April. Farmers need to be able to transport farm equipment, supplies and their employees throughout the year, especially in the late winter and early spring planting seasons. Families who live in Knights Landing, and/or are employed on area farms or otherwise outside their town need to ensure that their domestic transportation needs are met for employment, medical, emergency, basic provisioning and school attendance. The Project proponents seem to assume that other north south corridors (Interstate 5, State Hwy 16/CR 98, and State Hwy 113) will not be flooded on the wet side. We note that no one can accurately predict the movement of flood waters: all it takes is a wayward nutria to create a levee break where it is not anticipated. The significant fact is that the recommended project assigns the land north of the levee to basically "carry the water" to benefit the lands and the economy to the south of it. We also note the apparent extent of flood protection to be accorded to residents and landowner/farmers on the "wet" side (other than an existing 22 residences who may be provided flood insurance): the County will provide them notice to evacuate.

We call attention to the fact that looking at the result of several years of planning and expenditures, the agenda of the Project proponents appears to be obtaining community support for a second edition of the Lower Cache Creek Flood Barrier that was rejected by the voters in 2004. The fact that the Woodland City Council is considering a ballot measure to repeal "Measure S" is confirmation of both that fact and that City of Woodland officials know the proposed project is in violation of the specific language of Measure S since City of Woodland money has been spent on this substantially similar project.

We believe that there are regional options that would better serve a larger number of Yolo County residents and a larger amount of acreage in the Cache Creek watershed. Flood protection for the Woodland areas should be part of the broader discussion advocating a measure of protection for other areas, including Esparto, Madison, Yolo, Knights Landing, Plainfield and possibly Davis. The County should be involved in Woodland area flood management planning as should Yolo County Flood Control and Water Conservation District, with input from the Sustainable Groundwater Management Agency. Project proponents are basically leaving most of the County "out in the rain" from the standpoint of accessing the flood control federal and state tax dollars which will be spent just to protect portions of incorporated Woodland.

We also believe that construction of this Project without addressing flood issues in the above listed areas could limit or even preclude their solution.

In conclusion, we note that the City of Woodland sent out its Notice of Scoping Meeting in "August 2019". (No date is stamped on the letter.) This "notice" advises that Scoping Comments on the Project "must be provided to the City of Woodland no later than Wednesday, September 25, 2019. Yolo County Farm Bureau had its August meeting on August 13, 2019. The information did not come to the Executive Board's attention until later that month. Yolo County Farm Bureau does not have a board meeting in September: August through October are the busiest times for Yolo County farmers and ranchers. Thus, it has been difficult for Yolo County Farm Bureau to provide the opportunities for discussion that is our standard. The City imposed time constraints made it impossible for us to reach out to all of our members who live, own and/or farm acreage impacted by the City proposed Project. However, review of our archives and our input on the (2003-2004) Flood Wall and the fact that two of our Executive Board members have served as members of the City of Woodland Flood Control Advisory Committee (constituted 2015) since its inception has afforded us a reasonable predicate for this introductory discussion. The issues we raise need to be fleshed out in the environmental documents, and the City needs be aware that its costs of proceeding include compensation for all negative impacts on wet side farmland.

Sincerely,

Joe Martinez

Joseph F. Martinez
President

Cc: California Farm Bureau Federation, Jamie Johansson
California Farm Bureau Federation, Chris Scheuring

Martin, Sara

From: Tim Busch <Tim.Busch@cityofwoodland.org>
Sent: Thursday, September 26, 2019 10:16 AM
To: Martin, Sara
Cc: Ric Reinhardt
Subject: FW: Yolo County Comments on the NOP for the Woodland Flood Management Project
Attachments: WFRM Scoping Mtg 2019_NotificationLtr.pdf; Alt 2A Overall Project map.pdf

Yolo County comments on EIR.

From: Nicholas Burton [mailto:Nicholas.Burton@yolocounty.org]
Sent: Wednesday, September 25, 2019 3:45 PM
To: Tim Busch <Tim.Busch@cityofwoodland.org>
Cc: Taro Echiburu <Taro.Echiburu@yolocounty.org>; Leslie Lindbo <Leslie.Lindbo@yolocounty.org>; Panos Kokkas <Panos.Kokkas@yolocounty.org>; Darlene Comingore <Darlene.Comingore@yolocounty.org>; Stephanie Cormier <Stephanie.Cormier@yolocounty.org>; JD Trebec <JD.Trebec@yolocounty.org>
Subject: Yolo County Comments on the NOP for the Woodland Flood Management Project

Hello Tim,

Yolo County has reviewed the Notice of Preparation for the Woodland Flood Management Project and has the following understanding of the project.

The City is proposing to implement flood system improvements to the Lower Cache Creek in the vicinity of Woodland with the levee alignment is generally occurring north of Churchhill Downs Road and extending from CR98 to the Cache Creek Settling Basin. The improvements are mostly in the unincorporated County and include raising CR 98, 99, 101, and 102 over the new levee and conveyance channel.

There are 22 structures north of the levee that will logically need to be studied further however the current modeling shows that the construction of the levee doesn't increase in flooding depth. The County is aware that after further study the project will offer help to the owners of the 22 structures. There is an area west of the Cache Creek Settling Basin that does experience an increase in flooding depth, the project would mitigate for that by purchasing flood easements on the affected properties. Those fields for the most part are annual crops and not orchards in that area.

Yolo County Community Services has the following comments:

- Yolo County respectfully requests that the City's EIR take into consideration County Ordinances in place to protect public health, safety, and welfare, including but not limited to the County's Agricultural Conservation and Mitigation Program and Flood Protection Ordinance. These ordinances can be found in Title 8 of the Yolo County Code. Similarly, as a permittee of the Yolo HCP/NCCP, the EIR should consider compliance with the program as it relates to future impacts to covered species and/or their habitat. Lastly, the EIR should disclose whether or not any designated growth areas in the unincorporated area and/or whether any additional rural properties not already identified could be directly or inadvertently affected by a future flood reduction project in such a way as to prevent a property owner from pursuing development as allowed by County Code.
- A few sections of Yolo County Roads are being proposed being raised to the levee crown at a 5% grade. Yolo County directs the project proponents to review Section 4 – Transportation of the Yolo County Improvement Standards which establishes design requirements for road geometry and structural capacity.

- There are several culverts that will cross under the County roads being elevated and the design of these structures must comply with the County Drainage Manual and Section 4 – Transportation of the Yolo County Improvement Standards.
- Right-of-way will need to be purchased to accommodate the wider footprint of the road and allow for maintenance of the fill slopes.

The County requests that the EIR be sent to the Department of Community Services for review and comment.

Regards,
Nicholas Burton, P.E.
Senior Civil Engineer
Department of Community Services
Public Works Division
(530) 666-8844

Appendix C
Biological Resources

Appendix C.1

Special-Status Species with the Potential for Occurrence in the Proposed Project Study Area and the Alternative 2C Footprint

Table C.1-1. Special-Status Plant Species with the Potential for Occurrence in the Proposed Project Study Area or Alternative 2C Footprint

Scientific Name (Common Name)	Federal Status[a]	State Status[a]	Habitat Requirements	Potential for Occurrence[b]	
				Proposed Project	Alternative 2C
Astragalus tener var. *ferrisiae* Ferris' milk-vetch	None	CRPR 1B.1	Vernally mesic areas and subalkaline flats in foothill and valley grasslands. Usually found in dry adobe soils (5 to 245 feet).	Low. Marginal potential habitat for this species may be present in the alkaline seasonal wetlands and other mesic areas within alkaline soils in the eastern portion of the project footprint. Nearest recorded occurrence is approximately 9 miles south of the project footprint.	Low. Marginal potential habitat for this species may be present in the alkaline seasonal wetlands and other mesic areas within alkaline soils in the eastern portion of the Alternative 2C footprint. Nearest recorded occurrence is approximately 9 miles south of the Alternative 2C footprint.
Astragalus tener var. *tener* Alkali milk-vetch	None	CRPR 1B.2	On alkaline soils in playas, mesic areas within valley and foothill grasslands, and vernal pools (0 to 195 feet).	Low. Marginal potential habitat for this species may be present in the alkaline seasonal wetlands and other mesic areas within alkaline soils in the eastern portion of the project footprint. Nearest recorded occurrence is approximately 2.4 miles south of the project footprint.	Low. Marginal potential habitat for this species may be present in the alkaline seasonal wetlands and other mesic areas within alkaline soils in the eastern portion of the Alternative 2C footprint. Nearest recorded occurrence is approximately 2.4 miles south of the Alternative 2C footprint.
Atriplex cordulata var. *cordulata* Heartscale	None	CRPR 1B.2	Alkaline or saline valley and foothill grasslands, meadows and seeps, and chenopod scrub communities (0 to 1,835 feet).	Low. Marginal potential habitat for this species may be present in areas of Pescadero and Willows soils in the eastern portion of the project footprint. Nearest recorded occurrence is approximately 7.5 miles south of the project footprint.	Low. Marginal potential habitat for this species may be present in areas of Pescadero and Willows soils in the eastern portion of the Alternative 2C alignment. Nearest recorded occurrence is approximately 7.5 miles south of the Alternative 2C footprint.

Scientific Name (Common Name)	Federal Status[a]	State Status[a]	Habitat Requirements	Potential for Occurrence[b]	
				Proposed Project	Alternative 2C
Atriplex depressa Brittlescale	None	CRPR 1B.2	Chenopod scrub, meadows and seeps, playas, valley and foothill grasslands, and vernal pools. Typically found on alkaline clay soils (0 to 1,050 feet).	High. Potential habitat for this species is present in alkaline seasonal wetlands and other mesic areas within the alkaline soils in the eastern portion of the project footprint. This species was documented in a small corner of the project footprint in 1978.	High. Potential habitat for this species is present in alkaline seasonal wetlands and other mesic areas within the alkaline soils in the eastern portion of the Alternative 2C footprint. This species was documented within the Alternative 2C footprint in 1978.
Centromadia parryi ssp. *parryi* Pappose tarplant	None	CRPR 1B.2	Found on alkaline soils in coastal prairie, meadows, seeps, coastal salt marshes, and valley and foothill grasslands (0 to 1,380 feet).	Low. Marginal potential habitat for this species may be present in areas of alkaline soils in the eastern portion of the project footprint. Nearest recorded occurrence is approximately 8.1 miles south of the project footprint.	Low. Marginal potential habitat for this species may be present in areas of alkaline soils in the eastern portion of the Alternative 2C footprint. Nearest recorded occurrence is approximately 8.5 miles south of the Alternative 2C footprint.
Chloropyron palmatum Palmate-bracted bird's-beak	FE	CE, CRPR 1B.1	Found on alkaline soils in chenopod scrub and valley and foothill grasslands, primarily on side slopes adjacent to ditches and other waterways where the hydrology is appropriate (15 to 510 feet).	Moderate. Potential habitat for this species may be present in areas of alkaline soils in the eastern portion of the project footprint. An extirpated occurrence of this species is recorded approximately 0.4 mile southwest of the project footprint.	Moderate. Potential habitat for this species may be present in areas of alkaline soils in the eastern portion of the Alternative 2C footprint. An extirpated occurrence of this species is recorded approximately 0.4 mile southwest of the Alternative 2C footprint.

Scientific Name (Common Name)	Federal Status[a]	State Status[a]	Habitat Requirements	Potential for Occurrence[b]	
				Proposed Project	Alternative 2C
Extriplex joaquinana San Joaquin spearscale	None	CRPR 1B.2	Found in seasonal alkali wetlands or alkali sink scrub (0 to 2,740 feet).	High. Potential habitat for this species is present in alkaline seasonal wetlands and other mesic areas within the alkaline soils in the eastern portion of the project footprint. This species was documented within the project footprint in 1965.	High. Potential habitat for this species is present in alkaline seasonal wetlands and other mesic areas within the alkaline soils in the eastern portion of the Alternative 2C footprint. This species was documented within the Alternative 2C footprint in 1965.
Hibiscus lasiocarpus var. *occidentalis* Woolly rose-mallow	None	CRPR 1B.2	Found on freshwater-saturated riverbanks and low peat islands (0 to 395 feet).	Low. Marginal potential habitat for this species is present in the seasonal marshes, ponds, and irrigation canals and ditches within the project footprint, but the species has not been recorded within 5 miles of the project footprint.	Low. Marginal potential habitat for this species is present in the seasonal marshes, perennial marshes, ponds, and irrigation canals and ditches within the Alternative 2C footprint, but the species has not been recorded within 5 miles of the Alternative 2C footprint.
Lepidium latipes var. *heckardii* Heckard's pepper-grass	None	CRPR 1B.2	Found on alkaline flats in valley and foothill grasslands (5 to 655 feet).	Low. Marginal potential habitat for this species may be present in the alkaline seasonal wetlands and other mesic areas within alkaline soils in the eastern portion of the project footprint. Nearest recorded occurrence is approximately 2.3 miles south of the project footprint.	Low. Marginal potential habitat for this species may be present in the alkaline seasonal wetlands and other mesic areas within alkaline soils in the eastern portion of the Alternative 2C footprint. Nearest recorded occurrence is approximately 2.3 miles south of the Alternative 2C footprint.

Scientific Name (Common Name)	Federal Status[a]	State Status[a]	Habitat Requirements	Potential for Occurrence[b] Proposed Project	Alternative 2C
Lessingia hololeuca Woolly-headed lessingia	None	CRPR 3	Grows on clay and serpentinite soils in broadleafed upland forests, lower montane coniferous forests, coastal scrub, and valley and foothill grasslands (50 to 1,000 feet).	No habitat present. Outside of the distributional range of the species.	No habitat present. Outside of the distributional range of the species.
Malacothamnus helleri Heller's bush-mallow	None	CRPR 3.3	Found on sandstone in chaparral, or in gravelly soils in riparian woodland (1,000 to 2,085 feet).	No habitat present. Outside of the elevational range of the species.	No habitat present. Outside of the elevational range of the species.
Navarretia leucocephala ssp. *bakeri* Baker's navarretia	None	CRPR 1B.1	Occurs in vernal pools, meadows and seeps, and other mesic areas in cismontane woodland, lower montane coniferous forest, and valley and foothill grasslands (15 to 5,710 feet).	Low. Marginal potential habitat for this species may be present in the alkaline seasonal wetlands and other mesic areas within alkaline soils in the eastern portion of the project footprint, but the species has not been recorded within 5 miles of the project footprint.	Low. Marginal potential habitat for this species may be present in the alkaline seasonal wetlands and other mesic areas within alkaline soils in the eastern portion of the Alternative 2C footprint, but the species is not recorded within 5 miles of the Alternative 2C footprint.
Puccinellia simplex California alkali grass	None	CRPR 1B.2	Alkaline sinks, flats, and lake margins, vernal pools, meadows, seeps, and riparian wetlands (5 to 3,050 feet).	High. Potential habitat for this species is present in alkaline seasonal wetlands and other mesic areas within the alkaline soils in the eastern portion of the project footprint. This species was documented in a small corner of the project footprint in 1978.	High. Potential habitat for this species is present in alkaline seasonal wetlands and other mesic areas within the alkaline soils in the eastern portion of the Alternative 2C footprint. This species was documented within the Alternative 2C footprint in 1978.

Scientific Name (Common Name)	Federal Status[a]	State Status[a]	Habitat Requirements	Potential for Occurrence[b]	
				Proposed Project	Alternative 2C
Symphyotrichum lentum Suisun Marsh aster	None	CRPR 1B.2	Freshwater and saltwater marshes, often associated with blackberries, cattails, and bulrush (0 to 10 feet).	No habitat present. Outside of the distributional range of the species.	No habitat present. Outside of the distributional range of the species.
Trifolium hydrophilum Saline clover	None	CRPR 1B.2	Marshes, swamps, and vernal pools with alkaline soils (0 to 985 feet).	Low. Marginal potential habitat for this species is present within the seasonal wetlands, alkaline seasonal wetlands, seasonal marshes, perennial marshes, and irrigation canals within alkaline soils. Nearest recorded occurrence is approximately 2.5 miles south of the project footprint.	Low. Marginal potential habitat for this species is present within the seasonal wetlands, alkaline seasonal wetlands, seasonal marshes, perennial marshes, and irrigation canals within alkaline soils. Nearest recorded occurrence is approximately 2.5 miles south of the Alternative 2C footprint.

Sources: California Department of Fish and Wildlife 2019; California Natural Diversity Database (CNDDB) 2019, *RareFind 5;* California Department of Fish and Wildlife. Accesed: September 2019; California Native Plant Society 2019, Inventory of Rare and Endangered Plants (online edition, v8-02); California Native Plant Society, Sacramento, CA. Available: http://www.rareplants.cnps.org. Accessed: June 2019.

[a] Status explanations:

Federal

FE = federally listed as endangered; – = no status.

State

– = No status.

California Rare Plant Rank (CRPR)

1B = rare, threatened, or endangered in California and elsewhere; 2B = rare, threatened, or endangered in California, but more common elsewhere. 3 = plants about which we need more information; 4 = plants of limited distribution; 0.1 = seriously endangered in California; 0.2 = fairly endangered in California; 0.3 = not very endangered in California.

[b] Potential for Occurrence:

Low: The project or Alternative 2C footprints are within the species range, but only marginal, disturbed potential habitat for the species is present, and there are no records for the species within 2 miles of the footprint.

Moderate: The project or Alternative 2C footprints are within the species range, potential habitat for the species is present, and there are records for the species within less than 1 mile of the footprint.

High: The project or Alternative 2C footprints are within the species range, potential habitat for the species is present, and there are one or more records of the species within the footprint.

Table C.1-2. Special-Status Wildlife and Aquatic Species with the Potential for Occurrence in the Proposed Project Study Area or Alternative 2C Footprint Page 1 of 11

Scientific Name (Common Name)	Federal Status[a]	State Status[a]	Habitat Requirements	Potential for Occurrence[b] Proposed Project	Alternative 2C
Invertebrates					
Branchinecta lynchi Vernal pool fairy shrimp	FT	None	Vernal pools and seasonal wetlands.	Moderate. No vernal pools or seasonal wetlands with prolonged inundation are present within the project footprint. However, a large depressional wetland that represents marginally suitable habitat is immediately adjacent to the project footprint, just south of the Cache Creek Settling Basin.	Moderate. A large depressional wetland that represents marginally suitable habitat for this species is present within the southern portion of the Alternative 2C footprint.
Desmocerus californicus dimorphus Valley elderberry longhorn beetle	FT	None	Dependent upon elderberry *(Sambucus* species) shrubs as primary host species.	High. Suitable habitat for this species is present in elderberry shrubs within the project footprint.	High. Suitable habitat for this species may be present if elderberry shrubs are present within the Alternative 2C footprint. Several shrubs have been documented immediately adjacent to the Alternative 2C footprint.
Lepidurus packardi Vernal pool tadpole shrimp	FE	None	Vernal pools and seasonal wetlands.	Moderate. No vernal pools or seasonal wetlands with prolonged inundation are present within the project footprint. However, a large depressional wetland that represents marginally suitable habitat is immediately adjacent to the project footprint, just south of the Cache Creek Settling Basin.	Moderate. A large depressional wetland that represents marginally suitable habitat for this species is present within the southern portion of the Alternative 2C footprint.
Bombus occidentalis Western bumble bee	None	CE	Bumble bees are found in a wide variety of natural, agricultural, urban, and rural habitats (Goulson 2010).	Low. In California, *B. occidentalis* populations are largely restricted to high-elevation sites in the Sierra Nevada (Xerces Society 2019).	Low. In California, *B. occidentalis* populations are largely restricted to high-elevation sites in the Sierra Nevada (Xerces Society 2019).

Scientific Name (Common Name)	Federal Status[a]	State Status[a]	Habitat Requirements	Potential for Occurrence[b] Proposed Project	Alternative 2C
Fish					
Hypomesus transpacificus Delta smelt	FT	CE	Adults are found in the brackish open surface waters of the Delta and Suisun Bay. Although spawning has never been observed, it is believed to occur in tidally influenced sloughs and drainages on the freshwater side of the mixing zone.	No habitat present. The Cache Creek Settling Basin weir and irrigation canal pump facilities preclude this species' presence.	No habitat present. The Cache Creek Settling Basin weir and irrigation canal pump facilities preclude this species' presence.
Oncorhynchus mykiss Central Valley steelhead	FE	None	Occurs in well-oxygenated, cool, riverine habitat with water temperatures from 7.8 to 18°C (Moyle 2002). Habitat types are riffles, runs, and pools.	No habitat present. The Cache Creek Settling Basin weir and irrigation canal pump facilities preclude this species' presence.	No habitat present. The Cache Creek Settling Basin weir and irrigation canal pump facilities preclude this species' presence.
Oncorhynchus tshawytscha Central Valley spring-run Chinook salmon	FT	CT	Occurs in well-oxygenated, cool, riverine habitat with water temperatures from 8.0 to 12.5°C. Needs cold water pools for holding. Habitat types are riffles, runs, and pools (Moyle 2002).	No habitat present. The Cache Creek Settling Basin weir and irrigation canal pump facilities preclude this species' presence.	No habitat present. The Cache Creek Settling Basin weir and irrigation canal pump facilities preclude this species' presence.

Scientific Name (Common Name)	Federal Status[a]	State Status[a]	Habitat Requirements	Potential for Occurrence[b]	
				Proposed Project	Alternative 2C
Oncorhynchus tshawytscha Sacramento River winter-run Chinook salmon	FE	CE	Occurs in well-oxygenated, cool, riverine habitat with water temperatures from 8.0 to 12.5°C. Needs cold water pools for holding. Habitat types are riffles, runs, and pools (Moyle 2002).	No habitat present. The Cache Creek Settling Basin weir and irrigation canal pump facilities preclude this species' presence.	No habitat present. The Cache Creek Settling Basin weir and irrigation canal pump facilities preclude this species' presence.
Acipenser medirostris Green sturgeon (southern DPS)	FT	CSC	Anadromous species that spawns in large river systems with well-oxygenated water of 8.0 to 14°C.	No habitat present. The Cache Creek Settling Basin weir and irrigation canal pump facilities preclude this species' presence.	No habitat present. The Cache Creek Settling Basin weir and irrigation canal pump facilities preclude this species' presence.
Spirinchus thaleichthys Longfin smelt	FC	CT	Found in the San Francisco Bay and Delta, Humboldt Bay, and the estuaries of the Eel and Klamath Rivers. Uses a variety of habitats from nearshore waters to estuaries and lower portions of freshwater streams (Garwood 2017).	No habitat present. The Cache Creek Settling Basin weir and irrigation canal pump facilities preclude this species' presence.	No habitat present. The Cache Creek Settling Basin weir and irrigation canal pump facilities preclude this species' presence.

Scientific Name (Common Name)	Federal Status[a]	State Status[a]	Habitat Requirements	Potential for Occurrence[b] Proposed Project	Alternative 2C
Amphibians					
Ambystoma californiense California tiger salamander	FT	CT, CSC	Breeds in ponds or other deeply ponded wetlands and uses gopher holes and ground squirrel burrows in adjacent grasslands for upland refugia and foraging.	No habitat present. No large areas of undisturbed annual grassland are present within the project footprint.	No habitat present. No large areas of undisturbed annual grassland are present within the Alternative 2C footprint.
Rana draytonii California red-legged frog	FT	CSC	Breeds in permanent to semi-permanent aquatic habitats, including lakes, ponds, marshes, creeks, and other drainages.	No habitat present. Outside of the distributional range of the species.	No habitat present. Outside of the distributional range of the species.
Reptiles					
Actinemys marmorata Western pond turtle	–	CSC	Ponds, rivers, streams, wetlands, and irrigation ditches with associated marsh habitat.	High. Suitable habitat for this species occurs in ponds, irrigation and canals, Cache Creek, and the Cache Creek Settling Basin.	High. Suitable habitat for this species occurs in ponds, irrigation ditches and canals, and perennial marshes.
Thamnophis gigas Giant garter snake	FT	CT	Rivers, canals, irrigation ditches, rice fields, and other aquatic habitats with slow moving water and heavy emergent vegetation.	High. The major irrigation ditches and canals represent suitable aquatic habitat for this species, and adjacent areas represent suitable upland habitat.	High. The major irrigation ditches, canals, and perennial marshes represent suitable aquatic habitat for this species, and adjacent areas represent suitable upland habitat. This species has been documented in the southern portion of the Alternative 2C footprint (California Department of Fish and Wildlife 2019).

Scientific Name (Common Name)	Federal Status[a]	State Status[a]	Habitat Requirements	Potential for Occurrence[b]	
				Proposed Project	Alternative 2C
Birds					
Agelaius tricolor Tricolored blackbird	–	CT, CSC	Colonial nester in cattails, bulrush, or blackberries associated with marsh habitats.	High. Suitable nesting habitat for this species occurs in the irrigation ditches and canals, and ponds within the project footprint. Adjacent agricultural fields and seasonal marshes represent suitable foraging habitat. This species was documented nesting in nearby fields in 2010 (California Department of Fish and Wildlife 2019).	High. Suitable nesting habitat for this species occurs in the irrigation ditches and canals, perennial marshes, and ponds within the Alternative 2C footprint. Adjacent agricultural fields and seasonal marshes represent suitable foraging habitat. This species was documented nesting in nearby fields in 2010 (California Department of Fish and Wildlife 2019).
Aquila chrysaetos Golden eagle	–	CFP	Forages in open areas, including grasslands, savannahs, deserts, and early successional stages of shrub and forest communities. Nests in large trees and cliffs.	Low. The agricultural fields and nonnative annual grasslands within the project footprint represent marginally suitable winter foraging habitat for this species.	Low. The agricultural fields and nonnative annual grasslands within the Alternative 2C footprint represent marginally suitable winter foraging habitat for this species.
Athene cunicularia Burrowing owl	–	CSC	Nests in abandoned ground squirrel burrows associated with open grassland habitats.	Moderate. Agricultural, ruderal, and grassland habitats throughout the project footprint represent marginally suitable habitat due to the high degree of disturbance or dense vegetative cover.	Moderate. Agricultural, ruderal, and grassland habitats throughout the Alternative 2C footprint represent marginally suitable habitat due to the high degree of disturbance or dense vegetative cover.

Scientific Name (Common Name)	Federal Status[a]	State Status[a]	Habitat Requirements	Potential for Occurrence[b]	
				Proposed Project	Alternative 2C
Buteo regalis Ferruginous hawk	–	CSC	A wintering species in California. Forages in open areas such as grasslands and fields for ground squirrels as well as other small mammals, birds, lizards, snakes, and rabbits.	Low. The agricultural fields and nonnative annual grasslands within the project footprint represent marginally suitable winter foraging habitat for this species.	Low. The agricultural fields and nonnative annual grasslands within the Alternative 2C footprint represent marginally suitable winter foraging habitat for this species.
Buteo swainsoni Swainson's hawk	–	CT	Nests in large trees, preferably in riparian areas. Forages in fields, cropland, irrigated pasture, and grassland near large riparian corridors.	Present. This species was observed foraging within the project footprint during field surveys. The agricultural fields and annual grasslands throughout the project footprint provide suitable foraging habitat, and trees throughout provide suitable nesting habitat.	Present. This species was observed foraging within the Alternative 2C footprint during field surveys. The agricultural fields and annual grasslands throughout the Alternative 2C footprint provide suitable foraging habitat, and trees throughout provide suitable nesting habitat.
Charadrius alexandrinus nivosus Western snowy plover	FT	CSC	Barren to sparsely vegetated open areas near water.	Low. The agricultural fields within the project footprint represent marginally suitable winter foraging habitat for this species.	Low. The agricultural fields within the Alternative 2C footprint represent marginally suitable winter foraging habitat for this species.
Charadrius montanus Mountain plover	–	CSC	Breeds in the high plains east of the Rocky Mountains. Winters in central and southern California, Arizona, Texas, and Mexico.	Low. The agricultural fields within the project footprint represent marginally suitable winter foraging habitat for this species.	Low. The agricultural fields within the Alternative 2C footprint represent marginally suitable winter foraging habitat for this species.

Scientific Name (Common Name)	Federal Status[a]	State Status[a]	Habitat Requirements	Potential for Occurrence[b]	
				Proposed Project	Alternative 2C
Circus cyaneus Northern harrier	–	CSC	Nests in emergent wetland and marsh, open grasslands, or savannah habitats. Forages in open areas such as marshes, agricultural fields, and grasslands.	High. Suitable foraging habitat for this species occurs in agricultural fields throughout the project footprint. Suitable nesting habitat does not occur within the project footprint.	High. Suitable foraging habitat for this species occurs in agricultural fields throughout the Alternative 2C footprint. Suitable nesting habitat does not occur within the Alternative 2C footprint.
Coccyzus americanus occidentalis Western yellow-billed cuckoo	FT	CE	Nests in extensive (patches greater than 50 acres) mature cottonwood-willow riparian woodlands or mesquite forest with high canopy closure.	Moderate. The narrow band of riparian woodlands along Cache Creek is not of sufficient size to support this species. However, suitable nesting habitat for this species is present within the Cache Creek Settling Basin immediately adjacent to the eastern portions of the project footprint.	Moderate. Riparian woodlands do not occur within the Alternative 2C footprint. However, suitable nesting habitat for this species is present within the Cache Creek Settling Basin immediately adjacent to the eastern portions of the Alternative 2C footprint.
Elanus leucurus White-tailed kite	–	CFP	Forages in open grasslands, fields, and meadows. Nests and perches in isolated trees in close proximity to foraging habitat.	High. The agricultural fields and annual grasslands throughout the project footprint provide suitable foraging habitat for this species, and trees throughout provide suitable nesting habitat.	High. The agricultural fields and annual grasslands throughout the Alternative 2C footprint provide suitable foraging habitat for this species, and trees throughout provide suitable nesting habitat.
Haliaeetus leucocephalus Bald eagle	FD	CE, CFP	Nest in large trees within 1 mile of lakes, rivers, or larger streams. Forages in nearby open areas.	Low. Cache Creek and the irrigation canals provide marginally suitable foraging habitat, due to the relatively narrow widths. This species has not been documented utilizing Cache Creek east of Interstate 5 (eBird 2019).	Low. The irrigation canals provide marginally suitable foraging habitat, due to the relatively narrow widths of the canals. This species has not been documented within the Alternative 2C footprint (eBird 2019).

Scientific Name (Common Name)	Federal Status[a]	State Status[a]	Habitat Requirements	Potential for Occurrence[b] Proposed Project	Alternative 2C
Lanius ludovicianus Loggerhead shrike	–	CSC	Occurs in open areas with sparse trees, shrubs, and other perches.	High. The agricultural fields and annual grasslands throughout the project footprint provide suitable foraging habitat for this species, and isolated trees and shrubs throughout provide suitable nesting habitat.	High. The agricultural fields and annual grasslands throughout the Alternative 2C footprint provide suitable foraging habitat for this species, and isolated trees and shrubs throughout provide suitable nesting habitat.
Melospiza melodia mailliardi Song sparrow "Modesto" population	–	CSC	Nests in emergent freshwater marshes dominated by tules and cattails as well as riparian willow thickets. Also nests in riparian forests of valley oak with a blackberry understory, along vegetated irrigation canals and levees, and in recently planted valley oak restoration sites (Shuford and Gardali 2008).	High. Suitable nesting habitat for this species occurs in the irrigation ditches and canals, and ponds within the project footprint.	High. Suitable nesting habitat for this species occurs in the irrigation ditches and canals, and ponds within the Alternative 2C footprint.
Riparia riparia Bank swallow	–	CT	Restricted to sandy, vertical bluffs or riverbanks. Sometimes nests in vertical earthen streambanks, coastal bluffs, or sand and gravel pits.	No habitat present. No vertical banks or bluffs occur within the project footprint.	No habitat present. No vertical banks or bluffs occur within the Alternative 2C footprint.

Scientific Name (Common Name)	Federal Status[a]	State Status[a]	Habitat Requirements	Potential for Occurrence[b]	
				Proposed Project	Alternative 2C
Vireo bellii pusillus Least Bell's vireo	FE	CE	Nests in structurally diverse riparian and oak woodlands and mule fat scrub with dense shrub cover within 3 to 6 feet of the ground, and a dense stratified canopy for foraging.	Moderate. The narrow band of riparian woodlands along Cache Creek is not suitable for this species. However, suitable nesting habitat for this species is present in the Cache Creek Settling Basin immediately adjacent to the eastern portions of the project footprint.	Moderate. Sandbar willow scrub in the southern portion of the Alternative 2C footprint represents marginally suitable nesting habitat for this species. In addition, suitable nesting habitat for this species is present in the Cache Creek Settling Basin immediately adjacent to the eastern portions of the Alternative 2C footprint.
Mammals					
Antrozous pallidus Pallid bat	–	CSC	Roosts in crevices in rocky outcrops and cliffs, caves, mines, trees (e.g., basal hollows of coast redwoods and giant sequoias, bole cavities of oaks, exfoliating bark, deciduous trees in riparian areas, and fruit trees in orchards), bridges, barns, porches, bat boxes, and human-occupied as well as vacant buildings (Western Bat Working Group 2019).	High. Suitable habitat for this species is present in large mature trees, abandoned buildings, and under bridges throughout the project footprint.	High. Suitable habitat for this species is present in large mature trees, abandoned buildings, and under bridges throughout the Alternative 2C footprint.
Lasionycteris noctivagans Silver-haired bat	–	WBWG M	Roosts in abandoned woodpecker holes, under bark, and occasionally in rock crevices. Forages in open wooded areas near water features.	High. Suitable habitat for this species is present in large mature trees throughout the project footprint.	High. Suitable habitat for this species is present in large mature trees throughout the Alternative 2C footprint.

Scientific Name (Common Name)	Federal Status[a]	State Status[a]	Habitat Requirements	Potential for Occurrence[b] Proposed Project	Alternative 2C
Lasiurus blossevillii Western red bat	–	CSC	Roosts primarily in the foliage of trees or shrubs. Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. There may be an association with intact riparian habitat, particularly willows, cottonwoods, and sycamores (Western Bat Working Group 2019).	High. Suitable habitat for this species is present in trees throughout the project footprint, including orchards.	High. Suitable habitat for this species is present in trees throughout the Alternative 2C footprint, including orchards.
Lasiurus cinereus Hoary bat	–	WBWG M	Roosts primarily in foliage of both coniferous and deciduous trees at the edges of clearings (Western Bat Working Group 2019).	Moderate. Although roosting habitat for this species does not occur within the project footprint, suitable roosting habitat does occur in the adjacent riparian woodlands. Thus, this species has the potential to forage within the project footprint.	Moderate. Although roosting habitat for this species does not occur within the Alternative 2C footprint, suitable roosting habitat does occur in the adjacent riparian woodlands. Thus, this species has the potential to forage within the Alternative 2C footprint.
Taxidea taxus American badger	–	CSC	Prefers dry open fields, grasslands, and pastures.	No habitat present. Habitats within the project footprint are too frequently disturbed to support this large burrowing mammal.	No habitat present. Habitats within the Alternative 2C footprint are too frequently disturbed to support this large burrowing mammal.

[a] Status Codes:

Federal

FE = federally listed as endangered; FT = federally listed as threatened; FC = federal candidate for listing; FD = federally delisted.

State

CE = state listed as endangered; CT = state listed as threatened; CFP = fully protected in California; CSC = species of concern to California Department of Fish and Wildlife.

Western Bat Working Group

WBWG H = high threat rank; WBWG M = medium threat rank.

Table C.1-2 References

California Department of Fish and Wildlife (CDFW). 2019. California Natural Diversity Database (CNDDB). 2019. RareFind 5. California Department of Fish and Wildlife. Accesed: September 2019.

eBird. 2019. An online database of bird distribution and abundance. Cornell Lab of Ornithology, Ithaca, New York. Available: http://www.ebird.org. Accessed: December 19, 2019.

Garwood, R. S. 2017. Historic and contemporary distribution of longfin smelt (Spirinchus thaleichthys) along the California coast. California Fish and Game 103(3): 96-117. Available: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=152476&inline. Accessed: November 4, 2019.

Goulson, D. 2010. Bumblebees: behaviour, ecology, and conservation. Oxford University Press, New York. 317 pp.

Moyle, P. B. 2002. Inland fishes of California. 2nd edition. Davis, CA: University of California Press.

Shuford, W. D., and Gardali, T., editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

Western Bat Working Group (WBWG). 2019. Species Matrix and Species Accounts. Accessed online: http://wbwg.org/ in September 2019.

Xerces Society. 2019. Western Bumble Bee Species Profile. Accessed online: https://www.xerces.org/endangered-species/species-profiles/at-risk-bumble-bees/western-bumble-bee in December 2019.

Appendix C.2

U.S. Fish and Wildlife Service IPac Species List

IPaC Information for Planning and Consultation **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Project information

NAME

Lower Cache Creek Flood Protection Project

LOCATION

Yolo County, California

Local office

Sacramento Fish And Wildlife Office

(916) 414-6600
(916) 414-6713

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Log in to IPaC.
2. Go to your My Projects list.
3. Click PROJECT HOME for this project.
4. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Birds

NAME	STATUS
Western Snowy Plover *Charadrius nivosus nivosus* There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/8035	Threatened
Yellow-billed Cuckoo *Coccyzus americanus* There is **proposed** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/3911	Threatened

Reptiles

NAME	STATUS
Giant Garter Snake *Thamnophis gigas* No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander *Ambystoma californiense* There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt Hypomesus transpacificus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/321	Threatened

Insects

NAME	STATUS
Valley Elderberry Longhorn Beetle Desmocerus californicus dimorphus There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/7850	Threatened

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp Branchinecta lynchi There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/498	Threatened
Vernal Pool Tadpole Shrimp Lepidurus packardi There is **final** critical habitat for this species. Your location is outside the critical habitat. https://ecos.fws.gov/ecp/species/2246	Endangered

Flowering Plants

NAME	STATUS
Palmate-bracted Bird's Beak Cordylanthus palmatus No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1616	Endangered

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Jan 1 to Aug 31
Black Turnstone Arenaria melanocephala This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Burrowing Owl Athene cunicularia This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9737	Breeds Mar 15 to Aug 31
Common Yellowthroat Geothlypis trichas sinuosa This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/2084	Breeds May 20 to Jul 31
Golden Eagle Aquila chrysaetos This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Lawrence's Goldfinch Carduelis lawrencei This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9464	Breeds Mar 20 to Sep 20
Lewis's Woodpecker Melanerpes lewis This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9408	Breeds Apr 20 to Sep 30
Long-billed Curlew Numenius americanus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/5511	Breeds elsewhere
Marbled Godwit Limosa fedoa This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9481	Breeds elsewhere
Mountain Plover Charadrius montanus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/3638	Breeds elsewhere
Nuttall's Woodpecker Picoides nuttallii This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9410	Breeds Apr 1 to Jul 20

Oak Titmouse Baeolophus inornatus

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9656

Breeds Mar 15 to Jul 15

Rufous Hummingbird selasphorus rufus

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8002

Breeds elsewhere

Short-billed Dowitcher Limnodromus griseus

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Breeds elsewhere

Song Sparrow Melospiza melodia

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Breeds Feb 20 to Sep 5

Spotted Towhee Pipilo maculatus clementae

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/4243

Breeds Apr 15 to Jul 20

Tricolored Blackbird Agelaius tricolor

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3910

Breeds Mar 15 to Aug 10

Whimbrel Numenius phaeopus

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9483

Breeds elsewhere

Willet Tringa semipalmata

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds elsewhere

Wrentit Chamaea fasciata

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds Mar 15 to Aug 10

Yellow-billed Magpie Pica nuttalli

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9726

Breeds Apr 1 to Jul 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence ( )

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season ( )

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

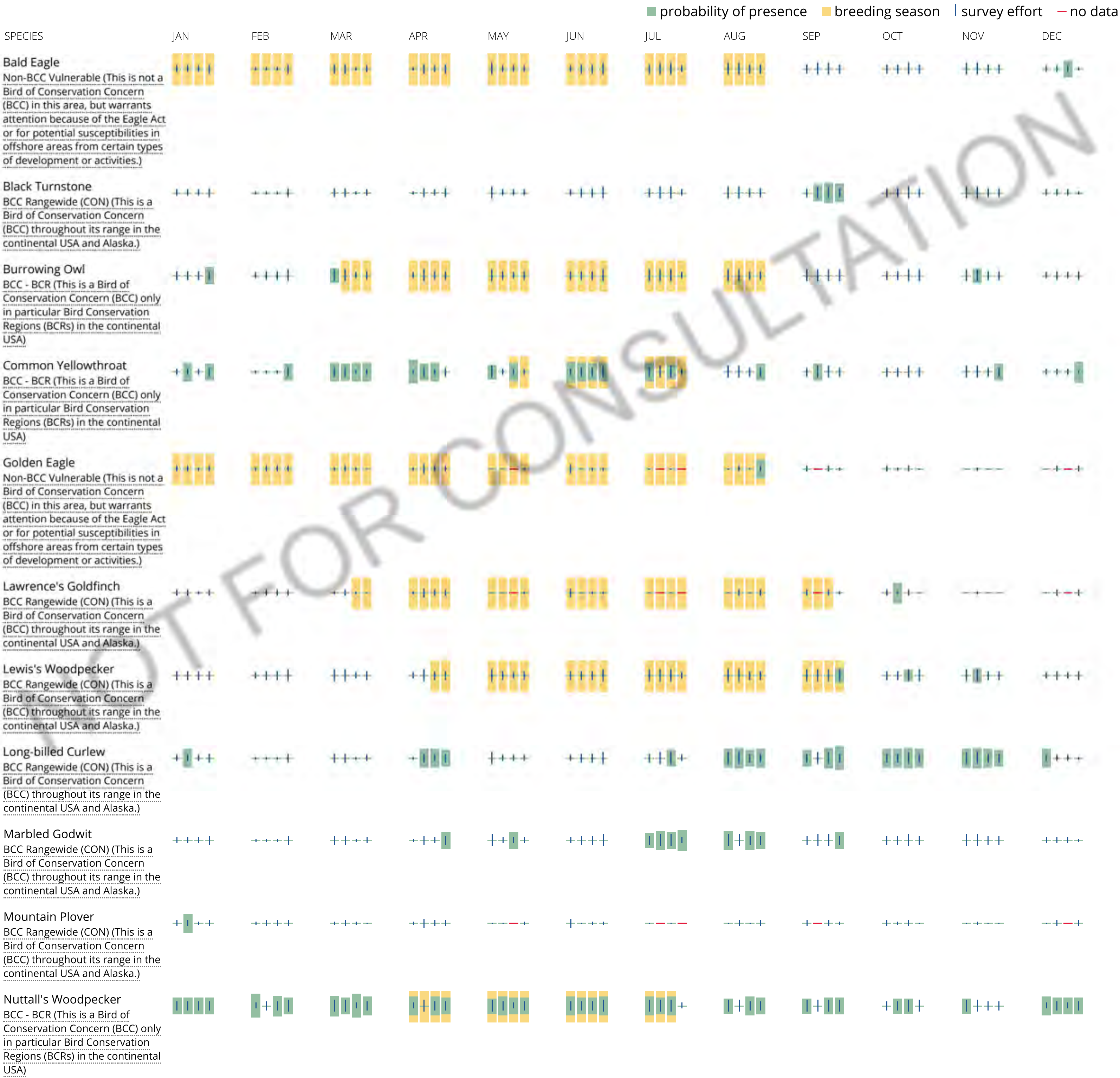
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

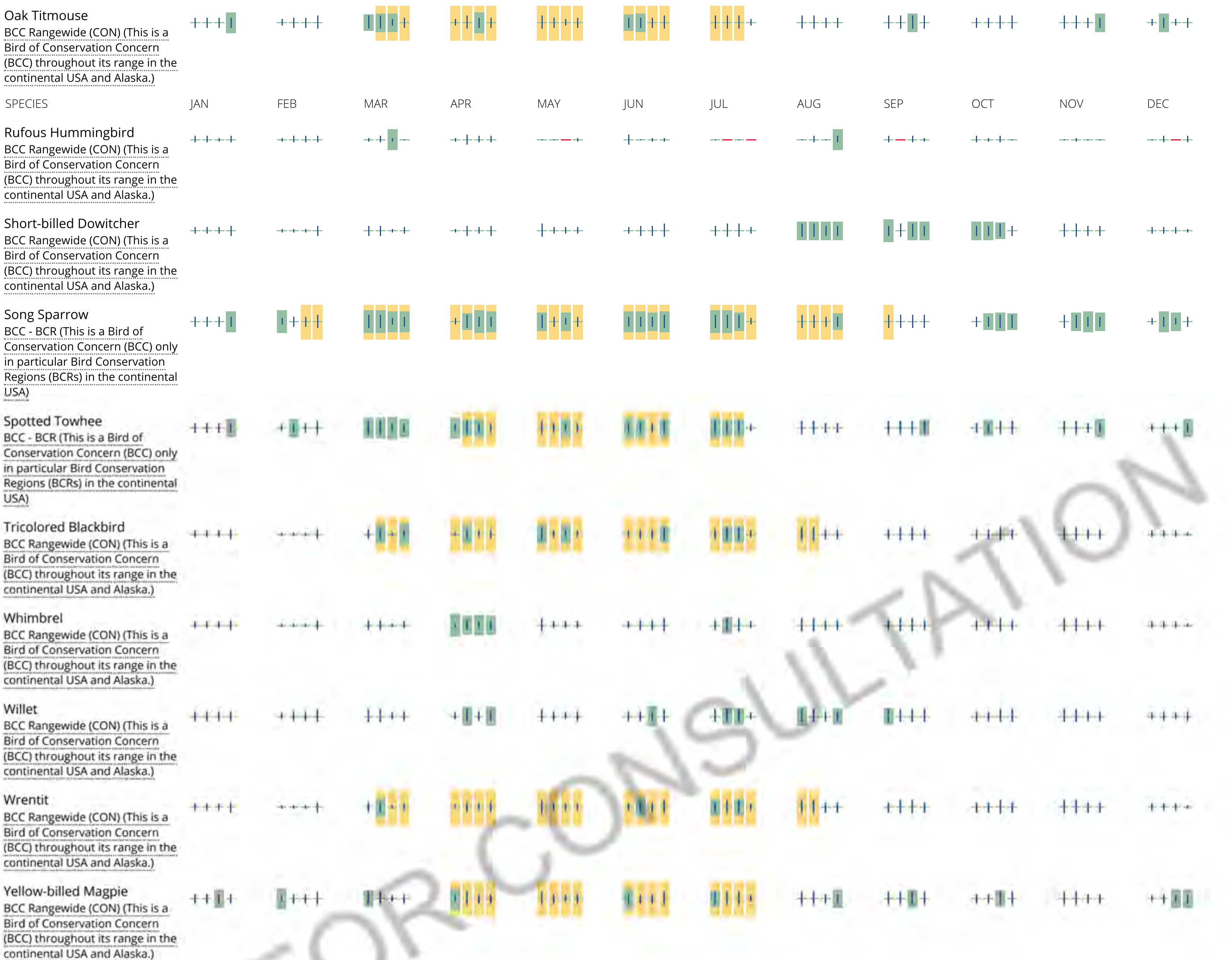
No Data (–)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.





Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND
- PEM1Kx

FRESHWATER POND
- PUBKx

LAKE
- L2UBKx

RIVERINE
- R4SBCx
- R5UBFx

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

Appendix C.3
California Natural Diversity Database Species List

SNAME	CNAME	OCCNUMBER	KQUADNAME	ELMDATE	FEDLIST	CALLIST	RPLANTRANK	CDFWSTATUS
Oncorhynchus mykiss irideus pop. 11	steelhead - Central Valley DPS	28	Knights Landing	20120510	Threatened	None		
Spirinchus thaleichthys	longfin smelt	14	Sacramento West	20040105	Candidate	Threatened		SSC
Pogonichthys macrolepidotus	Sacramento splittail	1	Taylor Monument	19950226	None	None		SSC
Puccinellia simplex	California alkali grass	58	Woodland	19460415	None	None	1B.2	
Puccinellia simplex	California alkali grass	53	Davis	19490401	None	None	1B.2	
Lasiurus cinereus	hoary bat	139	Woodland	19910508	None	None		
Antrozous pallidus	pallid bat	313	Woodland	19571028	None	None		SSC
Lasionycteris noctivagans	silver-haired bat	89	Woodland	19901002	None	None		
Taxidea taxus	American badger	330	Woodland	XXXXXXXX	None	None		SSC
Agelaius tricolor	tricolored blackbird	496	Woodland	19360601	None	Candidate Endangered		SSC
Bombus occidentalis	western bumble bee	175	Woodland	19470711	None	None		
Agelaius tricolor	tricolored blackbird	117	Grays Bend	19720510	None	Candidate Endangered		SSC
Charadrius montanus	mountain plover	30	Grays Bend	19700318	None	None		SSC
Extriplex joaquinana	San Joaquin spearscale	27	Grays Bend	19651004	None	None	1B.2	
Charadrius alexandrinus nivosus	western snowy plover	103	Grays Bend	1970XXXX	Threatened	None		SSC
Agelaius tricolor	tricolored blackbird	118	Grays Bend	19710512	None	Candidate Endangered		SSC
Agelaius tricolor	tricolored blackbird	495	Grays Bend	20100603	None	Candidate Endangered		SSC
Buteo swainsoni	Swainson's hawk	202	Knights Landing	2007XXXX	None	Threatened		
Agelaius tricolor	tricolored blackbird	403	Grays Bend	20130604	None	Candidate Endangered		SSC
Buteo swainsoni	Swainson's hawk	2170	Woodland	1994XXXX	None	Threatened		
Agelaius tricolor	tricolored blackbird	120	Grays Bend	20140531	None	Candidate Endangered		SSC
Buteo swainsoni	Swainson's hawk	152	Grays Bend	19940721	None	Threatened		
Buteo swainsoni	Swainson's hawk	29	Grays Bend	20150628	None	Threatened		
Thamnophis gigas	giant gartersnake	154	Grays Bend	19990930	Threatened	Threatened		
Puccinellia simplex	California alkali grass	51	Davis	19620423	None	None	1B.2	
Agelaius tricolor	tricolored blackbird	303	Madison	19940423	None	Candidate Endangered		SSC
Chloropyron palmatum	palmate-bracted bird's-beak	1	Grays Bend	20171113	Endangered	Endangered	1B.1	
Buteo swainsoni	Swainson's hawk	208	Grays Bend	201207XX	None	Threatened		
Buteo swainsoni	Swainson's hawk	449	Grays Bend	20130412	None	Threatened		
Buteo swainsoni	Swainson's hawk	223	Knights Landing	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	400	Woodland	20020710	None	Threatened		
Buteo swainsoni	Swainson's hawk	428	Woodland	2007XXXX	None	Threatened		
Puccinellia simplex	California alkali grass	61	Grays Bend	19550328	None	None	1B.2	
Puccinellia simplex	California alkali grass	56	Grays Bend	19960323	None	None	1B.2	
Charadrius montanus	mountain plover	12	Grays Bend	19991212	None	None		SSC
Charadrius montanus	mountain plover	7	Grays Bend	19980313	None	None		SSC
Buteo swainsoni	Swainson's hawk	2410	Grays Bend	1994XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	517	Grays Bend	1994XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	421	Woodland	1991XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	424	Woodland	1991XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	524	Woodland	1994XXXX	None	Threatened		
Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	198	Grays Bend	19960926	None	None	1B.2	
Buteo swainsoni	Swainson's hawk	384	Woodland	19920505	None	Threatened		
Buteo swainsoni	Swainson's hawk	522	Woodland	1991XXXX	None	Threatened		

SNAME	CNAME	OCCNUMBER	KQUADNAME	ELMDATE	FEDLIST	CALLIST	RPLANTRANK	CDFWSTATUS
Valley Oak Woodland	Valley Oak Woodland	1	Woodland	19861220	None	None		
Buteo swainsoni	Swainson's hawk	516	Grays Bend	1993XXXX	None	Threatened		
Athene cunicularia	burrowing owl	102	Davis	1988XXXX	None	None		SSC
Thamnophis gigas	giant gartersnake	131	Grays Bend	1985XXXX	Threatened	Threatened		
Riparia riparia	bank swallow	182	Knights Landing	19870611	None	Threatened		
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	13	Knights Landing	19850503	Threatened	None		
Buteo swainsoni	Swainson's hawk	133	Taylor Monument	1993XXXX	None	Threatened		
Extriplex joaquinana	San Joaquin spearscale	28	Grays Bend	20170530	None	None	1B.2	
Puccinellia simplex	California alkali grass	55	Grays Bend	19780814	None	None	1B.2	
Atriplex depressa	brittlescale	75	Grays Bend	19780913	None	None	1B.2	
Buteo swainsoni	Swainson's hawk	323	Taylor Monument	2007XXXX	None	Threatened		
Puccinellia simplex	California alkali grass	57	Grays Bend	20130419	None	None	1B.2	
Atriplex depressa	brittlescale	39	Grays Bend	19651004	None	None	1B.2	
Thamnophis gigas	giant gartersnake	289	Davis	20120708	Threatened	Threatened		
Buteo swainsoni	Swainson's hawk	561	Knights Landing	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2188	Grays Bend	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	531	Eldorado Bend	20090331	None	Threatened		
Thamnophis gigas	giant gartersnake	81	Davis	20110901	Threatened	Threatened		
Charadrius montanus	mountain plover	28	Grays Bend	20090110	None	None		SSC
Buteo swainsoni	Swainson's hawk	917	Merritt	20040721	None	Threatened		
Buteo swainsoni	Swainson's hawk	597	Grays Bend	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	423	Woodland	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	429	Merritt	20090715	None	Threatened		
Buteo swainsoni	Swainson's hawk	519	Grays Bend	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	416	Woodland	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	527	Eldorado Bend	2007XXXX	None	Threatened		
Thamnophis gigas	giant gartersnake	286	Davis	20110826	Threatened	Threatened		
Buteo swainsoni	Swainson's hawk	533	Eldorado Bend	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	210	Davis	20150710	None	Threatened		
Thamnophis gigas	giant gartersnake	120	Grays Bend	20090628	Threatened	Threatened		
Buteo swainsoni	Swainson's hawk	1367	Woodland	2007XXXX	None	Threatened		
Thamnophis gigas	giant gartersnake	148	Davis	20120710	Threatened	Threatened		
Buteo swainsoni	Swainson's hawk	1085	Davis	20150714	None	Threatened		
Buteo swainsoni	Swainson's hawk	426	Woodland	2007XXXX	None	Threatened		
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	285	Taylor Monument	201102XX	Threatened	None		
Buteo swainsoni	Swainson's hawk	513	Taylor Monument	20030711	None	Threatened		
Buteo swainsoni	Swainson's hawk	594	Taylor Monument	20020422	None	Threatened		
Buteo swainsoni	Swainson's hawk	115	Grays Bend	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	434	Merritt	20090609	None	Threatened		
Buteo swainsoni	Swainson's hawk	521	Woodland	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	920	Madison	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	1291	Woodland	20040709	None	Threatened		
Buteo swainsoni	Swainson's hawk	1060	Grays Bend	20160524	None	Threatened		
Lepidurus packardi	vernal pool tadpole shrimp	298	Grays Bend	20130201	Endangered	None		

SNAME	CNAME	OCCNUMBER	KQUADNAME	ELMDATE	FEDLIST	CALLIST	RPLANTRANK	CDFWSTATUS
Extriplex joaquinana	San Joaquin spearscale	55	Grays Bend	2003XXXX	None	None	1B.2	
Chloropyron palmatum	palmate-bracted bird's-beak	3	Grays Bend	19521104	Endangered	Endangered	1B.1	
Buteo swainsoni	Swainson's hawk	420	Woodland	1991XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	205	Taylor Monument	1994XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2135	Eldorado Bend	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2186	Woodland	1990XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2175	Woodland	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2184	Woodland	20030723	None	Threatened		
Buteo swainsoni	Swainson's hawk	2174	Woodland	2007XXXX	None	Threatened		
Melospiza melodia	song sparrow (""Modesto"" population)	85	Grays Bend	20110612	None	None		SSC
Buteo swainsoni	Swainson's hawk	2173	Woodland	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2669	Grays Bend	201207XX	None	Threatened		
Buteo swainsoni	Swainson's hawk	518	Grays Bend	20160614	None	Threatened		
Thamnophis gigas	giant gartersnake	288	Grays Bend	20120617	Threatened	Threatened		
Plegadis chihi	white-faced ibis	7	Grays Bend	19890627	None	None		WL
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	81	Woodland	19910516	Threatened	None		
Astragalus tener var. tener	alkali milk-vetch	37	Grays Bend	20100419	None	None	1B.2	
Buteo swainsoni	Swainson's hawk	155	Taylor Monument	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2165	Woodland	20090723	None	Threatened		
Buteo swainsoni	Swainson's hawk	1068	Eldorado Bend	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2190	Grays Bend	20160608	None	Threatened		
Thamnophis gigas	giant gartersnake	284	Grays Bend	20120629	Threatened	Threatened		
Buteo swainsoni	Swainson's hawk	1181	Woodland	2007XXXX	None	Threatened		
Ardea herodias	great blue heron	132	Taylor Monument	20160406	None	None		
Ardea alba	great egret	35	Taylor Monument	20160406	None	None		
Thamnophis gigas	giant gartersnake	280	Grays Bend	20090510	Threatened	Threatened		
Buteo swainsoni	Swainson's hawk	1711	Woodland	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	327	Grays Bend	20040719	None	Threatened		
Buteo swainsoni	Swainson's hawk	1183	Woodland	20040726	None	Threatened		
Buteo swainsoni	Swainson's hawk	422	Woodland	20090609	None	Threatened		
Buteo swainsoni	Swainson's hawk	1039	Knights Landing	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2172	Woodland	20090715	None	Threatened		
Buteo swainsoni	Swainson's hawk	418	Eldorado Bend	2007XXXX	None	Threatened		
Thamnophis gigas	giant gartersnake	287	Grays Bend	20090603	Threatened	Threatened		
Buteo swainsoni	Swainson's hawk	2129	Knights Landing	2007XXXX	None	Threatened		
Thamnophis gigas	giant gartersnake	281	Grays Bend	20120630	Threatened	Threatened		
Thamnophis gigas	giant gartersnake	283	Grays Bend	20090605	Threatened	Threatened		
Buteo swainsoni	Swainson's hawk	578	Eldorado Bend	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	1042	Grays Bend	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	1179	Woodland	20090723	None	Threatened		
Buteo swainsoni	Swainson's hawk	1180	Woodland	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	954	Woodland	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	401	Woodland	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2193	Grays Bend	20160608	None	Threatened		

SNAME	CNAME	OCCNUMBER	KQUADNAME	ELMDATE	FEDLIST	CALLIST	RPLANTRANK	CDFWSTATUS
Buteo swainsoni	Swainson's hawk	2178	Woodland	20030714	None	Threatened		
Buteo swainsoni	Swainson's hawk	2189	Grays Bend	20160427	None	Threatened		
Buteo swainsoni	Swainson's hawk	1402	Grays Bend	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	1174	Eldorado Bend	2007XXXX	None	Threatened		
Emys marmorata	western pond turtle	1216	Taylor Monument	20090407	None	None		SSC
Buteo swainsoni	Swainson's hawk	1074	Eldorado Bend	20040726	None	Threatened		
Thamnophis gigas	giant gartersnake	320	Grays Bend	20110908	Threatened	Threatened		
Buteo swainsoni	Swainson's hawk	417	Woodland	2007XXXX	None	Threatened		
Atriplex depressa	brittlescale	33	Grays Bend	20140514	None	None	1B.2	
Buteo swainsoni	Swainson's hawk	1282	Eldorado Bend	20040809	None	Threatened		
Chloropyron palmatum	palmate-bracted bird's-beak	27	Grays Bend	1996XXXX	Endangered	Endangered	1B.1	
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	287	Woodland	20050104	Threatened	None		
Lepidium latipes var. heckardii	Heckard's pepper-grass	1	Grays Bend	20100419	None	None	1B.2	
Atriplex depressa	brittlescale	62	Grays Bend	20180703	None	None	1B.2	
Buteo swainsoni	Swainson's hawk	641	Grays Bend	19940811	None	Threatened		
Buteo swainsoni	Swainson's hawk	1043	Grays Bend	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	153	Grays Bend	20040719	None	Threatened		
Buteo swainsoni	Swainson's hawk	1041	Grays Bend	20040730	None	Threatened		
Buteo swainsoni	Swainson's hawk	918	Woodland	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	1040	Grays Bend	20030707	None	Threatened		
Buteo swainsoni	Swainson's hawk	1177	Woodland	20040808	None	Threatened		
Buteo swainsoni	Swainson's hawk	1044	Grays Bend	20020716	None	Threatened		
Buteo swainsoni	Swainson's hawk	1086	Davis	20050724	None	Threatened		
Buteo swainsoni	Swainson's hawk	876	Woodland	20040724	None	Threatened		
Buteo swainsoni	Swainson's hawk	1184	Woodland	20040809	None	Threatened		
Buteo swainsoni	Swainson's hawk	1176	Woodland	20020802	None	Threatened		
Buteo swainsoni	Swainson's hawk	1187	Woodland	20020727	None	Threatened		
Buteo swainsoni	Swainson's hawk	1182	Woodland	20040709	None	Threatened		
Trifolium hydrophilum	saline clover	43	Grays Bend	20110425	None	None	1B.2	
Thamnophis gigas	giant gartersnake	282	Grays Bend	20090707	Threatened	Threatened		
Falco columbarius	merlin	26	Grays Bend	20090127	None	None		WL
Buteo swainsoni	Swainson's hawk	1401	Grays Bend	20040813	None	Threatened		
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	272	Taylor Monument	201102XX	Threatened	None		
Buteo swainsoni	Swainson's hawk	575	Grays Bend	20040815	None	Threatened		
Buteo swainsoni	Swainson's hawk	1355	Woodland	20040814	None	Threatened		
Buteo swainsoni	Swainson's hawk	1359	Woodland	20040814	None	Threatened		
Buteo swainsoni	Swainson's hawk	1364	Woodland	20040814	None	Threatened		
Buteo swainsoni	Swainson's hawk	1365	Woodland	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	1396	Eldorado Bend	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	1409	Woodland	20040714	None	Threatened		
Buteo swainsoni	Swainson's hawk	1410	Woodland	20040712	None	Threatened		
Buteo swainsoni	Swainson's hawk	1413	Woodland	20040816	None	Threatened		
Buteo swainsoni	Swainson's hawk	427	Woodland	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	1702	Grays Bend	20000613	None	Threatened		

SNAME	CNAME	OCCNUMBER	KQUADNAME	ELMDATE	FEDLIST	CALLIST	RPLANTRANK	CDFWSTATUS
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	284	Woodland	201102XX	Threatened	None		
Buteo swainsoni	Swainson's hawk	2130	Knights Landing	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2133	Knights Landing	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2136	Eldorado Bend	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	425	Woodland	20090616	None	Threatened		
Buteo swainsoni	Swainson's hawk	2166	Woodland	20090715	None	Threatened		
Buteo swainsoni	Swainson's hawk	402	Woodland	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	211	Woodland	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2168	Woodland	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2169	Woodland	20000701	None	Threatened		
Buteo swainsoni	Swainson's hawk	2171	Woodland	20090723	None	Threatened		
Buteo swainsoni	Swainson's hawk	2176	Woodland	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2177	Woodland	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2179	Woodland	20030719	None	Threatened		
Buteo swainsoni	Swainson's hawk	2180	Woodland	20030723	None	Threatened		
Buteo swainsoni	Swainson's hawk	2181	Woodland	20030714	None	Threatened		
Buteo swainsoni	Swainson's hawk	2182	Woodland	20030723	None	Threatened		
Buteo swainsoni	Swainson's hawk	2183	Woodland	1994XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2185	Woodland	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2191	Grays Bend	20030613	None	Threatened		
Buteo swainsoni	Swainson's hawk	2194	Grays Bend	20030711	None	Threatened		
Buteo swainsoni	Swainson's hawk	2195	Grays Bend	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2196	Grays Bend	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2198	Taylor Monument	20020514	None	Threatened		
Thamnophis gigas	giant gartersnake	322	Grays Bend	20110829	Threatened	Threatened		
Thamnophis gigas	giant gartersnake	321	Grays Bend	20110818	Threatened	Threatened		
Buteo swainsoni	Swainson's hawk	419	Woodland	20010401	None	Threatened		
Buteo swainsoni	Swainson's hawk	1640	Grays Bend	20060721	None	Threatened		
Buteo swainsoni	Swainson's hawk	520	Grays Bend	20010811	None	Threatened		
Buteo swainsoni	Swainson's hawk	1306	Eldorado Bend	20040726	None	Threatened		
Buteo swainsoni	Swainson's hawk	2670	Grays Bend	201207XX	None	Threatened		
Buteo swainsoni	Swainson's hawk	2671	Merritt	201207XX	None	Threatened		
Buteo swainsoni	Swainson's hawk	1299	Woodland	20040714	None	Threatened		
Buteo swainsoni	Swainson's hawk	1293	Woodland	20040607	None	Threatened		
Buteo swainsoni	Swainson's hawk	1292	Woodland	2007XXXX	None	Threatened		
Buteo swainsoni	Swainson's hawk	1260	Davis	20050815	None	Threatened		
Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	68	Knights Landing	19840905	None	None	1B.2	
Buteo swainsoni	Swainson's hawk	1069	Eldorado Bend	20010508	None	Threatened		
Buteo swainsoni	Swainson's hawk	1066	Eldorado Bend	20010817	None	Threatened		
Extriplex joaquinana	San Joaquin spearscale	41	Grays Bend	19940813	None	None	1B.2	
Lepidium latipes var. heckardii	Heckard's pepper-grass	8	Grays Bend	20090415	None	None	1B.2	
Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	199	Grays Bend	20110901	None	None	1B.2	

Appendix C.4

California Native Plant Society List

Plant List

17 matches found. *Click on scientific name for details*

Search Criteria

Found in Quads 3812167, 3812166, 3812178, 3812177, 3812176, 3812175, 3812165, 3812155, 3812156, 3812157 3812158 and 3812168;

Modify Search Criteria Export to Excel Modify Columns Modify Sort Display Photos

Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Rank	Global Rank
Astragalus pauperculus	depauperate milk-vetch	Fabaceae	annual herb	Mar-Jun	4.3	S4	G4
Astragalus tener var. ferrisiae	Ferris' milk-vetch	Fabaceae	annual herb	Apr-May	1B.1	S1	G2T1
Astragalus tener var. tener	alkali milk-vetch	Fabaceae	annual herb	Mar-Jun	1B.2	S1	G2T1
Atriplex cordulata var. cordulata	heartscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G3T2
Atriplex depressa	brittlescale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Centromadia parryi ssp. parryi	pappose tarplant	Asteraceae	annual herb	May-Nov	1B.2	S2	G3T2
Centromadia parryi ssp. rudis	Parry's rough tarplant	Asteraceae	annual herb	May-Oct	4.2	S3	G3T3
Chloropyron palmatum	palmate-bracted bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	May-Oct	1B.1	S1	G1
Extriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	1B.2	S3	G5T3
Lepidium latipes var. heckardii	Heckard's pepper-grass	Brassicaceae	annual herb	Mar-May	1B.2	S1	G4T1
Lessingia hololeuca	woolly-headed lessingia	Asteraceae	annual herb	Jun-Oct	3	S2S3	G3?
Malacothamnus helleri	Heller's bush-mallow	Malvaceae	perennial deciduous shrub	May-Jul	3.3	S3	G3Q
Navarretia leucocephala ssp. bakeri	Baker's navarretia	Polemoniaceae	annual herb	Apr-Jul	1B.1	S2	G4T2
Puccinellia simplex	California alkali grass	Poaceae	annual herb	Mar-May	1B.2	S2	G3
Symphyotrichum lentum	Suisun Marsh aster	Asteraceae	perennial rhizomatous herb	(Apr)May-Nov	1B.2	S2	G2
Trifolium hydrophilum	saline clover	Fabaceae	annual herb	Apr-Jun	1B.2	S2	G2

Suggested Citation

California Native Plant Society, Rare Plant Program. 2019. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 19 December 2019].

Appendix C.5

National Marine Fisheries Service Species List

Quad Name **Woodland**
Quad Number **38121-F7**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) - **X**
SRWR Chinook Salmon ESU (E) - **X**
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -	
Chinook Salmon EFH -	**X**
Groundfish EFH -	
Coastal Pelagics EFH -	
Highly Migratory Species EFH -	

Quad Name **Grays Bend**
Quad Number **38121-F6**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -

CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) - **X**
SRWR Chinook Salmon ESU (E) - **X**
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) - **X**

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat - **X**
SRWR Chinook Salmon Critical Habitat - **X**
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat - **X**
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat - **X**

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -

Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - **X**
Groundfish EFH - **X**
Coastal Pelagics EFH -
Highly Migratory Species EFH -

Appendix D
California Agricultural Land Evaluation and Site Assessment Model Farmland Conversion Impact Rating

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*

Date Of Land Evaluation Request 07/09/2019

Name of Project: Lower Cache Creek Feasibility Study

Federal Agency Involved: U.S. Army Corps of Engineers

Proposed Land Use: Levee Improvements / Flood Risk

County and State: Yolo County, CA

PART II *(To be completed by NRCS)*

Date Request Received By NRCS: 07/09/2019

Person Completing Form: Peter Fahnestock

Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES	NO	Acres Irrigated	Average Farm Size
	✔	☐	229,901	456

Major Crop(s)	Farmable Land In Govt. Jurisdiction	Amount of Farmland As Defined in FPPA
forage, truck, rice, wheat	Acres: 306,914 %: 47.0	Acres: 352,555 %: 54.0

Name of Land Evaluation System Used	Name of State or Local Site Assessment System	Date Land Evaluation Returned by NRCS
California Agricultural LESA	Storie	07/16/2019

PART III *(To be completed by Federal Agency)*		Alternative Site Rating			
		Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly		217			
B. Total Acres To Be Converted Indirectly		34.9			
C. Total Acres In Site		324			
PART IV *(To be completed by NRCS)* Land Evaluation Information		Site A	Site B	Site C	Site D
A. Total Acres Prime And Unique Farmland		234.5			
B. Total Acres Statewide Important or Local Important Farmland		7.6			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted		0.082			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value		82.4			
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)		64			
PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	**Maximum Points**	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)	10			
2. Perimeter In Non-urban Use	(10)	10			
3. Percent Of Site Being Farmed	(20)	16			
4. Protection Provided By State and Local Government	(20)	20			
5. Distance From Urban Built-up Area	(15)	0			
6. Distance To Urban Support Services	(15)	0			
7. Size Of Present Farm Unit Compared To Average	(10)	4			
8. Creation Of Non-farmable Farmland	(10)	7			
9. Availability Of Farm Support Services	(5)	1			
10. On-Farm Investments	(20)	10			
11. Effects Of Conversion On Farm Support Services	(10)	1			
12. Compatibility With Existing Agricultural Use	(10)	0			
TOTAL SITE ASSESSMENT POINTS	160	79	0	0	0
PART VII ***(To be completed by Federal Agency)***					
Relative Value Of Farmland *(From Part V)*	100	64	0	0	0
Total Site Assessment *(From Part VI above or local site assessment)*	160	79	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	143	0	0	0

Site Selected: Site A

Date Of Selection: February 27, 2019

Was A Local Site Assessment Used? YES ✔ NO ☐

Reason For Selection:

Site A is the only alternative being considered in the Lower Cache Creek Feasibility Study Supplemental EIS and Feasibility Report, as all other alternatives were screened out as infeasible due to the low cost benefit ratios or substantial environmental impacts.

Name of Federal agency representative completing this form: Keleigh Duey Kel.D

Date: 7-19-2019

(See Instructions on reverse side) **Form AD-1006 (03-02)**

Appendix E

Air Quality and Greenhouse Gas Modeling Inputs and Supporting Data

Air Quality Assumptions - Unmitigated

Phase	ID	Year 1		Year 2		Days per Year	
		Start Date	End Date	Start Date	End Date	2023	2024
Mobilization	1	3/1/2023	3/15/2023	3/1/2024	3/15/2024	10	10
Structure and road demolition	2	3/1/2023	3/15/2023	3/1/2024	3/15/2024	10	10
Clearing, grubbing, and stripping	3	3/16/2023	4/6/2023	3/16/2024	4/5/2024	15	15
Detention basin excavation	4	4/7/2023	8/4/2023			85	
Degrade Segments N & O	5	4/7/2023	5/19/2023			30	
Training levee degrade and haul	6	4/7/2023	7/14/2023			70	
Cutoff wall construction	7	5/14/2023	7/14/2023			45	
Canal and Inspection Trench Excavation	8			4/2/2024	6/4/2024		45
Highway 113 Crossing	9			6/8/2024	8/2/2024		40
Year 1 - Levee embankment	10	7/29/2023	8/18/2023			15	
Year 2 - Levee embankment, seepage berm	11			6/5/2024	7/31/2024		40
Year 1 - Levee resurfacing	12	8/19/2023	9/1/2023			10	
Year 2 - Levee resurfacing	13			8/1/2024	8/29/2024		20
Asphalt Paving	14			8/1/2024	8/29/2024		20
Weir	15	7/15/2023	8/25/2023			30	
Closure Structure Construction	16			8/1/2024	9/12/2024		30
Hydroseeding	17	9/4/2023	9/11/2023	9/1/2024	9/13/2024	5	10
Demobilization and site cleanup	18	9/12/2023	9/26/2023	9/14/2024	9/27/2024	10	10

Offroad Calculations

ID	Year	Wk Days	Equip	#/day	hrs/day	HP	LF	g/hp-hr (CalEEMod)									Pounds per day						Metric tons per year			
								ROG	NOX	CO	PM10	PM2.5	SO2	CO2	CH4	N2O	ROG	NOX	CO	PM10	PM2.5	SO2	CO2	CH4	N2O	CO2e
1	2023	10	Extended boom pallet loader	1	12	231	0.288	0.3	3.2	1.6	0.1	0.1	0.0	473.0	0.2	0.0	0.5	5.7	2.7	0.2	0.2	0.0	3.8	0.0	0.0	3.8
2	2023	10	Excavator	1	12	158	0.382	0.2	1.5	3.1	0.1	0.1	0.0	472.3	0.2	0.0	0.3	2.3	4.9	0.1	0.1	0.0	3.4	0.0	0.0	3.5
2	2023	10	Dozer	1	12	247	0.395	0.4	4.1	1.8	0.2	0.2	0.0	474.6	0.2	0.0	1.0	10.6	4.6	0.5	0.4	0.0	5.6	0.0	0.0	5.6
2	2023	10	Front-end loader	2	12	65	0.369	0.2	2.0	3.3	0.1	0.1	0.0	472.7	0.2	0.0	0.2	2.6	4.1	0.1	0.1	0.0	2.7	0.0	0.0	2.8
3	2023	15	Elevating scraper	2	12	367	0.482	0.3	2.7	2.0	0.1	0.1	0.0	473.2	0.2	0.0	2.4	25.0	18.5	1.0	0.9	0.0	30.2	0.0	0.0	30.6
3	2023	15	Front-end loader	1	12	65	0.369	0.2	2.0	3.3	0.1	0.1	0.0	472.7	0.2	0.0	0.1	1.3	2.1	0.0	0.0	0.0	2.0	0.0	0.0	2.1
4	2023	85	Elevating scraper	2	12	367	0.482	0.3	2.7	2.0	0.1	0.1	0.0	473.2	0.2	0.0	2.4	25.0	18.5	1.0	0.9	0.0	170.9	0.1	0.0	173.6
4	2023	15	Boaring machine	2	12	221	0.503	0.1	1.0	1.0	0.0	0.0	0.0	469.7	0.2	0.0	0.6	6.1	6.1	0.2	0.2	0.0	18.8	0.0	0.0	19.1
4	2023	5	Excavator	2	12	158	0.382	0.2	1.5	3.1	0.1	0.1	0.0	472.3	0.2	0.0	0.6	4.7	9.8	0.2	0.2	0.0	3.4	0.0	0.0	3.5
5	2023	30	Hydraulic excavator	3	12	158	0.382	0.2	1.5	3.1	0.1	0.1	0.0	472.3	0.2	0.0	0.9	7.0	14.7	0.3	0.3	0.0	30.8	0.0	0.0	31.3
5	2023	30	Dozer	3	12	247	0.395	0.4	4.1	1.8	0.2	0.2	0.0	474.6	0.2	0.0	3.0	31.7	13.8	1.4	1.3	0.0	50.0	0.0	0.0	50.8
6	2023	35	Hydraulic excavator	2	12	158	0.382	0.2	2.4	3.5	0.1	0.1	0.0	467.2	0.2	0.0	0.7	7.6	11.0	0.4	0.3	0.0	23.7	0.0	0.0	24.0
6	2023	35	Dozer	2	12	247	0.395	0.4	4.1	1.8	0.2	0.2	0.0	474.6	0.2	0.0	2.0	21.1	9.2	1.0	0.9	0.0	38.9	0.0	0.0	39.5
6	2023	85	Front-end loader	1	12	65	0.369	0.2	2.0	3.3	0.1	0.1	0.0	472.7	0.2	0.0	0.1	1.3	2.1	0.0	0.0	0.0	11.5	0.0	0.0	11.7
7	2023	45	Hydraulic excavator	6	12	158	0.382	0.2	2.4	3.5	0.1	0.1	0.0	467.2	0.2	0.0	2.2	22.8	33.1	1.1	1.0	0.0	91.3	0.0	0.0	92.8
7	2023	45	Dozer	3	12	247	0.395	0.4	4.1	1.8	0.2	0.2	0.0	474.6	0.2	0.0	3.0	31.7	13.8	1.4	1.3	0.0	75.1	0.0	0.0	76.2
7	2023	45	Front-end loader	3	12	65	0.369	0.2	2.0	3.3	0.1	0.1	0.0	472.7	0.2	0.0	0.3	3.9	6.2	0.1	0.1	0.0	18.3	0.0	0.0	18.6
7	2023	45	Extended boom pallet loader	3	12	231	0.288	0.3	3.2	1.6	0.1	0.1	0.0	473.0	0.2	0.0	1.6	17.1	8.2	0.7	0.7	0.0	51.0	0.0	0.0	51.8
7	2023	45	Slurry pump	3	12	84	0.74	0.3	2.5	3.4	0.1	0.1	0.0	568.3	0.0	0.0	1.5	12.4	16.8	0.6	0.6	0.0	57.2	0.0	0.0	57.7
7	2023	45	300-kw generator	3	12	84	0.74	0.3	2.5	3.3	0.1	0.1	0.0	568.3	0.0	0.0	1.4	12.2	16.5	0.6	0.6	0.0	57.2	0.0	0.0	57.7
10	2023	15	Scraper	6	12	367	0.482	0.3	2.7	2.0	0.1	0.1	0.0	473.2	0.2	0.0	7.1	74.9	55.5	2.9	2.7	0.1	90.5	0.0	0.0	91.9
10	2023	15	Dozer	2	12	247	0.395	0.4	4.1	1.8	0.2	0.2	0.0	474.6	0.2	0.0	2.0	21.1	9.2	1.0	0.9	0.0	16.7	0.0	0.0	16.9
10	2023	15	Motor grader	3	12	187	0.409	0.4	3.5	3.5	0.2	0.2	0.0	478.5	0.2	0.0	2.4	21.5	20.9	1.2	1.1	0.0	19.7	0.0	0.0	20.1
10	2023	15	Vibratory roller	3	12	80	0.375	0.3	3.0	3.5	0.2	0.2	0.0	473.9	0.2	0.0	0.7	7.2	8.2	0.4	0.4	0.0	7.7	0.0	0.0	7.8
12	2023	10	Motor grader	1	12	187	0.409	0.4	3.5	3.5	0.2	0.2	0.0	478.5	0.2	0.0	0.8	7.2	7.0	0.4	0.4	0.0	4.4	0.0	0.0	4.5
12	2023	10	Vibratory roller	1	12	80	0.375	0.3	3.0	3.5	0.2	0.2	0.0	473.9	0.2	0.0	0.2	2.4	2.7	0.1	0.1	0.0	1.7	0.0	0.0	1.7
15	2023	30	Excavator	1	12	158	0.382	0.2	1.5	3.1	0.1	0.1	0.0	472.3	0.2	0.0	0.3	2.3	4.9	0.1	0.1	0.0	10.3	0.0	0.0	10.4
15	2023	30	Paver	1	12	130	0.415	0.3	3.4	3.5	0.2	0.2	0.0	470.1	0.2	0.0	0.5	4.9	5.0	0.3	0.3	0.0	9.1	0.0	0.0	9.3
15	2023	30	Vibratory roller	1	12	80	0.375	0.3	3.0	3.5	0.2	0.2	0.0	473.9	0.2	0.0	0.2	2.4	2.7	0.1	0.1	0.0	5.1	0.0	0.0	5.2
17	2023	5	Hydroseeding truck	1	12	402	0.382	0.2	1.3	1.2	0.0	0.0	0.0	475.0	0.2	0.0	0.8	5.4	5.0	0.2	0.2	0.0	4.4	0.0	0.0	4.4
18	2023	10	Extended boom pallet loader	1	12	231	0.288	0.3	3.2	1.6	0.1	0.1	0.0	473.0	0.2	0.0	0.5	5.7	2.7	0.2	0.2	0.0	3.8	0.0	0.0	3.8
1	2024	10	Extended boom pallet loader	1	12	231	0.288	0.3	3.0	1.5	0.1	0.1	0.0	473.0	0.2	0.0	0.5	5.2	2.6	0.2	0.2	0.0	3.8	0.0	0.0	3.8
2	2024	10	Excavator	1	12	158	0.382	0.2	1.3	3.1	0.1	0.1	0.0	472.4	0.2	0.0	0.3	2.1	4.9	0.1	0.1	0.0	3.4	0.0	0.0	3.5
2	2024	10	Dozer	1	12	247	0.395	0.4	4.1	1.8	0.2	0.2	0.0	474.6	0.2	0.0	1.0	10.6	4.6	0.5	0.4	0.0	5.6	0.0	0.0	5.6
2	2024	10	Front-end loader	2	12	65	0.369	0.1	1.9	3.3	0.1	0.1	0.0	472.8	0.2	0.0	0.2	2.5	4.1	0.1	0.1	0.0	2.7	0.0	0.0	2.8
3	2024	25	Elevating scraper	4	12	367	0.482	0.2	2.5	1.9	0.1	0.1	0.0	472.8	0.2	0.0	4.6	46.4	36.0	1.8	1.7	0.1	100.5	0.0	0.0	102.0
3	2024	25	Front-end loader	2	12	65	0.369	0.1	1.9	3.3	0.1	0.1	0.0	472.8	0.2	0.0	0.2	2.5	4.1	0.1	0.1	0.0	6.8	0.0	0.0	6.9
8	2024	5	Excavator	8	12	158	0.382	0.2	1.3	3.1	0.1	0.1	0.0	472.4	0.2	0.0	2.2	16.9	39.4	0.8	0.8	0.1	13.7	0.0	0.0	13.9
8	2024	5	Dozer	8	12	247	0.395	0.4	4.1	1.8	0.2	0.2	0.0	474.6	0.2	0.0	8.2	84.5	37.1	3.8	3.5	0.1	22.2	0.0	0.0	22.6
8	2024	5	Vibratory roller	8	12	80	0.375	0.3	2.8	3.5	0.2	0.1	0.0	474.0	0.2	0.0	1.7	18.1	21.9	1.0	0.9	0.0	6.8	0.0	0.0	6.9
9	2024	35	Asphalt Paver	1	12	130	0.415	0.3	3.3	3.5	0.2	0.2	0.0	470.2	0.2	0.0	0.5	4.7	5.0	0.3	0.3	0.0	10.7	0.0	0.0	10.8
9	2024	35	Asphalt Compactor	1	12	8	0.43	0.7	4.1	3.5	0.2	0.2	0.0	568.3	0.1	0.0	0.1	0.4	0.3	0.0	0.0	0.0	0.8	0.0	0.0	0.8
9	2024	35	Crane	1	12	231	0.288	0.3	3.0	1.5	0.1	0.1	0.0	473.0	0.2	0.0	0.5	5.2	2.6	0.2	0.2	0.0	13.2	0.0	0.0	13.4
9	2024	60	Vibratory roller	1	12	80	0.375	0.3	2.8	3.5	0.2	0.1	0.0	474.0	0.2	0.0	0.2	2.3	2.7	0.1	0.1	0.0	10.2	0.0	0.0	10.4
11	2024	60	Scraper	13	12	367	0.482	0.2	2.5	1.9	0.1	0.1	0.0	472.8	0.2	0.0	14.9	150.8	116.9	6.0	5.5	0.3	783.6	0.3	0.0	795.8
11	2024	60	Dozer	2	12	247	0.395	0.4	4.1	1.8	0.2	0.2	0.0	474.6	0.2	0.0	2.1	21.1	9.3	1.0	0.9	0.0	66.7	0.0	0.0	67.8
11	2024	60	Motor grader	3	12	187	0.409	0.4	3.2	3.4	0.2	0.2	0.0	478.5	0.2	0.0	2.2	19.4	20.8	1.1	1.0	0.0	79.0	0.0	0.0	80.2
11	2024	5	Vibratory roller	7	12	80	0.375	0.3	2.8	3.5	0.2	0.1	0.0	474.0	0.2	0.0	1.5	15.8	19.2	0.8	0.8	0.0	6.0	0.0	0.0	6.1
13	2024	5	Motor grader	3	12	187	0.409	0.7	5.4	4.2	0.4	0.4	0.0	469.8	0.2	0.0	4.1	33.0	25.5	2.5	2.3	0.0	6.5	0.0	0.0	6.6
13	2024	55	Vibratory roller	3	12	80	0.375	0.3	2.8	3.5	0.2	0.1	0.0	474.0	0.2	0.0	0.6	6.8	8.2	0.4	0.3	0.0	28.2	0.0	0.0	28.6
14	2024	55	Asphalt Paver	4	12	130	0.415	0.3	3.3	3.5	0.2	0.2	0.0	470.2	0.2	0.0	1.9	18.7	20.0	1.2	1.1	0.0	67.0	0.0	0.0	68.1
14	2024	55	Asphalt Compactor	4	12	8	0.43	0.7	4.1	3.5	0.2	0.2	0.0	568.3	0.1	0.0	0.2	1.5	1.3	0.1	0.1	0.0	5.2	0.0	0.0	5.2
16	2024	20	Excavator	1	12	158	0.382	0.2	1.3	3.1	0.1	0.1	0.0	472.4	0.2	0.0	0.3	2.1	4.9	0.1	0.1	0.0	6.8	0.0	0.0	6.9
16	2024	20	Paver	1	12	130	0.415	0.3	3.3	3.5	0.2	0.2	0.0	470.2	0.2	0.0	0.5	4.7	5.0	0.3	0.3	0.0	6.1	0.0	0.0	6.2
16	2024	20	Vibratory roller	1	12	80	0.375	0.3	2.8	3.5	0.2	0.1	0.0	474.0	0.2	0.0	0.2	2.3	2.7	0.1	0.1	0.0	3.4	0.0	0.0	3.5
16	2024	20	Pile Driver	2	12	85	0.78	0.4	2.4	3.7	0.1	0.1	0.0	568.3	0.0	0.0	1.3	8.4	13.0	0.4	0.4	0.0	18.1	0.0	0.0	18.2
17	2024	20	Hydroseeding truck	1	12	402	0.382	0.2	1.2	1.2	0.0	0.0	0.0	475.2	0.2	0.0	0.7	5.0	4.9	0.2	0.2	0.0	17.5	0.0	0.0	17.8
18	2024	20	Extended boom pallet loader	1	12	231	0.288	0.3	3.0	1.5	0.1	0.1	0.0	473.0	0.2	0.0	0.5	5.2	2.6	0.2	0.2	0.0	7.6	0.0	0.0	7.7

Employee Onroad Calculations

ID	Year	Vehicle	Days	Trips/Day	Mi/Trip	Vehicle	Running g/mi (EMFAC, AP 42)											Process g/trip (EMFAC)										
							ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O	ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O
1	2023	Employee Auto	10	12	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	269	0.0	0.0	0.8	0.2	2.4	0.0	0.0	0.0	0.0	0.0	57	0.1	0.0
2	2023	Employee Auto	10	12	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	269	0.0	0.0	0.8	0.2	2.4	0.0	0.0	0.0	0.0	0.0	57	0.1	0.0
3	2023	Employee Auto	15	18	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	269	0.0	0.0	0.8	0.2	2.4	0.0	0.0	0.0	0.0	0.0	57	0.1	0.0
4	2023	Employee Auto	85	12	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	269	0.0	0.0	0.8	0.2	2.4	0.0	0.0	0.0	0.0	0.0	57	0.1	0.0
5	2023	Employee Auto	30	12	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	269	0.0	0.0	0.8	0.2	2.4	0.0	0.0	0.0	0.0	0.0	57	0.1	0.0
6	2023	Employee Auto	70	18	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	269	0.0	0.0	0.8	0.2	2.4	0.0	0.0	0.0	0.0	0.0	57	0.1	0.0
7	2023	Employee Auto	45	36	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	269	0.0	0.0	0.8	0.2	2.4	0.0	0.0	0.0	0.0	0.0	57	0.1	0.0
10	2023	Employee Auto	15	28	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	269	0.0	0.0	0.8	0.2	2.4	0.0	0.0	0.0	0.0	0.0	57	0.1	0.0
12	2023	Employee Auto	10	16	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	269	0.0	0.0	0.8	0.2	2.4	0.0	0.0	0.0	0.0	0.0	57	0.1	0.0
15	2023	Employee Auto	30	8	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	269	0.0	0.0	0.8	0.2	2.4	0.0	0.0	0.0	0.0	0.0	57	0.1	0.0
17	2023	Employee Auto	5	6	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	269	0.0	0.0	0.8	0.2	2.4	0.0	0.0	0.0	0.0	0.0	57	0.1	0.0
18	2023	Employee Auto	10	10	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	269	0.0	0.0	0.8	0.2	2.4	0.0	0.0	0.0	0.0	0.0	57	0.1	0.0
1	2024	Employee Auto	10	12	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	260	0.0	0.0	0.8	0.2	2.3	0.0	0.0	0.0	0.0	0.0	55	0.1	0.0
2	2024	Employee Auto	10	12	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	260	0.0	0.0	0.8	0.2	2.3	0.0	0.0	0.0	0.0	0.0	55	0.1	0.0
3	2024	Employee Auto	15	18	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	260	0.0	0.0	0.8	0.2	2.3	0.0	0.0	0.0	0.0	0.0	55	0.1	0.0
8	2024	Employee Auto	45	48	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	260	0.0	0.0	0.8	0.2	2.3	0.0	0.0	0.0	0.0	0.0	55	0.1	0.0
9	2024	Employee Auto	40	8	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	260	0.0	0.0	0.8	0.2	2.3	0.0	0.0	0.0	0.0	0.0	55	0.1	0.0
11	2024	Employee Auto	40	50	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	260	0.0	0.0	0.8	0.2	2.3	0.0	0.0	0.0	0.0	0.0	55	0.1	0.0
13	2024	Employee Auto	20	12	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	260	0.0	0.0	0.8	0.2	2.3	0.0	0.0	0.0	0.0	0.0	55	0.1	0.0
14	2024	Employee Auto	20	16	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	260	0.0	0.0	0.8	0.2	2.3	0.0	0.0	0.0	0.0	0.0	55	0.1	0.0
16	2024	Employee Auto	30	10	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	260	0.0	0.0	0.8	0.2	2.3	0.0	0.0	0.0	0.0	0.0	55	0.1	0.0
17	2024	Employee Auto	10	6	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	260	0.0	0.0	0.8	0.2	2.3	0.0	0.0	0.0	0.0	0.0	55	0.1	0.0
18	2024	Employee Auto	10	10	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	260	0.0	0.0	0.8	0.2	2.3	0.0	0.0	0.0	0.0	0.0	55	0.1	0.0

ID	Year	Vehicle	Days	Trips/Day	Mi/Trip	Vehicle	Pounds per day								Metric tons per year			
							ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O	CO2e
1	2023	Employee Auto	10	12	10.0	LDA-LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.1	0.0	0	0.0	0.0	0
2	2023	Employee Auto	10	12	10.0	LDA-LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.1	0.0	0	0.0	0.0	0
3	2023	Employee Auto	15	18	10.0	LDA-LDT	0.0	0.0	0.3	0.0	0.0	0.3	0.1	0.0	1	0.0	0.0	1
4	2023	Employee Auto	85	12	10.0	LDA-LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.1	0.0	3	0.0	0.0	3
5	2023	Employee Auto	30	12	10.0	LDA-LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.1	0.0	1	0.0	0.0	1
6	2023	Employee Auto	70	18	10.0	LDA-LDT	0.0	0.0	0.3	0.0	0.0	0.3	0.1	0.0	3	0.0	0.0	3
7	2023	Employee Auto	45	36	10.0	LDA-LDT	0.1	0.1	0.7	0.0	0.0	0.7	0.2	0.0	4	0.0	0.0	4
10	2023	Employee Auto	15	28	10.0	LDA-LDT	0.1	0.0	0.5	0.0	0.0	0.5	0.1	0.0	1	0.0	0.0	1
12	2023	Employee Auto	10	16	10.0	LDA-LDT	0.0	0.0	0.3	0.0	0.0	0.3	0.1	0.0	0	0.0	0.0	0
15	2023	Employee Auto	30	8	10.0	LDA-LDT	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	1	0.0	0.0	1
17	2023	Employee Auto	5	6	10.0	LDA-LDT	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0	0.0	0.0	0
18	2023	Employee Auto	10	10	10.0	LDA-LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0	0.0	0.0	0
1	2024	Employee Auto	10	12	10.0	LDA-LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.1	0.0	0	0.0	0.0	0
2	2024	Employee Auto	10	12	10.0	LDA-LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.1	0.0	0	0.0	0.0	0
3	2024	Employee Auto	15	18	10.0	LDA-LDT	0.0	0.0	0.3	0.0	0.0	0.3	0.1	0.0	1	0.0	0.0	1
8	2024	Employee Auto	45	48	10.0	LDA-LDT	0.1	0.1	0.8	0.0	0.0	0.9	0.2	0.0	6	0.0	0.0	6
9	2024	Employee Auto	40	8	10.0	LDA-LDT	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	1	0.0	0.0	1
11	2024	Employee Auto	40	50	10.0	LDA-LDT	0.1	0.1	0.9	0.0	0.0	1.0	0.2	0.0	5	0.0	0.0	5
13	2024	Employee Auto	20	12	10.0	LDA-LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.1	0.0	1	0.0	0.0	1
14	2024	Employee Auto	20	16	10.0	LDA-LDT	0.0	0.0	0.3	0.0	0.0	0.3	0.1	0.0	1	0.0	0.0	1
16	2024	Employee Auto	30	10	10.0	LDA-LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	1	0.0	0.0	1
17	2024	Employee Auto	10	6	10.0	LDA-LDT	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0	0.0	0.0	0
18	2024	Employee Auto	10	10	10.0	LDA-LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0	0.0	0.0	0

Offsite Haul Truck Calculations

ID	Year	Material Transported/ Trip Purpose	Days	Total Trips	Mile/Trip	Total Miles	Mile/Day	Trip/Day	Vehicle	Running g/mi (EMFAC, AP 42)											Process g/veh (EMFAC)										
										ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O	ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O
1	2023	Mobilization	10	30	10	300	30	3	T7Single	0.0	3.5	0.4	0.0	0.0	0.9	0.2	0.0	1727	0.0	0.3	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	883	0.0	0.1
2	2023	Demolition debris	10	167	22	3,667	367	17	T7Single	0.0	3.5	0.4	0.0	0.0	0.9	0.2	0.0	1727	0.0	0.3	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	883	0.0	0.1
3	2023	Demolition debris	15	250	22	5,500	367	17	T7Single	0.0	3.5	0.4	0.0	0.0	0.9	0.2	0.0	1727	0.0	0.3	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	883	0.0	0.1
4	2023	Detention basin excavation	85	1,528	22	33,611	395	18	T7Single	0.0	3.5	0.4	0.0	0.0	0.9	0.2	0.0	1727	0.0	0.3	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	883	0.0	0.1
5	2023	Degrade segments N & O	30	3,125	22	68,745	2,291	104	T7Single	0.0	3.5	0.4	0.0	0.0	0.9	0.2	0.0	1727	0.0	0.3	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	883	0.0	0.1
6	2023	Training levee degrade	70	12,139	22	267,056	3,815	173	T7Single	0.0	3.5	0.4	0.0	0.0	0.9	0.2	0.0	1727	0.0	0.3	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	883	0.0	0.1
7	2023	Bentonite haul	45	50	20	1,000	22	1	T7Single	0.0	3.5	0.4	0.0	0.0	0.9	0.2	0.0	1727	0.0	0.3	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	883	0.0	0.1
18	2023	Demobilization	10	30	10	300	30	3	T7Single	0.0	3.5	0.4	0.0	0.0	0.9	0.2	0.0	1727	0.0	0.3	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	883	0.0	0.1
1	2024	Mobilization	10	30	10	300	30	3	T7Single	0.0	3.5	0.4	0.0	0.0	0.9	0.2	0.0	1704	0.0	0.3	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	874	0.0	0.1
2	2024	Demolition debris	10	167	22	3,667	367	17	T7Single	0.0	3.5	0.4	0.0	0.0	0.9	0.2	0.0	1704	0.0	0.3	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	874	0.0	0.1
3	2024	Demolition debris	15	417	22	9,167	367	17	T7Single	0.0	3.5	0.4	0.0	0.0	0.9	0.2	0.0	1704	0.0	0.3	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	874	0.0	0.1
8	2024	Unsuitable Material Disposal	45	2,994	22	65,859	1,464	67	T7Single	0.0	3.5	0.4	0.0	0.0	0.9	0.2	0.0	1704	0.0	0.3	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	874	0.0	0.1
9	2024	Unsuitable Material Disposal	40	49	22	1,073	27	1	T7Single	0.0	3.5	0.4	0.0	0.0	0.9	0.2	0.0	1704	0.0	0.3	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	874	0.0	0.1
18	2024	Unsuitable Material Disposal	10	30	10	300	30	3	T7Single	0.0	3.5	0.4	0.0	0.0	0.9	0.2	0.0	1704	0.0	0.3	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	874	0.0	0.1

ID	Year	Material Transported/ Trip Purpose	Days	Total Trips	Mile/Trip	Total Miles	Mile/Day	Trip/Day	Vehicle	Pounds per day								Metric tons per year			
										ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O	CO2e
1	2023	Mobilization	10	30	10	300	30	3	T7Single	0.0	0.3	0.1	0.0	0.0	0.1	0.0	0.0	1	0.0	0.0	1
2	2023	Demolition debris	10	167	22	3,667	367	17	T7Single	0.0	3.2	0.5	0.0	0.0	0.8	0.2	0.0	6	0.0	0.0	7
3	2023	Demolition debris	15	250	22	5,500	367	17	T7Single	0.0	3.2	0.5	0.0	0.0	0.8	0.2	0.0	10	0.0	0.0	10
4	2023	Detention basin excavation	85	1,528	22	33,611	395	18	T7Single	0.1	3.4	0.6	0.0	0.0	0.8	0.2	0.0	59	0.0	0.0	62
5	2023	Degrade segments N & O	30	3,125	22	68,745	2,291	104	T7Single	0.3	19.9	3.3	0.1	0.1	4.7	1.2	0.1	121	0.0	0.0	127
6	2023	Training levee degrade	70	12,139	22	267,056	3,815	173	T7Single	0.5	33.1	5.5	0.2	0.1	7.8	2.0	0.1	472	0.0	0.1	494
7	2023	Bentonite haul	45	50	20	1,000	22	1	T7Single	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2	0.0	0.0	2
18	2023	Demobilization	10	30	10	300	30	3	T7Single	0.0	0.3	0.1	0.0	0.0	0.1	0.0	0.0	1	0.0	0.0	1
1	2024	Mobilization	10	30	10	300	30	3	T7Single	0.0	0.3	0.1	0.0	0.0	0.1	0.0	0.0	1	0.0	0.0	1
2	2024	Demolition debris	10	167	22	3,667	367	17	T7Single	0.0	3.1	0.5	0.0	0.0	0.8	0.2	0.0	6	0.0	0.0	7
3	2024	Demolition debris	15	417	22	9,167	367	17	T7Single	0.0	3.1	0.5	0.0	0.0	0.8	0.2	0.0	16	0.0	0.0	17
8	2024	Unsuitable Material Disposal	45	2,994	22	65,859	1,464	67	T7Single	0.2	12.6	2.1	0.1	0.1	3.0	0.8	0.1	115	0.0	0.0	120
9	2024	Unsuitable Material Disposal	40	49	22	1,073	27	1	T7Single	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0	2	0.0	0.0	2
18	2024	Unsuitable Material Disposal	10	30	10	300	30	3	T7Single	0.0	0.3	0.1	0.0	0.0	0.1	0.0	0.0	1	0.0	0.0	1

Onsite Haul Truck Calculations

ID	Year	Material Transported/ Trip Purpose	Days	Total Trips	Mile/Trip	Total Miles	Mile/Day	Trip/Day	Vehicle	Running g/mi (EMFAC, AP 42)											Process g/veh (EMFAC)										
										ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O	ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O
10	2023	Select levee fill needed	15	812	10	8,120	541	54	T7SingleOnsite	0.1	5.8	0.6	0.0	0.0	14.9	1.5	0.0	2287	0.0	0.4	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	883	0.0	0.1
12	2023	Aggregate base	10	310	10	3,100	310	31	T7SingleOnsite	0.1	5.8	0.6	0.0	0.0	14.9	1.5	0.0	2287	0.0	0.4	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	883	0.0	0.1
9	2024	Aggregate base/asphalt haul	10	235	10	2,350	235	6	T7SingleOnsite	0.1	5.8	0.6	0.0	0.0	14.9	1.5	0.0	2257	0.0	0.4	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	874	0.0	0.1
11	2024	Select levee fill needed	40	4,658	10	46,580	4,658	116	T7SingleOnsite	0.1	5.8	0.6	0.0	0.0	14.9	1.5	0.0	2257	0.0	0.4	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	874	0.0	0.1
13	2024	Aggregate base	20	2,085	10	20,850	2,085	104	T7SingleOnsite	0.1	5.8	0.6	0.0	0.0	14.9	1.5	0.0	2257	0.0	0.4	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	874	0.0	0.1
14	2024	Aggregate base/asphalt haul	10	152	10	1,520	152	8	T7SingleOnsite	0.1	5.8	0.6	0.0	0.0	14.9	1.5	0.0	2257	0.0	0.4	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	874	0.0	0.1

ID	Year	Material Transported/ Trip Purpose	Days	Total Trips	Mile/Trip	Total Miles	Mile/Day	Trip/Day	Vehicle	Pounds per day								Metric tons per year			
										ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O	CO2e
10	2023	Select levee fill needed	15	812	10	8,120	541	54	T7SingleOnsite	0.1	8.0	1.4	0.0	0.0	17.8	1.8	0.0	19	0.0	0.0	20
12	2023	Aggregate base	10	310	10	3,100	310	31	T7SingleOnsite	0.1	4.6	0.8	0.0	0.0	10.2	1.0	0.0	7	0.0	0.0	8
9	2024	Aggregate base/asphalt haul	10	235	10	2,350	235	6	T7SingleOnsite	0.0	3.1	0.4	0.0	0.0	7.7	0.8	0.0	6	0.0	0.0	6
11	2024	Select levee fill needed	40	4,658	10	46,580	4,658	116	T7SingleOnsite	0.7	62.0	7.7	0.1	0.1	153.0	15.6	0.2	109	0.0	0.0	114
13	2024	Aggregate base	20	2,085	10	20,850	2,085	104	T7SingleOnsite	0.3	28.7	4.0	0.1	0.0	68.5	7.0	0.1	49	0.0	0.0	51
14	2024	Aggregate base/asphalt haul	10	152	10	1,520	152	8	T7SingleOnsite	0.0	2.1	0.3	0.0	0.0	5.0	0.5	0.0	4	0.0	0.0	4

Pickup and Water Truck Calculations

ID	Year	Material Transported/ Trip Purpose	Days	Mile/Trip	Mile/Day	Trip/Day/Veh	Veh/Day	Vehicle	Running g/mi (EMFAC, AP 42)											Process g/veh (EMFAC)										
									ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O	ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O
1	2023	Pickup	10	5	40	4	2	LDT	0.1	0.1	1.5	0.0	0.0	14.8	1.5	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
2	2023	Pickup	10	5	20	4	1	LDT	0.1	0.1	1.5	0.0	0.0	14.8	1.5	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
3	2023	Pickup	15	10	80	4	2	LDT	0.1	0.1	1.5	0.0	0.0	14.8	1.5	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
3	2023	Water Truck	15	10	100	5	2	T6Heavy	0.0	6.2	0.8	0.0	0.0	14.9	1.5	0.0	2240	0.0	0.4	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	52	0.0	0.0
4	2023	Pickup	85	8	64	4	2	LDT	0.1	0.1	1.5	0.0	0.0	14.8	1.5	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
4	2023	Water Truck	85	8	40	5	1	T6Heavy	0.0	6.2	0.8	0.0	0.0	14.9	1.5	0.0	2240	0.0	0.4	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	52	0.0	0.0
5	2023	Pickup	30	8	64	4	2	LDT	0.1	0.1	1.5	0.0	0.0	14.8	1.5	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
5	2023	Water Truck	30	5	25	5	1	T6Heavy	0.0	6.2	0.8	0.0	0.0	14.9	1.5	0.0	2240	0.0	0.4	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	52	0.0	0.0
6	2023	Pickup	70	5	40	4	2	LDT	0.1	0.1	1.5	0.0	0.0	14.8	1.5	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
6	2023	Water Truck	80	2	10	5	1	T6Heavy	0.0	6.2	0.8	0.0	0.0	14.9	1.5	0.0	2240	0.0	0.4	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	52	0.0	0.0
7	2023	Pickup	45	2	16	4	2	LDT	0.1	0.1	1.5	0.0	0.0	14.8	1.5	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
7	2023	Water Truck	45	5	25	5	1	T6Heavy	0.0	6.2	0.8	0.0	0.0	14.9	1.5	0.0	2240	0.0	0.4	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	52	0.0	0.0
10	2023	Pickup	15	5	40	4	2	LDT	0.1	0.1	1.5	0.0	0.0	14.8	1.5	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
10	2023	Water Truck	15	5	25	5	1	T6Heavy	0.0	6.2	0.8	0.0	0.0	14.9	1.5	0.0	2240	0.0	0.4	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	52	0.0	0.0
12	2023	Water Truck	10	5	25	5	1	T6Heavy	0.0	6.2	0.8	0.0	0.0	14.9	1.5	0.0	2240	0.0	0.4	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	52	0.0	0.0
15	2023	Pickup	30	5	40	4	2	LDT	0.1	0.1	1.5	0.0	0.0	14.8	1.5	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
15	2023	Water Truck	30	1	15	5	3	T6Heavy	0.0	6.2	0.8	0.0	0.0	14.9	1.5	0.0	2240	0.0	0.4	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	52	0.0	0.0
17	2023	Pickup	5	5	40	4	2	LDT	0.1	0.1	1.5	0.0	0.0	14.8	1.5	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
18	2023	Pickup	10	5	40	4	2	LDT	0.1	0.1	1.5	0.0	0.0	14.8	1.5	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
1	2024	Pickup	10	5	40	4	2	LDT	0.1	0.1	1.4	0.0	0.0	14.8	1.5	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
2	2024	Pickup	10	5	20	4	1	LDT	0.1	0.1	1.4	0.0	0.0	14.8	1.5	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
3	2024	Pickup	15	10	80	4	2	LDT	0.1	0.1	1.4	0.0	0.0	14.8	1.5	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
3	2024	Water Truck	15	10	100	5	2	T6Heavy	0.1	6.3	0.8	0.0	0.0	14.9	1.5	0.0	2194	0.0	0.3	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	51	0.0	0.0
8	2024	Pickup	45	8	80	5	2	LDT	0.1	0.1	1.4	0.0	0.0	14.8	1.5	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
8	2024	Water Truck	45	8	80	5	2	T6Heavy	0.1	6.3	0.8	0.0	0.0	14.9	1.5	0.0	2194	0.0	0.3	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	51	0.0	0.0
9	2024	Pickup	40	5	40	4	2	LDT	0.1	0.1	1.4	0.0	0.0	14.8	1.5	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
9	2024	Water Truck	40	8	40	5	1	T6Heavy	0.1	6.3	0.8	0.0	0.0	14.9	1.5	0.0	2194	0.0	0.3	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	51	0.0	0.0
11	2024	Pickup	40	5	40	4	2	LDT	0.1	0.1	1.4	0.0	0.0	14.8	1.5	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
11	2024	Water Truck	40	8	40	5	1	T6Heavy	0.1	6.3	0.8	0.0	0.0	14.9	1.5	0.0	2194	0.0	0.3	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	51	0.0	0.0
13	2024	Pickup	20	5	40	4	2	LDT	0.1	0.1	1.4	0.0	0.0	14.8	1.5	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
13	2024	Water Truck	20	8	40	5	1	T6Heavy	0.1	6.3	0.8	0.0	0.0	14.9	1.5	0.0	2194	0.0	0.3	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	51	0.0	0.0
14	2024	Pickup	20	5	40	4	2	LDT	0.1	0.1	1.4	0.0	0.0	14.8	1.5	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
14	2024	Water Truck	20	2	10	5	1	T6Heavy	0.1	6.3	0.8	0.0	0.0	14.9	1.5	0.0	2194	0.0	0.3	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	51	0.0	0.0
16	2024	Pickup	30	5	20	2	2	LDT	0.1	0.1	1.4	0.0	0.0	14.8	1.5	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
16	2024	Water Truck	30	8	16	2	1	T6Heavy	0.1	6.3	0.8	0.0	0.0	14.9	1.5	0.0	2194	0.0	0.3	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	51	0.0	0.0
17	2024	Pickup	10	5	40	4	2	LDT	0.1	0.1	1.4	0.0	0.0	14.8	1.5	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
18	2024	Pickup	10	5	40	4	2	LDT	0.1	0.1	1.4	0.0	0.0	14.8	1.5	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0

ID	Year	Material Transported/ Trip Purpose	Days	Mile/Trip	Mile/Day	Trip/Day/Veh	Veh/Day	Vehicle	Pounds per day								Metric tons per year			
									ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O	CO2e
1	2023	Pickup	10	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	1.3	0.1	0.0	0	0.0	0.0	0
2	2023	Pickup	10	5	20	4	1	LDT	0.0	0.0	0.1	0.0	0.0	0.7	0.1	0.0	0	0.0	0.0	0
3	2023	Pickup	15	10	80	4	2	LDT	0.0	0.0	0.3	0.0	0.0	2.6	0.3	0.0	1	0.0	0.0	1
3	2023	Water Truck	15	10	100	5	2	T6Heavy	0.0	1.4	0.2	0.0	0.0	3.3	0.3	0.0	3	0.0	0.0	4
4	2023	Pickup	85	8	64	4	2	LDT	0.0	0.0	0.3	0.0	0.0	2.1	0.2	0.0	3	0.0	0.0	3
4	2023	Water Truck	85	8	40	5	1	T6Heavy	0.0	0.6	0.1	0.0	0.0	1.3	0.1	0.0	8	0.0	0.0	8
5	2023	Pickup	30	8	64	4	2	LDT	0.0	0.0	0.3	0.0	0.0	2.1	0.2	0.0	1	0.0	0.0	1
5	2023	Water Truck	30	5	25	5	1	T6Heavy	0.0	0.4	0.0	0.0	0.0	0.8	0.1	0.0	2	0.0	0.0	2
6	2023	Pickup	70	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	1.3	0.1	0.0	2	0.0	0.0	2
6	2023	Water Truck	80	2	10	5	1	T6Heavy	0.0	0.2	0.0	0.0	0.0	0.3	0.0	0.0	2	0.0	0.0	2
7	2023	Pickup	45	2	16	4	2	LDT	0.0	0.0	0.1	0.0	0.0	0.5	0.1	0.0	0	0.0	0.0	0
7	2023	Water Truck	45	5	25	5	1	T6Heavy	0.0	0.4	0.0	0.0	0.0	0.8	0.1	0.0	3	0.0	0.0	3
10	2023	Pickup	15	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	1.3	0.1	0.0	0	0.0	0.0	0
10	2023	Water Truck	15	5	25	5	1	T6Heavy	0.0	0.4	0.0	0.0	0.0	0.8	0.1	0.0	1	0.0	0.0	1
12	2023	Water Truck	10	5	25	5	1	T6Heavy	0.0	0.4	0.0	0.0	0.0	0.8	0.1	0.0	1	0.0	0.0	1
15	2023	Pickup	30	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	1.3	0.1	0.0	1	0.0	0.0	1
15	2023	Water Truck	30	1	15	5	3	T6Heavy	0.0	0.3	0.0	0.0	0.0	0.5	0.1	0.0	1	0.0	0.0	1
17	2023	Pickup	5	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	1.3	0.1	0.0	0	0.0	0.0	0
18	2023	Pickup	10	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	1.3	0.1	0.0	0	0.0	0.0	0
1	2024	Pickup	10	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	1.3	0.1	0.0	0	0.0	0.0	0
2	2024	Pickup	10	5	20	4	1	LDT	0.0	0.0	0.1	0.0	0.0	0.7	0.1	0.0	0	0.0	0.0	0
3	2024	Pickup	15	10	80	4	2	LDT	0.0	0.0	0.3	0.0	0.0	2.6	0.3	0.0	1	0.0	0.0	1
3	2024	Water Truck	15	10	100	5	2	T6Heavy	0.0	1.4	0.2	0.0	0.0	3.3	0.3	0.0	3	0.0	0.0	3
8	2024	Pickup	45	8	80	5	2	LDT	0.0	0.0	0.3	0.0	0.0	2.6	0.3	0.0	2	0.0	0.0	2
8	2024	Water Truck	45	8	80	5	2	T6Heavy	0.0	1.2	0.1	0.0	0.0	2.6	0.3	0.0	8	0.0	0.0	8
9	2024	Pickup	40	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	1.3	0.1	0.0	1	0.0	0.0	1

9	2024	Water Truck	40	8	40	5	1	T6Heavy	0.0	0.6	0.1	0.0	0.0	1.3	0.1	0.0	4	0.0	0.0	4
11	2024	Pickup	40	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	1.3	0.1	0.0	1	0.0	0.0	1
11	2024	Water Truck	40	8	40	5	1	T6Heavy	0.0	0.6	0.1	0.0	0.0	1.3	0.1	0.0	4	0.0	0.0	4
13	2024	Pickup	20	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	1.3	0.1	0.0	0	0.0	0.0	0
13	2024	Water Truck	20	8	40	5	1	T6Heavy	0.0	0.6	0.1	0.0	0.0	1.3	0.1	0.0	2	0.0	0.0	2
14	2024	Pickup	20	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	1.3	0.1	0.0	0	0.0	0.0	0
14	2024	Water Truck	20	2	10	5	1	T6Heavy	0.0	0.2	0.0	0.0	0.0	0.3	0.0	0.0	0	0.0	0.0	0
16	2024	Pickup	30	5	20	2	2	LDT	0.0	0.0	0.1	0.0	0.0	0.7	0.1	0.0	0	0.0	0.0	0
16	2024	Water Truck	30	8	16	2	1	T6Heavy	0.0	0.2	0.0	0.0	0.0	0.5	0.1	0.0	1	0.0	0.0	1
17	2024	Pickup	10	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	1.3	0.1	0.0	0	0.0	0.0	0
18	2024	Pickup	10	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	1.3	0.1	0.0	0	0.0	0.0	0

Paving Calculations

ID	Year	Days	Paved (sf/day)	Emission Factor	Pounds per day
				ROG (lbs per acre)	ROG
9	2024	20	1,400	2.620	0.084
14	2024	20	2,750	2.620	0.165

Earthmoving Calculations

ID	Year	Days	Grading (acre/day)	Dozing (hr/day)	Loading (cy/day)	Emission Factor Grading PM10 (lb/acre)	Grading PM2.5 (lb/acre)	Dozing PM10 (lbs/hr)	Dozing PM2.5 (lbs/hr)	Truck loading PM10 (lb/ton)	Truck loading PM2.5 (lb/ton)	Pounds per Day PM10 D	PM2.5 D
2	2023	10	0.00	12	0	1.061	0.115	0.753	0.414	0.000	0.000	9.0	5.0
3	2023	15	5.97	0	0	1.061	0.115	0.753	0.414	0.000	0.000	6.3	0.7
4	2023	85	0.53	0	216	1.061	0.115	0.753	0.414	0.000	0.000	0.6	0.1
5	2023	30	0.65	36	1,250	1.061	0.115	0.753	0.414	0.000	0.000	28.1	15.0
6	2023	70	0.13	24	2,081	1.061	0.115	0.753	0.414	0.000	0.000	18.6	10.0
7	2023	45	0.00	36	0	1.061	0.115	0.753	0.414	0.000	0.000	27.1	14.9
10	2023	15	1.31	24	325	1.061	0.115	0.753	0.414	0.000	0.000	19.5	10.1
12	2023	10	0.68	0	1,071	1.061	0.115	0.753	0.414	0.000	0.000	1.0	0.1
15	2023	30	0.93	0		1.061	0.115	0.753	0.414	0.000	0.000	1.0	0.1
17	2023	5	16.46	0		1.061	0.115	0.753	0.414	0.000	0.000	17.5	1.9
2	2024	10	0.00	12	0	1.061	0.115	0.753	0.414	0.000	0.000	9.0	5.0
3	2024	15	10.09	0	0	1.061	0.115	0.753	0.414	0.000	0.000	10.7	1.2
8	2024	45	1.80	96	1,103	1.061	0.115	0.753	0.414	0.000	0.000	74.4	40.0
9	2024	40	0.02	0	0	1.061	0.115	0.753	0.414	0.000	0.000	0.0	0.0
11	2024	40	1.70	24	1,796	1.061	0.115	0.753	0.414	0.000	0.000	20.3	10.2
13	2024	20	2.26	0	2,070	1.061	0.115	0.753	0.414	0.000	0.000	2.8	0.3
14	2024	20	0.06	0	152	1.061	0.115	0.753	0.414	0.000	0.000	0.1	0.0
17	2024	10	10.36	0	0	1.061	0.115	0.753	0.414	0.000	0.000	11.0	1.2

Batching Calculations

Dust (Piles)

Facility	Pile size (acre)	Start	End	Days	Pile Emission Factors (abated)		Pile Emissions (2023)	
					PM10 (lb/acre/day)	PM2.5 (lb/acre/day)	PM10 (lbs/day)	PM2.5 (lbs/day)
1	0.5	5/14/2023	7/14/2023	45	0.17	0.04	0.09	0.02

Dust (Batching)

Process	Unit	Controlled	
		PM10	PM2.5
Sand Transfer	lbs per ton of sand	0.000297	0.00015
Aggregate Transfer	lbs per ton of aggregate	0.00099	0.0005
Cement Unloading	lbs per ton of cement	0.00034	0.00005
Cement Supplment Unloading	lbs per ton of cement suppleme	0.0049	0.0007
Weight Hopper Loading	lbs per ton of aggregate + sand	0.00084	0.0004
Central Mix Loading	lbs per ton of cement + supplen	0.0055	0.0008
Truck Mix Loading	lbs per ton of cement + supplen	0.0263	0.0039

Source: AP-42 Table 11.12-2

Material	Pound	Material/Concrete
Course aggregate	1865	0.46
Sand	1428	0.35
Cement	491	0.12
Cemnt Supplment	73	0.02
Water (gallons)	20	-
Total Concrete Poured	4024	-

Facility	Batch		Pounds per Day (2023)	
	cy/day	ton/day	PM10	PM2.5
1	1845	3745	22	5

GHG (Batching)

Facility	Total Batch (CY)	PSI	CO2 (lb/CY)	CO2 (MT)
Offsite (I-5)	4,000	3,500	399	724

Stationary Sources

Facility	Equip	#/day	hrs/day	HP	LF	g/hp-hr (CalEEMod)								
						ROG	NOX	CO	PM10	PM2.5	SO2	CO2	CH4	N2O
1	Pump	1	12	84	0.74	0.3	2.5	3.4	0.1	0.1	0.0	568.3	0.0	0.0
	Generator	1	12	84	0.74	0.3	2.5	3.3	0.1	0.1	0.0	568.3	0.0	0.0
	Boom pallet loader	1	12	231	0.29	0.3	3.2	1.6	0.1	0.1	0.0	473.0	0.2	0.0

Facility	Equip	#/day	hrs/day	HP	LF	Pounds per day						Metric tons per year			
						ROG	NOX	CO	PM10	PM2.5	SO2	CO2	CH4	N2O	CO2e
1	Pump	1	12	84	0.74	0.5	4.1	5.6	0.2	0.2	0.0	19.1	0.0	0.0	19.2
	Generator	1	12	84	0.74	0.5	4.1	5.5	0.2	0.2	0.0	19.1	0.0	0.0	19.2
	Boom pallet loader	1	12	231	0.29	0.5	5.7	2.7	0.2	0.2	0.0	17.0	0.0	0.0	17.3

Electricity Calculations

		EF (lb/MWh)			Emissions (MT)			
Year	MWh/year	CO_2	CH_4	N_2O	CO_2	CH_4	N_2O	CO_2e
2023	7.32	152	0.01	0.00	0.51	0.00	0.00	0.5
2024	7.32	152	0.01	0.00	0.51	0.00	0.00	0.5

Air Quality Assumptions - Mitigated

Onsite Haul Truck Calculations

ID	Year	Material Transported/ Trip Purpose	Days	Total Trips	Mile/Trip	Total Miles	Mile/Day	Trip/Day	Vehicle	Running g/mi (EMFAC, AP 42)											Process g/veh (EMFAC)										
										ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O	ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O
10	2023	Select levee fill needed	15	812	10	8,120	541	54	T7SingleOnsite	0.1	5.8	0.6	0.0	0.0	2.2	0.2	0.0	2287	0.0	0.4	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	883	0.0	0.1
12	2023	Aggregate base	10	310	10	3,100	310	31	T7SingleOnsite	0.1	5.8	0.6	0.0	0.0	2.2	0.2	0.0	2287	0.0	0.4	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	883	0.0	0.1
9	2024	Aggregate base/asphalt haul	10	235	10	2,350	235	6	T7SingleOnsite	0.1	5.8	0.6	0.0	0.0	2.2	0.2	0.0	2257	0.0	0.4	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	874	0.0	0.1
11	2024	Select levee fill needed	40	4,658	10	46,580	4,658	116	T7SingleOnsite	0.1	5.8	0.6	0.0	0.0	2.2	0.2	0.0	2257	0.0	0.4	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	874	0.0	0.1
13	2024	Aggregate base	20	2,085	10	20,850	2,085	104	T7SingleOnsite	0.1	5.8	0.6	0.0	0.0	2.2	0.2	0.0	2257	0.0	0.4	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	874	0.0	0.1
14	2024	Aggregate base/asphalt haul	10	152	10	1,520	152	8	T7SingleOnsite	0.1	5.8	0.6	0.0	0.0	2.2	0.2	0.0	2257	0.0	0.4	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	874	0.0	0.1

ID	Year	Material Transported/ Trip Purpose	Days	Total Trips	Mile/Trip	Total Miles	Mile/Day	Trip/Day	Vehicle	Pounds per day								Metric tons per year			
										ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O	CO2e
10	2023	Select levee fill needed	15	812	10	8,120	541	54	T7SingleOnsite	0.1	8.0	1.4	0.0	0.0	2.6	0.3	0.0	19	0.0	0.0	20
12	2023	Aggregate base	10	310	10	3,100	310	31	T7SingleOnsite	0.1	4.6	0.8	0.0	0.0	1.5	0.2	0.0	7	0.0	0.0	8
9	2024	Aggregate base/asphalt haul	10	235	10	2,350	235	6	T7SingleOnsite	0.0	3.1	0.4	0.0	0.0	1.1	0.1	0.0	6	0.0	0.0	6
11	2024	Select levee fill needed	40	4,658	10	46,580	4,658	116	T7SingleOnsite	0.7	62.0	7.7	0.1	0.1	22.3	2.5	0.2	109	0.0	0.0	114
13	2024	Aggregate base	20	2,085	10	20,850	2,085	104	T7SingleOnsite	0.3	28.7	4.0	0.1	0.0	10.0	1.1	0.1	49	0.0	0.0	51
14	2024	Aggregate base/asphalt haul	10	152	10	1,520	152	8	T7SingleOnsite	0.0	2.1	0.3	0.0	0.0	0.7	0.1	0.0	4	0.0	0.0	4

Pickup and Water Truck Calculations

ID	Year	Material Transported/ Trip Purpose	Days	Mile/Trip	Mile/Day	Trip/Day/Veh	Veh/Day	Vehicle	Running g/mi (EMFAC, AP 42)											Process g/veh (EMFAC)										
									ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O	ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O
1	2023	Pickup	10	5	40	4	2	LDT	0.1	0.1	1.5	0.0	0.0	2.1	0.2	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
2	2023	Pickup	10	5	20	4	1	LDT	0.1	0.1	1.5	0.0	0.0	2.1	0.2	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
3	2023	Pickup	15	10	80	4	2	LDT	0.1	0.1	1.5	0.0	0.0	2.1	0.2	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
3	2023	Water Truck	15	10	100	5	2	T6Heavy	0.0	6.2	0.8	0.0	0.0	2.2	0.3	0.0	2240	0.0	0.4	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	52	0.0	0.0
4	2023	Pickup	85	8	64	4	2	LDT	0.1	0.1	1.5	0.0	0.0	2.1	0.2	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
4	2023	Water Truck	85	8	40	5	1	T6Heavy	0.0	6.2	0.8	0.0	0.0	2.2	0.3	0.0	2240	0.0	0.4	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	52	0.0	0.0
5	2023	Pickup	30	8	64	4	2	LDT	0.1	0.1	1.5	0.0	0.0	2.1	0.2	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
5	2023	Water Truck	30	5	25	5	1	T6Heavy	0.0	6.2	0.8	0.0	0.0	2.2	0.3	0.0	2240	0.0	0.4	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	52	0.0	0.0
6	2023	Pickup	70	5	40	4	2	LDT	0.1	0.1	1.5	0.0	0.0	2.1	0.2	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
6	2023	Water Truck	80	2	10	5	1	T6Heavy	0.0	6.2	0.8	0.0	0.0	2.2	0.3	0.0	2240	0.0	0.4	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	52	0.0	0.0
7	2023	Pickup	45	2	16	4	2	LDT	0.1	0.1	1.5	0.0	0.0	2.1	0.2	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
7	2023	Water Truck	45	5	25	5	1	T6Heavy	0.0	6.2	0.8	0.0	0.0	2.2	0.3	0.0	2240	0.0	0.4	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	52	0.0	0.0
10	2023	Pickup	15	5	40	4	2	LDT	0.1	0.1	1.5	0.0	0.0	2.1	0.2	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
10	2023	Water Truck	15	5	25	5	1	T6Heavy	0.0	6.2	0.8	0.0	0.0	2.2	0.3	0.0	2240	0.0	0.4	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	52	0.0	0.0
12	2023	Water Truck	10	5	25	5	1	T6Heavy	0.0	6.2	0.8	0.0	0.0	2.2	0.3	0.0	2240	0.0	0.4	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	52	0.0	0.0
15	2023	Pickup	30	5	40	4	2	LDT	0.1	0.1	1.5	0.0	0.0	2.1	0.2	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
15	2023	Water Truck	30	1	15	5	3	T6Heavy	0.0	6.2	0.8	0.0	0.0	2.2	0.3	0.0	2240	0.0	0.4	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	52	0.0	0.0
17	2023	Pickup	5	5	40	4	2	LDT	0.1	0.1	1.5	0.0	0.0	2.1	0.2	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
18	2023	Pickup	10	5	40	4	2	LDT	0.1	0.1	1.5	0.0	0.0	2.1	0.2	0.0	620	0.0	0.0	1.2	0.3	2.7	0.0	0.0	0.0	0.0	0.0	68	0.1	0.0
1	2024	Pickup	10	5	40	4	2	LDT	0.1	0.1	1.4	0.0	0.0	2.1	0.2	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
2	2024	Pickup	10	5	20	4	1	LDT	0.1	0.1	1.4	0.0	0.0	2.1	0.2	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
3	2024	Pickup	15	10	80	4	2	LDT	0.1	0.1	1.4	0.0	0.0	2.1	0.2	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
3	2024	Water Truck	15	10	100	5	2	T6Heavy	0.1	6.3	0.8	0.0	0.0	2.2	0.3	0.0	2194	0.0	0.3	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	51	0.0	0.0
8	2024	Pickup	45	8	80	5	2	LDT	0.1	0.1	1.4	0.0	0.0	2.1	0.2	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
8	2024	Water Truck	45	8	80	5	2	T6Heavy	0.1	6.3	0.8	0.0	0.0	2.2	0.3	0.0	2194	0.0	0.3	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	51	0.0	0.0
9	2024	Pickup	40	5	40	4	2	LDT	0.1	0.1	1.4	0.0	0.0	2.1	0.2	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
9	2024	Water Truck	40	8	40	5	1	T6Heavy	0.1	6.3	0.8	0.0	0.0	2.2	0.3	0.0	2194	0.0	0.3	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	51	0.0	0.0
11	2024	Pickup	40	5	40	4	2	LDT	0.1	0.1	1.4	0.0	0.0	2.1	0.2	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
11	2024	Water Truck	40	8	40	5	1	T6Heavy	0.1	6.3	0.8	0.0	0.0	2.2	0.3	0.0	2194	0.0	0.3	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	51	0.0	0.0
13	2024	Pickup	20	5	40	4	2	LDT	0.1	0.1	1.4	0.0	0.0	2.1	0.2	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
13	2024	Water Truck	20	8	40	5	1	T6Heavy	0.1	6.3	0.8	0.0	0.0	2.2	0.3	0.0	2194	0.0	0.3	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	51	0.0	0.0
14	2024	Pickup	20	5	40	4	2	LDT	0.1	0.1	1.4	0.0	0.0	2.1	0.2	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
14	2024	Water Truck	20	2	10	5	1	T6Heavy	0.1	6.3	0.8	0.0	0.0	2.2	0.3	0.0	2194	0.0	0.3	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	51	0.0	0.0
16	2024	Pickup	30	5	20	2	2	LDT	0.1	0.1	1.4	0.0	0.0	2.1	0.2	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
16	2024	Water Truck	30	8	16	2	1	T6Heavy	0.1	6.3	0.8	0.0	0.0	2.2	0.3	0.0	2194	0.0	0.3	0.0	2.4	0.2	0.0	0.0	0.0	0.0	0.0	51	0.0	0.0
17	2024	Pickup	10	5	40	4	2	LDT	0.1	0.1	1.4	0.0	0.0	2.1	0.2	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
18	2024	Pickup	10	5	40	4	2	LDT	0.1	0.1	1.4	0.0	0.0	2.1	0.2	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0

ID	Year	Material Transported/ Trip Purpose	Days	Mile/Trip	Mile/Day	Trip/Day/Veh	Veh/Day	Vehicle	Pounds per day								Metric tons per year			
									ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O	CO2e
1	2023	Pickup	10	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0	0.0	0.0	0
2	2023	Pickup	10	5	20	4	1	LDT	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0	0.0	0.0	0
3	2023	Pickup	15	10	80	4	2	LDT	0.0	0.0	0.3	0.0	0.0	0.4	0.0	0.0	1	0.0	0.0	1
3	2023	Water Truck	15	10	100	5	2	T6Heavy	0.0	1.4	0.2	0.0	0.0	0.5	0.1	0.0	3	0.0	0.0	4
4	2023	Pickup	85	8	64	4	2	LDT	0.0	0.0	0.3	0.0	0.0	0.3	0.0	0.0	3	0.0	0.0	3
4	2023	Water Truck	85	8	40	5	1	T6Heavy	0.0	0.6	0.1	0.0	0.0	0.2	0.0	0.0	8	0.0	0.0	8
5	2023	Pickup	30	8	64	4	2	LDT	0.0	0.0	0.3	0.0	0.0	0.3	0.0	0.0	1	0.0	0.0	1
5	2023	Water Truck	30	5	25	5	1	T6Heavy	0.0	0.4	0.0	0.0	0.0	0.1	0.0	0.0	2	0.0	0.0	2
6	2023	Pickup	70	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	2	0.0	0.0	2
6	2023	Water Truck	80	2	10	5	1	T6Heavy	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	2	0.0	0.0	2
7	2023	Pickup	45	2	16	4	2	LDT	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0	0.0	0.0	0
7	2023	Water Truck	45	5	25	5	1	T6Heavy	0.0	0.4	0.0	0.0	0.0	0.1	0.0	0.0	3	0.0	0.0	3
10	2023	Pickup	15	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0	0.0	0.0	0
10	2023	Water Truck	15	5	25	5	1	T6Heavy	0.0	0.4	0.0	0.0	0.0	0.1	0.0	0.0	1	0.0	0.0	1
12	2023	Water Truck	10	5	25	5	1	T6Heavy	0.0	0.4	0.0	0.0	0.0	0.1	0.0	0.0	1	0.0	0.0	1
15	2023	Pickup	30	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	1	0.0	0.0	1
15	2023	Water Truck	30	1	15	5	3	T6Heavy	0.0	0.3	0.0	0.0	0.0	0.1	0.0	0.0	1	0.0	0.0	1
17	2023	Pickup	5	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0	0.0	0.0	0
18	2023	Pickup	10	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0	0.0	0.0	0
1	2024	Pickup	10	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0	0.0	0.0	0
2	2024	Pickup	10	5	20	4	1	LDT	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0	0.0	0.0	0
3	2024	Pickup	15	10	80	4	2	LDT	0.0	0.0	0.3	0.0	0.0	0.4	0.0	0.0	1	0.0	0.0	1
3	2024	Water Truck	15	10	100	5	2	T6Heavy	0.0	1.4	0.2	0.0	0.0	0.5	0.1	0.0	3	0.0	0.0	3
8	2024	Pickup	45	8	80	5	2	LDT	0.0	0.0	0.3	0.0	0.0	0.4	0.0	0.0	2	0.0	0.0	2
8	2024	Water Truck	45	8	80	5	2	T6Heavy	0.0	1.2	0.1	0.0	0.0	0.4	0.0	0.0	8	0.0	0.0	8
9	2024	Pickup	40	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	1	0.0	0.0	1

9	2024	Water Truck	40	8	40	5	1	T6Heavy	0.0	0.6	0.1	0.0	0.0	0.2	0.0	0.0	4	0.0	0.0	4
11	2024	Pickup	40	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	1	0.0	0.0	1
11	2024	Water Truck	40	8	40	5	1	T6Heavy	0.0	0.6	0.1	0.0	0.0	0.2	0.0	0.0	4	0.0	0.0	4
13	2024	Pickup	20	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0	0.0	0.0	0
13	2024	Water Truck	20	8	40	5	1	T6Heavy	0.0	0.6	0.1	0.0	0.0	0.2	0.0	0.0	2	0.0	0.0	2
14	2024	Pickup	20	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0	0.0	0.0	0
14	2024	Water Truck	20	2	10	5	1	T6Heavy	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0
16	2024	Pickup	30	5	20	2	2	LDT	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0	0.0	0.0	0
16	2024	Water Truck	30	8	16	2	1	T6Heavy	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0	1	0.0	0.0	1
17	2024	Pickup	10	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0	0.0	0.0	0
18	2024	Pickup	10	5	40	4	2	LDT	0.0	0.0	0.2	0.0	0.0	0.2	0.0	0.0	0	0.0	0.0	0

Earthmoving Calculations

ID	Year	Days	Grading	Dozing	Loading	Emission Factor						Pounds per Day	
			(acre/day)	(hr/day)	(cy/day)	Grading PM10 (lb/acre)	Grading PM2.5 (lb/acre)	Dozing PM10 (lbs/hr)	Dozing PM2.5 (lbs/hr)	Truck loading PM10 (lb/ton)	Truck loading PM2.5 (lb/ton)	PM10 D	PM2.5 D
2	2023	10	0.00	12	0	0.414	0.045	0.294	0.161	0.000	0.000	3.5	1.9
3	2023	15	5.97	0	0	0.414	0.045	0.294	0.161	0.000	0.000	2.5	0.3
4	2023	85	0.53	0	216	0.414	0.045	0.294	0.161	0.000	0.000	0.2	0.0
5	2023	30	0.65	36	1,250	0.414	0.045	0.294	0.161	0.000	0.000	10.9	5.9
6	2023	70	0.13	24	2,081	0.414	0.045	0.294	0.161	0.000	0.000	7.3	3.9
7	2023	45	0.00	36	0	0.414	0.045	0.294	0.161	0.000	0.000	10.6	5.8
10	2023	15	1.31	24	325	0.414	0.045	0.294	0.161	0.000	0.000	7.6	3.9
12	2023	10	0.68	0	1,071	0.414	0.045	0.294	0.161	0.000	0.000	0.4	0.0
15	2023	30	0.93	0		0.414	0.045	0.294	0.161	0.000	0.000	0.4	0.0
17	2023	5	16.46	0		0.414	0.045	0.294	0.161	0.000	0.000	6.8	0.7
2	2024	10	0.00	12	0	0.414	0.045	0.294	0.161	0.000	0.000	3.5	1.9
3	2024	15	10.09	0	0	0.414	0.045	0.294	0.161	0.000	0.000	4.2	0.5
8	2024	45	1.80	96	1,103	0.414	0.045	0.294	0.161	0.000	0.000	29.0	15.6
9	2024	40	0.02	0	0	0.414	0.045	0.294	0.161	0.000	0.000	0.0	0.0
11	2024	40	1.70	24	1,796	0.414	0.045	0.294	0.161	0.000	0.000	7.9	4.0
13	2024	20	2.26	0	2,070	0.414	0.045	0.294	0.161	0.000	0.000	1.1	0.1
14	2024	20	0.06	0	152	0.414	0.045	0.294	0.161	0.000	0.000	0.0	0.0
17	2024	10	10.36	0	0	0.414	0.045	0.294	0.161	0.000	0.000	4.3	0.5

Air Quality Assumptions - Structure Raising (single structure)*

*Emissions were quantified in 2024, which represents the year with the highest emission factor intensity.

Phase	ID	Days
Prepare Structure for Raising	1	5
Raise Structure	2	5
Build New Foundation and Remove Temp. Shoring	3	5
Lower Structure and Repair Site to Previous Condition	4	5

Offroad Calculations

ID	Year	Wk Days	Equip	#/day	hrs/day	HP	LF	g/hp-hr (CalEEMod)								
								ROG	NOX	CO	PM10	PM2.5	SO2	CO2	CH4	N2O
1	2024	3	Excavators	1	8	158	0.382	0.2	1.3	3.1	0.1	0.1	0.0	472.4	0.2	0.0
4	2024	3	Excavators	1	8	158	0.382	0.2	1.3	3.1	0.1	0.1	0.0	472.4	0.2	0.0

ID	Year	Wk Days	Equip	#/day	hrs/day	HP	LF	Pounds per day						Tons per year						Metric tons per year			
								ROG	NOX	CO	PM10	PM2.5	SO2	ROG	NOX	CO	PM10	PM2.5	SO2	CO2	CH4	N2O	CO2e
1	2024	3	Excavators	1	8	158	0.382	0.2	1.4	3.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.7
4	2024	3	Excavators	1	8	158	0.382	0.2	1.4	3.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.7

Employee Onroad Calculations

ID	Year	Vehicle	Wrk Days	Trips/Day	Mi/Trip	Vehicle	Running g/mi (EMFAC, AP 42)											Process g/trip (EMFAC)										
							ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O	ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O
1	2024	Employee Auto	5	8	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	260	0.0	0.0	0.8	0.2	2.3	0.0	0.0	0.0	0.0	0.0	55	0.1	0.0
2	2024	Employee Auto	5	8	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	260	0.0	0.0	0.8	0.2	2.3	0.0	0.0	0.0	0.0	0.0	55	0.1	0.0
3	2024	Employee Auto	5	8	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	260	0.0	0.0	0.8	0.2	2.3	0.0	0.0	0.0	0.0	0.0	55	0.1	0.0
4	2024	Employee Auto	5	8	10.0	LDA-LDT	0.0	0.0	0.6	0.0	0.0	0.9	0.2	0.0	260	0.0	0.0	0.8	0.2	2.3	0.0	0.0	0.0	0.0	0.0	55	0.1	0.0

ID	Year	Vehicle	Wrk Days	Trips/Day	Mi/Trip	Vehicle	Pounds per day								Tons per year								Metric tons per year			
							ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O	CO2e
1	2024	Employee Auto	5	8	10.0	LDA-LDT	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0
2	2024	Employee Auto	5	8	10.0	LDA-LDT	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0
3	2024	Employee Auto	5	8	10.0	LDA-LDT	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0
4	2024	Employee Auto	5	8	10.0	LDA-LDT	0.0	0.0	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0

Offsite Haul Truck Calculations

ID	Year	Concat	Trip Purpose	Wrk Days	Total Trips	Mile/Trip	Total Miles	Mile/Day	Trip/Day	Vehicle	Running g/mi (EMFAC, AP 42)											Process g/veh (EMFAC)										
											ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O	ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O
1	2024	2024SVABT7Single	Deliver I beams	1	2	10	20	20	2	T7Single	0.0	3.5	0.4	0.0	0.0	0.9	0.2	0.0	1704	0.0	0.3	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	874	0.0	0.1
4	2024	2024SVABT7Single	Deliver I beams	1	2	10	20	20	2	T7Single	0.0	3.5	0.4	0.0	0.0	0.9	0.2	0.0	1704	0.0	0.3	0.3	8.6	5.1	0.0	0.0	0.0	0.0	0.0	874	0.0	0.1

ID	Year	Concat	Trip Purpose	Wrk Days	Total Trips	Mile/Trip	Total Miles	Mile/Day	Trip/Day	Vehicle	Pounds per day								Tons per year								Metric tons per year			
											ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O	CO2e
1	2024	2024SVABT7Single	Deliver I beams	1	2	10	20	20	2	T7Single	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0
4	2024	2024SVABT7Single	Deliver I beams	1	2	10	20	20	2	T7Single	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0

Onsite Truck Calculations

ID	Year	Trip Purpose	Wrk Days	Total Trips	Mile/Trip	Total Miles	Mile/Day	Trip/Day	Vehicle	Running g/mi (EMFAC, AP 42)											Process g/veh (EMFAC)										
										ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O	ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O
1	2024	Crew transport	5	40	10	400	80	8	LDT	0.1	0.1	1.4	0.0	0.0	14.8	1.5	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
2	2024	Crew transport	5	40	10	400	80	8	LDT	0.1	0.1	1.4	0.0	0.0	14.8	1.5	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
3	2024	Crew transport	5	40	10	400	80	8	LDT	0.1	0.1	1.4	0.0	0.0	14.8	1.5	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0
4	2024	Crew transport	5	40	10	400	80	8	LDT	0.1	0.1	1.4	0.0	0.0	14.8	1.5	0.0	600	0.0	0.0	1.1	0.3	2.6	0.0	0.0	0.0	0.0	0.0	65	0.1	0.0

ID	Year	Trip Purpose	Wrk Days	Total Trips	Mile/Trip	Total Miles	Mile/Day	Trip/Day	Vehicle	Pounds per day								Tons per year								Metric tons per year			
										ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	ROG	NOX	CO	PM10	PM2.5	PM10 D	PM2.5 D	SO2	CO2	CH4	N2O	CO2e
1	2024	Crew transport	5	40	10	400	80	8	LDT	0.0	0.0	0.3	0.0	0.0	2.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0
2	2024	Crew transport	5	40	10	400	80	8	LDT	0.0	0.0	0.3	0.0	0.0	2.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0
3	2024	Crew transport	5	40	10	400	80	8	LDT	0.0	0.0	0.3	0.0	0.0	2.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0
4	2024	Crew transport	5	40	10	400	80	8	LDT	0.0	0.0	0.3	0.0	0.0	2.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0

Earthmoving Calculations

ID	Lookup	Year	Wrk Days	Grading (acre/day)	Dozing (hr/day)	Loading (cy/day)	Emission Factor: Grading PM10 (lb/acre)	Grading PM2.5 (lb/acre)	Dozing PM10 (lbs/hr)	Dozing PM2.5 (lbs/hr)	Truck loading PM10 (lb/ton)	Truck loading PM2.5 (lb/ton)	Pounds per day: PM10 D	PM2.5 D	Tons per year: PM10 D	PM2.5 D
1	1:2024	2024	3	0.08	0	120	1.061	0.115	0.753	0.414	0.000	0.000	0.1	0.0	0.0	0.0
4	4:2024	2024	3	0.08	0	120	1.061	0.115	0.753	0.414	0.000	0.000	0.1	0.0	0.0	0.0

AERMOD

Available upon request

Appendix F
Key Observation Points for Aesthetics Analysis

Appendix F
Key Observation Points for Aesthetics Analysis (Photographs taken November 15, 2019)

KOP 1. View from end of N. Ashley Avenue/County Road 98B, facing north.

KOP 2. View from inside North Park residential development, facing northwest.

KOP 3. View from Pedrick Road/County Road 98, facing north (North Park residential development and sound wall to the east).

KOP 4. View from Pedrick Road/County Road 98, near Cherry Lane, facing west.

KOP 5. View from E. Beamer Street facing northeast (toward existing levee).

KOP 6. View from County Road 102 near E. Kentucky Avenue, facing west.

KOP 7. View from Velocity Island Park front entrance, facing south (toward I-5).

KOP 8. View from Velocity Island Park front entrance, facing west.

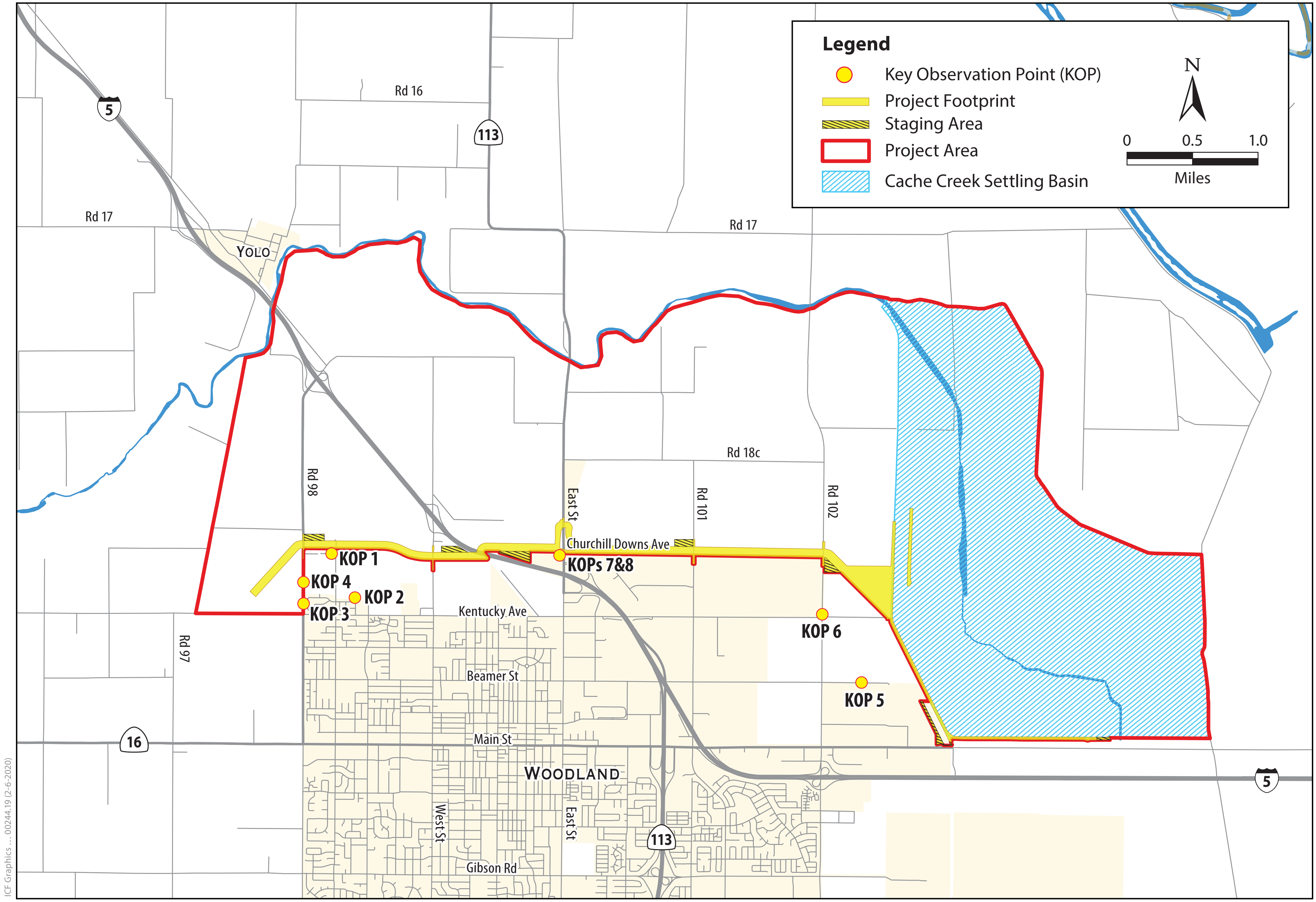


Figure F-1
Key Observation Points