DRAFT RECREATION RESOURCE MANAGEMENT PLAN

ATTACHMENT A

CONSTRUCTION COST ESTIMATE FOR THE WARD'S FERRY BRIDGE WHITEWATER BOATING TAKE-OUT IMPROVEMENTS

PROJECT: 390-177264-014
CLIENT: MID - TID

Don Pedro Hydroelectric Project (FERC No. 2299) - Ward's Ferry Bridge Whitewater Boating Take-Out
Conceptual Design Preliminary Cost Estimate - River Right Upgrade Option

EST. AS OF: 03/19/14
PREPARED BY: CR MacDonald
REVIEWED BY: J Gagnon / G Hickman

CODE	DESCRIPTION	MATERIAL QUANTITY	MATERIAL UNIT	MATERIAL PRICE	LABOR QUANTITY	LABOR UNIT	LABOR RATE	EQUIPMENT QUANTITY	EQUIPMENT UNIT	EQUIPMENT RATE	Total Rate Plus O&P	DIRECT TOTAL $	TOTAL $	COMMENTS
100	**GENERAL**												**$57,500**	
110	Mobilization										$35,000	$35,000		Assumed for adverse site location, narrow roads, remote location
120	Temporary Services										$5,000	$5,000		Assumed for power, data, and water
130	Site Management										$15,000	$15,000		Assumed, includes stockpile and surplus management, traffic control, trailer / office facilitities and general oversight
140	Site Access										$2,500	$2,500		Assumed travel costs for inspection and supervision
1000	**UPGRADE EXISTING ACCESS ROAD ON RIVER RIGHT**												**$170,604**	**Note: Costs provided are in Q2 2012 Dollars based in Modesto Ca. Values for labor and equipment have been increased by an addtional factor of 2.75 over means values and notes below due to the remote nature of the site.**
1100	**Road Restoration (Widen to 15' total to Old Abutment)**													
1110	Wall Construction	750	sqft	$21.27	750	sqft	$21.49	750	sqft	$2.39	$45.15	$33,865		Means ID: 32322313715 0 Segmental retaining walls, unit masonry interlocking wall system, straight split, 8" high x 18" wide x 20" deep, includes pins, and void fill, excludes base. Multiplied by a factor of 1.5, as MEANS does not provide an appropriate line item for this wall system. Assume 5 feet tall by length.
1120	Wall Footing	150	cuft	$32.57	150	cuft	$91.08	150	cuft	$3.58	$127.23	$19,084		Assuming a 1' wide x 1' tall footing along the length of wall: Means ID: 03113450020 C.I.P. concrete forms, footing, continuous wall, plywood, 1 use, includes erecting, bracing, stripping and cleaning & Means ID: 03310525015 0 Concrete, hand mix, for small quantities or remote areas, 5000 psi, using gas powered cement mixer, includes local bulk aggregate & sand, bagged Portland cement, excludes, forms, reinforcing, placing & finishing
1130	Common Borrow / Road Build Up	69	cuyd	$19.41	69	cuyd	$22.72	69	cuyd	$31.10	$73.23	$5,085		Means ID: 31232315400 0 Borrow, common earth, 1 C.Y. bucket, loading and/or spreading, shovel & Means ID: 31232315184 0 Borrow, delivery charge, minimum 20 tons, 2 hour round trip
1140	Select Road Materials	589	cuyd	$21.22	589	cuyd	$22.39	589	cuyd	$30.72	$74.32	$43,768		Means ID: 31232315500 0 Borrow, select granular fill, 1 C.Y. bucket, loading and/or spreading, shovel & Means ID: 31232315184 0 Borrow, delivery charge, minimum 20 tons, 2 hour round trip
1150	Pavement	7,950	sqft	$2.40	7,950	sqft	$0.94	7,950	sqft	$0.74	$4.08	$32,416		Means ID: 32121614002 5 Asphaltic concrete, parking lots & driveways, 6" s tone base, 2" binder course, 2" topping, no asphalt hauling included
1160	Pavement Hauling	192	ton	$0.00	192	ton	$19.22	192	ton	$26.92	$46.15	$8,866		Means ID: 31232315184 0 Borrow, delivery charge, minimum 20 tons, 2 hour round trip. Assumed as a more appropriate delivery charge given the presumed travel distance.
1170	Guardrail	530	lf	$40.43	530	$530.00	$7.12	530	lf	$4.37	$51.93	$27,520		RS Means 2012 4th Quarter Update, Modified to Modesto, Ca rates with Contractor OH&P, Sales Tax and Insurance.
2000	**UPGRADE RIVER RIGHT EXISTING TRAIL TO RIVER**												**$14,365**	
2100	**Widen Trail to 4'**													
2110	Grade Existing Trail	1,540	sqft	$0.00	1,540	sqft	$3.41	1,540	sqft	$0.41	$3.82	$5,887		Means ID: 31221610120 0 Fine grading, fine grade granular base for sidewalks and bikeways
2110	Select Trail Materials	114	cuyd	$21.22	114	cuyd	$22.39	114	cuyd	$30.72	$74.32	$8,478		Means ID: 31232315500 0 Borrow, select granular fill, 1 C.Y. bucket, loading and/or spreading, shovel & Means ID: 31232315184 0 Borrow, delivery charge, minimum 20 tons, 2 hour round trip
3000	**CONSTRUCT NEW ROAD TO RIVER ON RIVER RIGHT**												**$501,034**	
3100	**MSE Wall**												$443,800	
3110	Common Borrow / Road Build Up	1,463	cuyd	$19.41	1,463	cuyd	$22.72	1,463	cuyd	$31.10	$73.23	$107,129.12		Means ID: 31232315400 0 Borrow, common earth, 1 C.Y. bucket, loading and/or spreading, shovel & Means ID: 31232315184 0 Borrow, delivery charge, minimum 20 tons, 2 hour round trip
3120	Wall	6,160	sqft	$21.27	6,160	sqft	$21.49	6,160	sqft	$2.39	$45.15	$278,147.10		Means ID: 32322313715 0 Segmental retaining walls, unit masonry interlocking wall system, straight split, 8" high x 18" wide x 20" deep, includes pins, and void fill, excludes base. Multiplied by a factor of 1.5, as Means does not provide an appropriate line item for this wall system. Assume 10 feet tall by length.
3130	Wall Footing	460	cuft	$32.57	460	cuft	$91.08	460	cuft	$3.58	$127.23	$58,523.50		Assuming a 1' wide x 1' tall footing along the length of wall: Means ID: 03113450020 C.I.P. concrete forms, footing, continuous wall, plywood, 1 use, includes erecting, bracing, stripping and cleaning (units x3 to yield sqft per LF) & Means ID: 03310525015 0 Concrete, hand mix, for small quantities or remote areas, 5000 psi, using gas powered cement mixer, includes local bulk aggregate & sand, bagged Portland cement, excludes, forms, reinforcing, placing & finishing
3200	**General Road Construction**												$57,235	
3210	Select Road Materials	396	cuyd	$21.22	396	cuyd	$22.39	396	cuyd	$30.72	$74.32	$29,453.73		Means ID: 31232315500 0 Borrow, select granular fill, 1 C.Y. bucket, loading and/or spreading, shovel & Means ID: 31232315184 0 Borrow, delivery charge, minimum 20 tons, 2 hour round trip
3220	Pavement	5,350	sqft	$2.40	5,350	sqft	$0.94	5,350	sqft	$0.74	$4.08	$21,814.63		Means ID: 32121614002 5 Asphaltic concrete, parking lots & driveways, 6" s tone base, 2" binder course, 2" topping, no asphalt hauling included
3230	Pavement Hauling	129	ton	$0.00	129	ton	$19.22	129	ton	$26.92	$46.15	$5,966.16		Means ID: 31232315184 0 Borrow, delivery charge, minimum 20 tons, 2 hour round trip. Assumed as a more appropriate delivery charge given the presumed travel distance.

CONSTRUCTION COST MSE WALL	**SUBTOTAL**	**$743,503**
ENGINEERING	15%	$111,525
CONTINGENCY	30%	$223,051
ESCALATE TO Q1 2014 DOLLARS	4.6%	$50,014
CONSTRUCTION COST MSE WALL	**TOTAL**	**$1,128,094**

DRAFT RECREATION RESOURCE MANAGEMENT PLAN

ATTACHMENT B

DON PEDRO RECREATION AGENCY FIVE YEAR BUDGET PLAN

FIVE YEAR BUDGET PLAN - BY PROJECT
2014 - 2018

Don Pedro Recreation Agency				2014			
PROJECT DESCRIPTION	PRIORITY	MULTIYEAR PROJECT TOTAL	PRIOR YEARS TOTAL	PROJECT MATERIALS	OUTSIDE SERVICE	TOTAL	ACCUMULATED TOTAL
ADA Upgrades	A				5,000	5,000	5,000
Campsite Renovation	A			7,000		7,000	12,000
Restroom Roof Renovation	B			15,000		15,000	27,000
Electronics/IS/Communication	B			10,000	2,000	12,000	39,000
Signs	B			7,000		7,000	46,000
Restroom Interior Renovations	B			8,000		8,000	54,000
Water System Upgrades	B			3,000		3,000	57,000
Transformer	C			8,000		8,000	65,000
Lake Regulatory Management	C			10,000		10,000	75,000
Roadwork	C			3,000	147,000	150,000	225,000
Vehicles	C			35,000		35,000	260,000
Work Dock Renovation	C			6,000		6,000	266,000
Vegetation Management	D			6,000		6,000	272,000
Administrative Site Management	D				10,000	10,000	282,000
TOTALS		0	0	118,000	164,000	282,000	

PRIORITY: A = Required by Law B = Necessary for Continued Operation C = End of Life Replacement D = Result in Increased Efficiency
E = General Enhancement

FIVE YEAR BUDGET PLAN - BY PROJECT
2014 - 2018

Don Pedro Recreation Agency				2015			
PROJECT DESCRIPTION	PRIORITY	MULTIYEAR PROJECT TOTAL	PRIOR YEARS TOTAL	PROJECT MATERIALS	OUTSIDE SERVICE	TOTAL	ACCUMULATED TOTAL
ADA Upgrades	A			5,000		5,000	5,000
Campsite Renovation	A			7,000		7,000	12,000
Restroom Roof Renovation	B			15,000		15,000	27,000
Electronics/IS/Communication	B			10,000	2,000	12,000	39,000
Signs	B			7,000		7,000	46,000
Restroom Interior Renovations	B			8,000		8,000	54,000
Lake Regulatory Management	C			10,000		10,000	64,000
Roadwork	C			3,000	147,000	150,000	214,000
Outboard Engine	C			10,000		10,000	224,000
Vehicle	C			35,000		35,000	259,000
Automated Iron Ranger	D	90,000	0		30,000	30,000	289,000
TOTALS		90,000	0	110,000	179,000	289,000	

PRIORITY: A = Required by Law B = Necessary for Continued Operation C = End of Life Replacement D = Result in Increased Efficiency
E = General Enhancement

FIVE YEAR BUDGET PLAN - BY PROJECT
2014 - 2018

Don Pedro Recreation Agency				2016			
PROJECT DESCRIPTION	PRIORITY	MULTIYEAR PROJECT TOTAL	PRIOR YEARS TOTAL	PROJECT MATERIALS	OUTSIDE SERVICE	TOTAL	ACCUMULATED TOTAL
ADA Upgrades	A			5,000		5,000	5,000
Campsite Renovation	A			7,000		7,000	12,000
Electronics/IS/Communication	B			5,000	2,000	7,000	19,000
Signs	B			7,000		7,000	26,000
Restroom Interior Renovations	B			8,000		8,000	34,000
Lake Regulatory Management	C			10,000		10,000	44,000
Fleming B Restroom Modification	C			35,000		35,000	79,000
Vehicles	C			60,000		60,000	139,000
Roadwork	C			5,000	30,000	35,000	174,000
Automated Iron Ranger	D	90,000	30,000		30,000	30,000	204,000
Fleming Entrance Modification	D			85,000		85,000	289,000
TOTALS		90,000	30,000	227,000	62,000	289,000	

PRIORITY: A = Required by Law B = Necessary for Continued Operation C = End of Life Replacement D = Result in Increased Efficiency
E = General Enhancement

FIVE YEAR BUDGET PLAN - BY PROJECT
2014 - 2018

Don Pedro Recreation Agency — 2017

PROJECT DESCRIPTION	PRIORITY	MULTIYEAR PROJECT TOTAL	PRIOR YEARS TOTAL	PROJECT MATERIALS	OUTSIDE SERVICE	TOTAL	ACCUMULATED TOTAL
Campsite Renovation	A			7,000		7,000	7,000
Electronics/IS/Communication	B			5,000	2,000	7,000	14,000
Signs	B			7,000		7,000	21,000
Restroom Interior Renovations	B			8,000		8,000	29,000
Lake Regulatory Management	C			10,000		10,000	31,000
Roadwork	C			5000	30,000	35,000	64,000
Vehicles	C			60,000		60,000	124,000
Automated Iron Ranger	D	90,000	60,000		30,000	30,000	154,000
Fleming Entrance Modification	D			75,000	50,000	125,000	249,000
Vegetation Management	D			5,000		5,000	254,000
TOTALS		90,000	60,000	182,000	112,000	294,000	

PRIORITY: A = Required by Law B = Necessary for Continued Operation C = End of Life Replacement D = Result in Increased Efficiency
E = General Enhancement

FIVE YEAR BUDGET PLAN - BY PROJECT
2014 - 2018

Don Pedro Recreation Agency				2018			
PROJECT DESCRIPTION	PRIORITY	MULTIYEAR PROJECT TOTAL	PRIOR YEARS TOTAL	PROJECT MATERIALS	OUTSIDE SERVICE	TOTAL	ACCUMULATED TOTAL
Campsite Renovation	A			7,000		7,000	7,000
Electronics/IS/Communication	B			5,000	2,000	7,000	14,000
Signs	B			7,000		7,000	21,000
Restroom Interior Renovations	B			30,000		30,000	51,000
Lake Regulatory Management	C			10,000		10,000	61,000
Roadwork	C			5000	35,000	40,000	101,000
Vehicles	C			60,000		60,000	161,000
Concrete Food Lockers	C			30,000		30,000	191,000
TOTALS		0	0	154,000	37,000	191,000	

PRIORITY: A = Required by Law B = Necessary for Continued Operation C = End of Life Replacement D = Result in Increased Efficiency
E = General Enhancement

DON PEDRO HYDROELECTRIC PROJECT
FERC NO. 2299

FINAL LICENSE APPLICATION

EXHIBIT E – ENVIORONMENTAL REPORT

APPENDIX E-4
DRAFT HISTORICAL PROPERTIES MANAGEMENT PLAN
FILED ONLY WITH THE FEDERAL ENERGY REGULATORY COMMISSION AS PRIVILEGED INFORMATION

DON PEDRO HYDROELECTRIC PROJECT
FERC NO. 2299

FINAL LICENSE APPLICATION

APPENDIX E-5
DRAFT BIOLOGICAL ASSESSMENT FOR TERRESTRIAL SPECIES



WATER & POWER
Serving Central California since 1887

MID
Modesto Irrigation District

Prepared by:
Turlock Irrigation District
P.O. Box 949
Turlock, CA 95381

and

Modesto Irrigation District
P.O. Box 4060
Modesto, CA 95352

April 2014

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Attachment A	Conservation Guidelines for the Valley Elderberry Longhorn Beetle 9 July 1999

List of Acronyms

ac .....acres
ACEC.....Area of Critical Environmental Concern
ACHP.....Advisory Council for Historic Preservation
ACOE.....U.S. Army Corps of Engineers
ADA.....Americans with Disabilities Act (ADA/ABAAG)
AF .....acre-feet
AGS.....Annual Grasslands
ALJ.....Administrative Law Judge
APE.....Area of Potential Effect
APEA .....Applicant-Prepared Environmental Assessment
ARMR.....Archaeological Resource Management Report
AWQC .....Ambient Water Quality Criteria
BA .....Biological Assessment
BDCP .....Bay-Delta Conservation Plan
BLM.....U.S. Department of the Interior, Bureau of Land Management
BLM-S .....Bureau of Land Management – Sensitive Species
BMI.....Benthic macroinvertebrates
BMP .....Best Management Practices
BO .....Biological Opinion
BOW .....Blue Oak Woodland
ºC.....celsius
CalCOFI.....California Cooperative Oceanic Fisheries Investigations
CalEPPC .....California Exotic Pest Plant Council
CalSPA.....California Sportfishing Protection Alliance
CAS.....California Academy of Sciences
CBDA .....California Bay-Delta Authority
CCC.....Criterion Continuous Concentrations
CCIC .....Central California Information Center
CCSF.....City and County of San Francisco
CD.....Compact Disc
CDBW.....California Department of Boating and Waterways

CDEC.....California Data Exchange Center
CESA .....California Endangered Species Act
CDFA.....California Department of Food and Agriculture
CDFG.....California Department of Fish and Game (as of January 2013, CDFW)
CDFW .....California Department of Fish and Wildlife
CDMG.....California Division of Mines and Geology
CDOF .....California Department of Finance
CDPH.....California Department of Public Health
CDPR .....California Department of Parks and Recreation
CDSOD .....California Division of Safety of Dams
CDWR.....California Department of Water Resources
CE .....California Endangered Species
CEC.....California Energy Commission
CEII.....Critical Energy Infrastructure Information
CEQA.....California Environmental Quality Act
CESA .....California Endangered Species Act
CFR.....Code of Federal Regulations
cfs.....cubic feet per second
CGS.....California Geological Survey
cm.....centimeters
CMAP .....California Monitoring and Assessment Program
CMC.....Criterion Maximum Concentrations
CNDDB.....California Natural Diversity Database
CNPS.....California Native Plant Society
CORP .....California Outdoor Recreation Plan
CPUC .....California Public Utilities Commission
CPUE .....Catch Per Unit Effort
CRAM.....California Rapid Assessment Method
CRC.....Chamise-Redshank Chaparral
CRLF.....California Red-Legged Frog
CRRF .....California Rivers Restoration Fund
CSAS.....Central Sierra Audubon Society
CSBP.....California Stream Bioassessment Procedure

CSU.....California State University
CT .....California Threatened Species
CTR.....California Toxics Rule
CTS .....California Tiger Salamander
CVP.....Central Valley Project
CVRWQCB .....Central Valley Regional Water Quality Control Board
CWA .....Clean Water Act
CWD .....Chowchilla Water District
CWHR.....California Wildlife Habitat Relationship
CZMA .....Coastal Zone Management Act
DDT .....dichlorodiphenyltrichloroethane
Districts.....Turlock Irrigation District and Modesto Irrigation District
DLA .....Draft License Application
DO.....Dissolved Oxygen
DOI .....Department of Interior
DPRA.....Don Pedro Recreation Agency
DPS .....Distinct Population Segment
DSE.....Chief Dam Safety Engineer
EA .....Environmental Assessment
EBMUD .....East Bay Municipal Utilities District
EC .....Electrical Conductivity
EFH.....Essential Fish Habitat
EIR .....Environmental Impact Report
EIS.....Environmental Impact Statement
Elev or el.....Elevation
ENSO .....El Niño Southern Oscillation
EPA.....U.S. Environmental Protection Agency
ESA.....Federal Endangered Species Act
ESRCD.....East Stanislaus Resource Conservation District
ESU .....Evolutionary Significant Unit
EVC.....Existing Visual Condition
EWUA.....Effective Weighted Useable Area
°F.....fahrenheit

FERC.....Federal Energy Regulatory Commission
FFS.....Foothills Fault System
FL.....Fork length
FLA.....Final License Application
FMP.....Fishery Management Plan
FMU.....Fire Management Unit
FOT.....Friends of the Tuolumne
FPA.....Federal Power Act
FPC.....Federal Power Commission
FPPA.....Federal Plant Protection Act
ft.....feet
ft/mi.....feet per mile
FWCA.....Fish and Wildlife Coordination Act
FWUA.....Friant Water Users Authority
FYLF.....Foothill Yellow-Legged Frog
g.....grams
GIS.....Geographic Information System
GLO.....General Land Office
GORP.....Great Outdoor Recreation Pages
GPS.....Global Positioning System
HCP.....Habitat Conservation Plan
HSC.....Habitat Suitability Criteria
HHWP.....Hetch Hetchy Water and Power
HORB.....Head of Old River Barrier
hp.....horsepower
HPMP.....Historic Properties Management Plan
IFIM.....Instream Flow Incremental Methodology
ILP.....Integrated Licensing Process
in.....inches
ISR.....Initial Study Report
ITA.....Indian Trust Assets
IUCN.....International Union for the Conservation of Nature
KOPs.....Key Observation Points

kV.....kilovolt
kVA.....kilovolt-amperes
kW.....kilowatt
kWh.....kilowatt hours
LWD .....large woody debris
m .....meters
mm .....millimeter
M&I.....Municipal and Industrial
MCL.....Maximum Contaminant Level
mg/kg .....milligrams/kilogram
mg/L.....milligrams per liter
mgd .....million gallons per day
MGR .....Migration of Aquatic Organisms
MHW .....Montane Hardwood
mi .....miles
mi^2 .....square miles
MID.....Modesto Irrigation District
MOA .....Memorandum of Agreement
MOU .....Memorandum of Understanding
MPN.....Most Probable Number
MPR.....market price referents
MSCS.....Multi-Species Conservation Strategy
msl.....mean sea level
MUN .....municipal and domestic supply
MVA .....Megavolt-ampere
MW .....megawatt
MWh .....megawatt hour
mya.....million years ago
NAE .....National Academy of Engineering
NAHC .....Native American Heritage Commission
NAS.....National Academy of Sciences
NAVD 88.....North American Vertical Datum of 1988
NAWQA .....National Water Quality Assessment

NCCP .....Natural Community Conservation Plan
NGVD29 .....National Geodetic Vertical Datum of 1929
NEPA .....National Environmental Policy Act
NERC.....North American Electric Reliability Corporation
NGOs .....Non-Governmental Organizations
NHI .....Natural Heritage Institute
NHPA.....National Historic Preservation Act
NISC .....National Invasive Species Council
NMFS.....National Marine Fisheries Service
NOAA .....National Oceanic and Atmospheric Administration
NOI .....Notice of Intent
NPS .....U.S. Department of the Interior, National Park Service
NRCS .....National Resource Conservation Service
NRHP.....National Register of Historic Places
NRI.....Nationwide Rivers Inventory
NTU .....Nephelometric Turbidity Unit
NWI.....National Wetland Inventory
NWIS .....National Water Information System
NWR .....National Wildlife Refuge
O&M .....operation and maintenance
OEHHA.....Office of Environmental Health Hazard Assessment
OID .....Oakdale Irrigation District
ORV .....Outstanding Remarkable Value
OSHA.....Occupational Safety and Health Administration
PA .....Programmatic Agreement
PAD.....Pre-Application Document
PDAW.....Project Demand of Applied Water
PDO.....Pacific Decadal Oscillation
PEIR.....Program Environmental Impact Report
PGA.....Peak Ground Acceleration
PG&E.....Pacific Gas and Electric
PHABSIM.....Physical Habitat Simulation System
PHG.....Public Health Goal

PM&E .....Protection, Mitigation and Enhancement
PMF.....Probable Maximum Flood
POAOR .....Public Opinions and Attitudes in Outdoor Recreation
ppb.....parts per billion
ppm .....parts per million
PSP.....Proposed Study Plan
PWA.....Public Works Administration
QA.....Quality Assurance
QC .....Quality Control
RA .....Recreation Area
RBP .....Rapid Bioassessment Protocol
REC-1 .....water contact recreation
REC-2 .....water non-contact recreation
Reclamation .....U.S. Department of the Interior, Bureau of Reclamation
RM .....River Mile
RMP .....Resource Management Plan
RP.....Relicensing Participant
RPA.....Reasonable and Prudent Alternative
rpm .....Rotations per minute
RPS .....Renewable Portfolio Standard
RSP .....Revised Study Plan
RST .....Rotary Screw Trap
RWG .....Resource Work Group
RWQCB.....Regional Water Quality Control Board
SC.....State candidate for listing under CESA
SCADA .....Supervisory Control and Data Acquisition
SCD.....State candidate for delisting under CESA
SCE .....State candidate for listing as endangered under CESA
SCT .....State candidate for listing as threatened under CESA
SD1 .....Scoping Document 1
SD2 .....Scoping Document 2
SE.....State Endangered Species under the CESA
SEED.....U.S. Bureau of Reclamation's Safety Evaluation of Existing Dams

SFP.....State Fully Protected Species under CESA

SFPUC .....San Francisco Public Utilities Commission

SHPO .....State Historic Preservation Officer

SJRA .....San Joaquin River Agreement

SJRGA .....San Joaquin River Group Authority

SJTA .....San Joaquin River Tributaries Authority

SM.....Standard Method

SMUD.....Sacramento Municipal Utility District

SPAWN.....spawning, reproduction and/or early development

SPD .....Study Plan Determination

SRA.....State Recreation Area

SRMA .....Special Recreation Management Area or Sierra Resource Management Area (as per use)

SRMP.....Sierra Resource Management Plan

SRP .....Special Run Pools

SSC .....State species of special concern

ST.....California Threatened Species under the CESA

STORET .....Storage and Retrieval

SWAMP.....Surface Water Ambient Monitoring Program

SWE .....Snow-Water Equivalent

SWP .....State Water Project

SWRCB.....State Water Resources Control Board

TAC.....Technical Advisory Committee

TAF .....thousand acre-feet

TCP .....Traditional Cultural Properties

TCWC .....Tuolumne County Water Company

TDS .....Total Dissolved Solids

TID.....Turlock Irrigation District

TMDL .....Total Maximum Daily Load

TOC.....Total Organic Carbon

TRT .....Tuolumne River Trust

TRTAC .....Tuolumne River Technical Advisory Committee

UC .....University of California

USBR .....U.S. Bureau of Reclamation
USDA.....U.S. Department of Agriculture
USDOC .....U.S. Department of Commerce
USDOI .....U.S. Department of the Interior
USFS .....U.S. Department of Agriculture, Forest Service
USFWS .....U.S. Department of the Interior, Fish and Wildlife Service
USGS .....U.S. Department of the Interior, Geological Survey
USR.....Updated Study Report
UTM.....Universal Transverse Mercator
VAMP .....Vernalis Adaptive Management Plan
VELB .....Valley Elderberry Longhorn Beetle
VES .....visual encounter surveys
VRM .....Visual Resource Management
VRO .....Visual Resource Objective
WBWG .....Western Bat Working Group
WECC .....Western Electricity Coordinating Council
WPA.....Works Progress Administration
WPT .....Western Pond Turtle
WQCP .....Water Quality Control Plan
WSA.....Wilderness Study Area
WSIP .....Water System Improvement Program
WSNMB .....Western Sierra Nevada Metamorphic Belt
WUA .....weighted usable area
WWTP .....Wastewater Treatment Plant
WY .....water year
yd^3 .....cubic yard
yr .....year
µS/cm .....microSeimens per centimeter
µg/L.....micrograms per liter
µmhos.....micromhos

PREFACE

The Don Pedro Project provides water storage for irrigation and municipal and industrial (M&I) use, flood control, hydroelectric generation, recreation, and natural resource protection (hereinafter, the "Don Pedro Project"). The Don Pedro Project was originally conceived as a water supply project. The Don Pedro Project was constructed for the following primary purposes: (1) to provide water supply for the co-licensees, Turlock Irrigation District (TID) and Modesto Irrigation District (MID) (collectively, the Districts), for irrigation of over 200,000 acres (ac) of Central Valley farmland and for M&I use, (2) to provide flood control benefits along the Tuolumne and San Joaquin rivers, and (3) to provide a water banking arrangement for the benefit of the City and County of San Francisco (CCSF) and its 2.6 million Bay Area water customers. The original license was issued in 1966. In 1995, the Districts entered into an agreement with a number of parties which resulted in greater flows to the lower Tuolumne River for the protection of aquatic resources.

Hydroelectric generation is a secondary purpose of the Don Pedro Project. Hereinafter, the hydroelectric generation facilities and operations will be referred to as the "Don Pedro Hydroelectric Project", or the "Project". With this license application to FERC, the Districts are seeking a new license to continue generating hydroelectric power. Based on the information contained in this application, and other sources of information on the record, FERC will consider whether, and under what conditions, to issue a new license for the continued generation of hydropower at the Districts' Don Pedro Project. The Districts are providing a complete description of the facilities and operation of the Don Pedro Project so the effects of the operation and maintenance of the Don Pedro hydroelectric facilities can be distinguished from the effects of the operation and maintenance activities of the overall Don Pedro Project's flood control and water supply/consumptive use purposes.

Being able to differentiate the effects of the hydropower operations from the effects of the flood control and consumptive use purposes and needs of the Don Pedro Project will aid in defining the scope and substance of reasonable protection, mitigation, and enhancement (PM&E) alternatives to be considered in relicensing. As FERC states in Scoping Document 2 in a discussion related to alternative project operation scenarios: "…alternatives that address the consumptive use of water in the Tuolumne River through construction of new structures or methods designed to alter or reduce consumptive use of water are…alternative mitigation strategies that could not replace the Don Pedro *hydroelectric* project [emphasis added]. As such, these recommended alternatives do not satisfy the NEPA purpose and need for the proposed action and are not reasonable alternatives for the NEPA analysis."

1.0 INTRODUCTION

1.1 Purpose of the Biological Assessment

During National Environmental Policy Act (NEPA) scoping conducted by the Federal Energy Regulatory Commission (FERC) for the relicensing of hydroelectric power generation at the Don Pedro Hydroelectric Project (Project), issues were raised regarding the effects of the Proposed Action on species listed under the federal Endangered Species Act (ESA) and their

associated designated critical habitat. Fourteen ESA-listed terrestrial species–four Endangered and 10 Threatened–were identified by FERC as having the potential to occur in the Project vicinity.

Pursuant to the ESA, the Districts have prepared this Applicant-Prepared draft Biological Assessment (Draft BA) to describe potential effects of the Proposed Action on ESA-listed species in the Action Area. This Draft BA is intended to serve as the basis for consultation between FERC and the United States Fish and Wildlife Services (USFWS) pursuant to Section 7(a)(3) of the ESA.

1.1.1 Regulatory Framework

Under provisions of Section 7(a)(2) of the ESA, FERC is required to consult with the USFWS regarding the relicensing of the Project to ensure that the Proposed Action to be undertaken by FERC (see Section 2.1 of this Draft BA for a description of the Proposed Action) will not jeopardize the continued existence of Layne's ragwort (*Packera layneae*), California vervain (*Verbena californica*), California red-legged frog (*Rana draytonii*), California tiger salamander (*Ambystoma californiense*), valley elderberry longhorn beetle (*Desmocerus californicus* dimorphus), San Joaquin kit fox (*Vulpes macrotis mutica*), and vernal pool fairy shrimp (*Branchinecta lynchi*) or adversely modify these species' critical habitat (16 United States Code [U.S.C.] Section 1536(c)). There is a single ESA-listed aquatic species that occurs in the Tuolumne River, i.e., the threatened California Central Valley Steelhead Distinct Population Segment (DPS) (*Oncorhynchus mykiss irideus*). The Districts will provide a draft BA for the Central Valley Steelhead in November 2016 for eventual transmittal by FERC (with or without modification) to the National Marine Fisheries Service for ESA consultation purposes.

The Districts, under the direction and guidance of FERC's policies and procedures, have prepared this Draft BA. FERC will review and potentially modify this draft BA prior to providing its BA to the USFWS for consultation purposes. The USFWS will prepare and issue a Biological Opinion (BO), which will present the USFWS's determination as to whether or not the Proposed Action would be likely to jeopardize these species or adversely modify their critical habitat in the Action Area. If a "jeopardy" or "adverse modification" determination is made, the BO will identify any reasonable and prudent alternative (RPA) actions that might be necessary to address the effects of the Proposed Action.

If the USFWS issues either a "no jeopardy" opinion or a "jeopardy" opinion that includes RPAs, the BO may include an incidental take statement. The USFWS must anticipate the quantity of take that could result from the Proposed Action and authorize such take along with a statement that these species will not be jeopardized. The incidental take statement must contain terms and conditions designed to reduce the effect of the anticipated take. These RPAs and the associated take allowances would then be transmitted to FERC.

1.2 Project Background

The Districts are the co-licensees of the 168-megawatt (MW) Don Pedro Hydroelectric Project, located on the Tuolumne River in western Tuolumne County in the Central Valley region of

California. The Don Pedro Dam is located at river mile (RM) 54.8 and the Don Pedro Reservoir formed by the dam extends 24 miles upstream at the normal maximum water surface elevation of 830 ft above mean sea level (msl; NGVD 29). At elevation 830 ft, the reservoir stores over 2,000,000 acre-feet (AF) of water and has a surface area slightly less than 13,000 acres (ac). The watershed above Don Pedro Dam is approximately 1,533 square miles (mi^2). The Project is designated by FERC as Project No. 2299. Both TID and MID are local public agencies authorized under the laws of the State of California to provide water supply for irrigation and municipal and industrial (M&I) uses and to provide retail electric service.

1.2.1 Project Boundary and Facilities

The Project Boundary extends from RM 53.2, which is one mile downstream of the Don Pedro powerhouse to RM 80.8 corresponding to a water level of 845 feet (ft)(31 FPC 510 [1964]). The Project Boundary encompasses approximately 18,370 ac, with 74 percent of the lands owned jointly by the Districts and the remaining 26 percent (approximately 4,802 ac) owned by the United States and administered as a part of the U.S. Bureau of Land Management (BLM) Sierra Resource Management Area. The primary Don Pedro Project facilities include the main 585 ft high earth dam, gated and ungated spillways, low level outlet works, a four-unit powerhouse situated at the base of the dam, an electrical switchyard, four rim dikes, and three developed recreation areas. The location of the Don Pedro Project is shown in Figure 1.2-1.

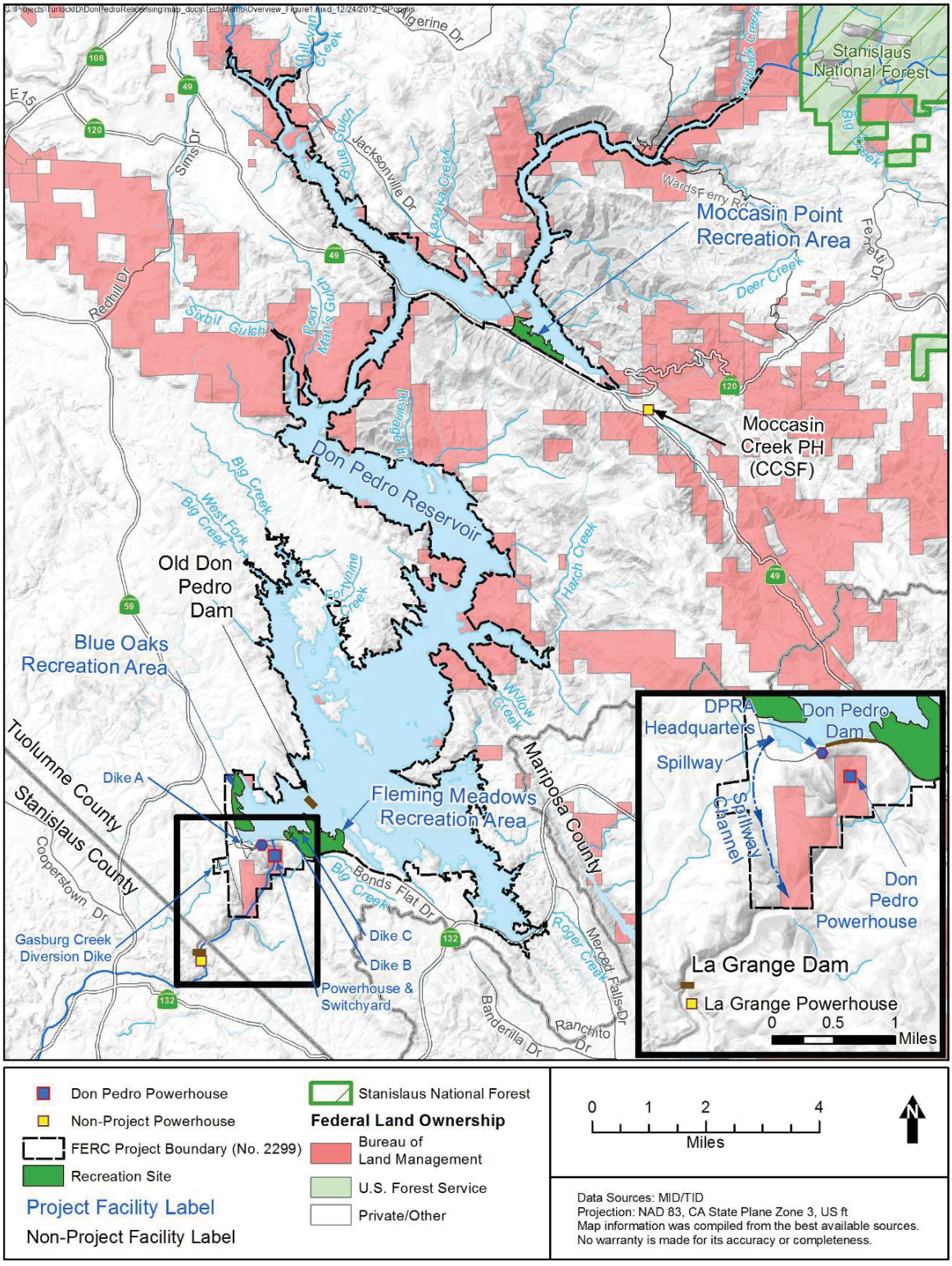

Figure 1.2-1. Don Pedro Hydroelectric Project site location map.

1.3 Consultation on FERC Relicensing Studies

The Districts consulted with the USFWS regarding ESA-listed species during the relicensing process for the Don Pedro Hydroelectric Project. The current FERC license for the Project expires on April 30, 2016, and the Districts will apply for a new license no later than April 30, 2014. The Districts began the relicensing process by filing a Notice of Intent and Pre-Application Document (PAD) with FERC on February 10, 2011, following the regulations governing the Integrated Licensing Process (ILP). The Districts' PAD included a summary of the extensive existing information available on area resources. The PAD also included 10 draft study plans that described a subset of the Districts' proposed relicensing studies. The Districts then convened a series of Resource Work Group meetings, engaging agencies and other relicensing participants in a collaborative study plan development process culminating in the Districts' Proposed Study Plan (PSP) and Revised Study Plan (RSP) filings with FERC on July 25, 2011 and November 22, 2011, respectively.

On December 22, 2011, FERC issued its Study Plan Determination (SPD) approving, or approving with modifications, 34 studies proposed in the RSP, which included 10 studies addressing terrestrial resources. Following the SPD, a total of seven studies (and associated study elements) that were either not adopted in the SPD, or were adopted with modifications, formed the basis of Study Dispute proceedings. In accordance with the ILP, FERC convened a Dispute Resolution Panel on April 17, 2012, and the Panel issued its findings on May 4, 2012. On May 24, 2012, FERC issued its Formal Study Dispute Determination, with additional clarifications related to the Formal Study Dispute Determination issued on August 17, 2012. Studies were implemented in a manner consistent with this determination.

On January 17, 2013, the Districts filed their Initial Study Report (ISR); included in the ISR was the Districts' NOI to file a Draft License Application (DLA) rather than a Preliminary Licensing Proposal under the ILP. The Districts held the ISR meeting with relicensing participants on January 30 and 31, 2013 in Modesto, California. On February 8, 2013, the Districts filed an ISR meeting summary.

Following the ISR meeting, relicensing participants filed requests for new studies and study modifications. The Districts responded to these comments on April 9, 2013 and agreed to a new computer model and three new studies. On May 21, 2013, FERC issued its Determination on Requests for Study Modifications and New Studies. The determination approved five study modifications and five new studies or study elements. On January 6, 2014, the Districts filed an Updated Study Report (USR), including revised drafts of five study reports, 11 new study reports for studies in progress at the time of the ISR, and progress reports for five studies still underway at the time of the USR. On January 16, 2014, the Districts held a USR meeting in Modesto, and on January 27, 2014 the Districts filed a USR meeting summary.

2.0 DESCRIPTION OF PROPOSED ACTION

2.1 Proposed Action

FERC is the federal agency authorized to issue licenses for the construction, operation, and maintenance of the nation's non-federal hydroelectric facilities. In accordance with the Federal Power Act (FPA), FERC is able to issue such licenses for a period not less than 30 years, but no more than 50 years. Upon expiration of an existing license, FERC must decide whether, and under what terms, to issue a new license. Under the FPA, FERC issues licenses that are best adapted to a comprehensive plan for improving or developing a waterway, and in so doing, must consider a suite of beneficial public uses including, among others, water supply, flood control, irrigation, and fish and wildlife. As the federal "action agency," FERC must also comply with the requirements of NEPA, under which FERC must clearly define the specific proposed action it is considering and define the purpose and need for the Proposed Action.

In the case of the Don Pedro Hydroelectric Project, the Proposed Action under review by FERC is the issuance of a new license to the Districts to authorize the continued generation of hydroelectric power at Don Pedro Dam, along with resource enhancement measures proposed by the Districts (enhancements are described below in Section 2.1.1 of this Draft BA). As such, and as generally described in FERC's Scoping Document 2 (SD2) issued on July 25, 2011, any alternatives to mitigate the Project's effects must be reasonably related to the purpose and need for the Proposed Action. In this case, the Proposed Action is whether, and under what terms, to authorize the continuation of hydroelectric power generation at the Don Pedro Hydroelectric Project.

Flow releases through the powerhouse from Don Pedro Reservoir are scheduled based on requirements for (1) coordinated flood flow management, including pre-releases in advance of anticipated high flows during wet years, (2) the Districts' irrigation and M&I demands, including flows to maintain water storage in Turlock Lake and Modesto Reservoir, and (3) protection of aquatic resources in the lower Tuolumne River in accordance with the terms of the current FERC license. Once the weekly and daily flow schedules are established based on these demands, outflows from the Don Pedro powerhouse are scheduled to deliver these flows. During periods of greater electrical demand, outflows may be shaped to generate more electricity during on-peak periods and less during off-peak periods, subject to meeting the requirements of the pre-established flow schedule and the physical constraints of the Districts' irrigation-related infrastructures. Hydroelectric power generation is a secondary consideration with respect to flow scheduling, and has no influence on flows in the lower Tuolumne River below La Grange Diversion Dam and no measurable effect on water surface elevations in Don Pedro Reservoir.

Issuance of a new FERC license will allow the Districts to continue generating electricity at the Don Pedro Project for the term of the new FERC license, thereby helping to meet the Districts' energy needs by producing low-cost electric power from a non-polluting, renewable resource. The average annual generation by the Project from 1997 to 2012 was approximately 622 million kilowatt hours (kWh) of electricity.

Clean, renewable hydroelectric power generated by the Project constitutes a valuable benefit to the Districts, the Central Valley region, and the State of California. The California Energy Commission (CEC) issued an Updated California Energy Demand Forecast 2011–2022 in May 2011. The report presented an update to the 2009 California Energy Demand electricity forecast adopted for the 2009 Integrated Energy Policy Report in December 2009. The updated forecast was meant to provide the CEC's best estimate of the effect of economic conditions on energy demand since the 2009 forecast was published. Average annual growth rates for consumption for 2010–2022 under low, mid, and high forecast scenarios are estimated to be 1.13 percent, 1.28 percent, and 1.53 percent, respectively (CEC 2011), and sources of clean, reliable energy like that generated at Don Pedro will be an important component to meet demand.

2.1.1 Proposed Resource Enhancements

The Districts have developed a comprehensive Vegetation Management Plan, a draft of which is included in the final license application (FLA). The Vegetation Management Plan incorporates measures to manage special status species occurrences within the Project Boundary, including control of noxious weeds, protection of special status plants, and protection of VELB host plants. In addition, the Districts propose to follow USFWS Conservation Guidelines pertaining to the valley elderberry longhorn beetle for the management of elderberry (USFWS 1999) (Attachment A).

2.2 Interrelated and Interdependent Actions

Interrelated actions are actions that are part of a larger action and depend on the larger action for their justification (50 CFR § 402.02), whereas interdependent actions are actions with no independent utility apart from a proposed action (50 CFR § 402.02). If a private activity would not occur were it not for the occurrence of a proposed action, the effects of that private activity are interdependent and interrelated with the proposed action, and the effects of the private activity are considered attributable to the proposed action for ESA consultation purposes.

In contrast, actions that would occur with or without the occurrence of a proposed action are not interdependent or interrelated with the proposed action. The USFWS and the National Marine Fisheries Service (NMFS) (1998) state that if a project would exist independent of a proposed action, it cannot be considered "interrelated" or "interdependent" and included in the effects assessment of the proposed action.

As noted above, the Proposed Action being considered by FERC based on the Districts' FLA is the issuance of a new FERC license for the continuation of hydroelectric power generation at the Don Pedro Hydroelectric Project. Water storage and releases to satisfy the Don Pedro Project's primary purposes of irrigation, M&I uses, including the CCSF's water bank, and flood control in cooperation with the US Army Corps of Engineers (ACOE), are not dependent on the issuance of a new FERC license for the Project, and would occur with or without the licensing of the Proposed Action. As such, these uses are *not* interrelated or interdependent with the issuance of a FERC license for hydroelectric power generation. Thus, their potential effects are not addressed as part of the Proposed Action in this Draft BA.

2.3 Action Area

Section 7 of the ESA requires the identification of an "Action Area" for use in determining the environmental baseline for a given resource and evaluating the potential effects of an action on that resource. The Action Area is defined as the area potentially affected by the direct[1] and indirect[2] effects of a proposed action (50 CFR § 402.02; USFWS and NMFS 1998). To evaluate the potential effects of the Proposed Action on the species addressed in this Draft BA (species identified and described in subsequent sections), the Action Area consists of lands within the existing FERC Project Boundary.

[1] Direct effect: the direct or immediate effects of the project on the species or its habitat (Final ESA § 7 Handbook at 4-25).
[2] Indirect effects: those effects that are caused by or will result from the proposed action and are later in time, but are still reasonably certain to occur. [50 CFR § 402.02].

3.0 SPECIES ADDRESSED IN THIS DRAFT BA

3.1 ESA Species Potentially Occurring in the Action Area

Threatened and Endangered species investigations began by identifying any terrestrial ESA-listed species with the potential to occur in the vicinity of the Project Boundary. A list of ESA-listed species for the 7.5-minute USGS topographic quadrangles (Chinese Camp, La Grange, Moccasin, Peñon Blanco Peak, Sonora, and Standard), which include lands within the Project Boundary, was generated via the online request service available at the USFWS's website (USFWS 2013). Fourteen terrestrial species with the potential to occur in the vicinity of the Project Boundary were identified, four listed as Endangered and 10 listed as Threatened[3]:

- Endangered:
  - Hartweg's golden sunburst (*Pseudobahia bahiifolia*),
  - Hairy Orcutt grass (*Orcuttia pilosa*),
  - Greene's tuctoria (*Tuctoria greenei*), and
  - San Joaquin kit fox (*Vulpes macrotis mutica*).
- Threatened:
  - Succulent owl's-clover (*Castilleja campestris* ssp. *succulenta*),
  - Hoover's spurge (*Chamaesyce hooveri*),
  - Colusa grass (*Neostapfia colusana*),
  - Chinese Camp brodiaea (*Brodiaea pallida*),
  - Layne's ragwort (*Packera layneae*),
  - California vervain (*Verbena californica*),
  - Valley elderberry longhorn beetle (VELB) (*Desmocerus californicus dimorphus*),
  - Vernal pool fairy shrimp (*Branchinecta lynchi*),
  - California tiger salamander (CTS), Central Valley Distinct Population Segment (DPS); *Ambystoma californiense*), and
  - California red-legged frog (CRLF) (*Rana draytonii*)

The species list presented above was refined during the study plan development process to include seven species that could actually be present in or near the Action Area. The Districts conducted terrestrial resource studies in 2012, which included surveys of lands within the Project Boundary, all Don Pedro Project facilities, and developed and dispersed recreation areas. These efforts documented the presence of two threatened plant species within the Action

[3] The Central Valley steelhead DPS is listed as threatened under the ESA (71 FR 834 [2006]), and is addressed in a separate BA.

Area: Layne's ragwort and California vervain, both known from five occurrences (a distinct geographic grouping of plants) (CDFG 2012). Based on species list inquiries and species habitat requirements, five ESA-listed wildlife species have the potential to occur in the Action Area.

3.2 Species Removed from Consideration

In addition to the 14 ESA-listed species initially considered by the Districts (see previous section), FERC's SD2 identified the following ESA-listed wildlife species to be addressed in FERC's environmental analysis for the Project:

- Riparian brush rabbit (*Sylvilagus bachmani riparius*),
- Riparian wood rat (*Neotoma fuscipes riparia*),
- Least Bell's vireo (*Vireo bellii pusillus*), and
- Conservancy fairy shrimp (*Branchinecta conservatio*).

However, these species and their critical habitats (when designated) have not been reported to occur within five miles of the Project Boundary, nor within Tuolumne County (CDFW 2013). As a result, these species were removed from further consideration. Habitat within the Action Area does not appear to be suitable for any of these species. The closest designated critical habitat for Conservancy fairy shrimp is over 10 miles from the Project Boundary, and no vernal pool habitats, which are required by Conservancy fairy shrimp (typically large or "playa" pools), were found during extensive field studies within the Action Area (Eng et. al 1990). Riparian brush rabbit, riparian wood rat, and least Bell's vireo each require riparian shrub habitats; field studies documented that these habitats are uncommon within the Action Area.

3.3 Designated Critical Habitat within the Action Area

Critical habitat for California red-legged frog was designated on March 13, 2001 (66 FR 14626), with additional critical habitat designated on April 13, 2006 (71 FR 19244), and revised on March 17, 2010 (75 FR 12816). No lands designated as critical habitat are located within the Action Area.

Critical habitat was designated for the Central Population DPS of California tiger salamander on August 23, 2005, (70 FR 79380), including an area approximately one mile southwest of the Action Area in Stanislaus County. No lands designated as critical habitat are located in the Action Area.

Critical habitat for valley elderberry longhorn beetle was designated on August 8, 1980 (45 FR 52803 52807). No lands designated as critical habitat are located in the Action Area.

Critical habitat for vernal pool fairy shrimp, along with other vernal pool species, was originally designated in a final rule on August 6, 2003. A revised final rule for critical habitat, with unit designations by species, was published on February 10, 2006, with 35 critical habitat units for vernal pool fairy shrimp totaling 597,821 acres (ac) (USFWS 2006a). Of these, critical habitat

unit VERFS21B is the closest to the Action Area, at approximately 2.6 miles from the edge of the Project Boundary.

No critical habitat has been designated for San Joaquin kit fox, Layne's ragwort or California vervain.

4.0 SPECIES ACCOUNTS AND ENVIRONMENTAL BASELINE

4.1 Layne's Ragwort

On October 18, 1996, the USFWS listed Layne's ragwort as threatened under the federal ESA (61 FR54346). A 5-year review was initiated by USFWS for this species in March 2009 (USFWS 2012a). The USFWS has issued a Recovery Plan for Gabbro Soil Plants of the Central Sierra Nevada, which included Layne's ragwort (USFWS 2002a).

4.1.1 Habitat Requirements

Layne's ragwort is a perennial herb that grows within dry pine or oak woodlands (USFWS 2012b) in open, disturbed rocky areas on gabbro and serpentine soils between 660 ft and 3,280 ft in elevation (Baldwin 2012; CNPS 2012). The species can occasionally be found along streams as well (CDFG 2012).

4.1.2 Environmental Baseline in the Action Area

This plant has been historically documented within the Chinese Camp and Moccasin quads (CNPS 2012). Botanical surveys in the Action Area were performed as part of relicensing studies on approximately 3,870 ac between March 5 and June 29, 2012. Surveys were carried out by qualified botanists on foot and by boat, and survey times coincided with blooming periods. Resurveys were conducted at areas and features where potential ESA-listed plant species or plant communities were not at the correct phonological stage for proper identification during the earlier bloom period, particularly in areas containing late blooming species.

Surveys were floristic in nature and generally followed CDFG's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009). Plants were identified using the (1) *Jepson Manual of Higher Plants of California* (Baldwin ed. 2012), (2) *A field guide to Pacific States wildflowers: Field marks of species found in Washington, Oregon, California, and adjacent areas: a visual approach arranged by color, form, and detail* (Niehaus and Ripper 1976), (3) *Trees and shrubs of California* (Stuart and Sawyer, 2001), (4) *Wildflowers of the Sierra Nevada and the Central Valley* (Blackwell 1999), (5) *Field Guide to the Sedges of the Pacific Northwest* (Wilson et. al 2008), and (6) *Selected Plants of Northern California and Adjacent Nevada* (Oswald 2002). As detailed in the FERC-approved study plan, surveys were conducted using a random meander technique, with additional focus on high quality habitat or areas with a higher probability of supporting ESA-listed plants.

Twenty-five occurrences of Layne's ragwort were recorded within or adjacent to the Action Area during botanical surveys. Occurrences of Layne's ragwort within the Action Area are summarized in Table 4.1-1. Occurrences ranged from five to 250 plants, with a total estimated area of 2.9 ac. The majority of Layne's ragwort was located in gray pine (*Pinus sabiniana*) woodlands, with wedgeleaf ceanothus (*Ceanothus cuneatus*), toyon (*Heteromeles arbutifolia*), chamise (*Adenostoma fasciculatum*), and common manazanita (*Arctostaphylos manzanita*) as common subdominants. Four of the occurrences were in chaparral, dominated by wedgeleaf

ceanothus, hollyleaf redberry (*Rhamnus ilicifolia*), and toyon. Special-status plants commonly co-occurred with Layne's ragwort, including Red Hills onion (*Allium tuolumnense*), Red Hills soaproot (*Chlorogalum grandiflorum*), tripod buckwheat (*Eriogonum tripodum*), Congdon's lomatium (*Lomatium congdonii*), and shaggy-haired lupine (*Lupinus spectabilis*).

The California Native Plant Society (CNPS) reports rapid urbanization as the primary threat to Layne's ragwort. In addition, clearing, grazing, road construction, and fire suppression threaten the species (CNPS 2012). Observed potential stressors to Layne's Ragwort within the Action Area include cattle grazing at all occurrences, recreation activities (i.e., trampling) at three occurrences, and noxious weeds at one occurrence. All occurrences were located within Sixbit and Poor Man's gulches, which both have evidence of cattle grazing. Three Layne's ragwort occurrences were recorded at Kanaka Point, near a day-use area off of Jacksonville Road. There are multiple footpaths throughout the area, including one within a few feet of two occurrences. Additionally, distaff thistle (*Carthamus creticus*) was observed within 250 ft of a Layne's ragwort occurrence. Distaff thistle is a noxious weed that spreads quickly and can form dense stands that displace native plants (DiTomaso and Healy 2007).

Table 4.1-1. Layne's ragwort occurrences located within the Action Area.

Occurrence Number	Land Ownership	Site Name	Phenology	Approximate Area (acre)	Estimated Plant Count	Existing CNDDB record?	Occurrence Data
91	BLM (Red Hills ACEC)	Kanaka Point	100% Vegetative	0.012	150-200	No	Found within mixed foothill woodland on island hillslope and below rock outcrop. Other plants at the site include Red Hills onion (*Allium tuolumnense*), serpentine bluecups (*Githopsis pulchella* ssp. *serpentinicola*), Coyote mint (*Monardella sheltonii*), and Mariposa clarkia (*Clarkia biloba* ssp. *australis*). Potential stressors include the presence of the weed species distaff thistle (*Carthamus creticus*) within the general vicinity; the area is potentially subject to trampling by recreationists on footpaths throughout area.
609	BLM (Red Hills ACEC)	Poor Man's Gulch	80% Vegetative, 20% Flowering	0.1	25-50	No	Located within Foothill pine woodland; other plants at the site include serpentine bluecups, buck brush (*Ceanothus cuneatus*), chamise (*Adenostoma fasciculatum*), and gold back fern (*Pentagramma triangularis*).
610	BLM (Red Hills ACEC)	Poor Man's Gulch	30% Vegetative, 70% Flowering	0.1	10-25	No	Found in small grassy opening within shrubland dominated by buck brush, toyon (*Heteromeles arbutifolia*), holyleaf redberry (*Rhamnus Ilicifolia*), and manzanita (*Arctostaphylos* sp.). Potential stressors include grazing, recreation, and noxious weeds. Noxious weeds in the area include barbed goatgrass (*Aegilops triuncialis*) and Bermudagrass (*Cynodon dactylon*).
613	BLM (Red Hills ACEC)	Poor Man's Gulch	10% Vegetative, 90% Flowering	0.006	5-10	No	Located within an open understory in foothill pine woodland. Other plants at the site include serpentine bluecups, buck brush, toyon, holyleaf redberry, purple sanicle (*Sanicula bipinnatifida*), and chaparral false bindweed (*Calystegia occidentalis*). A potential stressor to the occurrence is grazing.

Occurrence Number	Land Ownership	Site Name	Phenology	Approximate Area (acre)	Estimated Plant Count	Existing CNDDB record?	Occurrence Data
614	BLM (Red Hills ACEC)	Poor Man's Gulch	40% Vegetative, 60% Flowering	0.1	50-100	No	Found in small grassy opening within foothill pine woodland. Other plants at the site include serpentine bluecups, buck brush, holyleaf redberry, toyon, and chamise. A potential stressor to the occurrence is grazing.
615	BLM (Red Hills ACEC)	Poor Man's Gulch	30% Vegetative, 70% Flowering	0.022	25-50	No	Found in small grassy opening within foothill pine woodland. Other plants located at the site include serpentine bluecups, buck brush, holyleaf redberry, toyon, purple sanicle, and chamise. A potential stressor to the occurrence is grazing.
616	BLM (Red Hills ACEC)	Poor Man's Gulch	30% Vegetative, 70% Flowering	0.5	100-250	No	Found on rocky ground within foothill pine woodland. Other plants at the site include serpentine bluecups, buck brush, holyleaf redberry, toyon, purple sanicle, California melicgrass (*Melica californica*), and snakelily (*Dichelostemma multiflorum*). A potential stressor to the occurrence is grazing.
618	BLM (Red Hills ACEC)	Poor Man's Gulch	60% Vegetative, 40% Flowering	0.1	25-50	No	Located within foothill pine woodland. Other plants at the site include serpentine bluecups, Red Hills onion, buck brush, and toyon. A potential stressor to the occurrence is grazing.
619	BLM (Red Hills ACEC)	Poor Man's Gulch	80% Vegetative, 20% Flowering	0.1	25-50	No	Located within foothill pine woodland with scattered shrubs. Other plants at the site include serpenting bluecups, buck brush, chamise, holyleaf redberry, California melicgrass, and snakelily. A potential stressor to the occurrence is grazing.
621	BLM (Red Hills ACEC)	Poor Man's Gulch	100% Vegetative	0.022	5-25	No	Found on rocky ground within foothill pine woodland. Other plants at the site include serpentine bluecups, Red Hills onion, buck brush, Chamise, holyleaf redberry, and snakelily. Potential stressors include grazing, recreation, and noxious weeds. An equestrian trail runs near the occurrence. Noxious weeds found in the area include barbed goatgrass and

Occurrence Number	Land Ownership	Site Name	Phenology	Approximate Area (acre)	Estimated Plant Count	Existing CNDDB record?	Occurrence Data
							Bermudagrass.
624	BLM (Red Hills ACEC)	Poor Man's Gulch	60% Vegetative, 40% Flowering	0.046	50-100	No	Located within small opening in foothill pine woodland. Other plants at the site include Red Hills soaproot (*Chlorogalum grandiflorum*), Congdon's lomatium (*Lomatium congdonii*), toyon, holyleaf redberry, purple sanicle, and California melicgrass. Potential stressors include grazing, recreation and noxious weeds Noxious weeds found in the area include barbed goatgrass and Bermudagrass.
631	BLM (Red Hills ACEC)	Poor Man's Gulch	40% Vegetative, 60% Flowering	0.1	50-100	No	Located on rocky understory in foothill pine woodland. Other plants at the site include serpentine bluecups, Red Hills soaproot, purple sanicle, holyleaf readberry, toyon, and California melicgrass Potential stressors include grazing, recreation, and noxious weeds. Noxious weeds found in the area include barbed goatgrass and Bermudagrass.
632	BLM (Red Hills ACEC)	Poor Man's Gulch	60% Vegetative, 40% Flowering	0.1	25-50	No	Located within small opening in foothill pine woodland. Other plants at the site include serpentine bluecups, Red Hills soaproot, buck brush, holyleaf redberry, California melicgrass, and snakelily; Potential stressors include grazing, recreation, and noxious weeds. Noxious weeds found in the area include barbed goatgrass and Bermudagrass.
636	BLM (Red Hills ACEC)	Six Bit Gulch	70% Vegetative, 30% Flowering	1.0	100-250	No	Located within foothill pine woodland; other plants at the site include shaggyhair lupine (*Lupinus spectabilis*), snakelily, buckbrush, purple sanicle, and spicebush (*Calycanthus occidentalis*). Potential stressors include grazing, recreation, and noxious weeds. Barbed goatgrass occurs in the immediate vicinity of this occurrence.

Occurrence Number	Land Ownership	Site Name	Phenology	Approximate Area (acre)	Estimated Plant Count	Existing CNDDB record?	Occurrence Data
638	BLM (Red Hills ACEC)	Six Bit Gulch	60% Vegetative, 40% Flowering	0.022	10-25	No	Located within foothill pine woodland.. Other plants at the site include shaggyhair lupine, Red Hills soaproot, Congdon's lomatium, buck brush, squirrel tail grass (*Elymus elymoides*), and Indian paintbrush (*Castilleja appegatei*). Potential stressors include grazing, recreation, and noxious weeds.
641	BLM (Red Hills ACEC)	Six Bit Gulch	60% Vegetative, 40% Flowering	0.005	100	No	Located within foothill pine woodland. Other plants at the site include shaggyhair lupine, Red Hills soaproot, Congdon's lomatium, Red Hills onion, buck brush, California melicgrass, purple sanicle, and snakelily. Potential stressors include grazing, recreation, and noxious weeds.
647	BLM (Red Hills ACEC)	Six Bit Gulch	80% Vegetative, 20% Flowering	0.069	150	No	Located within foothill pine woodland. Other plants at the site include shaggyhair lupine, Red Hills soaproot, Congdon's lomatium, California melicgrass, holyleaf redberry, and purple sanicle. No potential stressors were identified.
654	BLM (Red Hills ACEC)	Six Bit Gulch	90% Vegetative, 10% Flowering	0.022	75	No	Found on the upperslope of serpentine/ultramafic soils. Other plants at the site include serpentine bluecups, shaggyhair lupine, Red Hills soaproot, Red Hills onion, Congdon's lomatium, tripod buckwheat (*Eriogonum tripodum*), buck brush, snakelily, purple sanicle, and California melicgrass. Potential stressors include grazing, recreation, and noxious weeds.
656	BLM (Red Hills ACEC)	Six Bit Gulch	50% Vegetative, 50% Flowering	0.064	100	No	Found on the upperslope of serpentine/ultramafic soils. Other plants at the site include serpentine bluecups, shaggyhair lupine, Red Hills soaproot, Red Hills onion, Congdon's lomatium, tripod buckwheat, snakelily, buck brush, and purple sanicle. The potential stressor on this occurrence is

Occurrence Number	Land Ownership	Site Name	Phenology	Approximate Area (acre)	Estimated Plant Count	Existing CNDDB record?	Occurrence Data
							recreation.
659	BLM (Red Hills ACEC)	Six Bit Gulch	50% Vegetative, 50% Flowering	0.172	60	No	Found on the upperslope of serpentine/ultramafic soils. Other plants at the site include serpentine bluecups, shaggyhair lupine, Red Hills soaproot, Red Hills onion, Congdon's lomatium, tripod buckwheat, and snakelily. The potential stressor on this occurrence is water-based recreation.
672	BLM (Red Hills ACEC)	Six Bit Gulch	90% Vegetative, 10% Flowering	0.002	10	Yes	Found within foothill pine woodland on serpentine soil. Other plants at the site include Mariposa cryptantha (*Cryptantha mariposae*), serpentine bluecups, Red Hills onion, Congdon's lomatium, snakelily, California melicgrass, and holyleaf redberry. The potential stressor on this occurrence is recreation.
675	BLM (Red Hills ACEC)	Six Bit Gulch	10% Vegetative, 90% Flowering	0.002	10	No	Found on serpentine/ultramafic soils. Other plants at the site include serpentine bluecups, Red Hills soaproot, Red Hills onion, Congdon's lomatium, Mariposa cryptantha, buck brush, snakelily, and California melicgrass. The potential stressor on this occurrence is recreation.
677	BLM (Red Hills ACEC)	Kanaka Point	100% Vegetative	0.002	55	No	Found within foothill pine woodland. Other plants at the site include Red Hills onion, toyon, and purple sanicle. Potential stressors to the occurrence include trampling by recreators due to footpaths throughout area, and the presence of the noxious weed distaff thistle, which occurs within the general vicinity.

Occurrence Number	Land Ownership	Site Name	Phenology	Approximate Area (acre)	Estimated Plant Count	Existing CNDDB record?	Occurrence Data
679	BLM (Red Hills ACEC)	Kanaka Point	99% Vegetative, 1% Flowering	0.008	40	No	Found within foothill pine woodland. Other plants at the site include Mariposa cryptantha, serpentine bluecups, toyon, California melicgrass, coyote mint, and soft brome (*Bromus hordeaceus*). Potential stressors include trampling by recreators due to footpaths throughout area and the noxious weed, distaff thistle, which occurs within the general vicinity.
693	BLM (Red Hills ACEC)	Poor Man's Gulch	5% Vegetative, 95% Flowering	0.0005	5	No	Found within in gray pine (*Pinus sabiniana*) dominated foothill woodland. Other plants at the site include buckbrush, spicebush, snakelily, California melicgrass and gold back fernPotential stressors on this occurrence include water-based recreation and the noxious weed, Bermudagrass, which was observed nearby.

4.2 California Vervain

On September 14, 1998, the USFWS listed California vervain as threatened under the federal ESA (Federal Register 63:49002). In December 2007, a five-year review of the species by the USFWS recommended no change in designation (USFWS 2012b). USFWS is currently developing a Recovery Plan for California vervain.

4.2.1 Habitat Requirements

California vervain is only known to grow in the Red Hills of California (CNPS 2012). The species is a perennial herb that is only found along intermittent or small, perennial streams (CDFG 2005), usually within serpentinite, cismontane woodlands in valley and foothill grasslands between 853 ft and 1,312 ft in elevation. It is occasionally found in non-wetland areas (Calflora 2012).

4.2.2 Environmental Baseline in the Action Area

California vervain has been historically documented within the Chinese Camp and Sonora quads, as well as the surrounding Keystone quad (CNPS 2012). Botanical surveys for California vervain were performed in the Action Area as part of the larger botanical survey effort described in Section 4.1. During these surveys, two occurrences of California vervain were documented in the Action Area: one in Poor Man's Gulch and one in Six Bit Gulch. Both occur on public lands administered by the BLM within the Red Hills ACEC. In Poor Man's Gulch, the occurrence consisted of over 200 individuals occupying approximately 0.2 ac. The occurrence in Six Bit Gulch consisted of two individuals occupying approximately 4 ft^2. Both were located within riparian zones dominated by arroyo willow (*Salix lasiolepis*), sedges (*Carex sp.*), white broadiaea (*Triteleia hycinthina*), and baltic rush (*Juncus balticus*). Occurrences of California vervain within the Action Area are summarized in Table 4.2-1.

Observed potential stressors included cattle grazing and recreation near one California vervain occurrence, and noxious weeds (barbed goatgrass [*Aegilops triuncialis*]) near both occurrences. The USFWS reports that threats to California vervain include recreational activities such as gold mining, mountain biking, and hiking. In addition, hydrologic changes resulting from residential developments and mining activities also affect the species (USFWS 2012b).

Table 4.2-1. California vervain occurrences located within the Action Area.

Occurrence Number	Ownership	Site Name	Phenology	Approximate Area (acre)	Plant Count	Existing CNDDB record?	Occurrence Data
700	BLM (Red Hills ACEC)	Poor Man's Gulch	75% Vegetative, 25% Flowering	0.2	200	No	Found in riparian wetland; other plants at the site include Pacific willow (*Salix lasiandra*), *Carex* spp., white hedge nettle (*Stachys albens*), panicgrass (*Panicum* sp.), rabbitsfoot grass

Occurrence Number	Ownership	Site Name	Phenology	Approximate Area (acre)	Plant Count	Existing CNDDB record?	Occurrence Data
							(*Polypogon* sp.), and milkweed (Asclepias sp.); Potential stressors include grazing, noxious weeds, and recreation. Barbed goatgrass was observed nearby.
702	BLM (Red Hills ACEC)	Six Bit Gulch	100% Vegetative	0.00009	2	No	Found within willow dominated riparian wetland. Other plants at the site include Pacific willow, spicebush, *Carex* spp., panicgrass, and meadow barley (*Horedum brachyantherum*). Potential stressors include grazing and noxious weeds. Barbed goatgrass was observed in immediate vicinity.

4.3 California Red-Legged Frog

On May 23, 1996, the USFWS listed the CRLF as Threatened throughout its range under the ESA (61 FR 25813 25833). The final CRLF Recovery Plan was issued on September 12, 2002 (67 FR 57830). No occurrences of CRLF have been recorded within five miles of the Action Area since 1984, and USFWS's Recovery Plan for the species lists CRLF as extirpated from the Tuolumne River watershed (USFWS 2002b).

4.3.1 Life History and Habitat Requirements

Depending on elevation and climate, CRLF may breed from late November to late April. Egg masses are attached to emergent vegetation such as cattails or bulrush in natural ponds, stock ponds, marshes, or in deep pools and stream backwaters. Larvae typically metamorphose between July and September (Jennings and Hayes 1994).

Adult dispersal outside the breeding season may be directed upstream, downstream, or upslope of breeding habitat, and may be associated with foraging and pursuit of hiding cover or aestivation habitat. Telemetry and other detection methods indicate that CRLF use small-mammal burrows, leaf litter, and other moist sites as much as 200 ft from riparian areas (Jennings and Hayes 1994; USFWS 2006b). Long-distance dispersal has been documented at distances of up to one mile and probably occurs only during wet periods (USFWS 2006b).

CRLF are primarily associated with perennial ponds or pools and perennial or seasonal streams where water remains for a minimum of 20 weeks beginning in the spring (i.e., sufficiently long

for breeding to occur and larvae to complete development) (Jennings and Hayes 1994; USFWS 2006b). Locations with the highest densities of CRLF have dense emergent or shoreline riparian vegetation closely associated with moderately deep (greater than 2.3 ft), still, or slow-moving water. Vegetation that provides the most suitable habitat consists of willows, cattails, and bulrushes at or close to the water level, which shade a substantial area of the water (Hayes and Jennings 1988). Another factor correlated with CRLF occurrence is the absence or near-absence of introduced predators such as American bullfrog and predatory fish, particularly freshwater sunfishes–which feed on the larvae at higher rates than native predatory species (Hayes and Jennings 1988)–and mosquitofish. Hiding cover used to avoid predators may consist of emergent vegetation, undercut banks, and semi-submerged root wads (USFWS 2005). Some habitats that are not suitable for breeding (e.g., shallow or short-seasonal wetlands, pools in intermittent streams, seeps, and springs) may constitute habitats for aestivation, shelter, foraging, predator avoidance, and juvenile dispersal.

4.3.2 Environmental Baseline in the Action Area

No occurrences of CRLF have been documented within the Action Area. Known historical and current CRLF occurrences near the Action Area are summarized in Table 4.3-1. There are five known historical occurrences of CRLF within 10 miles of the Don Pedro Project (Basey 2010; Jennings 2010; CDFG 2012; Fellers 2010), two of these within one mile of the Action Area, on Piney Creek prior to 1984. Piney Creek is a tributary to Lake McClure, located east of Don Pedro Reservoir. At these locations CRLF occurred in a ravine with a deep pool upstream of Highway 132 (Basey 2010) and at another pool farther upstream (USFWS 2010; Jennings 2010). American bullfrogs were found in two other pools on Piney Creek at the time of the CRLF observations. CRLF in Piney Creek are generally presumed to be extirpated, based on field investigations conducted by the USFWS (2002c). There are no recent or extant occurrences of CRLF near the Action Area. The nearest extant occurrence is 29 miles northwest of the Project within Critical Habitat Unit CAL-1 in Calaveras County (CAS 2012).

Table 4.3-1. Recorded occurrences of CRLF in Tuolumne, Mariposa, Merced, and Stanislaus counties.

Occurrence[1]	Distance from the Project and Status of the Occurrence
Piney Creek upstream of Highway 132, Mariposa Co. (3 adults, 1972-1984[2])	1.0 mile E of Don Pedro Reservoir. Presumed extirpated [4].
Piney Creek at Gusano Way, Mariposa Co. (unknown number of individuals, 1972 and 1974[3])	1.1 miles E of Don Pedro Reservoir. Presumed extirpated[4].
Woods Creek, near Columbia and Sonora, Tuolumne Co. (4 adults or juveniles, 1950 collection[4])	8.5 miles NW of Don Pedro Reservoir. Population in a nonspecific area, possibly extirpated[4].
Maxwell Creek near Coulterville, Mariposa Co. (1 tadpole, 1992[5])	8.3 miles E of Don Pedro Reservoir. Presumed extirpated [4].
Parrotts Ferry Road, near Columbia, Tuolumne Co. (1 adult or juvenile, 1975 collection[4])	9.7 miles N of Don Pedro Reservoir. Occurrence "presumed extant" by CNDDB[4]; however no wildlife professionals consulted could confirm the accuracy of the record or its status if accurate.

Occurrence[1]	Distance from the Project and Status of the Occurrence
Snelling, Merced Co. (adult or juvenile, 1915 collection[6])	12.5 miles S of Don Pedro Reservoir. Presumed extirpated [4].
"Merced River Bridge, Highway Crossing," Merced Co. (1 adult or juvenile, 1922 collection[7])	Unknown distance. Presumed extirpated [4].
Jordan Creek, 2 miles N of Greeley Hill Rd., Tuolumne Co. (1 adult female, 1967[3])	14.4 miles E of Don Pedro Reservoir. Presumed extirpated [4].
Mather, near Tuolumne River, Tuolumne Co. (1 unknown life stage, 1922 collection[4])	22.4 miles E of Don Pedro Reservoir. Population considered possibly extirpated[4].
Swamp Lake, near Miguel Meadow, Tuolumne Co. (1 unknown life stage, 1940 collection[4])	23.9 miles E of Don Pedro Reservoir. Population considered possibly extirpated [4].

[1] Records and critical habitat units in western Stanislaus County and Merced County are not included due to distance from the Project area (greater than 30 miles).
Sources: [2]H.E. Basey, pers. comm., 2010; [3]Dr. M.R. Jennings, pers. comm., 2010; [4]CNDDB (CDFG 2012); [5]Dr. G.M. Fellers, USGS, pers. comm., 2010; [6]MVZ 2012; [7]CAS 2012.

Site assessments and habitat characterizations were performed for CRLF in the vicinity of the Project Boundary, including a review of historical data, identification of potential habitats using aerial photography and National Wetlands Inventory digital maps (USFWS 1987), and site evaluations. Ponds and streams within the vicinity of the Project Boundary are located in a mix of oak pastureland and pine savannah with shrubs, grasses, and forbs adjacent to the aquatic habitat. The study locations varied from large streams with substantial overhanging vegetation to agricultural or water treatment ponds with no cover and limited vegetation. The diversity of study locations was representative of the Don Pedro Project area as a whole. As specified in the FERC-approved CRLF study plan, the study area for this effort consisted of all suitable aquatic habitats within the Action Area and lands within one mile of the Project Boundary, consistent with USFWS requirements.

Initial assessment using aerial photography and National Wetlands Inventory digital maps determined that a total of 211 locations within the study area met the minimum criterion of 20 weeks of standing or slow-moving water during the CRLF breeding season. Many of the aerially assessed sites that met the 20-week criterion had some emergent and overhanging vegetation, but while these sites were located within the study area, they were not located within the Action Area, and were classified as marginal habitat due to the type of habitat (e.g., human-made agricultural ponds) and the presence of bullfrogs. Table 4.3-2 provides a summary of all sites assessed for CRLF habitat within one mile of the Action Area.

Table 4.3-2. Summary of sites assessed for CRLF habitat.

Aquatic Habitat Type	Number of Aquatic Habitat Locations	Number of Locations that Meet 20-Week Criterion[1]	Land Ownership[3]		
			MID/TID	BLM	Private/ Other
Within the Action Area					
Streams and Pools in Streams	53	27 (*3*)	44[2]	7[2]	8[2]
Natural Ponds	1	4(*1*)	7[2]	4	2[2]
Stock/Irrigation/ Detention Pond	7	7	4	3	0
Upland/Developed	4	0	3	1	0
Other	1	1	1	0	0

Aquatic Habitat Type	Number of Aquatic Habitat Locations	Number of Locations that Meet 20-Week Criterion[1]	Land Ownership[3]		
			MID/TID	BLM	Private/ Other
Within the Action Area					
Total	**66**	**39 (*4*)**	**59[2]**	**15[2]**	**10[2]**
Within One Mile of the Action Area					
Streams and Pools in Streams	58	50	2	1	55
Natural Ponds	129	105	3[2]	2	125[2]
Stock/ Irrigation/ Detention Pond	11	9	0	1[2]	11[2]
Other Wetlands	62	6	1[2]	1[2]	62
Upland[2]/ Developed	3	2	0	0	1
Other	2	2	0	0	2
Total	**264**	**172**	**5[2]**	**5[2]**	**256[2]**
Study Area Total	**330**	**211(*4*)**	**64[2]**	**20[2]**	**266[2]**

[1] Italic numbers in parenthesis are those sites for which 20-week criterion status is unknown.
[2] Includes locations with multiple ownerships.
[3] Some sites have multiple ownerships; therefore, ownership total exceeds the number of assessed locations.

Following aerial assessment, field surveys to verify habitat characterizations and collect additional information were performed at potential breeding sites within the Action Area, and representative breeding locations on publicly accessible lands within one mile of the Action Area. Field surveys revealed that the majority of these sites provide marginal habitat due to the lack of emergent or overhanging vegetation or because of the presence of predators such as fish and bullfrogs. Of the field-assessed sites, 52 were characterized as potentially suitable CRLF breeding sites based on the minimum criterion, 10 of which were considered more favorable for CRLF breeding due to the presence of suitable vegetation and lack of predators. No CRLF were observed during this or other studies.

Potential stressors to CRLF include predators, cattle grazing, and facilities and recreational area maintenance activities. Exotic species (e.g., American bullfrogs [*Lithobates catesbeianus*], non-native crayfish, sunfish, catfish, or mosquitofish), may limit or preclude the occurrence of CRLF in otherwise suitable habitats (USFWS 2002b).

4.4 California Tiger Salamander

On August 4, 2004, the Central California DPS of CTS was listed as Threatened under the ESA (69 FR 47212).

4.4.1 Life History and Habitat Requirements

CTS breeding habitat is generally associated with shallow, seasonal (i.e., continuously flooded for a minimum of 10-12 consecutive weeks) or semi-permanent pools and ponds that fill during heavy winter rains, or in permanent ponds (Alvarez 2004a. Adult CTS spend little time at breeding sites before returning to upland habitats. CTS populations generally do not persist where fish, American bullfrog, or predacious insects are well established. Breeding occurs mainly from December through February after rains fill pools and ponds. Eggs are laid singly or in small clusters, often attached to submerged stems and leaves, and hatch in two to four

weeks. Larvae transform in about four months (Behler and King 1979) as water recedes in late spring or summer, but larvae may overwinter in permanent ponds (Alvarez 2004b). CTS may not breed at all in drought years when ponds fail to fill. CTS live in vacant or mammal-occupied burrows (e.g., California ground squirrel, *Otospermophilus beecheyi*, and valley pocket gopher, *Thomomys bottae*) (Trenham 2001), or occasionally other underground retreats, throughout most of the year in grassland, savannah, or open woodland habitats.

4.4.2 Environmental Baseline in the Action Area

There are five known historical CTS occurrences within five miles of the Action Area. The most recent of these was documented in 2007, approximately 0.4 miles from Don Pedro Reservoir (CDFW 2013). Known historical and current CTS occurrences in the vicinity of the Project Boundary are summarized in Table 4.4-1. No CTS were observed during the site assessments performed as part of 2012 surveys, nor were there any incidental sightings of CTS during other relicensing studies.

Table 4.4-1. Recorded occurrences of CTS within five miles of the Action Area.

Occurrence	Distance from the Project Boundary and Status of the Occurrence
Tuolumne Co. (3 larvae, 2007)	0.37 mi S of Don Pedro Reservoir. Presumed extant by CNDDB.
About 0.5 mi E of La Grange, Stanislaus Co. (unknown number and lifestage, 1973)	3.13 mi SW of Don Pedro Reservoir. Presumed extant by CNDDB.
Cardoza Lake, E side of Highway J-59, about 1.25 mi S of La Grange, Stanislaus Co. (1 adult, 1986)	3.98 mi SW Don Pedro Reservoir. Presumed extant by CNDDB.
About 2 mi S of La Grange, Stanislaus Co. (unknown number and lifestage, 1973)	5.00 mi SW of Don Pedro Reservoir. Presumed extant by CNDDB.
La Grange Regional Park, near Basso Bridge on the Tuolumne River, Stanislaus Co. (unknown number and lifestage, 1973)	5.06 mi SW of Don Pedro Reservoir. Presumed extant by CNDDB.

Source: CNDDB (CDFG 2012)

CTS site assessments and habitat characterizations conducted in the vicinity of the Project Boundary consisted of historical data review, identification of potential habitats using aerial photography and National Wetlands Inventory digital maps (USFWS 1987), and site evaluations. As specified in the FERC-approved study plan, the study area for this effort consisted of all suitable aquatic habitats within the Action Area and lands within 1.24 miles of the Action Area, consistent with USFWS requirements. Table 4.4-2 provides a summary of all sites assessed for CTS breeding habitat within 1.24 miles of the Action Area. Study locations varied from large streams with substantial overhanging vegetation to manmade agricultural or water treatment ponds with no cover and limited vegetation. Ponds and streams within the vicinity of the Project Boundary are located in a mix of oak pastureland and pine savannah with shrubs, grasses, and forbs adjacent to the aquatic habitat. The diversity of study locations was representative of the Don Pedro Project area as a whole. Small burrows were present at many sites.

Table 4.4-2. Summary of sites assessed for CTS breeding habitat.

Aquatic Habitat Type	Number of Aquatic Habitat Locations	Number of Locations that Meet 10-Week Criterion[1]	Land Ownership[3]		
			MID/TID	BLM	Private/ Other
Within the Action Area					
Streams and Pools in Streams	53	27 (*3*)	45[2]	10[2]	8[2]
Natural Ponds	8	5	7[2]	4	2[2]
Stock/Irrigation/ Detention Pond	7	7	4	3	0
Upland/Developed	4	0	3	1	0
Other	1	1	1	0	0
Total	**73**	**40 (*3*)**	**60[2]**	**18[2]**	**10[2]**
Within 1.24 Miles of the Action Area					
Streams and Pools in Streams	72	61	2[2]	3	68[2]
Natural Ponds	158	129	4[2]	2	154[2]
Stock/ Irrigation/ Detention Pond	13	9	0	1[2]	13[2]
Other Wetlands	73	6	1[2]	1[2]	73[2]
Upland[2]/ Developed	1	0	0	0	1
Other	2	2	0	0	2
Total	**319**	**207**	**7**	**7**	**311**
Study Area Total	**392**	**247(*3*)**	**67[2]**	**25[2]**	**321[2]**

[1] Italic numbers in parentheses are those sites for which 20-week criterion status is unknown.
[2] Includes locations with multiple ownerships.
[3] Some sites have multiple ownerships; therefore, ownership total exceeds the number of assessed locations.

Potential CTS breeding habitat (standing water for at least 10 weeks during the breeding season) was documented at or near 247 habitat sites within the study area. Many of the aerially assessed sites that held water for at least 10 weeks appeared to have suitable upland dispersal habitat. Following aerial assessment, field surveys to verify habitat conditions and collect additional information were performed at potential breeding sites within the Action Area and representative breeding locations on publicly accessible lands within 1.24 miles of the Action Area. Field surveys revealed that the majority of these sites were perennial streams that were unsuitable because of high gradient or a lack of upland habitat suitable for dispersal. Within the Action Area, 38 field-assessed sites were characterized as potentially suitable CTS breeding sites, 29 of which were considered more favorable to CTS breeding due to the presence of small burrows and upland habitat suitable for dispersal.

Potential stressors to CTS include predators and habitat disturbance from noxious weeds, grazing, and facilities and recreational area maintenance activities. Predatory fish can severely limit the survival of CTS in otherwise suitable breeding habitat (Jennings and Hayes, 1994), and CTS can be excluded from potential habitats due to invasion by noxious weeds or direct disturbance caused by cattle, maintenance activities, and recreation activities (e.g. trampling).

4.5 Valley Elderberry Longhorn Beetle

On August 8, 1980, the USFWS listed the VELB as Threatened under the ESA (Federal Register 45:52803). The USFWS issued a VELB Recovery Plan on August 28, 1984 (USFWS

2009). On February 14, 2007, the USFWS completed a five-year review, which resulted in USFWS's recommendation that the species be delisted. In October 2012, the USFWS began the process of reviewing the delisting proposal (USFWS 2012c).

Delisting is being assessed because of evidence that VELB may be widespread and less threatened than it was when initially listed. There are currently over 200 recorded occurrences of VELB, where there had been only ten at the time of listing. Also, the destruction of riparian areas has slowed, and recovery efforts have led to the restoration and replanting of riparian areas, including plantings of elderberry (USFWS 2012c).

4.5.1 Life History and Habitat Requirements

The VELB is dependent on its host plant, elderberry (*Sambucus* spp.), which is a common component of riparian corridors and adjacent upland areas in the Central Valley, for all of its life stages (i.e., egg, larva, and adult). VELB primarily occur within the riparian corridor but can occur infrequently in non-riparian scrub habitats adjacent to the corridor, and less commonly in annual grasslands and live oak woodlands. VELB appear to be capable of limited dispersal and prefer to remain within contiguous patches of high quality riparian habitat.

The VELB life cycle takes one or two years to complete. Eggs are laid on elderberry leaves or bark and hatch within two days. The larvae live within the stems of the plants feeding on the pith for one to two years. Adults emerge from the stems through holes made by larvae prior to pupation. Adults generally emerge from late March through June and are short-lived (USFWS 2009). The exit holes created by larvae prior to pupation are often the only evidence of VELB presence.

4.5.2 Environmental Baseline in the Action Area

A data review for known occurrences of VELB, botanical surveys for elderberry plants, and stem inspections for beetle exit holes on elderberry plants were conducted in 2012. Surveys for elderberry plants followed CDFW's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009). The study included all Don Pedro Project facilities and recreation sites, dispersed recreation areas along Don Pedro Reservoir, and 10 drainages within the Action Area that were also designated for wetland studies.

Surveys recorded a total of 73 elderberry plant occurrences within the Action Area. VELB boreholes were observed at 14 of the elderberry occurrences, ranging from two to 43 exit holes (Table 4.5-1). Of the 14 elderberry plants with exit holes, only two were found in riparian areas; the majority were in partially-disturbed habitat near roads or developed recreation areas.

Table 4.5-1. Elderberry shrubs with observed boreholes within the Action Area.

Occurrence	Riparian Yes|No	Stem Count[1]	Class	Number of Exit Holes	Recent Yes|No	Land Ownership	Site Location
4	No	15	II	15	No	MID/TID	Moccasin Point Recreation Area

Occurrence	Riparian Yes|No	Stem Count[1]	Class	Number of Exit Holes	Recent Yes|No	Land Ownership	Site Location
6	No	13	II	7	No	MID/TID	Moccasin Point Recreation Area
9	Yes	10	III	43	Yes	MID/TID	Moccasin Point Recreation Area
10	Yes	1	I	2	No	BLM	Moccasin Point Recreation Area
17	No	1	III	8	No	MID/TID	Below dam
18	No	1	III	5	No	MID/TID	Beside sewage pond across from Blue Oaks Recreation Area
26	No	1	III	10	No	MID/TID	Hatch Creek
31	No	1	II	6	No	BLM	Jacksonville Road
32	No	1	II	3	No	BLM	Jacksonville Road
38	No	1	II	2	No	MID/TID	Jacksonville Road
46	No	1	III	2	No	BLM	Jacksonville-Harney Road
47	No	Unknown – not accessed for safety reasons	I, II, III	19	No	MID/TID	Moccasin transmission line
301	No	18	I, II, III	8	No	MID/TID	Rogers Creek Arm
304	No	7	III	9	No	MID/TID	Rogers Creek Arm

[1] Stems one inch or greater at the base.

Similar to ESA-listed plants, observed potential stressors to elderberry plants, and thus VELB, include cattle grazing, invasion by noxious weeds, maintenance activities, and trampling in recreation areas. Elderberry occurrences 19, 20, 24, and 25 are within lands permitted for grazing by the Districts, and occurrences 5, 6, 8-13, 39, 44-5, 603-4, 612, and 901 were all observed to be in close proximity to noxious weeds. At Moccasin Point Recreation Area, elderberry occurrences 1-4, 13 and 45 are located in areas where there is the potential for disturbance (roads and/or campsites) due to recreation and management activities. Occurrence 300 at Blue Oaks Recreation Area is also located in an area with disturbances (roads and/or campsites) resulting from recreation and management activities. Occurrences 14 and 18 are located near a sewage pond and potentially subject to disturbance by vegetation management. Occurrences 28 and 32-36 at Kanaka Point, 42 at Harney Road, 26 at Hatch Creek, 40-1 on Shawmut Road, and 301-306 and 308 at Rogers Creek Arm are potentially subject to disturbances caused by day-use recreation, particularly during the summer months. Similarly, occurrence 45 is located in the middle of a campground at Moccasin Point Recreation Area.

4.6 San Joaquin Kit Fox

The San Joaquin kit fox was originally listed as endangered in 1967 under the Endangered Species Preservation Act (32 FR 4001). It is currently ESA-listed as an endangered species. The Final Recovery Plan for Upland Species of the San Joaquin Valley, including San Joaquin kit fox, was issued on September 30, 1998 (Williams et. al. 1998). A five-year review was completed for the species in February 2010, and no change to listing status was recommended.

4.6.1 Life History and Habitat Requirements

San Joaquin kit foxes mate in winter and have between four and seven young in February or March. They use multiple underground dens throughout the year, sometimes using pipes or culverts as den sites in addition to burrows. Their primary prey is usually the most abundant nocturnal rodent or lagomorph in their area. They also feed opportunistically on carrion, birds, reptiles, insects, and fruits (NatureServe 2009).

San Joaquin kit foxes are reported to use a wide range of habitats, including alkali sink, valley grassland, and foothill woodlands (NatureServe 2009), at times in proximity to agriculture and grazing lands (Bell 1994). Kit foxes prefer loose-textured soils (Grinnell et al. 1937, Hall 1946, Egoscue 1962, Morrell 1972) but are found on virtually every soil type. Dens appear to be scarce in areas with shallow soils (OFarrell and Gilbertson 1979, OFarrell et al. 1980), high water tables (McCue et al. 1981), or impenetrable hardpan layers (Morrell 1972). However, kit foxes will occupy soils with high clay content, such as those in the Altamont Pass area in Alameda County, where they modify burrows excavated by other animals (Orloff et al. 1986).

4.6.2 Environmental Baseline in the Action Area

The California Natural Diversity Database (CNDDB) includes a single record of a San Joaquin kit fox within the general vicinity of the Project Boundary, approximately 2.1 mi southwest of the Action Area. The record is from 1972-1973, in an area that is currently an OHV recreation development (CDFW 2013). No occurrences of San Joaquin kit fox have been recorded within five miles of the Action Area since 1973 (CDFW 2013).

No kit fox sightings or large burrows were documented during extensive terrestrial surveys conducted in the Action Area during 2012, but nearby occurrence records indicate that the presence of kit foxes cannot be ruled out.

4.7 Vernal Pool Fairy Shrimp

On September 19, 1994, vernal pool fairy shrimp were listed as Threatened under the ESA (59 FR 48136-48153). Critical habitat for vernal pool fairy shrimp, along with other vernal pool species, was originally designated in a final rule on August 6, 2003. A revised final rule for critical habitat, with unit designations by species, was published on February 10, 2006, with 35 critical habitat units for vernal pool fairy shrimp totaling 597,821 ac (USFWS 2006a). Of these, critical habitat unit VERFS21B is the closest to the Project, at approximately 2.6 miles from the edge of the Action Area.

The USFWS issued a draft Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon in October 2004; the recovery plan was finalized on December 15, 2005 (USFWS 2005a). A five-year status review for vernal pool fairy shrimp and other species was initiated on May 25, 2011 (USFWS 2011).

4.7.1 Life History and Habitat Requirements

Vernal pool fairy shrimp occur mostly in vernal pools, but may also occur in natural and artificial seasonal wetland habitats, such as alkali pools, ephemeral drainages, stock ponds, roadside ditches, vernal swales, and rock outcrop pools (NatureServe 2009). Vernal pool fairy shrimp occupy a variety of different vernal pool habitats, from small clear sandstone rock pools to large turbid alkaline grassland valley floor pools (Eng et al. 1990, Helm 1998). Although the vernal pool fairy shrimp has been collected from large vernal pools, including one exceeding 25 ac in area (Eriksen and Belk 1999), it tends to occur primarily in smaller pools (Platenkamp 1998) and is most frequently found in pools measuring less than 0.05 ac (Gallagher 1996, Helm 1998). The vernal pool fairy shrimp typically occurs at elevations from 30 to 4,000 ft (Eng et al. 1990), although the species has been found at two sites in the Los Padres National Forest at an elevation of 5,600 ft. The vernal pool fairy shrimp has been collected at water temperatures as low as 4.5°C (Eriksen and Belk 1999) and has not been found in water with temperatures above about 23°C (Helm 1998, Eriksen and Belk 1999). The species is typically found in pools with low to moderate salinity or total dissolved solids concentrations (Collie and Lathrop 1976, Keeley 1984, Syrdahl 1993). Because vernal pools are mostly rain-fed, they usually have low nutrient levels and often have dramatic daily fluctuations in pH, dissolved oxygen, and carbon dioxide (Keeley and Zedler 1998).

4.7.2 Environmental Baseline in the Action Area

Most of the known occurrences of vernal pool fairy shrimp are in the Central Valley and Coast Ranges of California, with disjunct populations in San Luis Obispo County, Santa Barbara County, and Riverside County (Eng et al. 1990, Erickson and Belk 1999). The CNDDB includes a record of one occurrence within the Sonora quad, which is adjacent to Don Pedro Project quads (CDFW 2013). The Districts engaged in detailed terrestrial resource studies in 2012, during which no vernal pools, or vernal pool plants that might indicate their presence, were located.

5.0 EFFECTS OF THE PROPOSED ACTION

5.1 Direct and Indirect Effects of the Proposed Action

There would be no direct or indirect effects as a result of the Proposed Action on the seven ESA-listed species addressed in this Draft BA. The Proposed Action, i.e., relicensing of existing hydropower operations at Don Pedro Dam along with proposed resource enhancements, would have no effect on reservoir water surface elevations, recreational use, or maintenance activities in the Action Area, and as a result no adverse effect on habitat for listed species.

Electric power is generated at the Don Pedro Hydroelectric Project using flows released for other purposes. Irrigation, municipal, and industrial water deliveries are pre-scheduled based on forecasted demands and actual projected inflow and then released through the powerhouse up to its hydraulic capacity. These releases are shaped during periods of peak electrical demand, when consistent with water supply requirements and subject to irrigation infrastructure constraints, to release more flow during on-peak rather than off-peak hours. However, such minor variability in flow releases immediately downstream of Don Pedro Dam as the result of hydroelectric operations has no significant influence on water surface elevation or other conditions in Don Pedro Reservoir. Reservoir levels reflect operations related to diversions and releases made in association with unrelated and non-interdependent actions, e.g., providing water for irrigation and M&I uses, as well as flood management in accordance with ACOE guidelines. Hydroelectric generation at the Don Pedro Project cannot adversely impact ESA-listed species in the Action Area, because environmental variability in the reservoir is not linked to power production and, absent power production at the Don Pedro Project, the operations, including recreation, would remain as they are under existing conditions, i.e., driven by uses other than hydropower production.

As noted in Section 2.1 of this Draft BA, the Districts propose to develop a Vegetation Management Plan that will include measures to manage special status species occurrences within the Project Boundary, including control of noxious weeds, protection of special status plants, and protection of VELB. In addition, the Districts proposed to follow USFWS Conservation Guidelines pertaining to the VELB for the management of elderberry within the Action Area (USFWS 1999). These enhancement measures are expected to benefit ESA-listed species by limiting noxious weed distributions and providing protection of VELB habitat.

5.2 Effects from Interrelated and Interdependent Actions

As noted above, the Districts are seeking a new FERC license to allow for the continuation of hydroelectric power generation at existing facilities at the Don Pedro Dam, and for the upgrade of power production by replacing the existing turbines and uprating the generators. None of the work associated with the upgrade would entail construction outside the powerhouse. Water storage and releases for irrigation, M&I uses, and flood management are in no way dependent on the issuance of a FERC license for the Project, and would occur with or without the licensing of the Proposed Action. As such, these uses are *not* interrelated or interdependent with the issuance of a FERC license for hydroelectric power generation. Thus, the effects of relevant O&M actions associated with the non-hydropower water uses are addressed as independent

actions in the cumulative effects analysis section of this Draft BA. The Districts are aware of no other actions that have the potential to affect ESA-listed species in the Action Area that could be considered related to or interdependent with the Proposed Action.

5.3 Cumulative Effects of the Proposed Action

According to the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (NEPA) (50 C.F.R. §1508.7), "cumulative effects on a resource are the result of the combined influence of past, present, and reasonably foreseeable future actions within a specified geographical range (FERC 2008), regardless of what agency (federal or non-federal) or person undertakes such actions." Cumulative effects may be beneficial or adverse.

5.3.1 O&M Actions in the Action Area

All actions described and evaluated below are related to the Don Pedro Project's primary purposes (which have been described above). These actions are unrelated to the Proposed Action and would not contribute in any way to cumulative adverse effects on ESA-listed species. Nevertheless, the evaluations below are being provided for informational purposes.

5.3.1.1 Facilities and Road Maintenance

As part of operating the Don Pedro Project to achieve its primary purposes, the Districts maintain developed facilities and roads using a combination of mechanical mowing and periodic use of pre-emergent herbicides to manage vegetation. Areas maintained by the Districts are typically managed in proportion to their use. Developed facilities (e.g., housing areas near Don Pedro Dam) and associated roads are managed with pre-emergent herbicides annually after the first fall rain (usually in November). Similarly, the perimeters of wastewater treatment facilities are sprayed annually, using herbicides labeled for aquatic use when appropriate, to manage vegetation or aquatic weeds and algae. Mechanical removal of aquatic weeds is also conducted when growth is excessive. Main access road shoulders are mechanically mowed or treated with herbicides. In contrast, unpaved roads leading to Don Pedro Dam from the main road are rarely used, and no formal management is conducted. Some roads may be treated for specific uses, e.g., a small access road leading to La Grange Diversion Dam is typically unmanaged but was mowed in 2012 to allow access for water quality monitoring. All herbicide use is conducted by licensed applicators in accordance with label requirements.

5.3.1.2 Recreation Area Maintenance

The Districts' three developed recreation areas are managed to control vegetation and the associated risk of fire. High-use sections of each recreation area are subject to mechanical mowing and trimming on a frequent basis, and pads, road edges, firebreaks, and the immediate area around restrooms and Don Pedro Recreation Agency (DPRA) facilities are sprayed with pre-emergent and/or post-emergent herbicides annually after the first rains. All herbicide use is conducted by licensed applicators in accordance with label requirements. Additionally, the Districts may engage in ground squirrel control via two methods:

(1) Burrow blasting: This poison-free management approach involves injection of nearly pure oxygen and a small amount of propane into the squirrel burrow. Once a correct amount of oxygen and gas is injected the source of the gas is shut off and the gas in the burrow is ignited. This method was used in 2012 and 2013 in the Action Area.

(2) Targeted use of pelleted rodent bait in developed recreation areas. The last such application was during the 2009–2010 season. The Districts will notify the USFWS of any rodenticide use and locations of application on an annual basis. All rodenticide use is conducted by licensed applicators in accordance with label requirements.

The Districts have a Prescribed Burn Program that allows the use of prescribed burns for vegetation management. The Prescribed Burn Program includes limitations on the timing and frequency of burns, depending on weather conditions, to minimize fire risk and the potential for damage to adjacent habitats. The Districts use prescribed burning on a limited basis as a management tool; the last burn conducted under the Program occurred in 2009, but the Districts will continue to use prescribed burns as conditions permit.

5.3.1.3 Woody Debris Management

Article 52 of the existing FERC license requires the implementation of the Districts' Log and Debris Removal Plan. Under the Plan, the Districts collect and remove debris at Don Pedro Dam and at other areas of the reservoir as needed. Debris is collected in boom rafts, piled in un-vegetated areas below the high-water mark along the reservoir's edge, and burned during fall and winter.

5.3.2 Effects Analysis for O&M Actions

The following sections assess, for each ESA-listed species addressed in this Draft BA, the potential effects of O&M activities (described in Section 5.3.1.) conducted to support the Don Pedro Project's primary purposes of water supply and flood control. Effects discussed in the following sections are unrelated to the Proposed Action for the reasons described in Section 5.1.

5.3.2.1 Layne's Ragwort and California Vervain

Potential stressors and disturbances to Layne's ragwort and California vervain include terrestrial recreation, cattle grazing, noxious weeds, vegetation management, and road maintenance. Small portions of several Layne's ragwort occurrences are located below the normal maximum water surface elevation of the reservoir. These plants are not currently adversely affected by variation in water surface elevation related to the Don Pedro Project's primary purposes of water supply and flood control.

Three occurrences of Layne's ragwort and one occurrence of California vervain were found near recreation sites, but no occurrences were found adjacent to roads or other facilities. Recreation activities, particularly equestrian trail riding, take place in the vicinity of several occurrences of Layne's ragwort and California vervain in Poor Man's Gulch. A cleared trail runs close by Layne's ragwort occurrence 631. Equestrians ride into the Action Area from

upstream of the Don Pedro Project. Very few recreationists appear to access portions of the Action Area in the gulches from the reservoir. On Kanaka Point, recreationists access the Action Area via a free day-use parking lot, and there is evidence of a walking trail in the vicinity of all Layne's ragwort surveyed in the area.

5.3.2.2 California Red-Legged Frog and California Tiger Salamander

CRLF are not known to occur within the Action Area; no occurrences are known within a 5-mile radius of the Don Pedro Project, and the species is reported to be extirpated from the Tuolumne River watershed. Because the species is not thought to occur in the Action Area, there is little to no potential for facilities and road maintenance, recreation, recreation area maintenance, and woody debris management to have an adverse effect on CRLF.

CTS are not known to occur within the Action Area, but are reported to occur in the Don Pedro Project vicinity. CTS breeding habitat is present within the Action Area, but it is considered to be of marginal quality. As a result, adverse effects on CTS resulting from facilities and road maintenance, recreation, or recreation area maintenance are unlikely.

Ten of the sites that met the minimum criteria for both CTS and CRLF breeding habitats are located within or adjacent to the Don Pedro Dam spillway channel. However, flow has only been passed through the spillway once since Project construction (i.e., during the 1997 flood). The rare use of the spillway makes potential adverse effects on any CTS or CRLF, if they were present, highly unlikely.

CRLF and CTS breeding habitat was documented at seven sites located at recreational facilities, i.e., one constructed swimming lagoon and six sewage treatment ponds. Each of these sites is lined with either concrete or gravel and has little or no surrounding upland vegetation. Although these sites all hold water for at least 10 weeks during the CTS breeding season and 20 weeks during the CRLF breeding season, they are considered marginal habitat due to their lack of overhanging and emergent vegetation and lack of suitable adjacent upland habitat. Therefore, they are unlikely to support CRLF or CTS. No potential CRLF or CTS breeding habitat was documented adjacent to roads or other facilities.

5.3.2.3 Valley Elderberry Longhorn Beetle

VELB host plants (i.e., elderberry) and evidence of VELB were documented within the Action Area. Most elderberry shrubs are located on shorelines or hillsides that are not affected by the Don Pedro Project. The elderberry plants located in developed recreation areas and adjacent to Don Pedro Project facilities were vigorous at the time of the 2012 surveys, showing no signs of stress.

Elderberry occurrences 47 and 307 are located near the normal maximum surface elevation of Don Pedro Reservoir. Under existing conditions, these plants are not adversely affected by variation in water surface elevation related to the Don Pedro Project's primary purposes of water supply and flood management.

Two elderberry occurrences are located near a sewage pond, where vegetation management activities are conducted. Six occurrences at Moccasin Point and one occurrence at Blue Oaks Recreation Area are located near roads and campsites, and nine occurrences at Kanaka Point, Harney Road, Hatch Creek, Shawmut Road, and Rogers Creek Arm are potentially subject to trampling caused by day-use recreation, particularly during the summer months.

Under existing conditions, elderberry found near roads and recreation areas showed no signs of stress from human disturbance. In addition, the Districts propose to follow USFWS Conservation Guidelines for the VELB for the management of elderberry within the Action Area (USFWS 1999). The Districts also propose to develop a Vegetation Management Plan, which will include measures to manage noxious weeds within the Action Area using methods specified to ensure protection of ESA-listed plants and other important vegetation. As noted previously, these measures are expected to benefit ESA-listed species by limiting noxious weed distributions and providing protection of VELB habitat. Therefore, under existing conditions, road maintenance, recreation facilities maintenance, and woody debris management are expected to have no significant adverse effects on elderberry, and as a result should have no effects on VELB. Disturbance by recreational users is possible, as stated above, but because elderberry found near roads and recreation areas showed no signs of stress from human disturbance under existing conditions, it is reasonable to assume that disturbance is likely to be limited in the future.

5.3.2.4 San Joaquin Kit Fox

San Joaquin kit fox are not reported to occur within the Action Area, and during extensive terrestrial field surveys conducted in 2012 no kit foxes were sighted and no large burrows were documented. However, nearby occurrence records indicate that kit foxes have the potential to be present in the Action Area. The Districts do not engage in predator control that could affect San Joaquin kit fox, and no habitat conversions are proposed that would alter potential San Joaquin kit fox habitat within the Action Area. As a result, adverse effects on any kit foxes that might occur in the Action Area are unlikely.

5.3.2.5 Vernal Pool Fairy Shrimp

Vernal pool fairy shrimp are not reported to occur within the Action Area, and the Districts' extensive terrestrial resources field surveys conducted in 2012 documented no vernal pools or plant species indicating the presence of vernal pools. Given the absence of the vernal pool fairy shrimp and its habitat, there will be no adverse effects on the species associated with any maintenance or recreation activities in the Action Area.

6.0 CONCLUSIONS

Table 6.0-1 summarizes potential effects of the Proposed Action on ESA-listed species and their habitats in the Action Area.

Table 6.0-1. Effects determinations associated with the Proposed Action for ESA-listed species potentially occurring in the Action Area.

	ESA-listed Threatened Species	Effect Determination (Species)	Effect Determination (Critical Habitat)	Comments
1	Layne's ragwort	No adverse effect	Critical Habitat not designated	The Proposed Action would have no effect on reservoir water surface elevations, O&M actions, or recreation, and thereby no effect on ESA-listed plant species in the Action Area. The Districts propose to develop a Vegetation Management Plan that will include measures to manage noxious to provide protection for ESA-listed plants. This enhancement measure is expected to benefit ESA-listed plants in the Action Area.
2	California vervain	No adverse effect	Critical Habitat not designated	See Row 1.
3	California red-legged frog	No adverse effect	No adverse effect	The Proposed Action would have no effect on reservoir water surface elevations, O&M actions, or recreation, and thereby no effect on ESA-listed wildlife species in the Action Area.
4	California tiger salamander	No adverse effect	No adverse effect	See Row 3.
5	Valley elderberry longhorn beetle	No adverse effect	No adverse effect	See Row 3. The Districts propose to manage elderberry by adhering to USFWS Conservation Guidelines for VELB. This enhancement measure is expected to help protect VELB habitat in the Action Area.
6	San Joaquin Kit Fox	No adverse effect	Critical Habitat not designated	See Row 3
7	Vernal pool fairy shrimp	No adverse effect	No adverse effect	The species and its habitat do not occur in the Action Area.

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DRAFT BIOLOGICAL ASSESSMENT

ATTACHMENT A

CONSERVATION GUIDELINES FOR THE VALLEY ELDERBERRY LONGHORN BEETLE 9 JULY 1999

United States Department of the Interior

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

Conservation Guidelines for the
Valley Elderberry Longhorn Beetle
9 July 1999

The following guidelines have been issued by the U.S. Fish and Wildlife Service (Service) to assist Federal agencies and non-federal project applicants needing incidental take authorization through a section 7 consultation or a section 10(a)(1)(B) permit in developing measures to avoid and minimize adverse effects on the valley elderberry longhorn beetle. The Service will revise these guidelines as needed in the future. The most recently issued version of these guidelines should be used in developing all projects and habitat restoration plans. The survey and monitoring procedures described below are designed to avoid any adverse effects to the valley elderberry longhorn beetle. Thus a recovery permit is not needed to survey for the beetle or its habitat or to monitor conservation areas. If you are interested in a recovery permit for research purposes please call the Service's Regional Office at (503) 231-2063.

Background Information

The valley elderberry longhorn beetle (Desmocerus californicus dimorphus), was listed as a threatened species on August 8, 1980 (Federal Register 45: 52803-52807). This animal is fully protected under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). The valley elderberry longhorn beetle (beetle) is completely dependent on its host plant, elderberry (Sambucus species), which is a common component of the remaining riparian forests and adjacent upland habitats of California's Central Valley. Use of the elderberry by the beetle, a wood borer, is rarely apparent. Frequently, the only exterior evidence of the elderberry's use by the beetle is an exit hole created by the larva just prior to the pupal stage. The life cycle takes one or two years to complete. The animal spends most of its life in the larval stage, living within the stems of an elderberry plant. Adult emergence is from late March through June, about the same time the elderberry produces flowers. The adult stage is short-lived. Further information on the life history, ecology, behavior, and distribution of the beetle can be found in a report by Barr (1991) and the recovery plan for the beetle (USFWS 1984).

Surveys

Proposed project sites within the range of the valley elderberry longhorn beetle should be surveyed for the presence of the beetle and its elderberry host plant by a qualified biologist. The beetle's range extends throughout California's Central Valley and associated foothills from about the 3,000-foot elevation contour on the east and the watershed of the Central Valley on the west (Figure 1). All or portions of 31 counties are included: Alameda, Amador, Butte, Calaveras, Colusa, Contra Costa, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Madera, Mariposa, Merced, Napa, Nevada, Placer, Sacramento, San Benito, San Joaquin, San Luis Obispo, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba.

If elderberry plants with one or more stems measuring 1.0 inch or greater in diameter at ground level occur on or adjacent to the proposed project site, or are otherwise located where they may be directly or indirectly affected by the proposed action, minimization measures which include planting replacement habitat (conservation planting) are required (Table 1).

All elderberry shrubs with one or more stems measuring 1.0 inch or greater in diameter at ground level that occur on or adjacent to a proposed project site must be thoroughly searched for beetle exit holes (external evidence of beetle presence). In addition, all elderberry stems one inch or greater in diameter at ground level must be tallied by diameter size class (Table 1). As outlined in Table 1, the numbers of elderberry seedlings/cuttings and associated riparian native trees/shrubs to be planted as replacement habitat are determined by stem size class of affected elderberry shrubs, presence or absence of exit holes, and whether a proposed project lies in a riparian or non-riparian area.

Elderberry plants with no stems measuring 1.0 inch or greater in diameter at ground level are unlikely to be habitat for the beetle because of their small size and/or immaturity. Therefore, no minimization measures are required for removal of elderberry plants with no stems measuring 1.0 inch or greater in diameter at ground level with no exit holes. Surveys are valid for a period of two years.

Avoid and Protect Habitat Whenever Possible

Project sites that do not contain beetle habitat are preferred. If suitable habitat for the beetle occurs on the project site, or within close proximity where beetles will be affected by the project, these areas must be designated as avoidance areas and must be protected from disturbance during the construction and operation of the project. When possible, projects should be designed such that avoidance areas are connected with adjacent habitat to prevent fragmentation and isolation of beetle populations. Any beetle habitat that cannot be avoided as described below should be considered impacted and appropriate minimization measures should be proposed as described below.

Avoidance: Establishment and Maintenance of a Buffer Zone

Complete avoidance (i.e., no adverse effects) may be assumed when a 100-foot (or wider) buffer is established and maintained around elderberry plants containing stems measuring 1.0 inch or greater in diameter at ground level. Firebreaks may not be included in the buffer zone. In buffer areas construction-related disturbance should be minimized, and any damaged area should be promptly restored following construction. The Service must be consulted before any disturbances within the buffer area are considered. In addition, the Service must be provided with a map identifying the avoidance area and written details describing avoidance measures.

Protective Measures

1. Fence and flag all areas to be avoided during construction activities. In areas where encroachment on the 100-foot buffer has been approved by the Service, provide a minimum setback of at least 20 feet from the dripline of each elderberry plant.

2. Brief contractors on the need to avoid damaging the elderberry plants and the possible penalties for not complying with these requirements.

3. Erect signs every 50 feet along the edge of the avoidance area with the following information: "This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment." The signs should be clearly readable from a distance of 20 feet, and must be maintained for the duration of construction.

4. Instruct work crews about the status of the beetle and the need to protect its elderberry host plant.

Restoration and Maintenance

1. Restore any damage done to the buffer area (area within 100 feet of elderberry plants) during construction. Provide erosion control and re-vegetate with appropriate native plants.

2. Buffer areas must continue to be protected after construction from adverse effects of the project. Measures such as fencing, signs, weeding, and trash removal are usually appropriate.

3. No insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant should be used in the buffer areas, or within 100 feet of any elderberry plant with one or more stems measuring 1.0 inch or greater in diameter at ground level.

4. The applicant must provide a written description of how the buffer areas are to be restored, protected, and maintained after construction is completed.

5. Mowing of grasses/ground cover may occur from July through April to reduce fire hazard. No mowing should occur within five (5) feet of elderberry plant stems. Mowing must be done in a manner that avoids damaging plants (e.g., stripping away bark through careless use of mowing/trimming equipment).

Transplant Elderberry Plants That Cannot Be Avoided

Elderberry plants must be transplanted if they can not be avoided by the proposed project. All elderberry plants with one or more stems measuring 1.0 inch or greater in diameter at ground level must be transplanted to a conservation area (see below). At the Service's discretion, a plant that is unlikely to survive transplantation because of poor condition or location, or a plant that would be extremely difficult to move because of access problems, may be exempted from transplantation. In cases where transplantation is not possible the minimization ratios in Table 1 may be increased to offset the additional habitat loss.

Trimming of elderberry plants (e.g., pruning along roadways, bike paths, or trails) with one or more stems 1.0 inch or greater in diameter at ground level, may result in take of beetles. Therefore, trimming is subject to appropriate minimization measures as outlined in Table 1.

1. Monitor. A qualified biologist (monitor) must be on-site for the duration of the transplanting of the elderberry plants to insure that no unauthorized take of the valley elderberry longhorn beetle occurs. If unauthorized take occurs, the monitor must have the authority to stop work until corrective measures have been completed. The monitor must immediately report any unauthorized take of the beetle or its habitat to the Service and to the California Department of Fish and Game.

2. Timing. Transplant elderberry plants when the plants are dormant, approximately November through the first two weeks in February, after they have lost their leaves. Transplanting during the non-growing season will reduce shock to the plant and increase transplantation success.

3. Transplanting Procedure.

    a. Cut the plant back 3 to 6 feet from the ground or to 50 percent of its height (whichever is taller) by removing branches and stems above this height. The trunk and all stems measuring 1.0 inch or greater in diameter at ground level should be replanted. Any leaves remaining on the plant should be removed.

b. Excavate a hole of adequate size to receive the transplant.

c. Excavate the plant using a Vemeer spade, backhoe, front end loader, or other suitable equipment, taking as much of the root ball as possible, and replant immediately at the conservation area. Move the plant only by the root ball. If the plant is to be moved and transplanted off site, secure the root ball with wire and wrap it with burlap. Dampen the burlap with water, as necessary, to keep the root ball wet. Do not let the roots dry out. Care should be taken to ensure that the soil is not dislodged from around the roots of the transplant. If the site receiving the transplant does not have adequate soil moisture, pre-wet the soil a day or two before transplantation.

d. The planting area must be at least 1,800 square feet for each elderberry transplant. The root ball should be planted so that its top is level with the existing ground. Compact the soil sufficiently so that settlement does not occur. As many as five (5) additional elderberry plantings (cuttings or seedlings) and up to five (5) associated native species plantings (see below) may also be planted within the 1,800 square foot area with the transplant. The transplant and each new planting should have its own watering basin measuring at least three (3) feet in diameter. Watering basins should have a continuous berm measuring approximately eight (8) inches wide at the base and six (6) inches high.

e. Saturate the soil with water. Do not use fertilizers or other supplements or paint the tips of stems with pruning substances, as the effects of these compounds on the beetle are unknown.

f. Monitor to ascertain if additional watering is necessary. If the soil is sandy and well-drained, plants may need to be watered weekly or twice monthly. If the soil is clayey and poorly-drained, it may not be necessary to water after the initial saturation. However, most transplants require watering through the first summer. A drip watering system and timer is ideal. However, in situations where this is not possible, a water truck or other apparatus may be used.

Plant Additional Seedlings or Cuttings

Each elderberry stem measuring 1.0 inch or greater in diameter at ground level that is adversely affected (i.e., transplanted or destroyed) must be replaced, in the conservation area, with elderberry seedlings or cuttings at a ratio ranging from 1:1 to 8:1 (new plantings to affected stems). Minimization ratios are listed and explained in Table 1. Stock of either seedlings or cuttings should be obtained from local sources. Cuttings may be obtained from the plants to be transplanted if the project site is in the vicinity of the conservation area. If the Service determines that the elderberry plants on the proposed project site are unsuitable candidates for

transplanting, the Service may allow the applicant to plant seedlings or cuttings at higher than the stated ratios in Table 1 for each elderberry plant that cannot be transplanted.

Plant Associated Native Species

Studies have found that the beetle is more abundant in dense native plant communities with a mature overstory and a mixed understory. Therefore, a mix of native plants associated with the elderberry plants at the project site or similar sites will be planted at ratios ranging from 1:1 to 2:1 [native tree/plant species to each elderberry seedling or cutting (see Table 1)]. These native plantings must be monitored with the same survival criteria used for the elderberry seedlings (see below). Stock of saplings, cuttings, and seedlings should be obtained from local sources. If the parent stock is obtained from a distance greater than one mile from the conservation area, approval by the Service of the native plant donor sites must be obtained prior to initiation of the revegetation work. Planting or seeding the conservation area with native herbaceous species is encouraged. Establishing native grasses and forbs may discourage unwanted non-native species from becoming established or persisting at the conservation area. Only stock from local sources should be used.

Examples

Example 1
The project will adversely affect beetle habitat on a vacant lot on the land side of a river levee. This levee now separates beetle habitat on the vacant lot from extant Great Valley Mixed Riparian Forest (Holland 1986) adjacent to the river. However, it is clear that the beetle habitat located on the vacant lot was part of a more extensive mixed riparian forest ecosystem extending farther from the river's edge prior to agricultural development and levee construction. Therefore, the beetle habitat on site is considered riparian. A total of two elderberry plants with at least one stem measuring 1.0 inch or greater in diameter at ground level will be affected by the proposed action. The two plants have a total of 15 stems measuring over 1.0 inch. No exit holes were found on either plant. Ten of the stems are between 1.0 and 3.0 inches in diameter and five of the stems are greater than 5.0 inches in diameter. The conservation area is suited for riparian forest habitat. Associated natives adjacent to the conservation area are box elder (Acer negundo californica), walnut (Juglans californica var. hindsii), sycamore (Platanus racemosa), cottonwood (Populus fremontii), willow (Salix gooddingii and S. laevigata), white alder (Alnus rhombifolia), ash (Fraxinus latifolia), button willow (Cephalanthus occidentalis), and wild grape (Vitis californica).

Minimization (based on ratios in Table 1):

• Transplant the two elderberry plants that will be affected to the conservation area.

• Plant 40 elderberry rooted cuttings (10 affected stems compensated at 2:1 ratio and 5 affected stems compensated at 4:1 ratio, cuttings planted:stems affected)

• Plant 40 associated native species (ratio of associated natives to elderberry plantings is 1:1 in areas with no exit holes):

5 saplings each of box elder, sycamore, and cottonwood
5 willow seedlings
5 white alder seedlings
5 saplings each of walnut and ash
3 California button willow
2 wild grape vines
Total: 40 associated native species

• Total area required is a minimum of 1,800 sq. ft. for one to five elderberry seedlings and up to 5 associated natives. Since, a total of 80 plants must be planted (40 elderberries and 40 associated natives), a total of 0.33 acre (14,400 square feet) will be required for conservation plantings. The conservation area will be seeded and planted with native grasses and forbs, and closely monitored and maintained throughout the monitoring period.

Example 2
The project will adversely affect beetle habitat in Blue Oak Woodland (Holland 1986). One elderberry plant with at least one stem measuring 1.0 inch or greater in diameter at ground level will be affected by the proposed action. The plant has a total of 10 stems measuring over 1.0 inch. Exit holes were found on the plant. Five of the stems are between 1.0 and 3.0 inches in diameter and five of the stems are between 3.0 and 5.0 inches in diameter. The conservation area is suited for elderberry savanna (non-riparian habitat). Associated natives adjacent to the conservation area are willow (Salix species), blue oak (Quercus douglasii), interior live oak (Q. wislizenii), sycamore, poison oak (Toxicodendron diversilobum), and wild grape.

Minimization (based on ratios in Table 1):

• Transplant the one elderberry plant that will be affected to the conservation area.

• Plant 30 elderberry seedlings (5 affected stems compensated at 2:1 ratio and 5 affected stems compensated at 4:1 ratio, cuttings planted:stems affected)

• Plant 60 associated native species (ratio of associated natives to elderberry plantings is 2:1 in areas with exit holes):

20 saplings of blue oak, 20 saplings of sycamore, and 20 saplings of willow, and seed and plant with a mixture of native grasses and forbs

• Total area required is a minimum of 1,800 sq. ft. for one to five elderberry seedlings and up to 5 associated natives. Since, a total of 90 plants must be planted (30 elderberries and 60 associated natives), a total of 0.37 acre (16,200 square feet) will be required for conservation plantings. The conservation area will be seeded and planted with native grasses and forbs, and closely monitored and maintained throughout the monitoring period.

Conservation Area—Provide Habitat for the Beetle in Perpetuity

The conservation area is distinct from the avoidance area (though the two may adjoin), and serves to receive and protect the transplanted elderberry plants and the elderberry and other native plantings. The Service may accept proposals for off-site conservation areas where appropriate.

1. Size. The conservation area must provide at least 1,800 square feet for each transplanted elderberry plant. As many as 10 conservation plantings (i.e., elderberry cuttings or seedlings and/or associated native plants) may be planted within the 1800 square foot area with each transplanted elderberry. An additional 1,800 square feet shall be provided for every additional 10 conservation plants. Each planting should have its own watering basin measuring approximately three feet in diameter. Watering basins should be constructed with a continuous berm measuring approximately eight inches wide at the base and six inches high.

   The planting density specified above is primarily for riparian forest habitats or other habitats with naturally dense cover. If the conservation area is an open habitat (i.e., elderberry savanna, oak woodland) more area may be needed for the required plantings. Contact the Service for assistance if the above planting recommendations are not appropriate for the proposed conservation area.

   No area to be maintained as a firebreak may be counted as conservation area. Like the avoidance area, the conservation area should connect with adjacent habitat wherever possible, to prevent isolation of beetle populations.

   Depending on adjacent land use, a buffer area may also be needed between the conservation area and the adjacent lands. For example, herbicides and pesticides are

often used on orchards or vineyards. These chemicals may drift or runoff onto the conservation area if an adequate buffer area is not provided.

2. Long-Term Protection. The conservation area must be protected in perpetuity as habitat for the valley elderberry longhorn beetle. A conservation easement or deed restrictions to protect the conservation area must be arranged. Conservation areas may be transferred to a resource agency or appropriate private organization for long-term management. The Service must be provided with a map and written details identifying the conservation area; and the applicant must receive approval from the Service that the conservation area is acceptable prior to initiating the conservation program. A true, recorded copy of the deed transfer, conservation easement, or deed restrictions protecting the conservation area in perpetuity must be provided to the Service before project implementation.

   Adequate funds must be provided to ensure that the conservation area is managed in perpetuity. The applicant must dedicate an endowment fund for this purpose, and designate the party or entity that will be responsible for long-term management of the conservation area. The Service must be provided with written documentation that funding and management of the conservation area (items 3-8 above) will be provided in perpetuity.

3. Weed Control. Weeds and other plants that are not native to the conservation area must be removed at least once a year, or at the discretion of the Service and the California Department of Fish and Game. Mechanical means should be used; herbicides are prohibited unless approved by the Service.

4. Pesticide and Toxicant Control. Measures must be taken to insure that no pesticides, herbicides, fertilizers, or other chemical agents enter the conservation area. No spraying of these agents must be done within one 100 feet of the area, or if they have the potential to drift, flow, or be washed into the area in the opinion of biologists or law enforcement personnel from the Service or the California Department of Fish and Game.

5. Litter Control. No dumping of trash or other material may occur within the conservation area. Any trash or other foreign material found deposited within the conservation area must be removed within 10 working days of discovery.

6. Fencing. Permanent fencing must be placed completely around the conservation area to prevent unauthorized entry by off-road vehicles, equestrians, and other parties that might damage or destroy the habitat of the beetle, unless approved by the Service. The applicant must receive written approval from the Service that the fencing is acceptable prior to initiation of the conservation program. The fence must be maintained in perpetuity, and must be repaired/replaced within 10 working days if it is found to be damaged. Some conservation areas may be made available to the public for appropriate recreational and educational opportunities with written approval from the Service. In

these cases appropriate fencing and signs informing the public of the beetle's threatened status and its natural history and ecology should be used and maintained in perpetuity.

7. Signs. A minimum of two prominent signs must be placed and maintained in perpetuity at the conservation area, unless otherwise approved by the Service. The signs should note that the site is habitat of the federally threatened valley elderberry longhorn beetle and, if appropriate, include information on the beetle's natural history and ecology. The signs must be approved by the Service. The signs must be repaired or replaced within 10 working days if they are found to be damaged or destroyed.

Monitoring

The population of valley elderberry longhorn beetles, the general condition of the conservation area, and the condition of the elderberry and associated native plantings in the conservation area must be monitored over a period of either ten (10) consecutive years or for seven (7) years over a 15-year period. The applicant may elect either 10 years of monitoring, with surveys and reports every year; or 15 years of monitoring, with surveys and reports on years 1, 2, 3, 5, 7, 10, and 15. The conservation plan provided by the applicant must state which monitoring schedule will be followed. No change in monitoring schedule will be accepted after the project is initiated. If conservation planting is done in stages (i.e., not all planting is implemented in the same time period), each stage of conservation planting will have a different start date for the required monitoring time.

Surveys. In any survey year, a minimum of two site visits between February 14 and June 30 of each year must be made by a qualified biologist. Surveys must include:

1. A population census of the adult beetles, including the number of beetles observed, their condition, behavior, and their precise locations. Visual counts must be used; mark-recapture or other methods involving handling or harassment must not be used.

2. A census of beetle exit holes in elderberry stems, noting their precise locations and estimated ages.

3. An evaluation of the elderberry plants and associated native plants on the site, and on the conservation area, if disjunct, including the number of plants, their size and condition.

4. An evaluation of the adequacy of the fencing, signs, and weed control efforts in the avoidance and conservation areas.

5. A general assessment of the habitat, including any real or potential threats to the beetle and its host plants, such as erosion, fire, excessive grazing, off-road vehicle use, vandalism, excessive weed growth, etc.

The materials and methods to be used in the monitoring studies must be reviewed and approved by the Service. All appropriate Federal permits must be obtained prior to initiating the field studies.

Reports. A written report, presenting and analyzing the data from the project monitoring, must be prepared by a qualified biologist in each of the years in which a monitoring survey is required. Copies of the report must be submitted by December 31 of the same year to the Service (Chief of Endangered Species, Sacramento Fish and Wildlife Office), and the Department of Fish and Game (Supervisor, Environmental Services, Department of Fish and Game, 1416 Ninth Street, Sacramento, California 95814; and Staff Zoologist, California Natural Diversity Data Base, Department of Fish and Game, 1220 S Street, Sacramento, California 95814). The report must explicitly address the status and progress of the transplanted and planted elderberry and associated native plants and trees, as well as any failings of the conservation plan and the steps taken to correct them. Any observations of beetles or fresh exit holes must be noted. Copies of original field notes, raw data, and photographs of the conservation area must be included with the report. A vicinity map of the site and maps showing where the individual adult beetles and exit holes were observed must be included. For the elderberry and associated native plants, the survival rate, condition, and size of the plants must be analyzed. Real and likely future threats must be addressed along with suggested remedies and preventative measures (e.g. limiting public access, more frequent removal of invasive non-native vegetation, etc.).

A copy of each monitoring report, along with the original field notes, photographs, correspondence, and all other pertinent material, should be deposited at the California Academy of Sciences (Librarian, California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118) by December 31 of the year that monitoring is done and the report is prepared. The Service's Sacramento Fish and Wildlife Office should be provided with a copy of the receipt from the Academy library acknowledging receipt of the material, or the library catalog number assigned to it.

Access. Biologists and law enforcement personnel from the California Department of Fish and Game and the Service must be given complete access to the project site to monitor transplanting activities. Personnel from both these agencies must be given complete access to the project and the conservation area to monitor the beetle and its habitat in perpetuity.

Success Criteria

A minimum survival rate of at least 60 percent of the elderberry plants and 60 percent of the associated native plants must be maintained throughout the monitoring period. Within one year of discovery that survival has dropped below 60 percent, the applicant must replace failed plantings to bring survival above this level. The Service will make any determination as to the

applicant's replacement responsibilities arising from circumstances beyond its control, such as plants damaged or killed as a result of severe flooding or vandalism.

Service Contact

These guidelines were prepared by the Endangered Species Division of the Service's Sacramento Fish and Wildlife Office. If you have questions regarding these guidelines or to request a copy of the most recent guidelines, telephone (916) 414-6600, or write to:

U.S. Fish and Wildlife Service
Ecological Services
2800 Cottage Way, W-2605
Sacramento, CA 95825

Figure 1: Range of the Valley Elderberry Longhorn Beetle

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Table 1: Minimization ratios based on location (riparian vs. non-riparian), stem diameter of affected elderberry plants at ground level, and presence or absence of exit holes.

Location	Stems (maximum diameter at ground level)	Exit Holes on Shrub Y/N (quantify)[1]	Elderberry Seedling Ratio[2]	Associated Native Plant Ratio[3]
non-riparian	stems > = 1" & = < 3"	No:	1:1	1:1
		Yes:	2:1	2:1
non-riparian	stems > 3" & < 5"	No:	2:1	1:1
		Yes:	4:1	2:1
non-riparian	stems >= 5"	No:	3:1	1:1
		Yes:	6:1	2:1
riparian	stems > = 1" & = < 3"	No:	2:1	1:1
		Yes:	4:1	2:1
riparian	stems > 3" & < 5"	No:	3:1	1:1
		Yes:	6:1	2:1
riparian	stems > = 5"	No:	4:1	1:1
		Yes:	8:1	2:1

[1] All stems measuring one inch or greater in diameter at ground level on a single shrub are considered occupied when exit holes are present anywhere on the shrub.

[2] Ratios in the *Elderberry Seedling Ratio* column correspond to the number of cuttings or seedlings to be planted per elderberry stem (one inch or greater in diameter at ground level) affected by a project.

[3] Ratios in the *Associated Native Plant Ratio* column correspond to the number of associated native species to be planted per elderberry (seedling or cutting) planted.

DON PEDRO HYDROELECTRIC PROJECT
FERC NO. 2299

FINAL LICENSE APPLICATION

EXHIBIT F – GENERAL DESIGN DRAWINGS



WATER & POWER
Serving Central California since 1887

MID
Modesto Irrigation District

Prepared by:
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April 2014

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List of Appendices

Appendix F-1	Exhibit F Drawings Filed only with the Federal Energy Regulatory Commission as Critical Energy Infrastructure Information (CEII)
Appendix F-2	Supporting Design Report Filed only with the Federal Energy Regulatory Commission as Critical Energy Infrastructure Information (CEII)

EXHIBIT F – GENERAL DESIGN DRAWINGS

The following excerpt from the Code of Federal Regulations (CFR) at 18 CFR § 4.41(g) describes the required content of this Exhibit[1].

Exhibit F consists of general design drawings of the principal project works described under paragraph (b) of this section (Exhibit A) and supporting information used as the basis of design. If the Exhibit F submitted with the application is preliminary in nature, applicant must so state in the application. The drawings must conform to the specifications of § 4.39.

(1) The drawings must show all major project structures in sufficient detail to provide a full understanding of the project, including:
- *(i) Plans (overhead view);*
- *(ii) Elevations (front view);*
- *(iii) Profiles (side view); and*
- *(iv) Sections.*

(2) The applicant may submit preliminary design drawings with the application. The final Exhibit F may be submitted during or after the licensing process and must show the precise plans and specifications for proposed structures. If the project is licensed on the basis of preliminary designs, the applicant must submit a final Exhibit F for Commission approval prior to commencement of any construction of the project.

(3) Supporting design report. The applicant must furnish, at a minimum, the following supporting information to demonstrate that existing and proposed structures are safe and adequate to fulfill their stated functions and must submit such information in a separate report at the time the application is filed. The report must include:
- *(i) An assessment of the suitability of the site and the reservoir rim stability based on geological and subsurface investigations, including investigations of soils and rock borings and tests for the elevation of all foundations and construction materials sufficient to determine the location and type of dam structure suitable for the site;*
- *(ii) Copies of boring logs, geology reports and laboratory test reports;*
- *(iii) An identification of all borrow areas and quarry sites and an estimate of required quantities of suitable construction material;*
- *(iv) Stability and stress analyses for all major structures and critical abutment slopes under all probable loading conditions, including seismic and hydrostatic forces induced by water loads up to the Probable Maximum Flood as appropriate; and*
- *(v) The bases for determination of seismic loading and the spillway Design Flood in sufficient detail to permit independent staff evaluation.*

(4) The applicant must submit two copies of the supporting design report described in paragraph (g)(3) of this section at the time preliminary and final design drawings are submitted to the Commission for review. If the report contains preliminary drawings, it must be designated a "Preliminary Supporting Design Report."

[1] 18 CFR § 4.51(g) cross-references Exhibit F requirements published at 18 CFR § 4.41(g).

1.0 REQUEST FOR PRIVILEGED TREATMENT – CEII

In accordance with 18 CFR Part §388.112, the Districts are requesting privileged treatment by the Federal Energy Regulatory Commission (FERC) for the Exhibit F General Design Drawings as the drawings contain Critical Energy Infrastructure Information (CEII). This request for privileged treatment is made to FERC in accordance with the series of CEII Rulemakings issued by FERC in Order Nos. 630, 630-A, 643, 649, 662, 683, and 702. The Districts are requesting that the General Design Drawings be given privileged treatment because the drawings and Supporting Design Report clearly show the location of the critical project features and design information. For this reason, the Districts have filed the Exhibit F General Design Drawings and the Supporting Design Report with FERC as CEII

In accordance with FERC's CEII Regulations, the following statement regarding access to CEII is provided:

> *Procedures for obtaining access to Critical Energy Infrastructure Information (CEII) may be found at 18 CFR §388.113. Requests for access to CEII should be made to the Commission's CEII Coordinator.*

2.0 GENERAL DESIGN DRAWINGS

The General Design Drawings show overall plan views, elevations, and sections of the principal project works in sufficient detail to provide a full understanding of the Don Pedro Project. The drawings are prepared in accordance with FERC's regulations and provide plan views, elevations, and sections of the principal project works. The drawings were developed from the FERC-approved Exhibit L and F drawings, which depict the as-built condition of the Don Pedro Project as described in Exhibit A of this license application.

As noted above in Section 1.0, these drawings are designated CEII, are included in the version of Exhibit F filed only with FERC as Appendix F-1, and are summarized in Table 2.0-1.

Table 2.0-1. Exhibit F General Design Drawings for the Don Pedro Project

Drawing No.	Description
F-1	General Project Layout
F-2	Rockfill Dam – Section and Details
F-3	Dikes A, B & C – Plans and Sections
F-4	Diversion Tunnel
F-5	Inlet Works
F-6	Outlet Works
F-7	Power Tunnel – Plan and Profile
F-8	Power Tunnel – Intake and Gate Shaft
F-9	Unit 4 Tailrace Tunnel
F-10	Spillway
F-11	Powerhouse Service Area
F-12	Powerhouse Generator Floor
F-13	Powerhouse Turbine Floor
F-14	Powerhouse Valve Floor
F-15	Powerhouse Longitudinal Section
F-16	Powerhouse Transverse Sections
F-17	Powerhouse Electrical - Main Single Line Diagram
F-18	Switchyard Electrical - Main Single Line Diagram
F-19	Switchyard Electrical Layout – South End
F-20	Switchyard Electrical Layout – North End and Sections

3.0 SUPPORTING DESIGN REPORT

Section 4.41(g)(2) requires that an applicant for new license file a Supporting Design Report with the final license application. The purpose of the Supporting Design Report is to demonstrate "…that existing structures are safe and adequate to fulfill their stated functions…". As noted above in Section 1.0, the Supporting Design Report is designated as CEII and is included in the version of Exhibit F filed only with FERC as Appendix F-2.

Since the Don Pedro Project began operation, a FERC-approved independent inspector has inspected the Don Pedro Project eight times and has submitted to FERC Independent Safety Inspection Reports once every five years in conformance with 18 CFR part 12, Safety of Water Power Projects and Project Works. Table 3.0-1 summarizes these past reports, the date they were filed, and the names of the FERC-approved independent inspector who performed each of these Part 12 inspections. The Districts are not proposing any modifications to the principal civil works as part of this license application.

Table 3.0-1. Summary of Part 12 Dam Safety Inspection Reports for the Don Pedro Project

Independent Inspector	No. / Date Filed
William A. Rettberg, GEI Consultants	Eighth Part 12 Safety Inspection Report / June 2011
Peter J, Hradilek, HDR Engineering, Inc.	Seventh Part 12 Safety Inspection Report / April 2006
Wayne D. Edwards, HDR Engineering, Inc	Sixth Part 12 Safety Inspection Report / June 2001
Harza Corp	Fifth Part 12 Safety Inspection Report / June 1996
Bechtel Corp	Fourth Part 12 Safety Inspection Report / June 1991
Bechtel Corp	Third Part 12 Safety Inspection Report / May 1986
Carl V. Taylor	Second Part 12 Safety Inspection Report / June 1981
Carl V. Taylor	First Part 12 Safety Inspection Report / June 1976

CEII

DON PEDRO HYDROELECTRIC PROJECT
FERC NO. 2299

FINAL LICENSE APPLICATION

EXHIBIT F – GENERAL DESIGN DRAWINGS

APPENDIX F-1
EXHIBIT F DRAWINGS

DRAWINGS FILED ONLY WITH THE FEDERAL ENERGY REGULATORY COMMISSION AS CRITICAL ENERGY INFRASTRUCTURE INFORMATION

CEII

DON PEDRO HYDROELECTRIC PROJECT
FERC NO. 2299

FINAL LICENSE APPLICATION

EXHIBIT F – GENERAL DESIGN DRAWINGS

APPENDIX F-2
SUPPORTING DESIGN REPORT

SUPPORTING DESIGN REPORT FILED ONLY WITH THE FEDERAL ENERGY REGULATORY COMMISSION AS CRITICAL ENERGY INFRASTRUCTURE INFORMATION

DON PEDRO HYDROELECTRIC PROJECT
FERC NO. 2299

FINAL LICENSE APPLICATION

EXHIBIT G – PROJECT MAPS



Prepared by:
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P.O. Box 949
Turlock, CA 95381

and

Modesto Irrigation District
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Modesto, CA 95352

April 2014

EXHIBIT G – PROJECT BOUNDARY MAPS

The following excerpt from the Code of Federal Regulations (CFR) at 18 CFR § 4.41(h) describes the required content of this Exhibit[1].

Exhibit G is a map of the project that must conform to the specifications of § 4.39. In addition to the other components of Exhibit G, the applicant must provide the project boundary data in a georeferenced electronic format – such as ArcView shape files, GeoMedia files, MapInfo files, or any similar format. The electronic boundary data must be potentially accurate to ± 40 ft, in order to comply with the National Map Accuracy Standards for maps at a 1:24,000 scale (the scale of the USGS quadrangle maps). The electronic exhibit G data must include a text file describing the map projection used (i.e., UTM, State Plane, Decimal Degrees, etc.), the map datum (i.e., North American 27, North American 83, etc.) and the units of measurement (i.e., feet, meters, miles, etc.). Three sets of the maps must be submitted on CD or other appropriate electronic media. If more than one sheet is used, for the paper maps, the sheets must be numbered consecutively, and each sheet must bear a small insert sketch showing the entire project and indicating that portion of the project depicted on that sheet. Each sheet must contain a minimum of three known reference points. The latitude and longitude coordinates, or stat plane coordinates, of each reference point must be shown. If at any time after the application is filed there is any change in the project boundary, the applicant must submit, within 90 days following the completion of project construction, a final Exhibit G showing the extent of such changes. The map must show:

(1) Location of the project and principal features. The map must show the location of the project as a whole with reference to the affected stream or other body of water and, if possible, to a nearby town or any other permanent monuments or objects, such as roads, transmissions lines or other structures, that can be noted on the map and recognized in the field. The map must also show the relative locations and physical interrelationships of the principal project works and other features described under paragraph (b) of this section (Exhibit A).

(2) Project Boundary. The map must show a project boundary enclosing all project works and other features described under paragraph (b) of this section (Exhibit A) that are to be licensed. If accurate survey information is not available at the time the application is filed, the applicant must so state, and a tentative boundary may be submitted. The boundary must enclose only those lands necessary for operation and maintenance of the project and for other project purposes, such as recreation, shoreline control, or protection of environmental resources (see paragraph (f) of this section (Exhibit E)). Existing residential, commercial, or other structures may be included within the boundary only to the extent that underlying lands are needed for project purposes (e.g., for flowage, public recreation, shoreline control, or protection of environmental resources). If the boundary is on land covered by a public survey, ties must be shown on the map at sufficient points to permit accurate platting of the position of the boundary relative to the lines of the public land survey, the best available legal description of the

[1] 18 CFR 4.51(h) cross-references Exhibit G requirements published at 18 CFR 4.41(h).

position of the boundary must be provided, including distances and directions from fixed monuments or physical features. The boundary must be described as follows:

(i) Impoundments.

(A) The boundary around a project impoundment must be described by one of the following:

(1) Contour lines, including the contour elevation (preferred method);

(2) Specified courses and distances (meets and bounds);

(3) If the project lands are covered by a public land survey, lines upon or parallel to the lines of the survey; or

(4) Any combination of the above methods.

(B) The boundary must be located no more than 200 feet (horizontal measurement) from the exterior margin of the reservoir, defined by the normal maximum surface elevation, except where deviations may be necessary in describing the boundary according to the above methods or where additional lands are necessary for project purposes, such as public recreation, shoreline control, or protection of environmental resources.

(ii) Continuous features. The boundary around linear (continuous) project features such as access roads, transmission lines, and conduits may be described by specified distances from center lines or offset lines of survey. The width of such corridors must not exceed 200 feet unless good cause is shown for a greater width. Several sections of a continuous feature may be shown on a single sheet with information showing the sequence of contiguous sections.

(iii) Noncontinuous features.

(A) The boundary around noncontinuous project works such as dams, spillways, and powerhouses must be described by one of the following:

(1) Contour lines;

(2) Specified courses and distances;

(3) If the project lands are covered by a public land survey, lines upon or parallel to the lines of the survey; or

(4) Any combination of the above methods.

(B) The boundary must enclose only those lands that are necessary for safe and efficient operation and maintenance of the project or for other specified project purposes, such as public recreation or protection of environmental resources.

(3) Federal lands. Any public lands and reservations of the United States (Federal lands) [see 16 U.S.C. 796 (1) and (2)] that are within the project boundary, such as lands administered by the U.S. Forest Service, Bureau of Land Management, or National Park Service, or Indian tribal lands, and the boundaries of those Federal lands, must be identified as such on the map by:

(i) Legal subdivisions of a public land survey of the affected area (a protration of identified township and section lines is sufficient for this purpose); and

(ii) The Federal agency, identified by symbol or legend, that maintains or manages each identified subdivision of the public land survey within the project boundary; or

(iii) In the absence of a public land survey, the location of the Federal lands according to the distances and directions from fixed monuments or physical features. When a Federal survey monument or a Federal bench mark will be destroyed or rendered unusable by the construction of project works, at least two permanent, marked witness monuments or bench marks must be established at accessible points. The maps show the location (and elevation, for bench marks) of the survey monument or bench mark which will be destroyed or rendered unusable, as well as of the witness monuments or bench marks. Connecting courses and distances from the witness monuments or bench marks to the original must also be shown.

(iv) The project location must include the most current information pertaining to affected federal lands as described under § 4.81(b)(5).

(4) Non-Federal lands. For those lands within the project boundary not identified under paragraph (h)(3) of this section, the map must identify by legal subdivision:

(i) Lands owned in fee by the applicant and lands that the applicant plans to acquire in fee; and

(ii) Lands over which the applicant has acquired or plans to acquire rights to occupancy and use other than fee title, including rights acquired or to be acquired by easement or lease

1.0 PROJECT BOUNDARY MAPS

This Exhibit G contains maps depicting the Project Boundary for the Don Pedro Hydroelectric Project in Appendix G-1. Appendix G-1 contains the 27 sheets that comprise the Exhibit G maps arranged to depict the Don Pedro Hydroelectric Project from the lower extent of the Project Boundary below the Don Pedro Dam to the upstream end of the Project Boundary on the Tuolumne River at River Mile 80.8. The Exhibit G maps have been prepared in accordance with FERC's regulations and show the relative locations and physical relationships within the approved Project Boundary. The principal civil works and other features depicted on the Exhibit G maps are described in detail in Exhibit A and Exhibit F of this application. The co-licensees, Turlock Irrigation District and Modesto Irrigation District, are not proposing any boundary amendments as part of this license application.

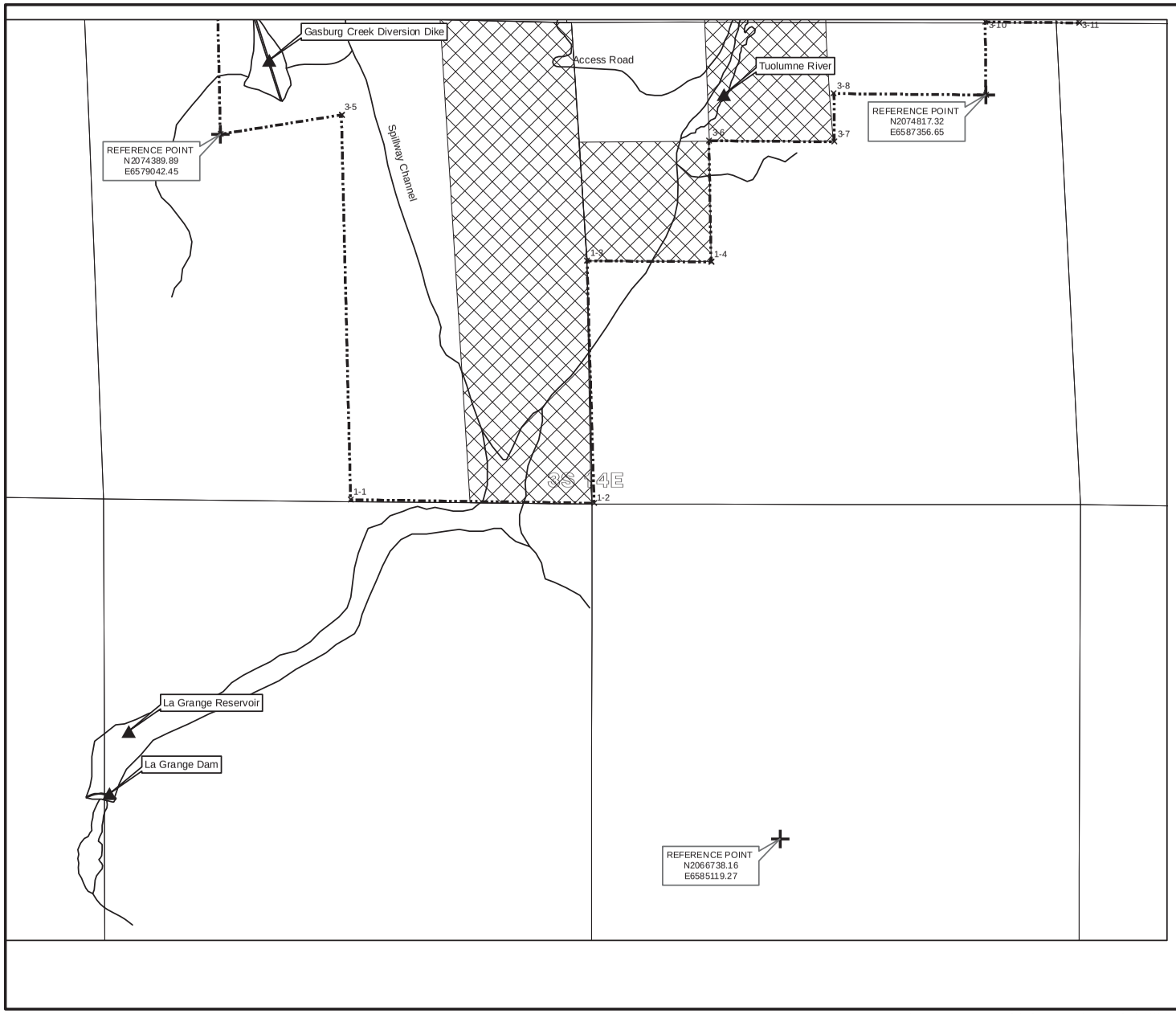
Appendix G-2 contains updated copies of FERC Form-587 identifying the Exhibit G Project Boundary maps associated with federal lands. The Project occupies approximately 4,802 acres of federal land within the Bureau of Land Management's Sierra Resource Management Unit.

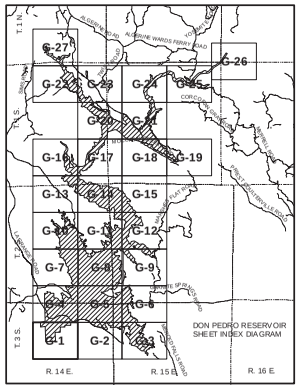
DON PEDRO HYDROELECTRIC PROJECT
FERC NO. 2299

FINAL LICENSE APPLICATION

EXHIBIT G – PROJECT MAPS

APPENDIX G-1
EXHIBIT G PROJECT BOUNDARY MAPS





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- ✕ Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 1**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

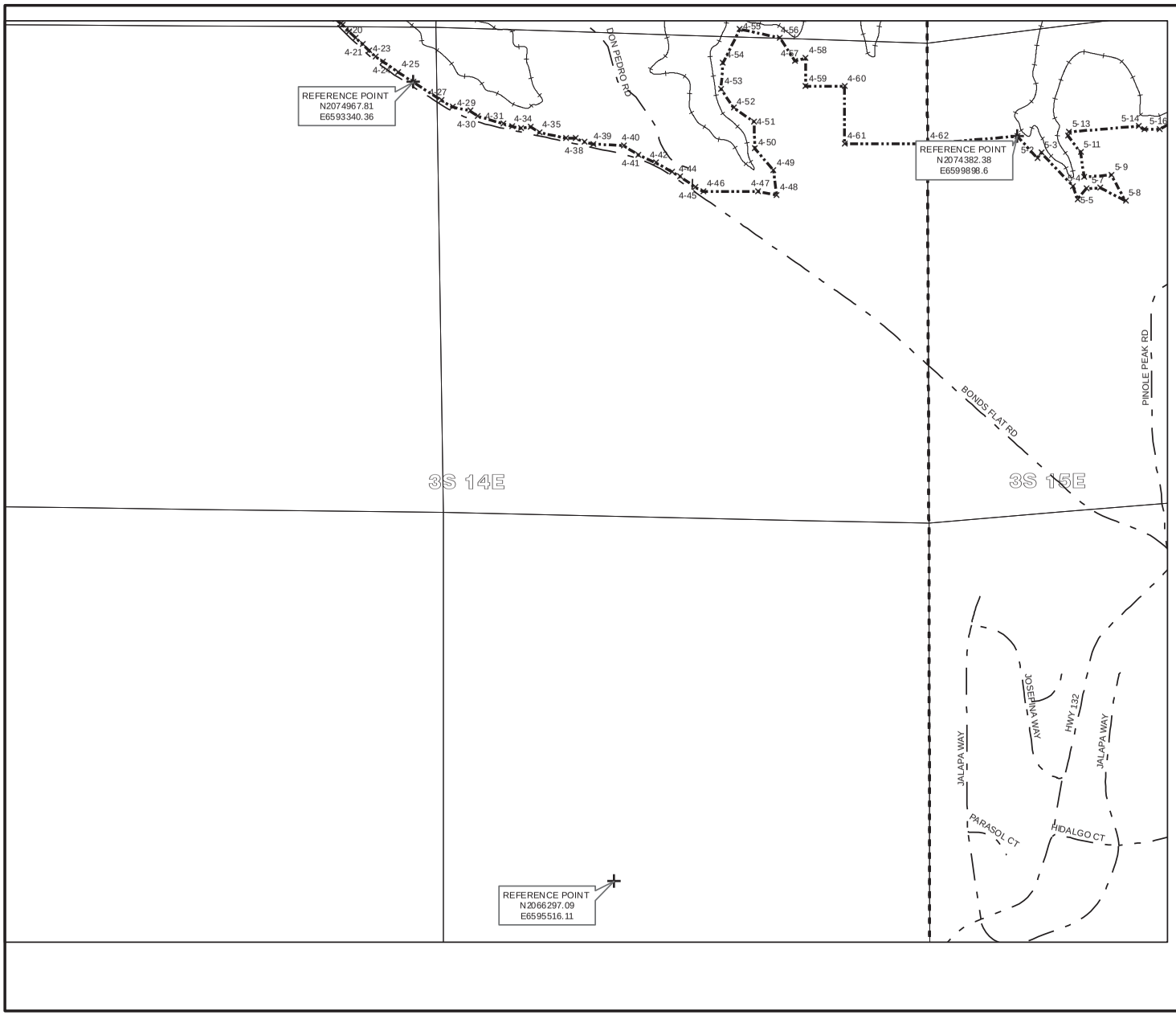
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

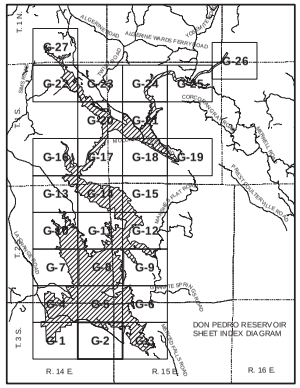
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 1 FERC DRAWING NO. 2299-085

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 2**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

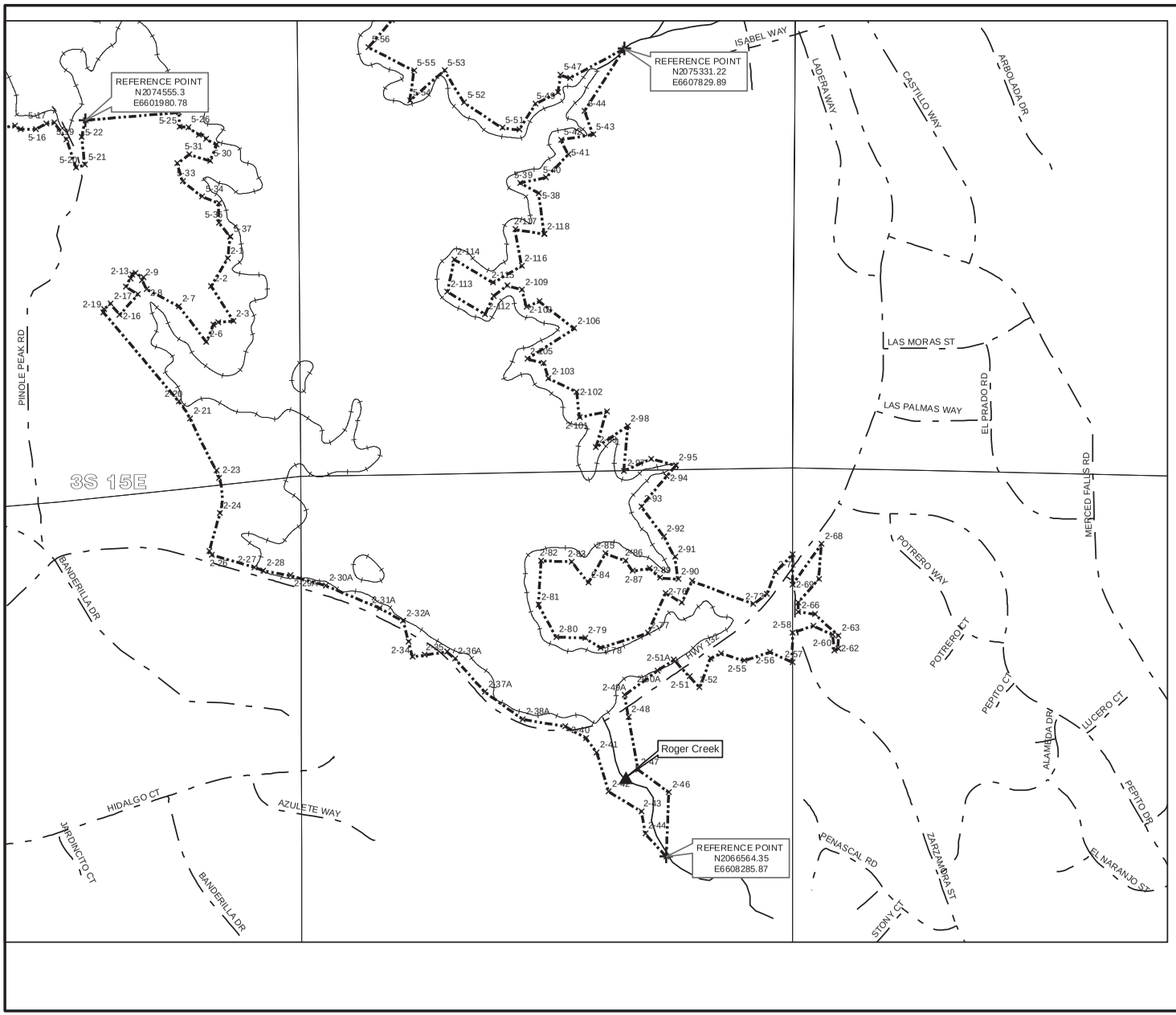
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

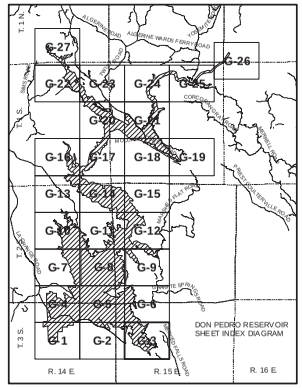
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 2, 4 & 5 FERC DRAWING NO. 2299-136,2299-088 & 2299-089

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 3**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

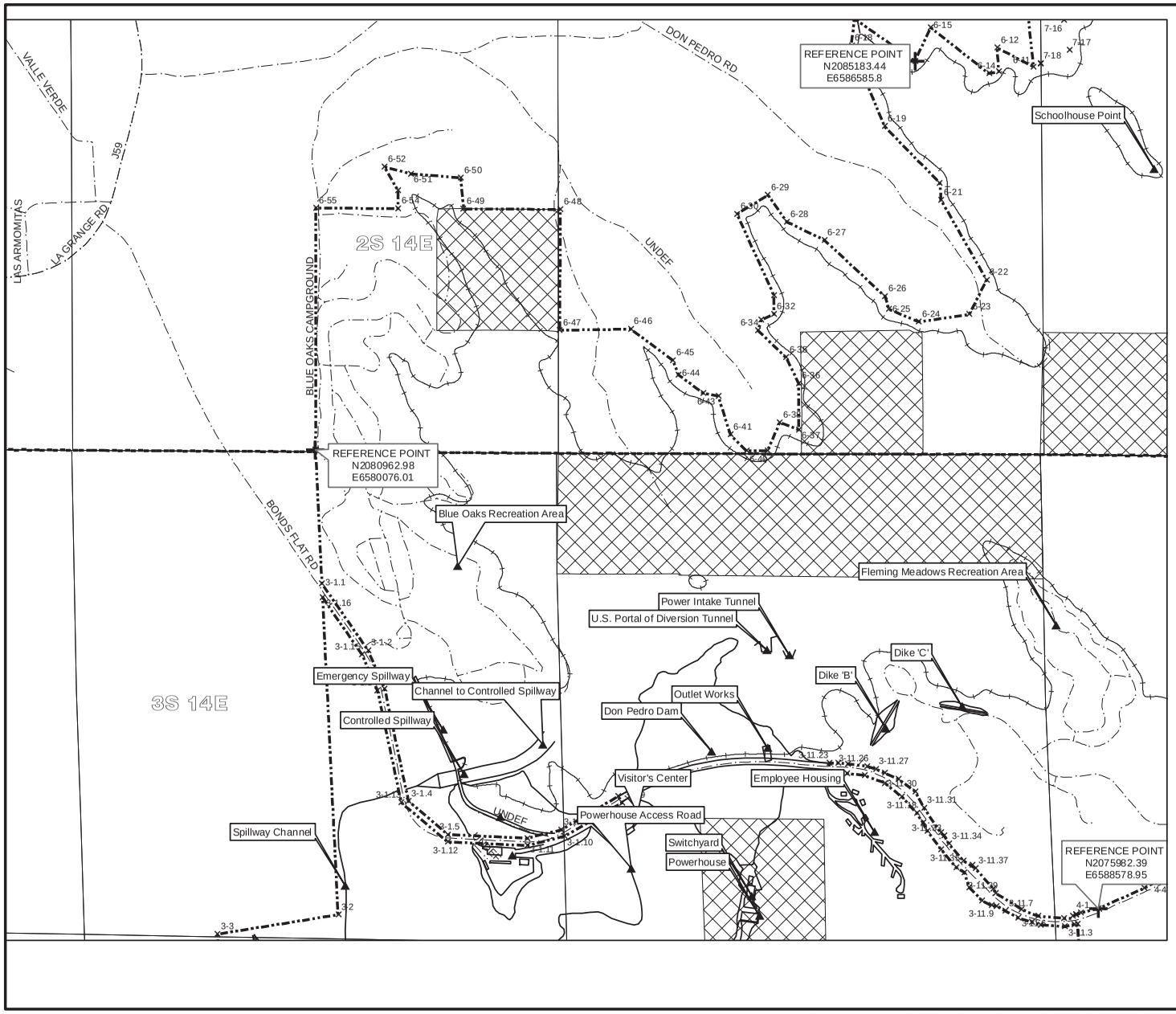
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

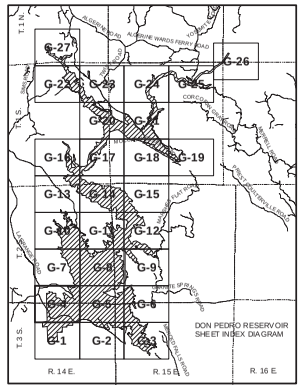
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 2 & 5 FERC DRAWING NO. 2299-136 & 2299-089

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G — **SHEET 4**

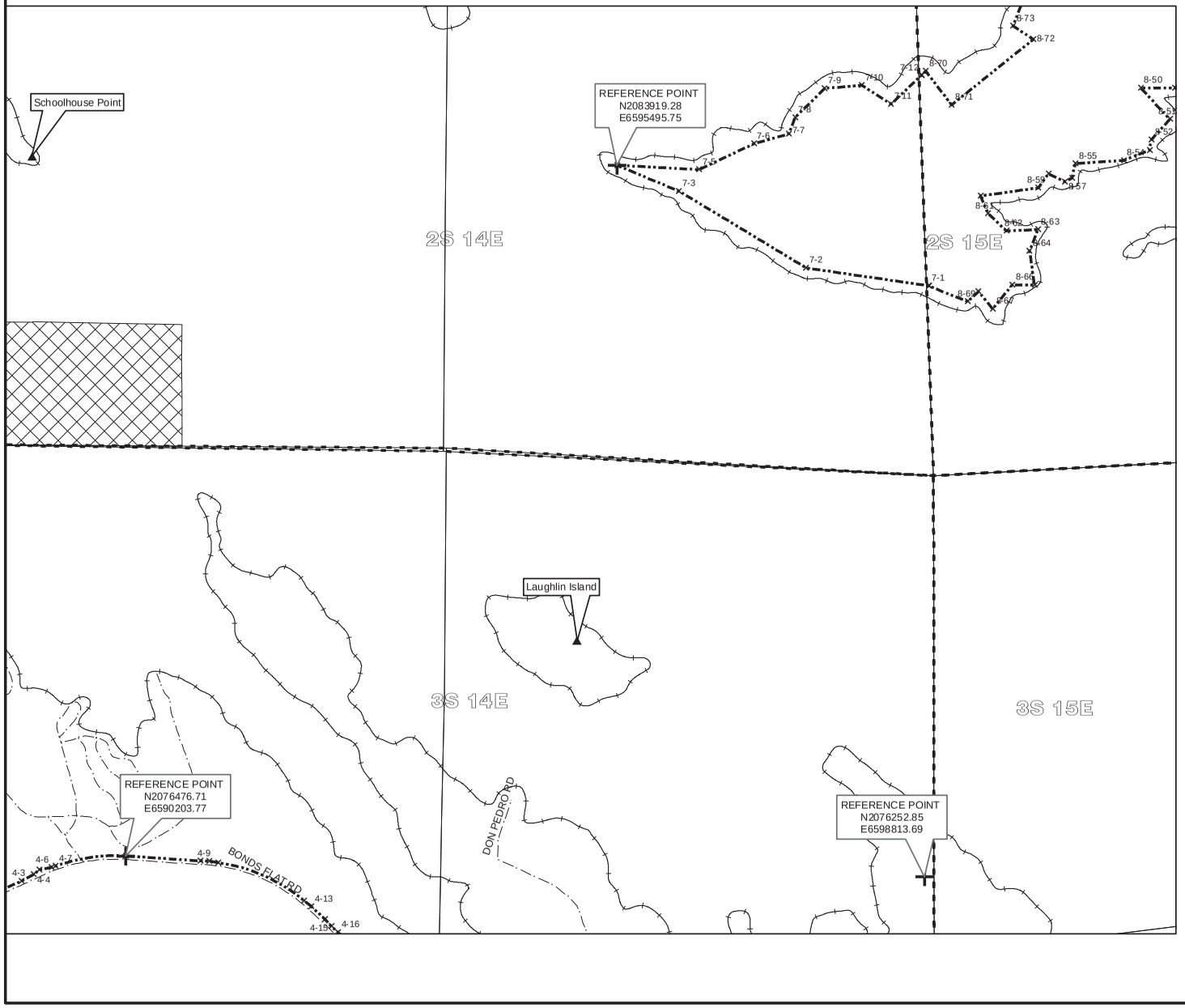
DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

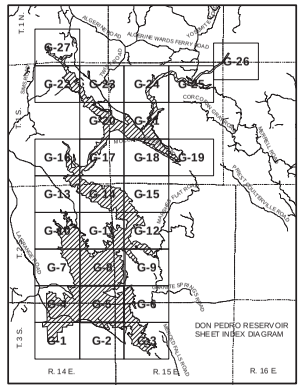
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 3,4 & 5 FERC DRAWING NO. 2299-137, 2299-088 & 2299-090

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 5**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

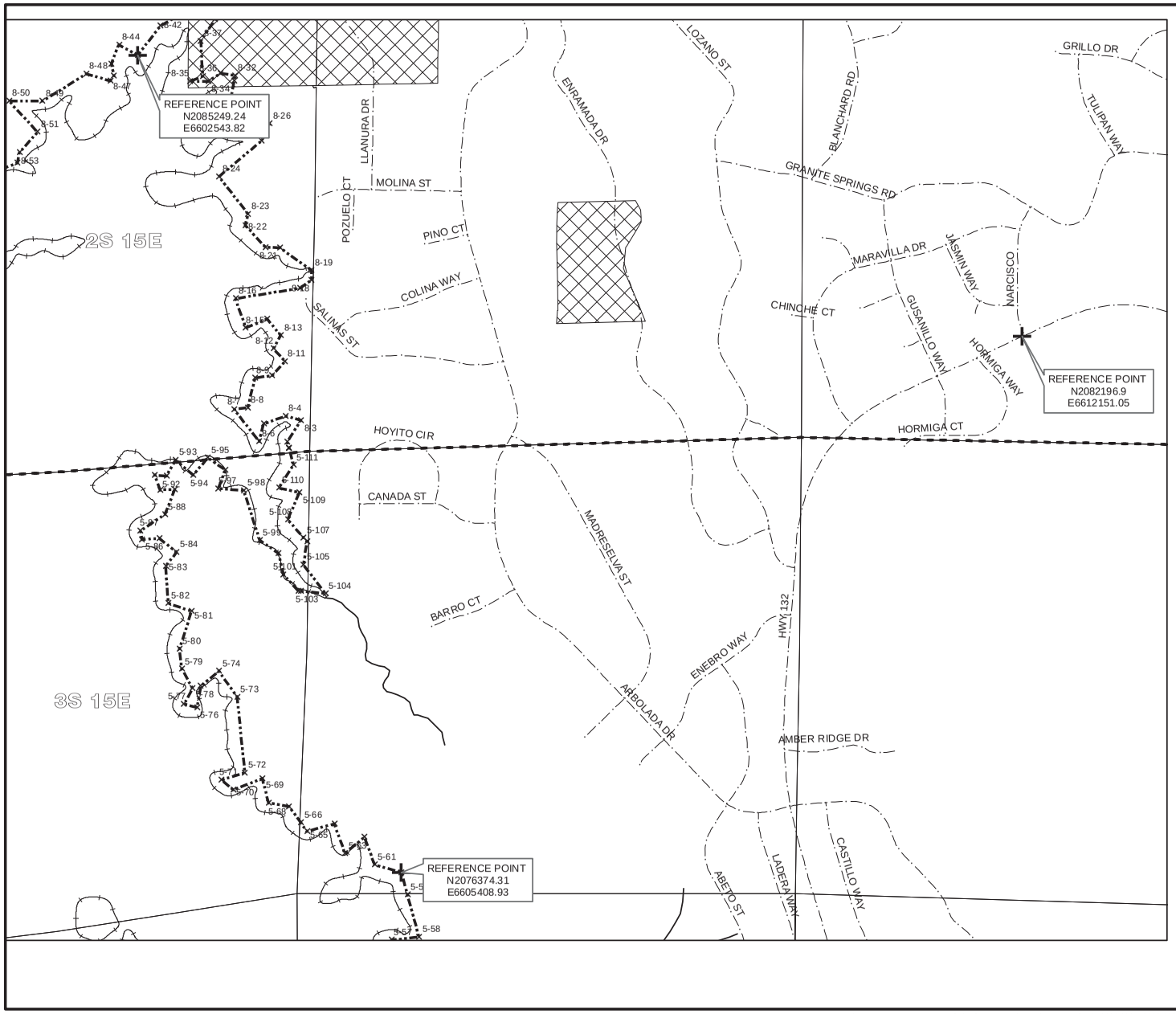
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

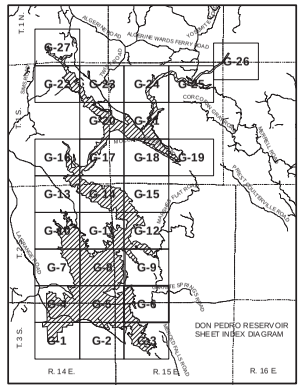
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 4,5,7 & 8 FERC DRAWING NO. 2299-088, 2299-089, 2299-090 & 2299-091

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G — **SHEET 6**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

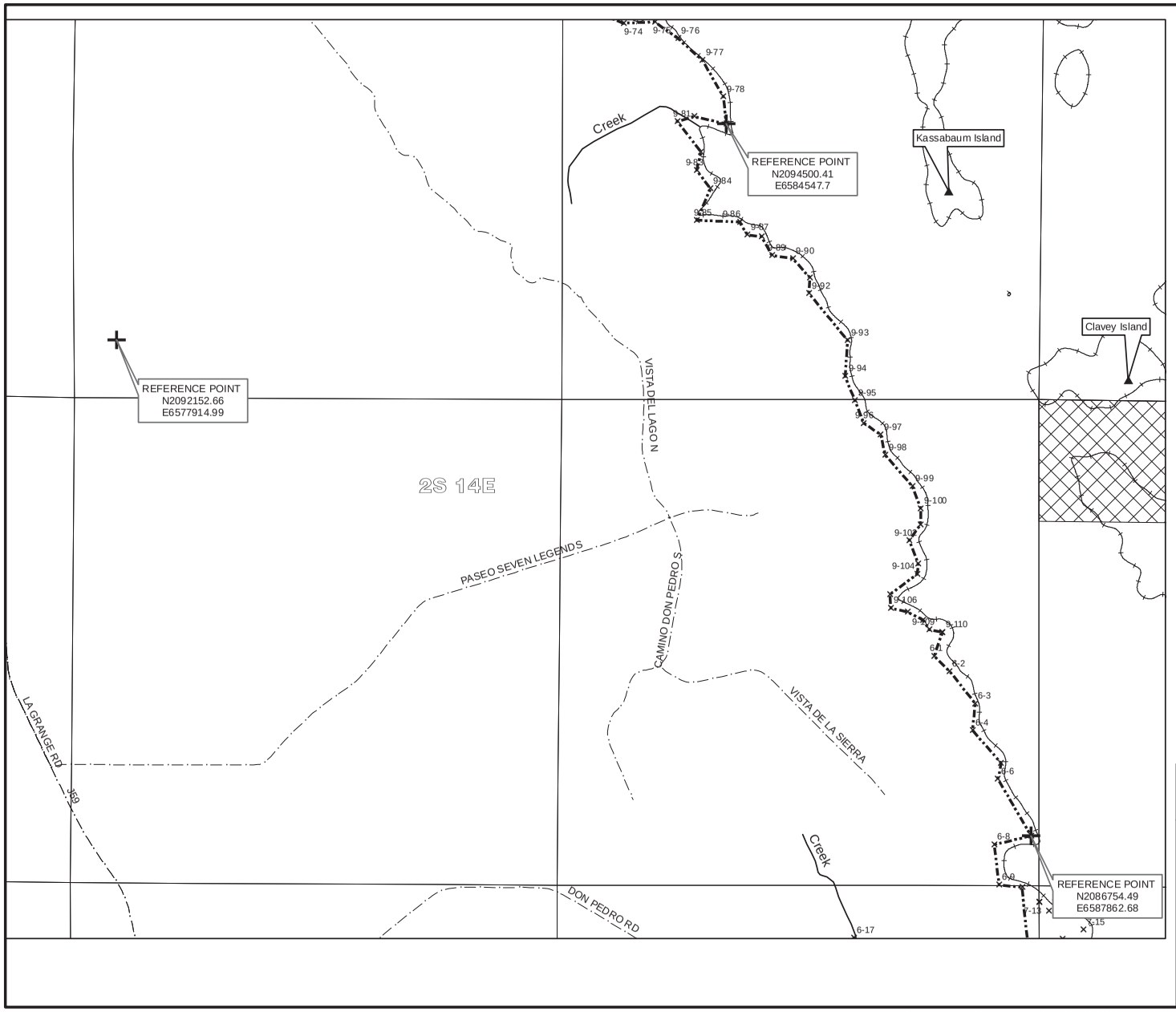
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

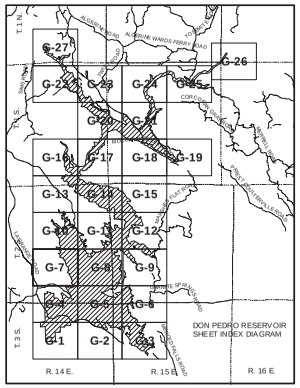
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 5 & 8 FERC DRAWING NO. 2299-089 & 2299-092

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 7**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

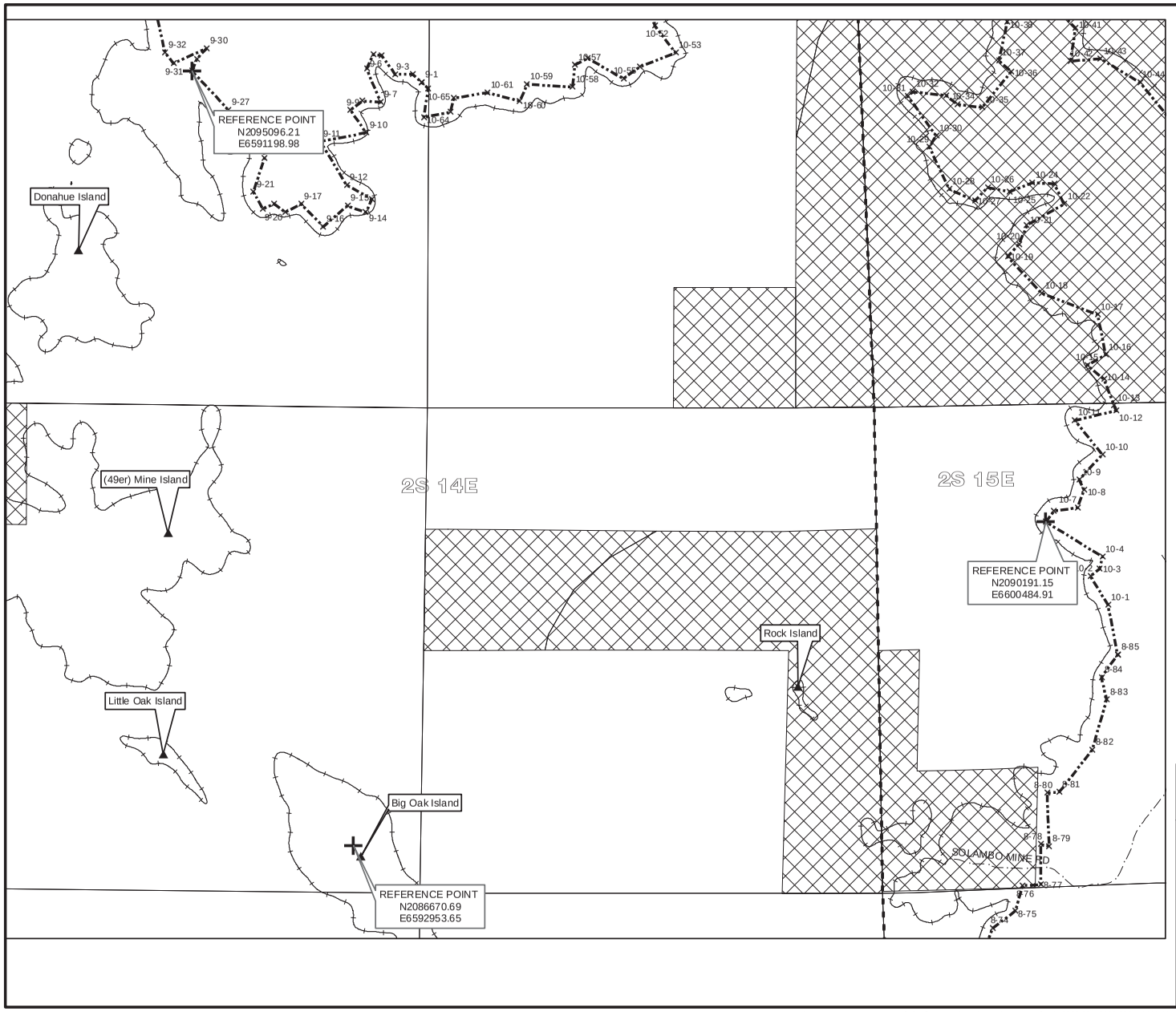
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

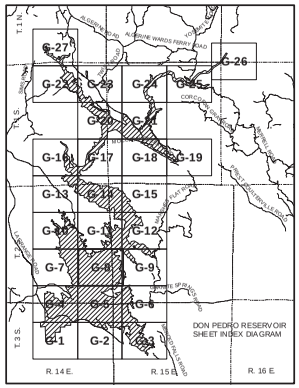
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 6,7 & 8 FERC DRAWING NO. 2299-090, 2299-091 & 2299-092

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 8**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

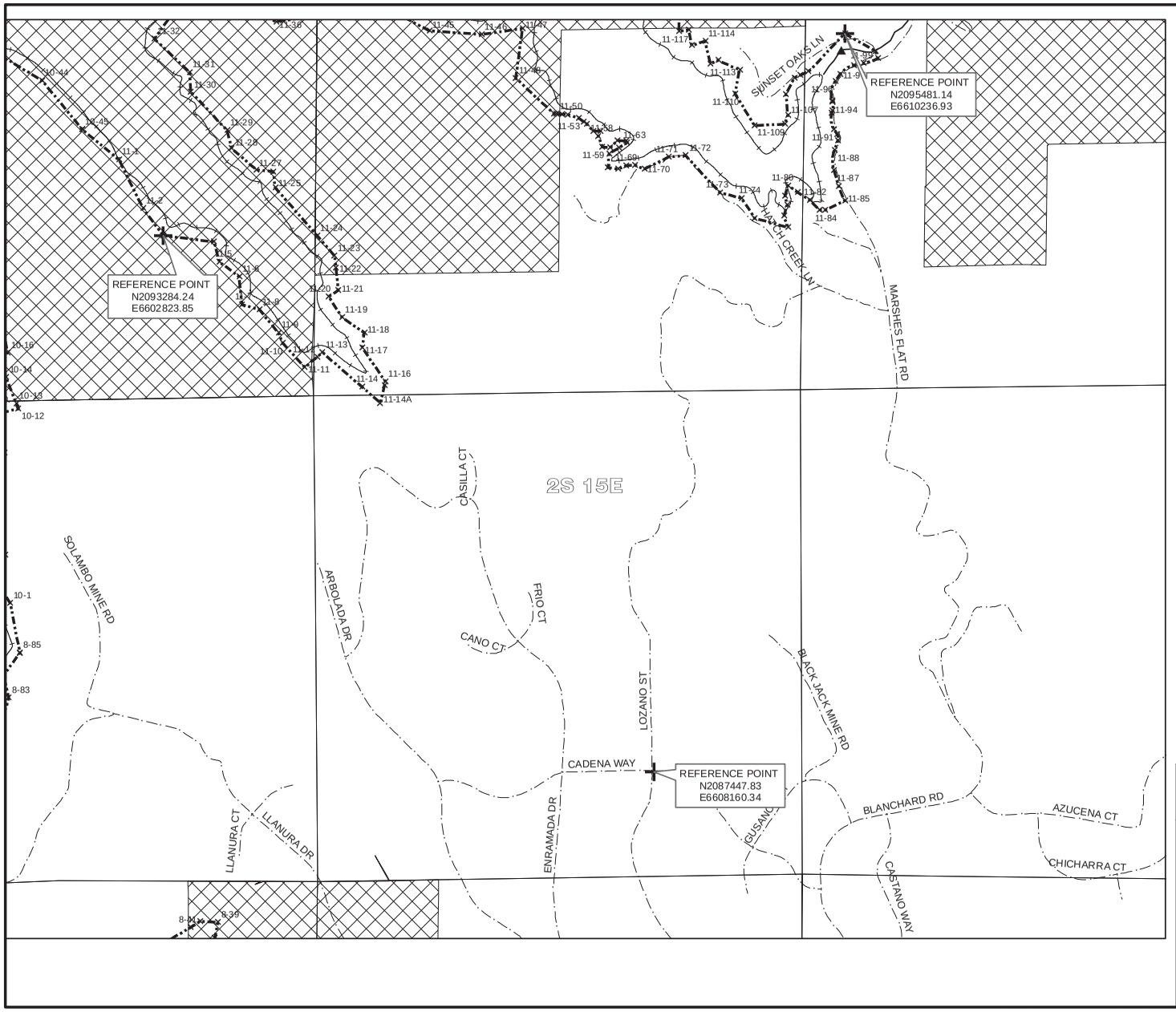
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

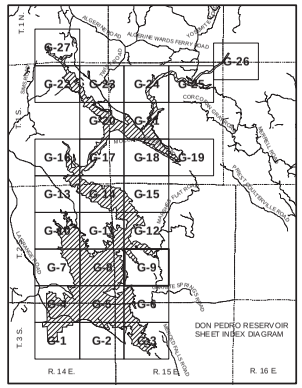
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 7,8 & 10 FERC DRAWING NO. 2299-091, 2299-092 & 2299-094

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 9**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

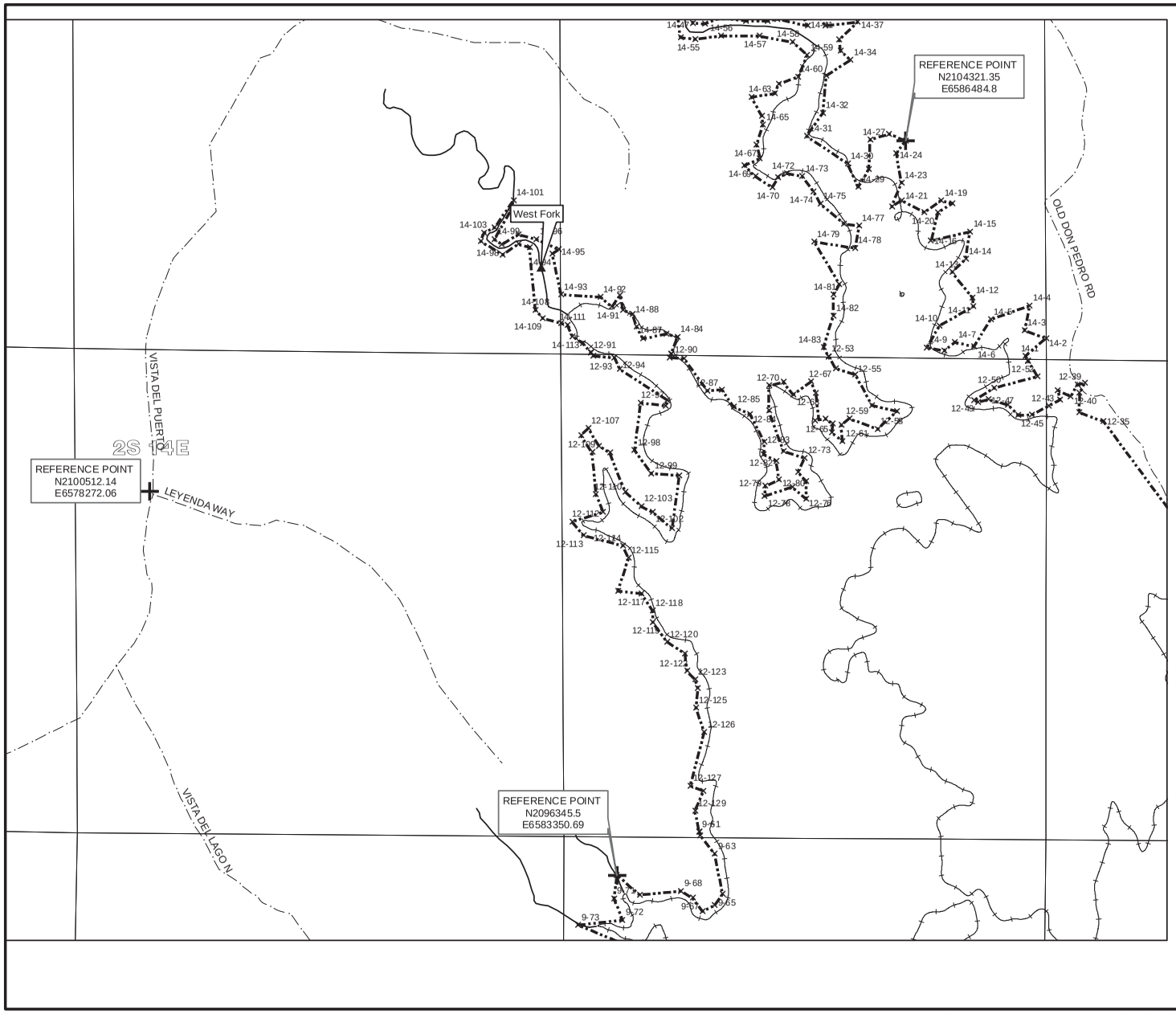
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

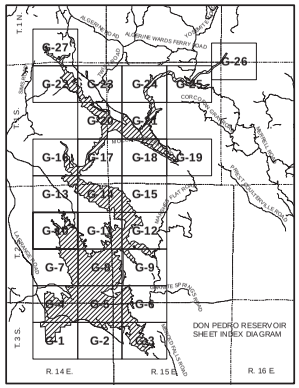
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 11 FERC DRAWING NO. 2299-095

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- ✕ Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G — **SHEET 10**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

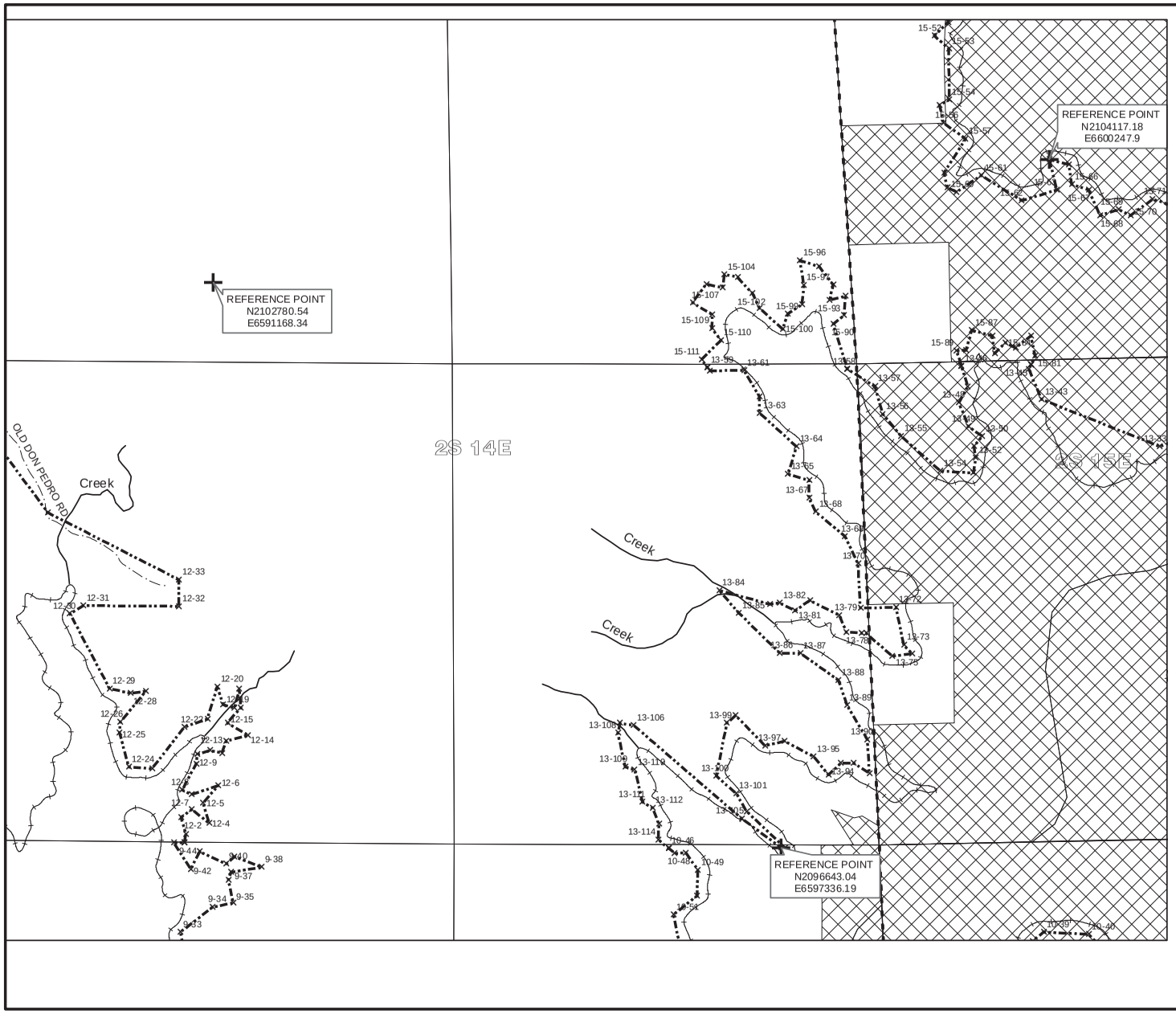
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

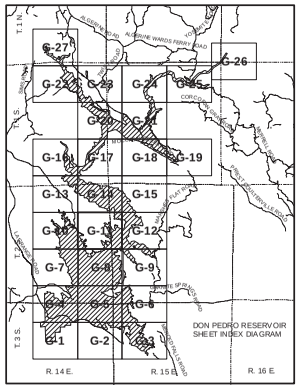
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 12 & 14 FERC DRAWING NO. 2299-096 & 2299-098

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G — **SHEET 11**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

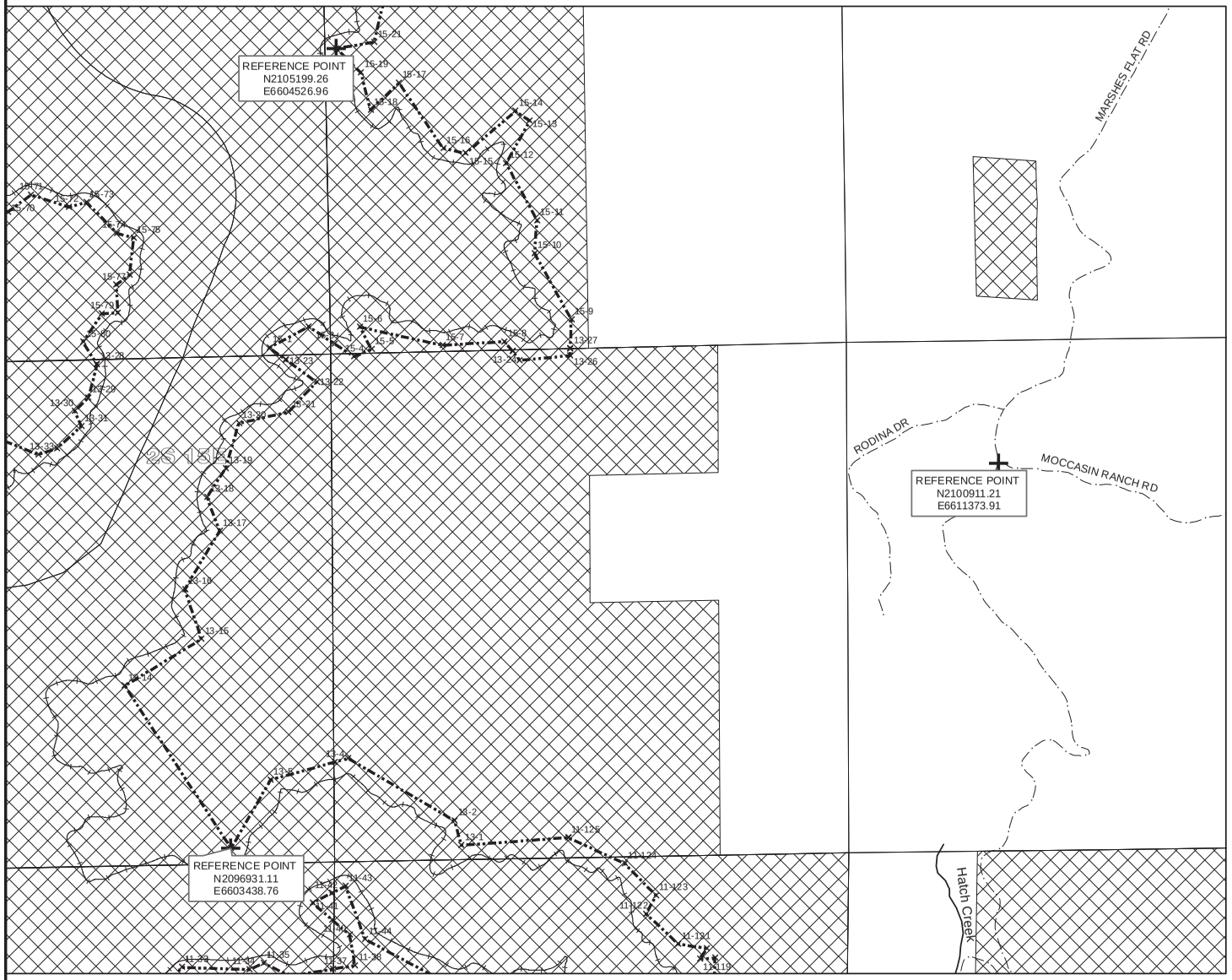
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

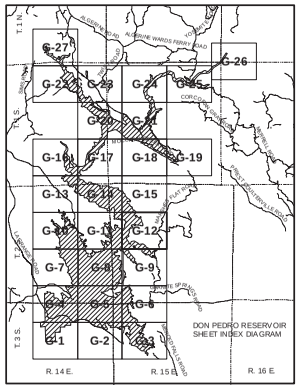
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 12, 13, 14 & 15 FERC DRAWING NO. 2299-096, 2299-097, 2299-098 & 2299-099

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 12**

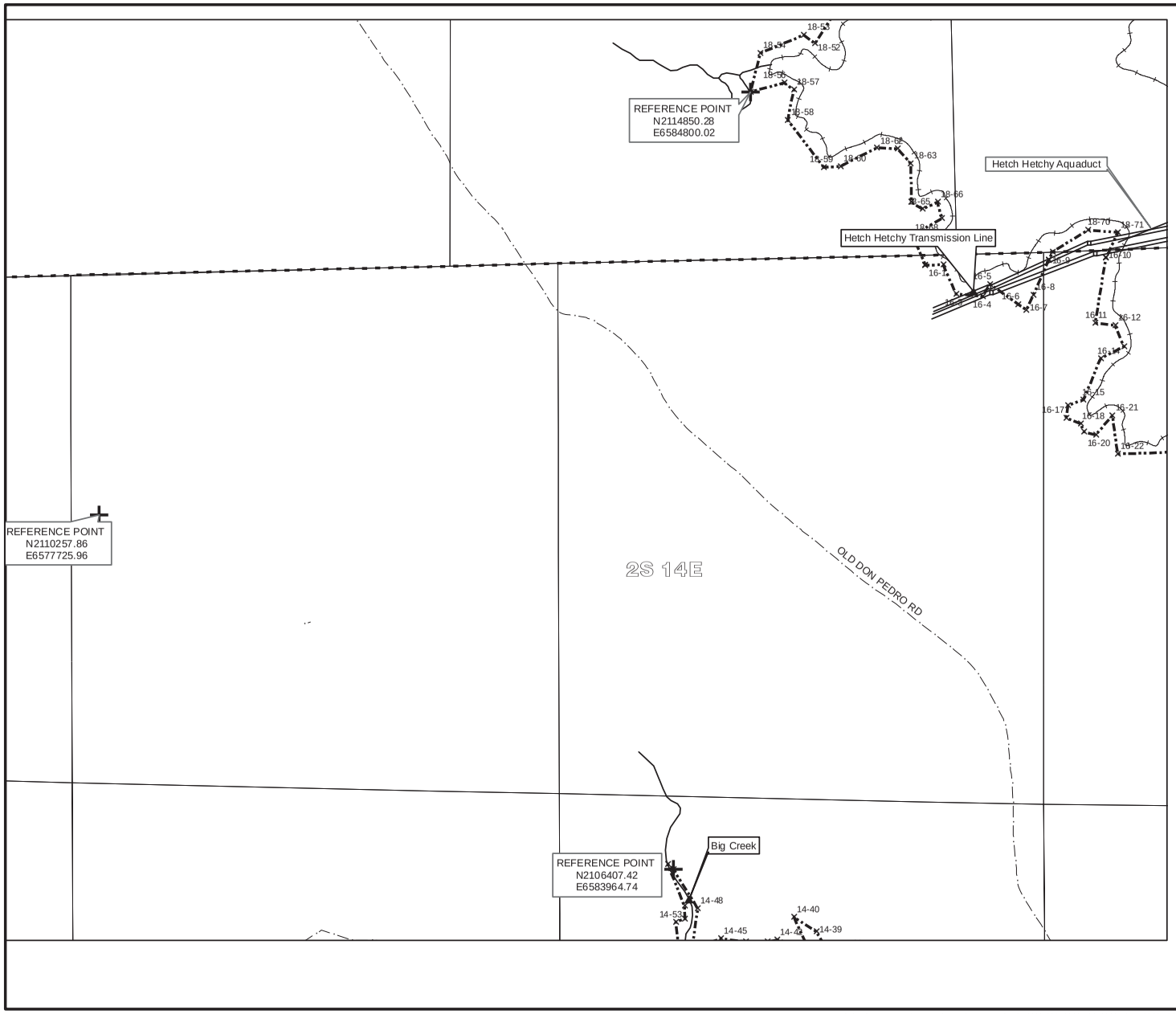
DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

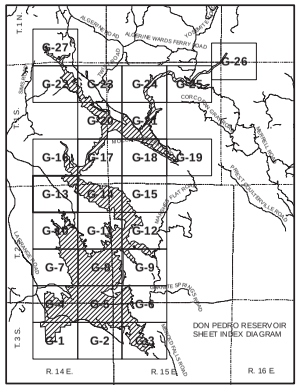
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 13 & 15 FERC DRAWING NO. 2299-097 & 2299-099

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 13**

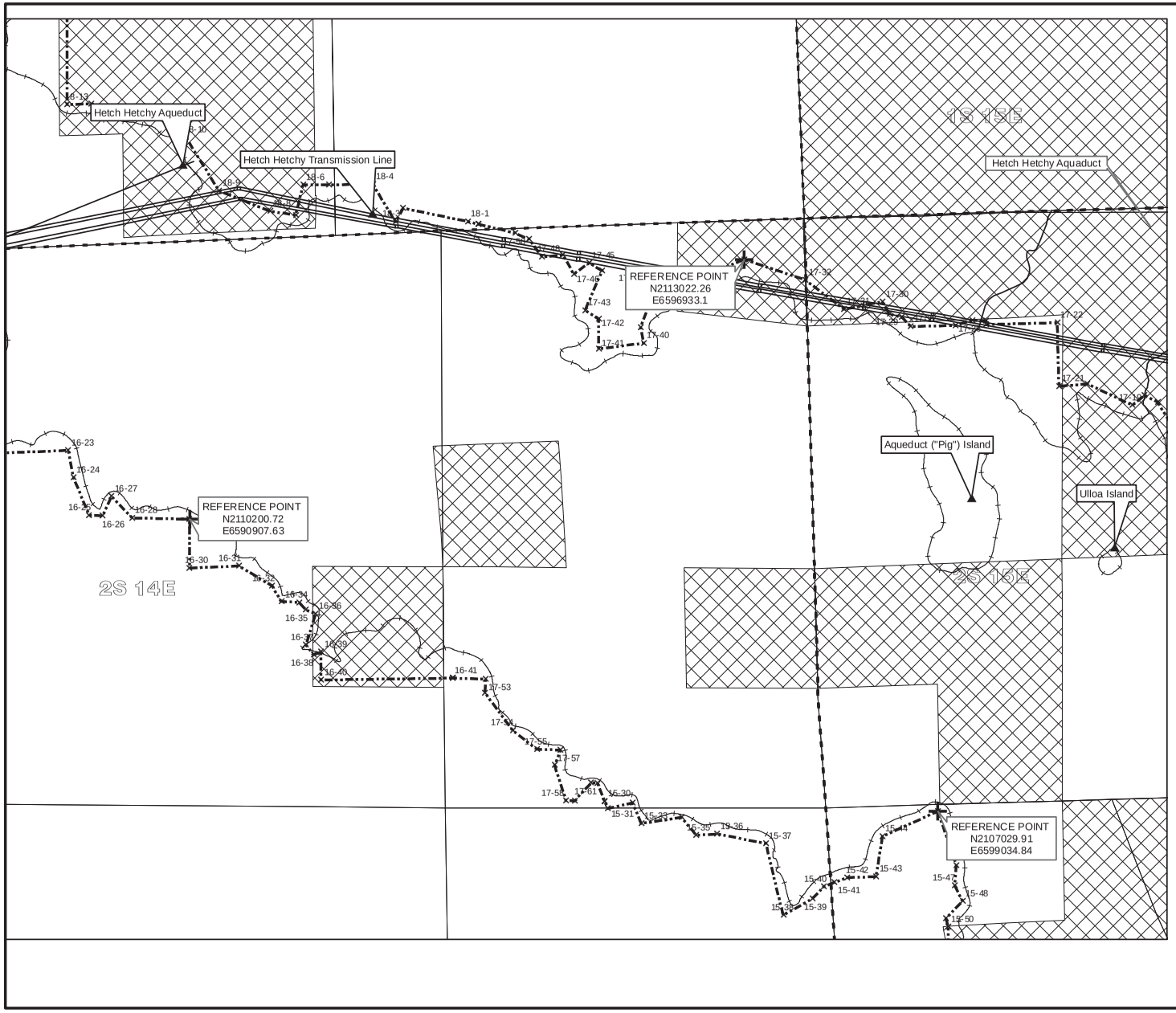
DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

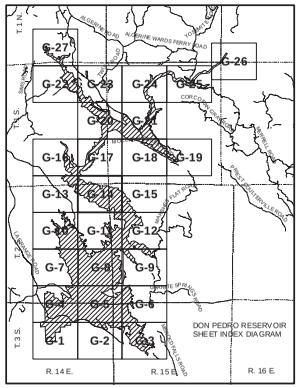
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 15, 16, 17 & 18 FERC DRAWING NO. 2299-099, 2299-100, 2299-101 & 2299-102

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 14**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

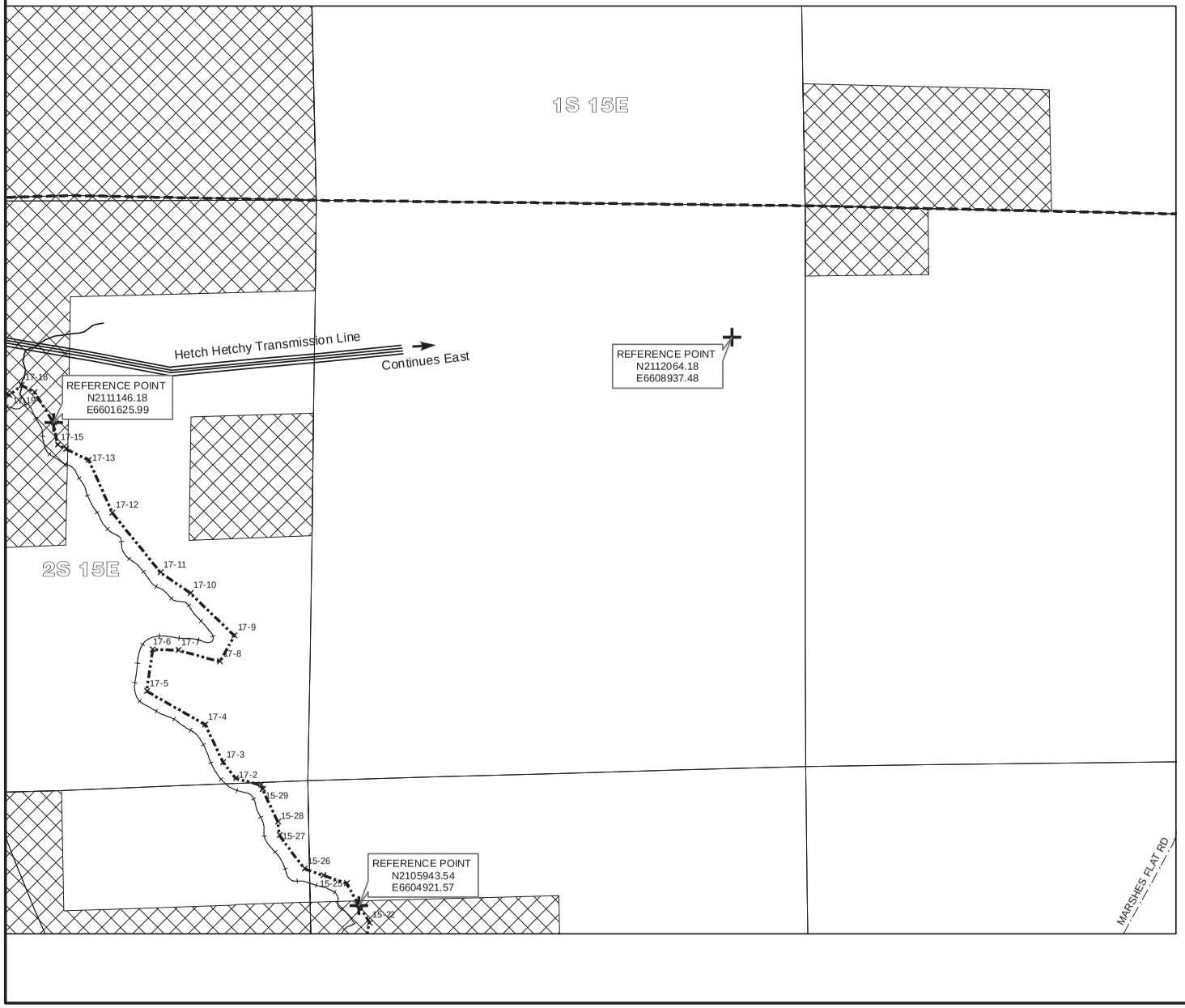
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

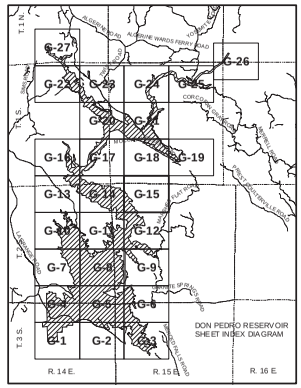
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 15, 16, 17 & 18 FERC DRAWING NO. 2299-099, 2299-100, 2299-101 & 2299-102

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 15**

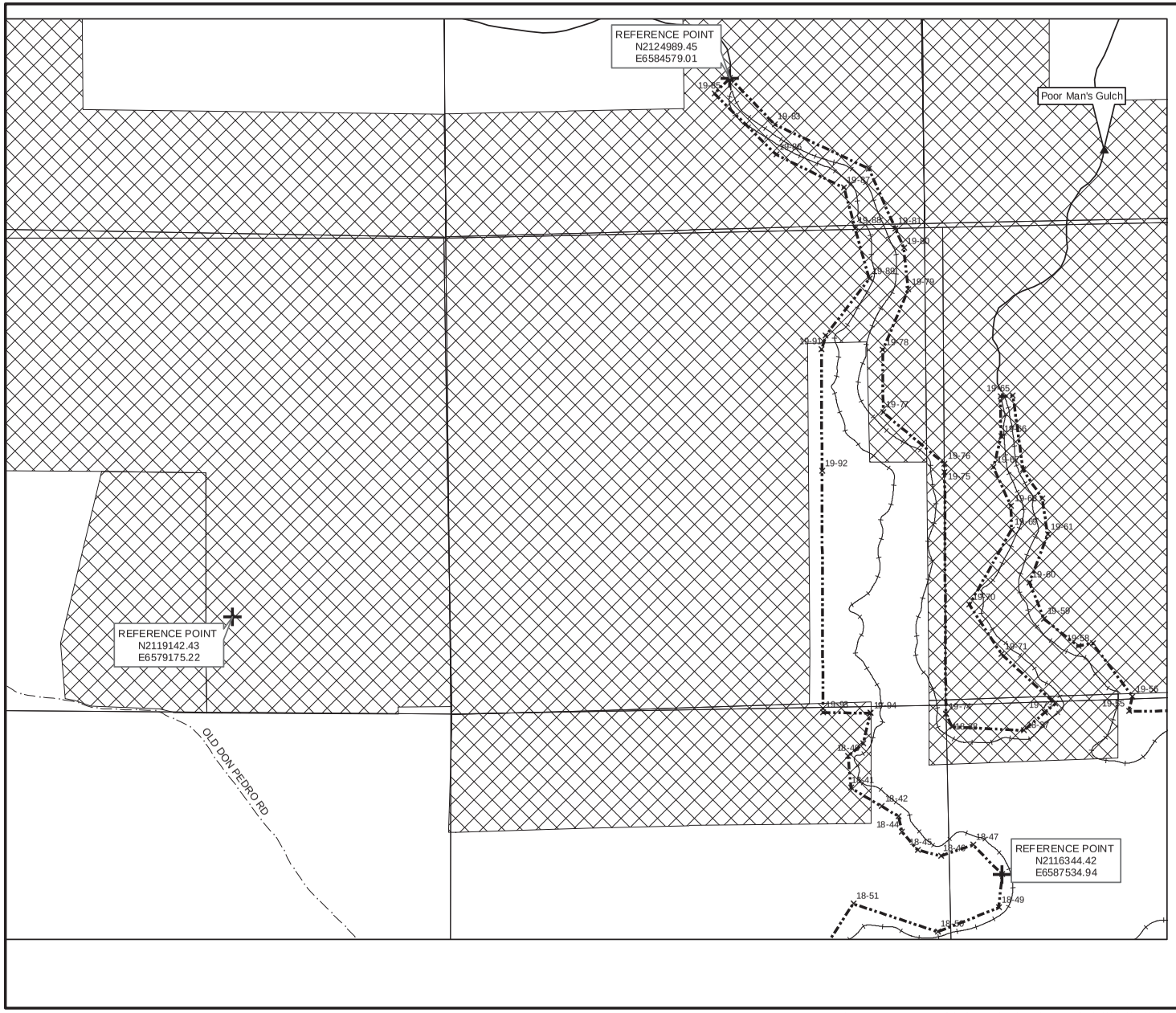
DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

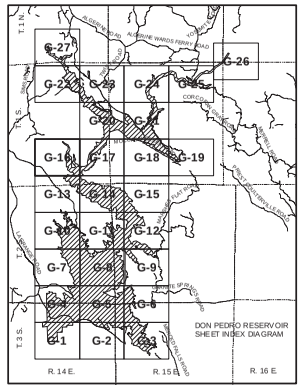
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 15 & 17 FERC DRAWING NO. 2299-099 & 2299-101

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 16**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

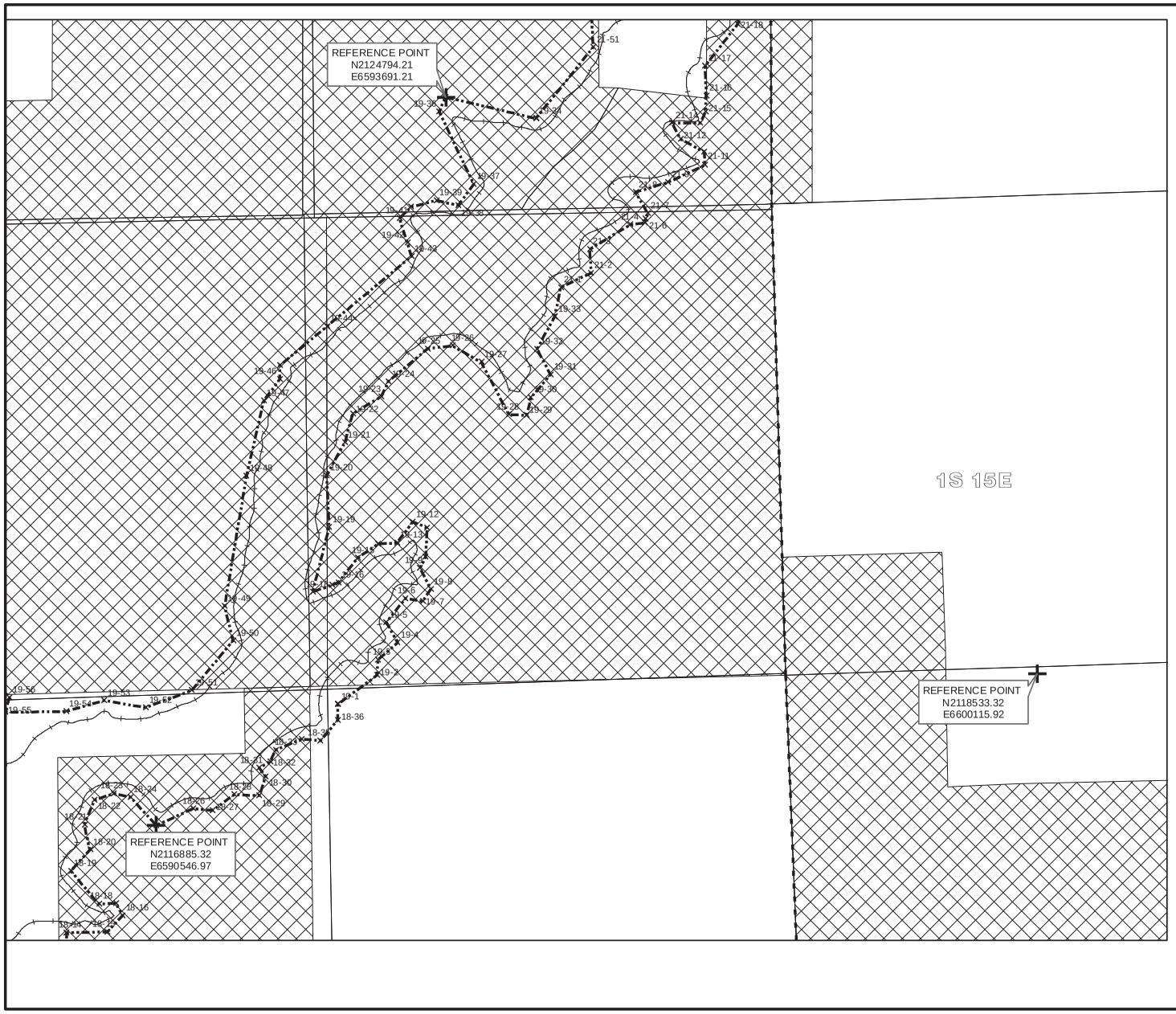
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

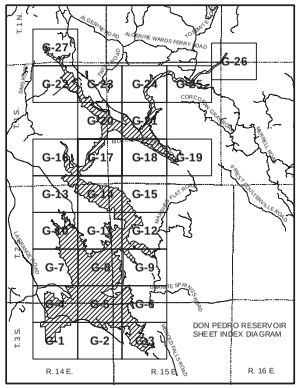
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 18 & 19 FERC DRAWING NO. 2299-102 & 2299-103

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 17**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

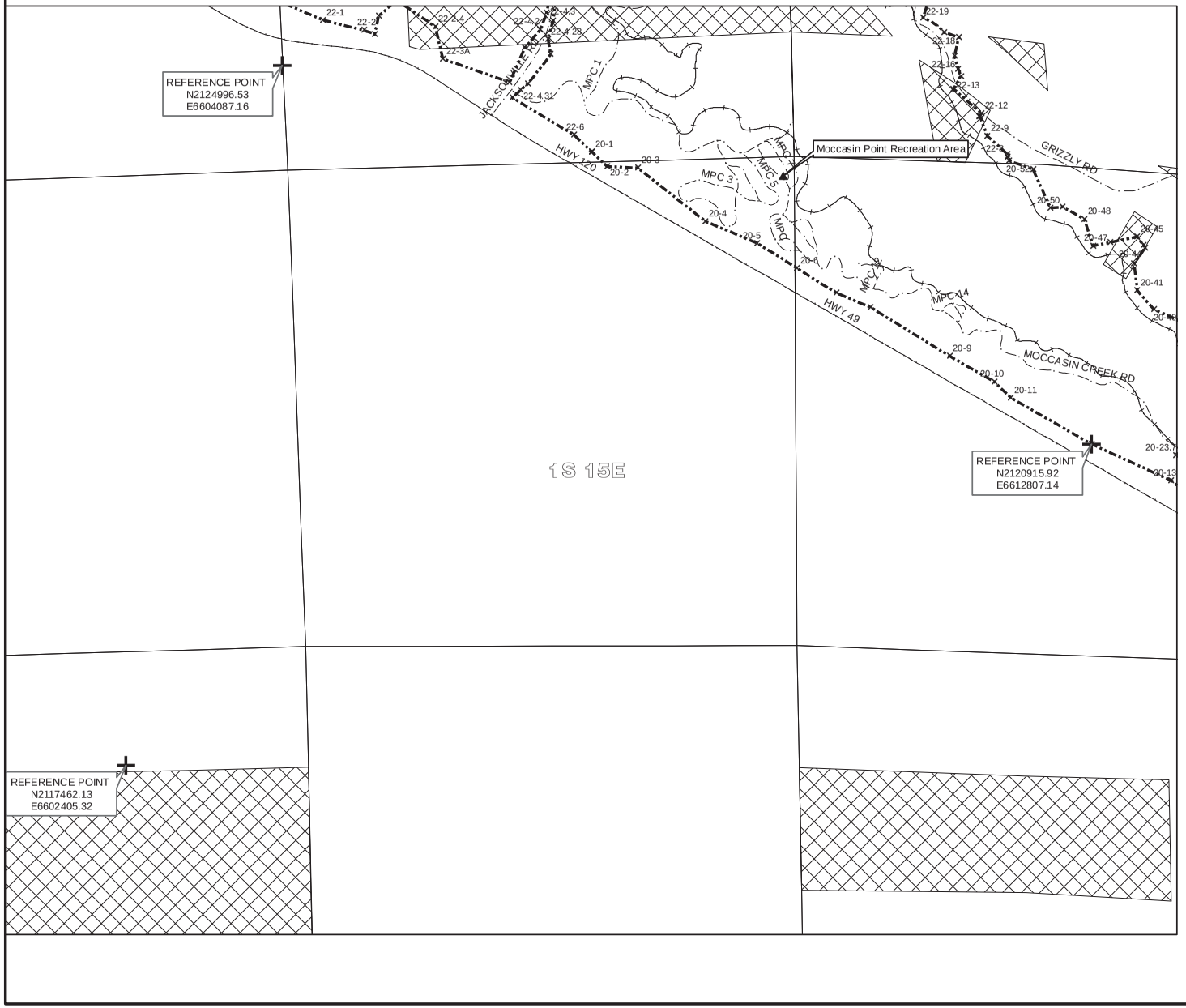
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

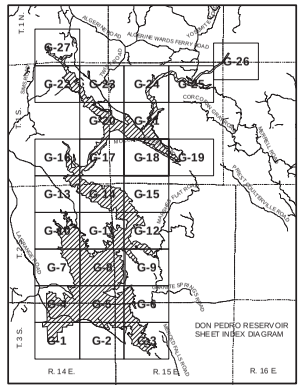
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 19 & 21 FERC DRAWING NO. 2299-103 & 2299-142

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 18**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

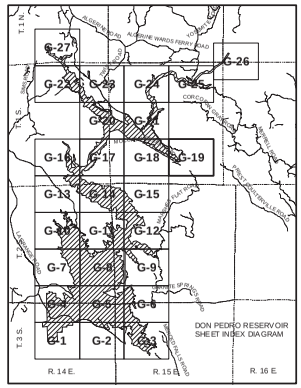
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 20, 21 & 22 FERC DRAWING NO. 2299-141, 2299-142 & 2299-143

FERC DRAWING NO. 2299-



NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 19**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

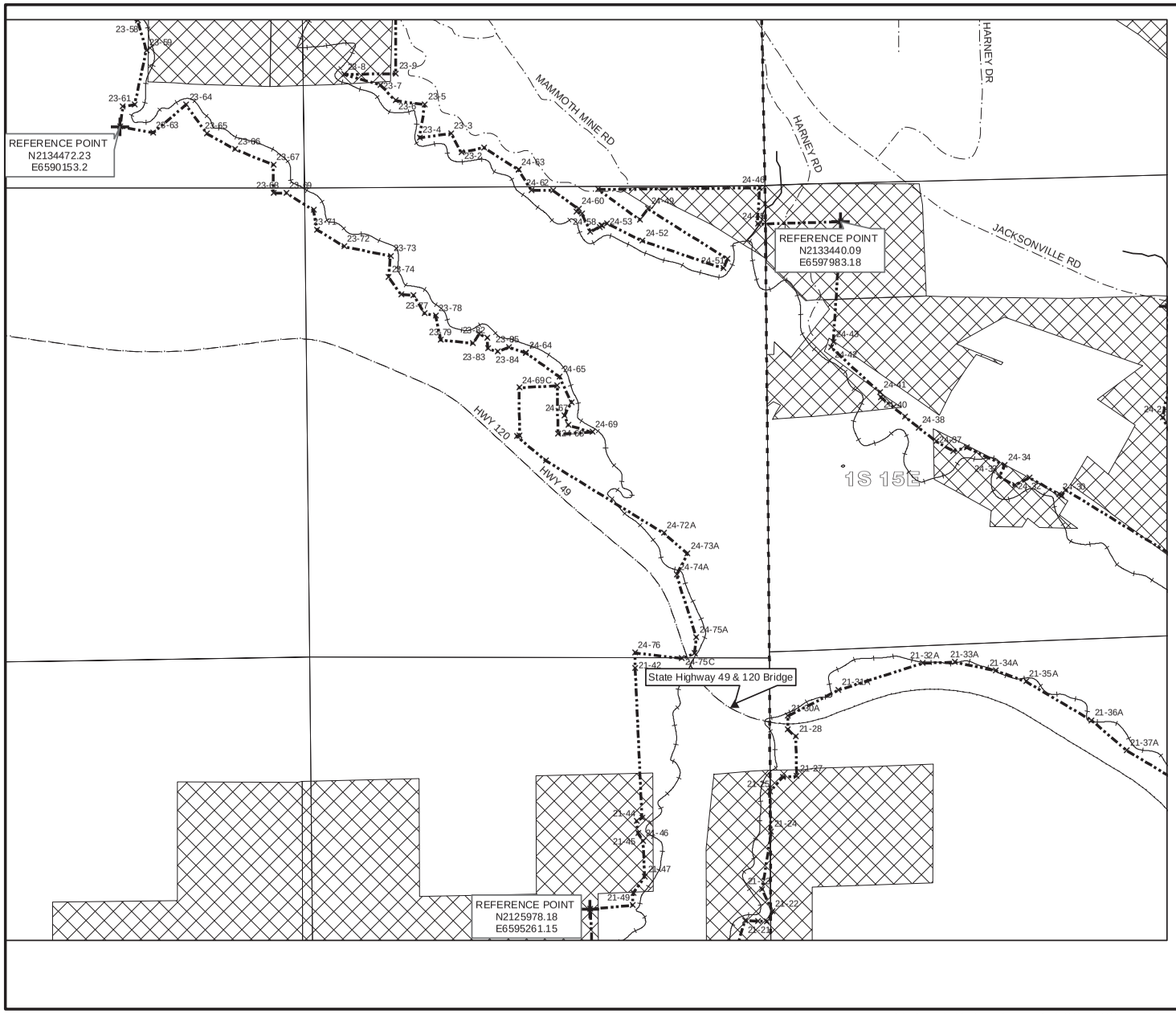
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

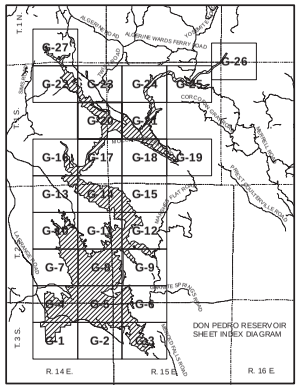
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 20 FERC DRAWING NO. 2299-141

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 20**

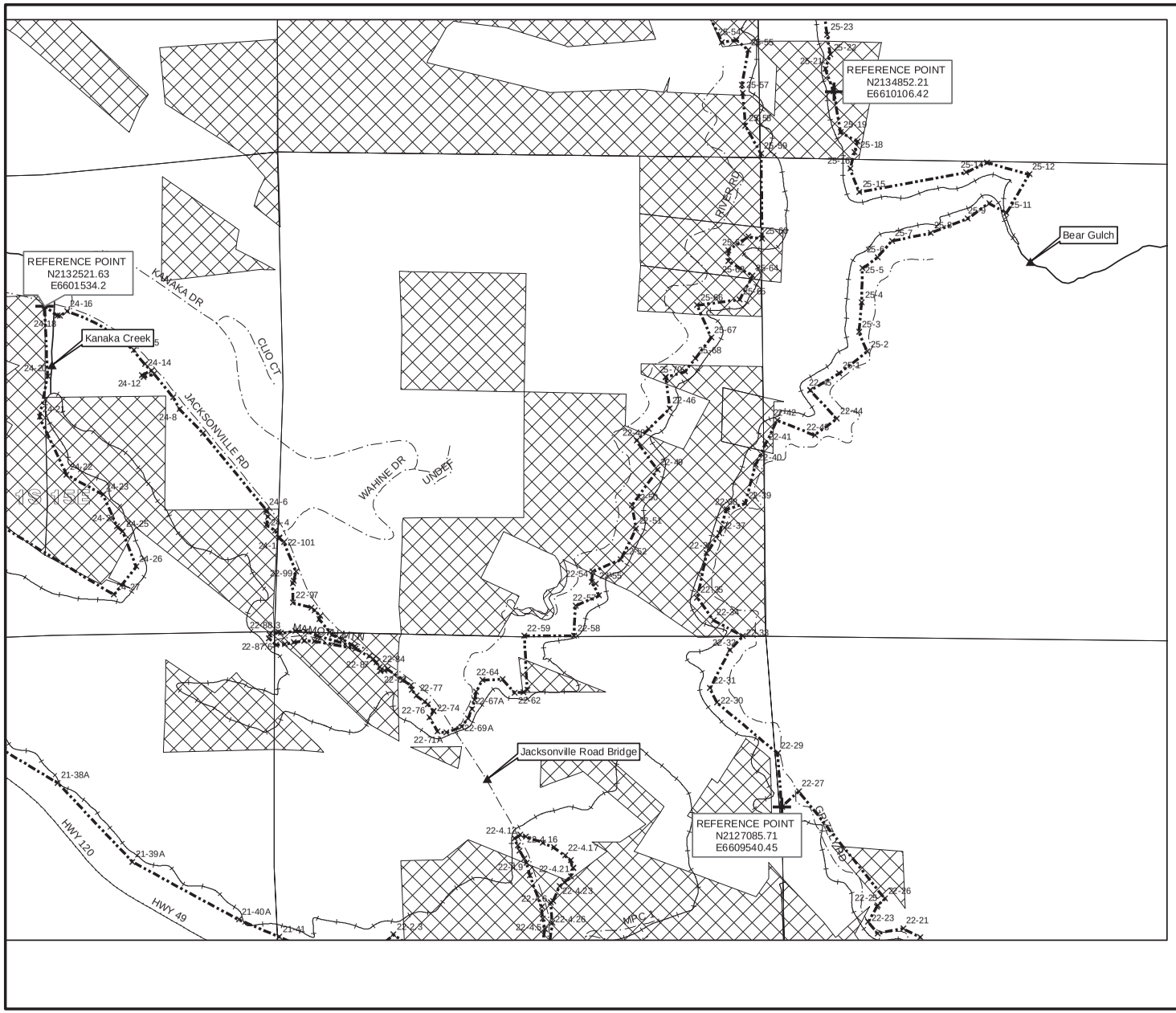
DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

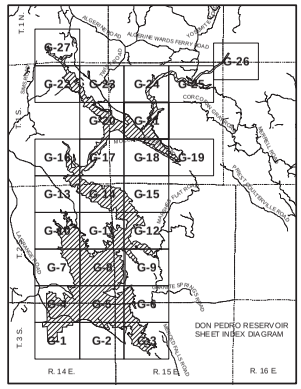
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 21, 23 & 24 FERC DRAWING NO. 2299-142, 2299-144 & 2299-145

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 21**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

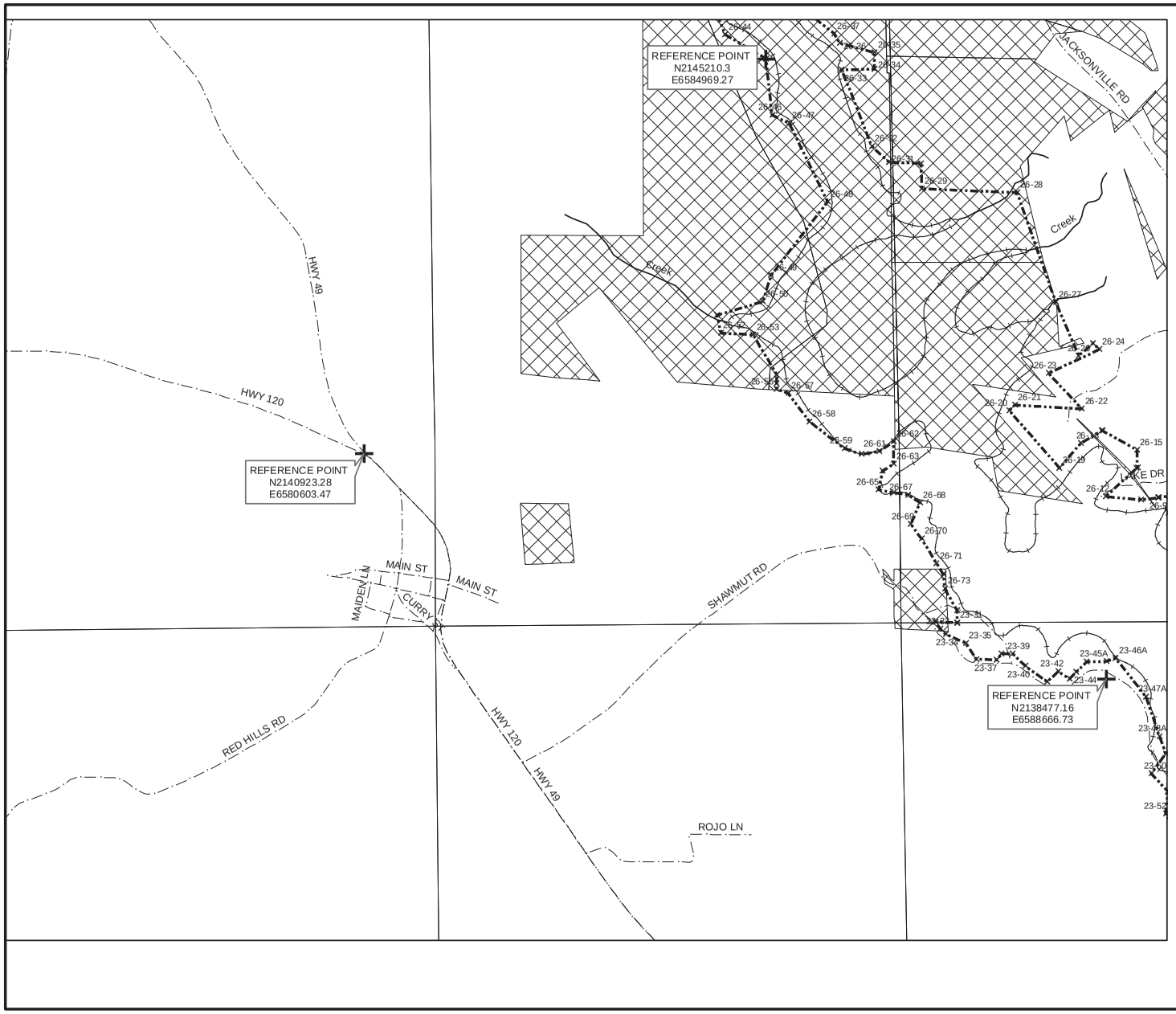
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

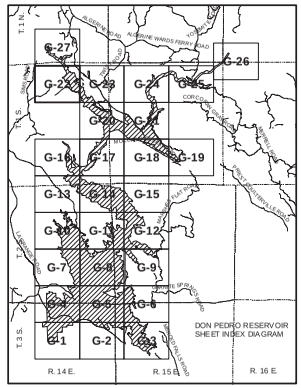
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 21, 22, 24 & 25 FERC DRAWING NO. 2299-142, 2299-143, 2299-145 & 2299-110

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 22**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

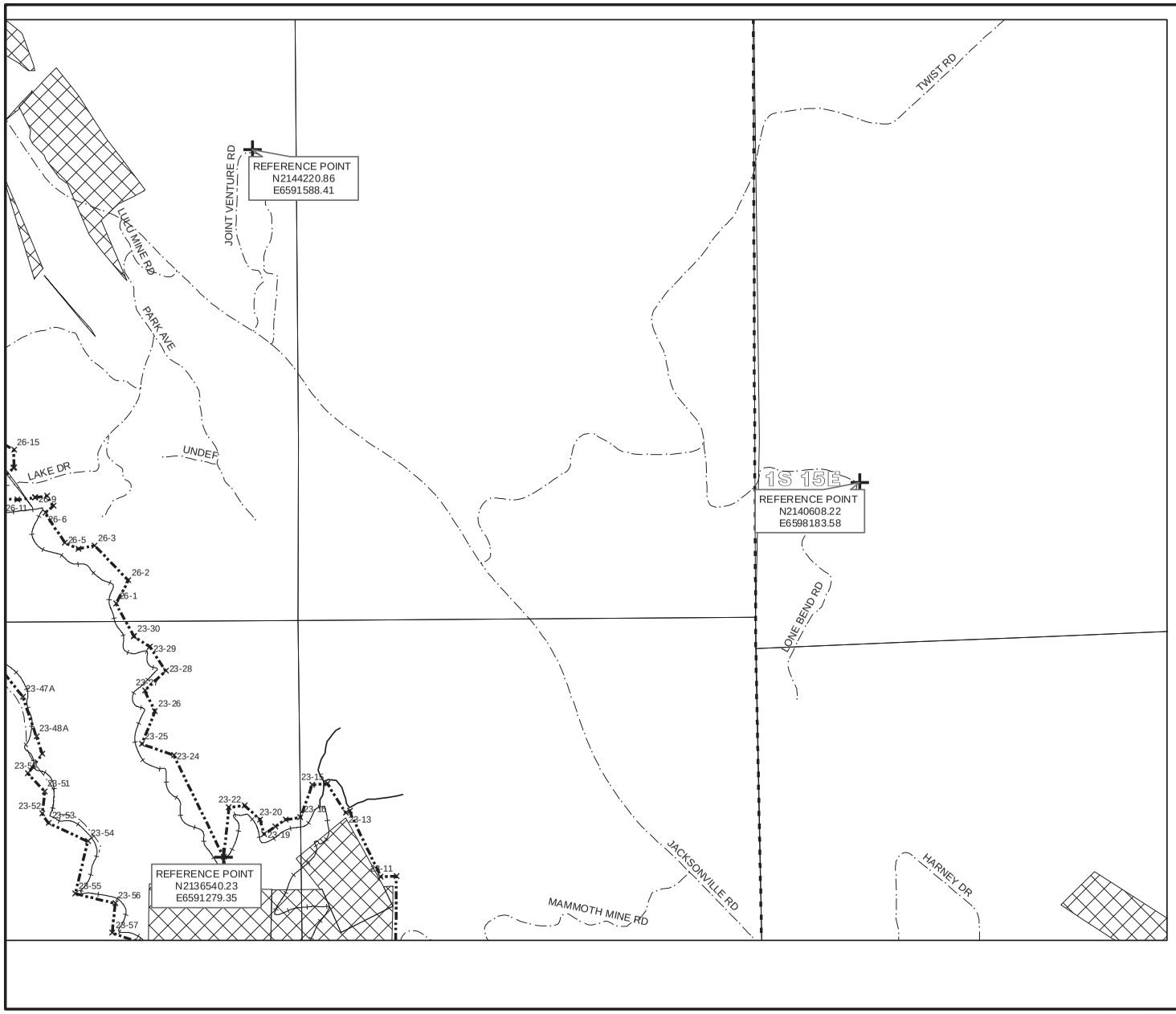
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

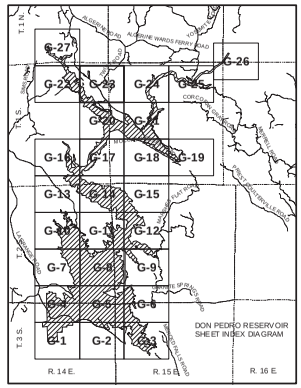
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 23 & 26 FERC DRAWING NO. 2299-144 & 2299-111

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 23**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

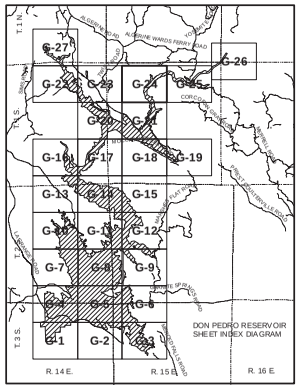
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 23 & 26 FERC DRAWING NO. 2299-144 & 2299-111

FERC DRAWING NO. 2299-



NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 24**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

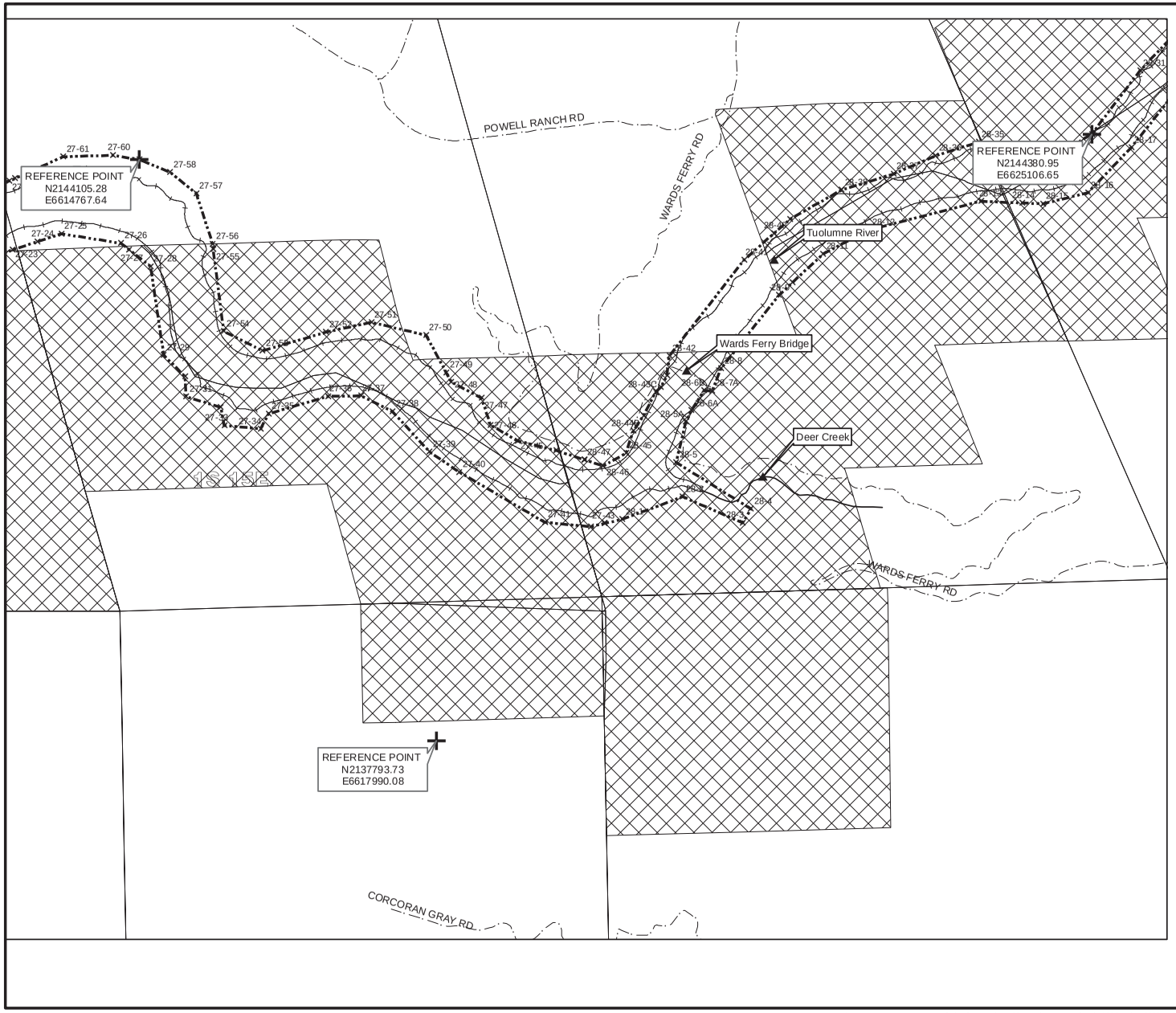
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

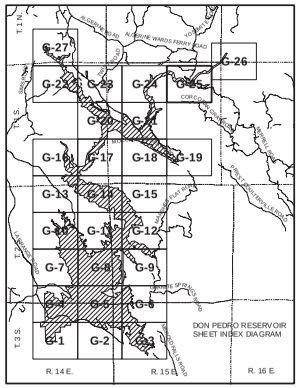
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 25 & 27 FERC DRAWING NO. 2299-110 & 2299-112

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 25**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

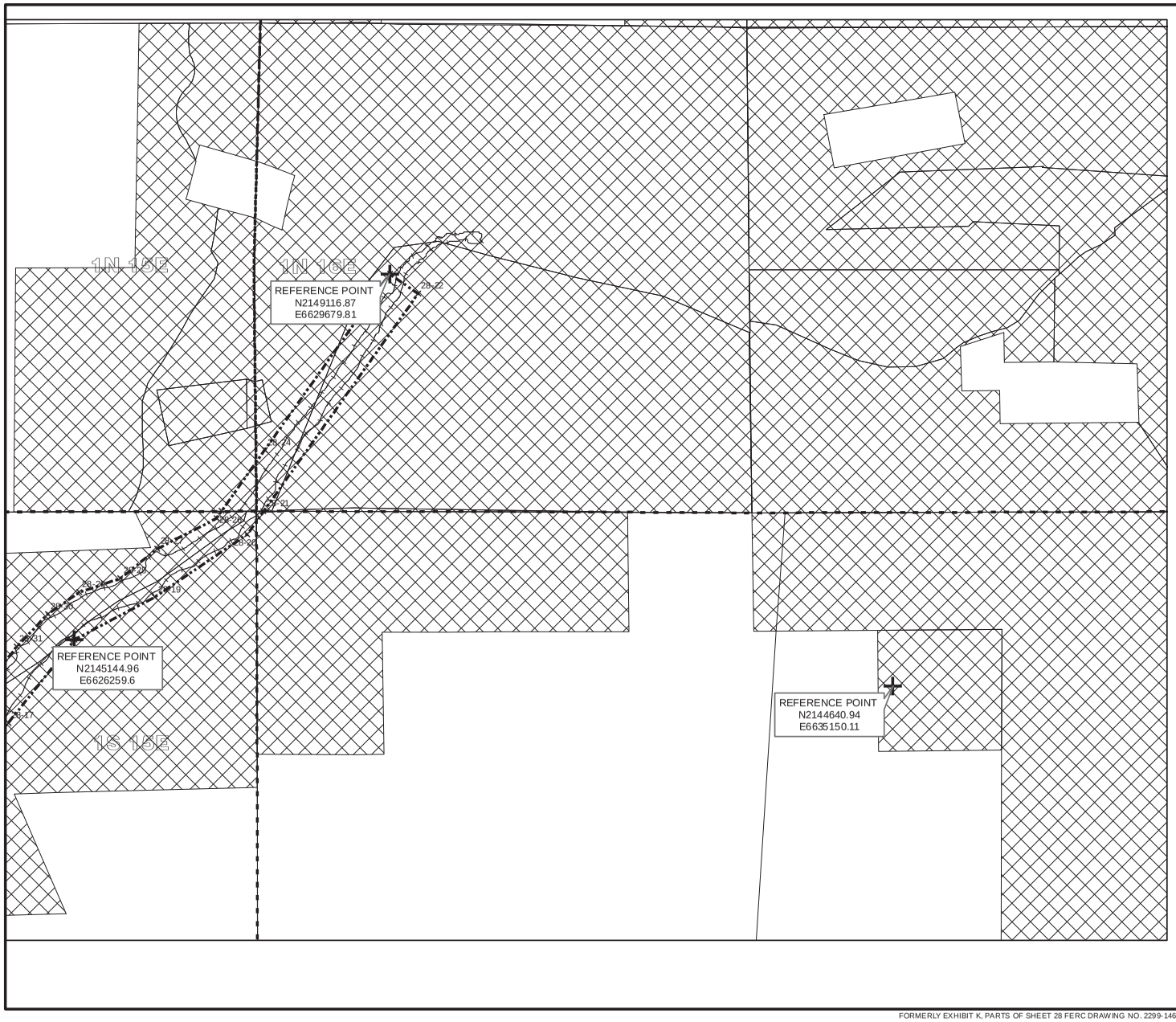
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

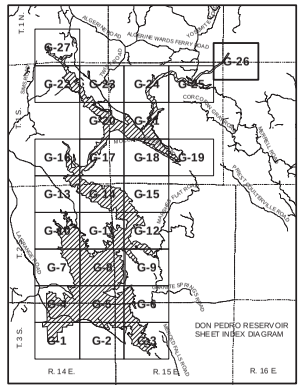
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 27 & 28 FERC DRAWING NO. 2299-112 & 2299-146

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 26**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

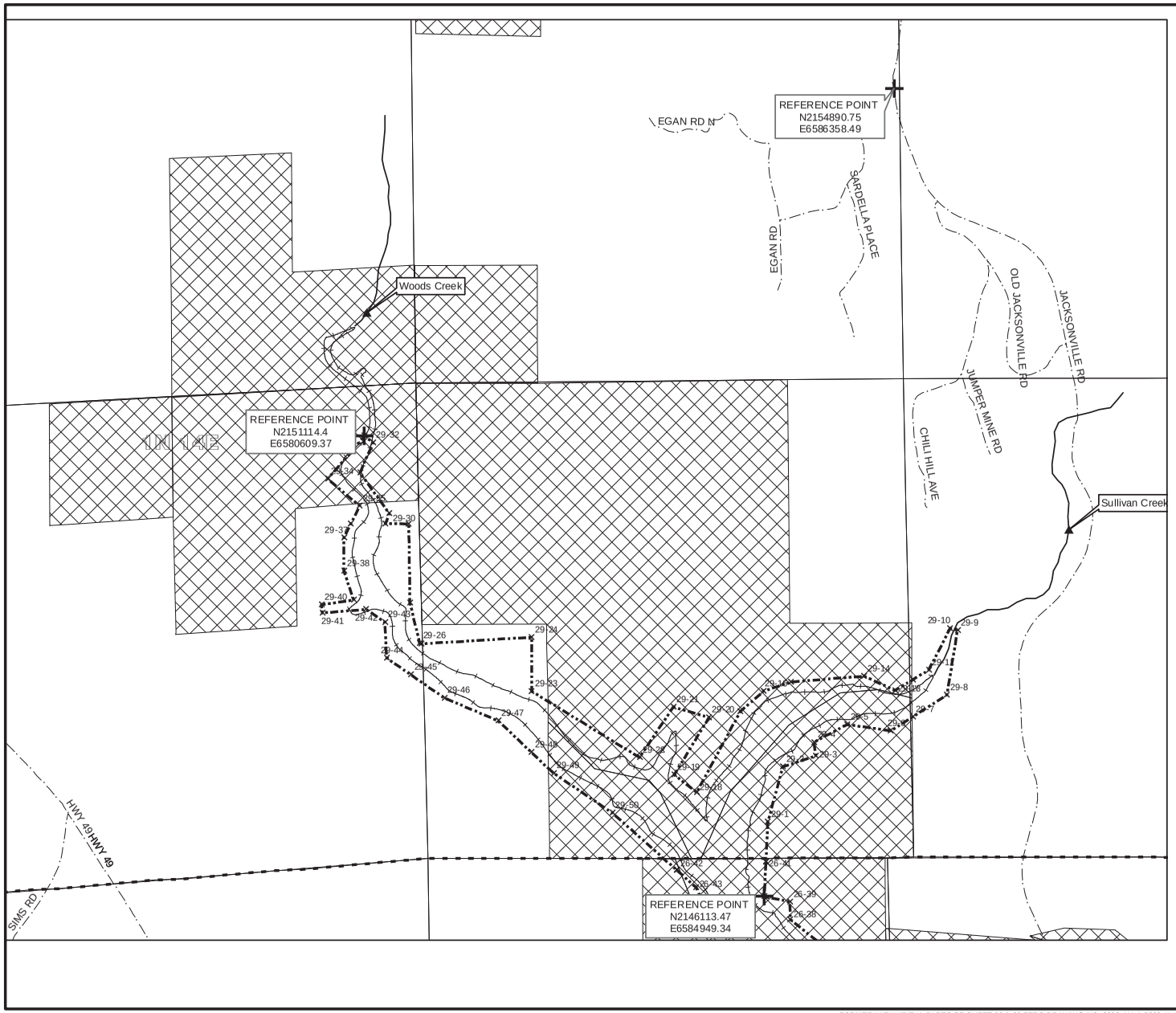
TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

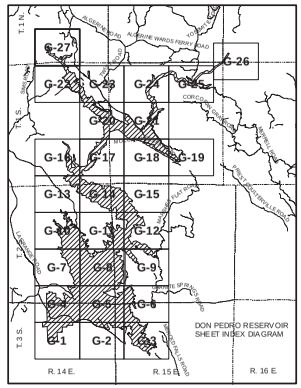
FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 28 FERC DRAWING NO. 2299-146

FERC DRAWING NO. 2299-





NORTH

0 175 350 700 1,050 1,400 Feet

1 inch = 1,015 feet

COORDINATE VALUES, BEARINGS AND DISTANCES ARE BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 3, NAD 83

Legend

- Boundary Monuments
- Tuolumne County Roads
- Maximum Normal Water Surface Elev. 830
- Project Boundary Line
- Township Lines
- Section Lines
- USA/BLM

NOTES:

1. UNLESS OTHERWISE INDICATED, ALL PARCELS WITHIN THE PROJECT BOUNDARY ARE PROJECT OWNED.
2. TOTAL USA/BLM LAND WITHIN THE PROJECT BOUNDARY = 4801.86 ACRES.

THE BEARINGS AND DISTANCES HEREON WERE DERIVED FROM RECORD DATA BASED UPON THE EXHIBIT K MAPS OF THE DON PEDRO PROJECT TOPOGRAPHIC AND BOUNDARY SURVEY DATED AUGUST 30, 1974. THE PROJECT WAS TRANSLATED FROM NAD 1927 HORIZONTAL DATUM TO NAD 1983 HORIZONTAL DATUM USING CORPSCON VERSION 6.0.1.

REV	DATE	DESCRIPTION	DRAWN	CHK'D	APPR'D
A	11/30/10	UPDATE MAP & NEW BORDER			

EXHIBIT G **SHEET 27**

DON PEDRO RESERVOIR
PROPERTY & PROJECT BOUNDARY
DON PEDRO HYDROELECTRIC PROJECT

TURLOCK AND MODESTO IRRIGATION DISTRICTS
TURLOCK, CALIFORNIA

FERC PROJECT NO. 2299 | APRIL 12, 2014

Modesto Irrigation District/Turlock Irrigation District
Joint Comments on Draft SED - Appendix G

FORMERLY EXHIBIT K, PARTS OF SHEET 26 & 29 FERC DRAWING NO. 2299-111 & 2299-114

FERC DRAWING NO. 2299-

HDR

LETTER OF TRANSMITTAL
SENT VIA FEDEX PRIORITY

DATE: April 28, 2014	SUBJECT: Don Pedro Exhibit G GIS Shapefiles (FERC No. 2299)
TO: Kimberly D. Bose, Secretary Federal Energy Regulatory Commission 888 First Street, NE Washington, DC 20426	PROJECT NO. 390 / 225106
	COPY TO: Steve Boyd Greg Dias John Devine Project files

ENCLOSED:	THESE:	FOR:	PLEASE:
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NO. COPIES	DATE	DOCUMENT OR DRAWING NO.	DESCRIPTION
3	4/28/14	CD-ROMs providing Exhibit G GIS Shapefiles	On April 28, 2014, Turlock Irrigation District and Modesto Irrigation District e-filed the Final License Application (FLA) for the relicensing of the Don Pedro Hydroelectric Project. The e-Library receipt of filing of the FLA filing is attached to this transmittal letter. Enclosed are three identical CD-ROMs that provide the digital GIS files required as part of the submission of the Exhibit G maps as specified by the FERC regulations at 18 CFR §4.41(h). Also included in separate subfolders are the Exhibit G maps in TIFF and PDF format as well as PDF copies of the FERC Form-587s filed with the FLA.

SIGNED: _____

Tim Bachelder
Senior Licensing and Regulatory Specialist

If enclosures are not as specified, please notify us at once.
TELEPHONE (207) 775-4495 FAX (207) 775-1031

DON PEDRO HYDROELECTRIC PROJECT
FERC NO. 2299

FINAL LICENSE APPLICATION

EXHIBIT G – PROJECT MAPS

APPENDIX G-2
FERC FORM-587

Form FERC-587
OMB No. 1902-0145
(Expires 07/31/2015)

LAND DESCRIPTION

Public Land States
(Rectangular Survey System Lands)

1. STATE CALIFORNIA 2. FERC PROJECT NO. P-2299

3. TOWNSHIP 3S RANGE 14E MERIDIAN Mt. Diablo

4. Check one:

x License
_____ Preliminary Permit

Check one:

_____ Pending
x Issued

If preliminary permit is issued, give expiration date: _____

5. EXHIBIT SHEET NUMBERS OR LETTERS

Section 6	**5**	**4**	**3** G-4	**2**	**1**
7	**8**	**9** G-1	**10** G-1	**11**	**12**
18	**17**	**16**	**15**	**14**	**13**
19	**20**	**21**	**22**	**23**	**24**
30	**29**	**28**	**27**	**26**	**25**
31	**32**	**33**	**34**	**35**	**36**

6. contact's name Tim Bachelder

telephone no. (207.239.3874)

Date submitted April 27, 2014

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31	**32**	**33** G-4	**34** G-4	**35** G-4, G-5	**36**

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Section 6 G-14, G-15	**5**	**4**	**3**	**2**	**1**
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18 G-11, G-12	**17** G-12	**16**	**15**	**14**	**13**
19 G-8, G-9, G-11, G-12	**20** G-9, G-12	**21**	**22**	**23**	**24**
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DON PEDRO HYDROELECTRIC PROJECT
FERC NO. 2299

FINAL LICENSE APPLICATION

EXHIBIT H - PLANS AND ABILITY OF APPLICANTS TO OPERATE THE DON PEDRO HYDROELECTRIC PROJECT



Prepared by:
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and

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April 2014

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ac .....acres
ACEC.....Area of Critical Environmental Concern
ACHP.....Advisory Council for Historic Preservation
ACOE.....U.S. Army Corps of Engineers
ADA.....Americans with Disabilities Act (ADA/ABAAG)
AF .....acre-feet
AGS.....Annual Grasslands
ALJ.....Administrative Law Judge
APE.....Area of Potential Effect
APEA .....Applicant-Prepared Environmental Assessment
ARMR.....Archaeological Resource Management Report
AWQC .....Ambient Water Quality Criteria
BA .....Biological Assessment
BDCP .....Bay-Delta Conservation Plan
BLM.....U.S. Department of the Interior, Bureau of Land Management
BLM-S .....Bureau of Land Management – Sensitive Species
BMI.....Benthic macroinvertebrates
BMP .....Best Management Practices
BO .....Biological Opinion
BOW .....Blue Oak Woodland
ºC.....celsius
CalCOFI.....California Cooperative Oceanic Fisheries Investigations
CalEPPC .....California Exotic Pest Plant Council
CalSPA.....California Sportfishing Protection Alliance
CAS.....California Academy of Sciences
CBDA .....California Bay-Delta Authority
CCC.....Criterion Continuous Concentrations
CCIC .....Central California Information Center
CCSF.....City and County of San Francisco
CD.....Compact Disc
CDBW.....California Department of Boating and Waterways

CDEC.....California Data Exchange Center
CESA .....California Endangered Species Act
CDFA.....California Department of Food and Agriculture
CDFG.....California Department of Fish and Game (as of January 2013, CDFW)
CDFW .....California Department of Fish and Wildlife
CDMG.....California Division of Mines and Geology
CDOF .....California Department of Finance
CDPH.....California Department of Public Health
CDPR .....California Department of Parks and Recreation
CDSOD .....California Division of Safety of Dams
CDWR.....California Department of Water Resources
CE .....California Endangered Species
CEC.....California Energy Commission
CEII.....Critical Energy Infrastructure Information
CEQA.....California Environmental Quality Act
CESA .....California Endangered Species Act
CFR.....Code of Federal Regulations
cfs.....cubic feet per second
CGS.....California Geological Survey
cm.....centimeters
CMAP .....California Monitoring and Assessment Program
CMC.....Criterion Maximum Concentrations
CNDDB.....California Natural Diversity Database
CNPS.....California Native Plant Society
CORP .....California Outdoor Recreation Plan
CPUC .....California Public Utilities Commission
CPUE .....Catch Per Unit Effort
CRAM.....California Rapid Assessment Method
CRC.....Chamise-Redshank Chaparral
CRLF.....California Red-Legged Frog
CRRF .....California Rivers Restoration Fund
CSAS.....Central Sierra Audubon Society
CSBP.....California Stream Bioassessment Procedure

CSU.....California State University
CT .....California Threatened Species
CTR.....California Toxics Rule
CTS .....California Tiger Salamander
CVP.....Central Valley Project
CVRWQCB .....Central Valley Regional Water Quality Control Board
CWA .....Clean Water Act
CWD .....Chowchilla Water District
CWHR.....California Wildlife Habitat Relationship
CZMA .....Coastal Zone Management Act
DDT .....dichlorodiphenyltrichloroethane
Districts.....Turlock Irrigation District and Modesto Irrigation District
DLA .....Draft License Application
DO.....Dissolved Oxygen
DOI .....Department of Interior
DPRA.....Don Pedro Recreation Agency
DPS .....Distinct Population Segment
DSE.....Chief Dam Safety Engineer
EA .....Environmental Assessment
EBMUD .....East Bay Municipal Utilities District
EC .....Electrical Conductivity
EFH.....Essential Fish Habitat
EIR .....Environmental Impact Report
EIS.....Environmental Impact Statement
Elev or el.....Elevation
ENSO .....El Niño Southern Oscillation
EPA.....U.S. Environmental Protection Agency
ESA.....Federal Endangered Species Act
ESRCD.....East Stanislaus Resource Conservation District
ESU .....Evolutionary Significant Unit
EVC.....Existing Visual Condition
EWUA.....Effective Weighted Useable Area
°F.....fahrenheit

FERC.....Federal Energy Regulatory Commission
FFS.....Foothills Fault System
FL.....Fork length
FLA.....Final License Application
FMP.....Fishery Management Plan
FMU.....Fire Management Unit
FOT.....Friends of the Tuolumne
FPA.....Federal Power Act
FPC.....Federal Power Commission
FPPA.....Federal Plant Protection Act
ft.....feet
ft/mi.....feet per mile
FWCA.....Fish and Wildlife Coordination Act
FWUA.....Friant Water Users Authority
FYLF.....Foothill Yellow-Legged Frog
g.....grams
GIS.....Geographic Information System
GLO.....General Land Office
GORP.....Great Outdoor Recreation Pages
GPS.....Global Positioning System
HCP.....Habitat Conservation Plan
HSC.....Habitat Suitability Criteria
HHWP.....Hetch Hetchy Water and Power
HORB.....Head of Old River Barrier
hp.....horsepower
HPMP.....Historic Properties Management Plan
IFIM.....Instream Flow Incremental Methodology
ILP.....Integrated Licensing Process
in.....inches
ISR.....Initial Study Report
ITA.....Indian Trust Assets
IUCN.....International Union for the Conservation of Nature
KOPs.....Key Observation Points

kV.....kilovolt
kVA.....kilovolt-amperes
kW.....kilowatt
LWD .....large woody debris
m .....meters
mm .....millimeter
M&I.....Municipal and Industrial
MCL.....Maximum Contaminant Level
mg/kg .....milligrams/kilogram
mg/L.....milligrams per liter
mgd .....million gallons per day
MGR .....Migration of Aquatic Organisms
MHW .....Montane Hardwood
mi .....miles
mi^2 .....square miles
MID.....Modesto Irrigation District
MOA .....Memorandum of Agreement
MOU .....Memorandum of Understanding
MPN.....Most Probable Number
MPR .....market price referents
MSCS.....Multi-Species Conservation Strategy
msl.....mean sea level
MUN .....municipal and domestic supply
MVA .....Megavolt-ampere
MW .....megawatt
MWh .....megawatt hour
mya.....million years ago
NAE .....National Academy of Engineering
NAHC .....Native American Heritage Commission
NAS.....National Academy of Sciences
NAVD 88.....North American Vertical Datum of 1988
NAWQA .....National Water Quality Assessment
NCCP.....Natural Community Conservation Plan

NGVD29 .....National Geodetic Vertical Datum of 1929
NEPA .....National Environmental Policy Act
NERC.....North American Electric Reliability Corporation
NGOs .....Non-Governmental Organizations
NHI .....Natural Heritage Institute
NHPA.....National Historic Preservation Act
NISC .....National Invasive Species Council
NMFS.....National Marine Fisheries Service
NOAA .....National Oceanic and Atmospheric Administration
NOI .....Notice of Intent
NPS .....U.S. Department of the Interior, National Park Service
NRCS .....National Resource Conservation Service
NRHP.....National Register of Historic Places
NRI.....Nationwide Rivers Inventory
NTU .....Nephelometric Turbidity Unit
NWI.....National Wetland Inventory
NWIS .....National Water Information System
NWR .....National Wildlife Refuge
O&M .....operation and maintenance
OEHHA.....Office of Environmental Health Hazard Assessment
OID .....Oakdale Irrigation District
ORV .....Outstanding Remarkable Value
OSHA.....Occupational Safety and Health Administration
PA .....Programmatic Agreement
PAD.....Pre-Application Document
PDAW.....Project Demand of Applied Water
PDO.....Pacific Decadal Oscillation
PEIR.....Program Environmental Impact Report
PGA.....Peak Ground Acceleration
PG&E.....Pacific Gas and Electric
PHABSIM.....Physical Habitat Simulation System
PHG.....Public Health Goal
PM&E .....Protection, Mitigation and Enhancement

PMF.....Probable Maximum Flood
POAOR.....Public Opinions and Attitudes in Outdoor Recreation
ppb.....parts per billion
ppm .....parts per million
PSP.....Proposed Study Plan
PWA.....Public Works Administration
QA.....Quality Assurance
QC .....Quality Control
RA .....Recreation Area
RBP .....Rapid Bioassessment Protocol
REC-1 .....water contact recreation
REC-2 .....water non-contact recreation
Reclamation .....U.S. Department of the Interior, Bureau of Reclamation
RM .....River Mile
RMP .....Resource Management Plan
RP.....Relicensing Participant
rpm .....Rotations per minute
RPS .....Renewable Portfolio Standard
RSP .....Revised Study Plan
RST .....Rotary Screw Trap
RWG .....Resource Work Group
RWQCB.....Regional Water Quality Control Board
SC.....State candidate for listing under CESA
SCADA .....Supervisory Control and Data Acquisition
SCD.....State candidate for delisting under CESA
SCE .....State candidate for listing as endangered under CESA
SCT .....State candidate for listing as threatened under CESA
SD1 .....Scoping Document 1
SD2 .....Scoping Document 2
SE.....State Endangered Species under the CESA
SEED.....U.S. Bureau of Reclamation's Safety Evaluation of Existing Dams
SFP .....State Fully Protected Species under CESA
SFPUC .....San Francisco Public Utilities Commission

SHPO .....State Historic Preservation Officer

SJRA .....San Joaquin River Agreement

SJRGA .....San Joaquin River Group Authority

SJTA .....San Joaquin River Tributaries Authority

SM.....Standard Method

SMUD.....Sacramento Municipal Utility District

SPAWN.....spawning, reproduction and/or early development

SPD .....Study Plan Determination

SRA.....State Recreation Area

SRMA .....Special Recreation Management Area or Sierra Resource Management Area (as per use)

SRMP.....Sierra Resource Management Plan

SRP .....Special Run Pools

SSC .....State species of special concern

ST.....California Threatened Species under the CESA

STORET .....Storage and Retrieval

SWAMP.....Surface Water Ambient Monitoring Program

SWE .....Snow-Water Equivalent

SWP .....State Water Project

SWRCB.....State Water Resources Control Board

TAC.....Technical Advisory Committee

TAF .....thousand acre-feet

TCP .....Traditional Cultural Properties

TCWC .....Tuolumne County Water Company

TDS .....Total Dissolved Solids

TID.....Turlock Irrigation District

TMDL .....Total Maximum Daily Load

TOC.....Total Organic Carbon

TRT .....Tuolumne River Trust

TRTAC .....Tuolumne River Technical Advisory Committee

UC .....University of California

USBR .....U.S. Bureau of Reclamation

USDA.....U.S. Department of Agriculture

USDOC .....U.S. Department of Commerce
USDOI .....U.S. Department of the Interior
USFS .....U.S. Department of Agriculture, Forest Service
USFWS .....U.S. Department of the Interior, Fish and Wildlife Service
USGS .....U.S. Department of the Interior, Geological Survey
USR.....Updated Study Report
UTM.....Universal Transverse Mercator
VAMP .....Vernalis Adaptive Management Plan
VELB .....Valley Elderberry Longhorn Beetle
VES .....visual encounter surveys
VRM .....Visual Resource Management
VRO .....Visual Resource Objective
WBWG .....Western Bat Working Group
WECC .....Western Electricity Coordinating Council
WPA.....Works Progress Administration
WPT .....Western Pond Turtle
WQCP .....Water Quality Control Plan
WSA.....Wilderness Study Area
WSIP .....Water System Improvement Program
WSNMB .....Western Sierra Nevada Metamorphic Belt
WUA .....weighted usable area
WWTP .....Wastewater Treatment Plant
WY .....water year
yd^3 .....cubic yard
yr .....year
µS/cm .....microSeimens per centimeter
µg/L.....micrograms per liter
µmhos.....micromhos

EXHIBIT H - PLANS AND ABILITY OF APPLICANT TO OPERATE THE PROJECT

The following excerpt from the Code of Federal Regulations (CFR) at 18 CFR § 5.18(c) describes the required content of this Exhibit.

(i) Information to be supplied by all applicants. All Applicants for a new license under this part must file the following information with the Commission:

(A) A discussion of the plans and ability of the applicant to operate and maintain the project in a manner most likely to provide efficient and reliable electric service, including efforts and plans to:

(1) Increase capacity or generation at the project;

(2) Coordinate the operation of the project with any upstream or downstream water resource projects; and

(3) Coordinate the operation of the project with the applicant's or other electrical systems to minimize the cost of production.

(B) A discussion of the need of the applicant over the short and long term for the electricity generated by the project, including:

(1) The reasonable costs and reasonable availability of alternative sources of power that would be needed by the applicant or its customers, including wholesale customers, if the applicant is not granted a license for the project;

(2) A discussion of the increase in fuel, capital, and any other costs that would be incurred by the applicant or its customers to purchase or generate power necessary to replace the output of the licensed project, if the applicant is not granted a license for the project;

(3) The effect of each alternative source of power on:

(i) The applicant's customers, including wholesale customers;

(ii) The applicant's operating and load characteristics; and

(iii) The communities served or to be served, including any reallocation of costs associated with the transfer of a license from the existing licensee.

(C) The following data showing need and the reasonable cost and availability of alternative sources of power:

(1) The average annual cost of the power produced by the project, including the basis for that calculation;

(2) The projected resources required by the applicant to meet the applicant's capacity and energy requirements over the short and long term including:

(i) Energy and capacity resources, including the contributions from the applicant's generation, purchases, and load modification measures (such as conservation, if considered as a resource), as separate components of the total resources required;

(ii) A resource analysis, including a statement of system reserve margins to be maintained for energy and capacity;

(iii) If load management measures are not viewed as resources, the effects of such measures on the projected capacity and energy requirements indicated separately;

(iv) For alternative sources of power, including generation of additional power at existing facilities, restarting deactivated units, the purchase of power off-system, the construction or purchase and operation of a new power plant, and load management measures such as conservation: The total annual cost of each alternative source of power to replace project power; the basis for the determination of projected annual cost; and a discussion of the relative merits of each alternative, including the issues of the period of availability and dependability of purchased power, average life of alternatives, relative equivalent availability of generating alternatives, and relative impacts on the applicant's power system reliability and other system operating characteristics; and the effect on the direct providers (and their immediate customers) of alternate sources of power.

(D) If an applicant uses power for its own industrial facility and related operations, the effect of obtaining or losing electricity from the project on the operation and efficiency of such facility or related operations, its workers, and the relate community.

(E) If an applicant is an Indian tribe applying for a license for a project located on the tribal reservation, a statement of the need of such Indian tribe for electricity generated by the project to foster the purposes of the reservation.

(F) A comparison of the impact on the operations and planning of the applicant's transmission system of receiving or not receiving the project license, including:

(1) An analysis of the effects of any resulting redistribution of power flows on line loading (with respect to applicable thermal, voltage, or stability limits), line losses, and necessary new construction of transmission facilities or upgrading of existing facilities, together with the cost impact of these effects;

(2) An analysis of the advantages that the applicant's transmission system would provide in the distribution of the project's power; and

(3) Detailed single-line diagrams, including existing system facilities identified by name and circuit number, that show system transmission elements in relation to the project and other principal interconnected system elements. Power flow and loss data that represent system operating conditions may be appended if applicants believe such data would be useful to show that the operating impacts described would be beneficial.

(G) If the applicant has plans to modify existing project facilities or operations, a statement of the need for, or usefulness of, the modifications, including at least a reconnaissance-level study of the effect and projected costs of the proposed plans and any alternate plans, which in conjunction with other developments in the area would conform with a comprehensive plan for improving or developing the waterway and for other beneficial public uses as defined in Section 10(a)(1) of the Federal Power Act.

(H) If the applicant has no plans to modify existing project facilities or operations, at least a reconnaissance level study to show that the project facilities or operations in conjunction with other developments in the area would conform with a comprehensive plan for improving or developing the waterway and for other beneficial public uses as defined in Section 10(a)(1) of the Federal Power Act.

(I) A statement describing the applicant's financial and personnel resources to meet its obligations under a new license, including specific information to demonstrate that the applicant's personnel are adequate in number and training to operate and maintain the project in accordance with the provisions of the license.

(J) If an applicant proposes to expand the project to encompass additional lands, a statement that the applicant has notified, by certified mail, property owners on the additional lands to be encompassed by the project and governmental agencies and subdivisions likely to be interested in or affected by the proposed expansion.

(K) The applicant's electricity consumption efficiency improvement program, as defined under Section 10(a)(2)(C) of the Federal Power Act, including:

(1) A statement of the applicant's record of encouraging or assisting its customers to conserve electricity and a description of its plans and capabilities for promoting electricity conservation by its customers; and

(2) A statement describing the compliance of the applicant's energy conservation programs with any applicable regulatory requirements.

(L) The names and mailing addresses of every Indian tribe with land on which any part of the proposed project would be located or which the applicant reasonably believes would otherwise be affected by the proposed project.

(ii) Information to be provided by an applicant licensee. An existing licensee that applies for a new license must provide:

(A) The information specified in paragraph (c)(1) of this section.

(B) A statement of measures taken or planned by the licensee to ensure safe management, operation, and maintenance of the project, including:

(1) A description of existing and planned operation of the project during flood conditions;

(2) A discussion of any warning devices used to ensure downstream public safety;

(3) A discussion of any proposed changes to the operation of the project or downstream development that might affect the existing Emergency Action Plan, as described in subpart C of part 12 of this chapter, on file with the Commission;

(4) A description of existing and planned monitoring devices to detect structural movement or stress, seepage, uplift, equipment failure, or water conduit failure, including a description of the maintenance and monitoring programs used or planned in conjunction with the devices; and

(5) A discussion of the project's employee safety and public safety record, including the number of lost-time accidents involving employees and the record of injury or death to the public within the project boundary.

(C) A description of the current operation of the project, including any constraints that might affect the manner in which the project is operated.

(D) A discussion of the history of the project and record of programs to upgrade the operation and maintenance of the project.

(E) A summary of any generation lost at the project over the last five years because of unscheduled outages, including the cause, duration, and corrective action taken.

(F) A discussion of the licensee's record of compliance with the terms and conditions of the existing license, including a list of all incidents of noncompliance, their disposition, and any documentation relating to each incident.

(G) A discussion of any actions taken by the existing licensee related to the project which affects the public.

(H) A summary of the ownership and operating expenses that would be reduced if the project license were transferred from the existing licensee.

(I) A statement of annual fees paid under part I of the Federal Power Act for the use of any Federal or Indian lands included within the project boundary.

PREFACE

The Don Pedro Project provides water storage for irrigation and municipal and industrial (M&I) use, flood control, hydroelectric generation, recreation, and natural resource protection (hereinafter, the "Don Pedro Project"). The Don Pedro Project was originally conceived as a water supply project. The Don Pedro Project was constructed for the following primary purposes: (1) to provide water supply for the co-licensees, Turlock Irrigation District (TID) and Modesto Irrigation District (MID) (collectively, the Districts), for irrigation of over 200,000 acres of Central Valley farmland and for M&I use, (2) to provide flood control benefits along the Tuolumne and San Joaquin rivers, and (3) to provide a water banking arrangement for the benefit of the City and County of San Francisco (CCSF) and its 2.6 million Bay Area water customers. The original license was issued in 1966. In 1995, the Districts entered into an agreement with a number of parties which resulted in greater flows to the lower Tuolumne River for the protection of aquatic resources.

Hydroelectric generation is a secondary purpose of the Don Pedro Project. Hereinafter, the hydroelectric generation facilities and operations will be referred to as the "Don Pedro Hydroelectric Project", or the "Project". With this license application to FERC, the Districts are seeking a new license to continue generating hydroelectric power. Based on the information contained in this application, and other sources of information on the record, FERC will consider whether, and under what conditions, to issue a new license for the continued generation of hydropower at the Districts' Don Pedro Project. The Districts are providing a complete description of the facilities and operation of the Don Pedro Project so the effects of the operation and maintenance of the Don Pedro hydroelectric facilities can be distinguished from the effects of the operation and maintenance activities of the overall Don Pedro Project's flood control and water supply/consumptive use purposes.

Being able to differentiate the effects of the hydropower operations from the effects of the flood control and consumptive use purposes and needs of the Don Pedro Project will aid in defining the scope and substance of reasonable protection, mitigation, and enhancement (PM&E) alternatives to be considered in relicensing. As FERC states in Scoping Document 2 in a discussion related to alternative project operation scenarios: "…alternatives that address the consumptive use of water in the Tuolumne River through construction of new structures or methods designed to alter or reduce consumptive use of water are…alternative mitigation strategies that could not replace the Don Pedro *hydroelectric* project [emphasis added]. As such, these recommended alternatives do not satisfy the NEPA purpose and need for the proposed action and are not reasonable alternatives for the NEPA analysis."

1.0 EFFICIENT AND RELIABLE ELECTRIC SERVICE

Pursuant to 18 CFR § 5.18(c), the Federal Energy Regulatory Commission (FERC) requires the TID and the MID as joint licensees of the Don Pedro Hydroelectric Project (Project) to provide certain information concerning its plans and abilities to operate, maintain, and improve the Project in support of its application for a new license. Also required is a description of the Districts' record of operating, maintaining, and managing the Project under the current license.

1.1 Efficiency and Reliability

The Districts are co-licensees of the Don Pedro Hydroelectric Project on the Tuolumne River in the Central Valley area of California. Each of the Districts are authorized under California law to provide water supply for irrigation and M&I purposes and retail electric service within their designated service territories in Stanislaus and Merced counties.

The Don Pedro Project is a vital resource for the Districts' customers and to the economy of the Central Valley region. TID, as Project operator on behalf of the Districts, is responsible for the day-to-day operation and maintenance of the Don Pedro Project and has been so since completion of construction in 1971. For over 40 years, both Districts have consistently demonstrated their capability to jointly manage and maintain the Don Pedro Project in a manner that delivers efficient, reliable, renewable electricity and reliable water supplies to their service areas while consistently meeting or exceeding their responsibilities related to resource protection and recreation opportunity.

The primary purposes and needs of the Don Pedro Project are to provide reliable water supplies to the Districts' irrigation and M&I water customers, provide for flood management on the Tuolumne and San Joaquin rivers, and create a 570,000 acre-foot "water bank" credit for the CCSF and its 2.6 million water customers in the San Francisco Bay Area. The renewable hydropower generation provided by the Project facilities is an important, but secondary, benefit of the Don Pedro Project to the Districts' service territory. The Don Pedro powerhouse sits immediately below Don Pedro Dam and contains four turbine-generator units with a total hydraulic capacity of approximately 5,500 cubic feet per second (cfs) and a FERC-authorized installed capacity of 168 megawatt (MW). Maximum output under maximum reservoir level and favorable flow conditions can exceed 200 MW, but these conditions occur relatively infrequently.

Flow releases from the Don Pedro Reservoir through the powerhouse are scheduled based upon requirements for (1) flood flow management, including "pre-releases" in advance of anticipated high flows during wet years, (2) Districts' irrigation and M&I demands, including flows to maintain sufficient water storage in Turlock Lake and Modesto Reservoir for those purposes, and (3) anadromous fish protection in the lower Tuolumne River in accordance with the requirements of the FERC license. Once the weekly and daily flow schedules are established based on these demands, then outflows from the Don Pedro powerhouse are scheduled to deliver the appropriate flows. During periods of greater electrical demand, Don Pedro outflows may be shaped to generate more electricity during on-peak periods and less during off-peak periods, subject to meeting the requirements of the pre-established flow schedule for delivery of water supplies or pre-releases for flood flow management (see Exhibit B of this application for license). In accordance with the Districts' "water-first" policy, Don Pedro flow releases are scheduled to satisfy the three requirements listed above, then delivered via the generation units up to their capacity and availability.

More specifically, the Don Pedro Project serves the following primary purposes and needs:

- Provide water storage for the beneficial use of irrigation of over 200,000 acres of prime farmland served by the Districts in California's Central Valley. Combined, the Districts

supply, on average, approximately 850,000 acre-feet of irrigation water per year to their customers.

- Provide water storage for the beneficial use of M&I customers. MID provides treated water to the City of Modesto (population: 210,000), and TID and MID jointly provide treated water to the community of La Grange. The Districts provide up to a maximum of 67,500 AF of water per year for M&I use. In addition, consistent with agreements between the Districts and the CCSF, the Don Pedro Project provides a water bank of up to 570,000 AF that CCSF uses to help manage the water supply from its Hetch Hetchy water system while meeting senior water rights of the Districts. CCSF's water bank provides significant benefits for CCSF's 2.6 million customers in the Bay Area.
- Provide storage for flood management on the Tuolumne and San Joaquin rivers. In cooperation with the U.S. Army Corps of Engineers (ACOE), the Don Pedro Project provides up to 340,000 AF of seasonal storage for the purpose of flood control.

Other important uses supported by the water storage and water supply of the Don Pedro Project are clean and renewable hydroelectric power production, recreation at Don Pedro Reservoir, and flows to benefit aquatic resources of the lower Tuolumne River. With respect to hydropower generation, the four turbine-generator units and the balance of plant at Don Pedro have operated with consistently high reliability and performance over the 40-plus years of commercial operation. Other than scheduled outages, there have been no prolonged forced outages and all plant equipment and materials are well maintained and serviced in accordance with manufacturer specifications.

As a demonstration of the Districts' continuing commitment to investing in the efficiency, reliability and performance of the Project's hydropower generation, the Districts added a fourth generating unit in 1989, after receiving FERC approval. The addition of the fourth unit increased the authorized capacity by approximately 35 MW to the current 168 MW. This was a significant capital investment and demonstrates the Districts' commitment to improving energy production and efficiency at the Project.

1.1.1 Increase in Capacity or Energy Generation

As explained in Exhibit B of this license application, the Districts are proposing to upgrade Units 1, 2, and 3 to improve the efficiency and capacity of the plant's hydropower generation, subject to a final financial feasibility assessment once the terms and conditions of the new license are established. The upgrade would consist of replacing the turbine runners of Units 1, 2, and 3 with new runners and uprating the existing generators.

1.1.2 Coordination with any Upstream or Downstream Water Resource Projects

The Don Pedro Project is operated and managed as a multi-purpose water resource development providing water storage for irrigation, municipal and industrial, flood control, recreation, power generation, and fisheries protection and enhancement purposes. TID is the Project operator and is also the majority owner holding title to 68.46 percent with MID owning the remaining 31.54 percent. The Districts are authorized and obligated under California law to provide both water

supply and retail electric service. Over 200,000 acres of highly productive Central Valley farmland are dependent upon the irrigation water provided by the Districts.

The original planning and design of the Don Pedro Project, and its current operations, provide an excellent example of a coordinated plan of development for a waterway. Integrated into the design and operation of the Don Pedro Project are considerations to maximize water resource benefits for a number of public purposes and uses, including irrigation, flood control, water supply, recreation, enhancement of fish and wildlife, and hydropower generation. Operating the Don Pedro Project to satisfy multiple uses demonstrates a high degree of basin-wide cooperation and coordination.

1.1.2.1 Coordination with the City and County of San Francisco's Hetch Hetchy Water Supply System.

The planning of the Don Pedro Project fit into a comprehensive plan of water resource development on the Tuolumne River involving TID, MID, ACOE, and CCSF. The passage of the Raker Act by Congress in 1913 set the stage for a coordinated development of the waters of the Tuolumne River by the Districts and CCSF. Following passage, the Districts and CCSF entered into various agreements related to water resource development on the Tuolumne River. The two most recent of these agreements, the Third Agreement (1949) and the Fourth Agreement (1966), established the scope of and responsibilities for the cooperative development of the Tuolumne River by CCSF and the Districts. While the Third Agreement set the stage for the building of the new Don Pedro Project, the Fourth Agreement defines the allocation of the waters of the river between the Districts and CCSF and the water accounting for CCSF's water bank. The Fourth Agreement is provided in Appendix H-1 of this Exhibit.

CCSF contributed financially to the construction of the Don Pedro Project to meet its flood control obligations and to obtain water banking privileges in the new Don Pedro Reservoir. This innovative water banking arrangement allows CCSF to pre-release flows from its upstream facilities into the Don Pedro Reservoir where the flows are credited against CCSF's obligation to meet the Districts' water entitlements so that at other times, CCSF can divert water that otherwise would have to be released to satisfy the Districts' senior water rights. Both the transfer of flood management and the creation of the water bank provide CCSF and its wholesale customers in the Bay Area with improved reliability of water supply and greater flexibility with its water and power operations. Under certain circumstances, the Districts and CCSF share responsibility for meeting FERC license requirements in the lower Tuolumne River downstream of the Don Pedro Project (see Exhibit B, Article 8 on page 2-4). Therefore, changes in downstream flow requirements may affect both the Districts' and CCSF's ability to meet the water supply needs of their customers in the Central Valley and the Bay Area, respectively. The Fourth Agreement demonstrates the Districts' commitment to coordination with upstream water resource developments.

1.1.2.2 Coordination with the US Army Corps of Engineers

The Don Pedro Project was also developed in coordination with the ACOE. Joint efforts to provide additional flood control on the Tuolumne River date back to the 1930s, all resulting in an agreement between the ACOE and Districts in 1944 where the ACOE would abandon its efforts to build a separate flood control dam at Jacksonville if the Districts would build the new Don Pedro Dam and design it to provide the same amount of flood control space, 340,000 AF, as the ACOE planned for its Jacksonville reservoir. The agreement reached with ACOE led to its incorporation into the Flood Control Act of 1944 passed by Congress. By agreement, ACOE contributed financially to the construction of the Don Pedro Project in exchange for 340,000 AF of seasonal flood control storage in Don Pedro.

Flood flow management and coordination is implemented in accordance with the 1972 ACOE Flood Control Manual (see Exhibit B of this application for more information). The management of flood flows at Don Pedro also assists ACOE with its overall mission of flood control on the entire San Joaquin River. The Flood Control Manual is provided in Appendix H-3 of this Exhibit.

1.1.2.3 Water Quality Control Plan and Vernalis Adaptive Management Plan

In addition to cooperation with in-basin water resource developments and flood management on the Tuolumne and San Joaquin rivers, the Districts have demonstrated their willingness to cooperate voluntarily with federal and state fishery resource agencies to benefit anadromous fish in the lower Tuolumne River and downstream in the San Joaquin and Bay-Delta. For example, the Districts reached an agreement with resource agencies and conservation groups in 1995 which led to FERC issuing in 1996 an amendment to the existing Don Pedro license that increased minimum and pulse flows to the lower Tuolumne River to benefit fall-run Chinook salmon. The agreement also established a strategy for further recovery of fall-run Chinook salmon; funding for habitat restoration planning, riparian improvements and other non-flow measures; a Tuolumne River biologist; a fisheries technical advisory committee; and an extensive monitoring and reporting program.

More recently, the Districts participated in the Vernalis Adaptive Management Plan (VAMP). The California State Water Resources Control Board's (SWRCB) adoption of the 1995 Water Quality Control Plan (WQCP) for the Sacramento-San Joaquin Delta and Estuary was tracked with great interest by the Districts, given that the Districts hold senior appropriative water rights on the Tuolumne River.

The Districts were particularly concerned since (1) the 1995 WQCP required additional flow for the San Joaquin River at Vernalis, and (2) it was extremely unlikely that such water could be obtained from any source other than the Districts and other San Joaquin Basin tributaries. Since there are no large tributaries to the San Joaquin River capable of providing the quantity of water necessary to meet the flows at Vernalis required by the 1995 WQCP other than the Stanislaus, Tuolumne, and Merced rivers, it was clear that the vast majority of the water necessary to meet the new Vernalis flow requirements would have to come from the Districts along with other water right holders on the Merced and Stanislaus rivers.

Given their joint interest in the water quality standards contained in the 1995 WQCP, TID, MID, and other major water right holders on the Merced and Stanislaus rivers formed the San Joaquin Tributaries Association (SJTA). The SJTA felt that there was not enough scientific evidence in the administrative record regarding the relationship of Chinook salmon survival and increased flow in the San Joaquin River to justify the adoption of the specific flow objectives for the San Joaquin River contained in the 1995 WQCP.

The SWRCB suggested that the SJTA should attempt to resolve its concerns about the adequacy of the scientific underpinnings of the Vernalis flow requirements contained in the 1995 WQCP through the development of an implementation strategy which would provide for the acquisition of data regarding the effect such flow would have on Chinook salmon survival. The SJTA's members were interested in making certain that the Vernalis flow requirements were based upon sound science.

Therefore, in response to the SWRCB's invitation to water right holders to develop and present agreed-upon implementation plans, the SJTA decided to seek a broader coalition, one which was not based solely upon senior water right holders in the San Joaquin River Basin, but one which also included other stakeholders and parties interested in issues associated with the San Joaquin River. As a result, the SJTA joined with the Friant Water Users Authority, the San Joaquin River Exchange Contractors, and CCSF to form the San Joaquin River Group Authority (SJRGA), which then entered into an 18-month process of broad discussions to develop a package of scientifically based flow and non-flow actions designed to benefit outmigrating salmon smolts and other aquatic species. Such meetings and discussions brought together and included other water right holders, such as CCSF and East Bay Municipal Utilities District (EBMUD), the state and federal export contractors, the U.S. Bureau of Reclamation (USBR) and California Department of Water Resources (CDWR), various federal and state resources agencies, including the Environmental Protection Agency (EPA), U.S. Department of the Interior, Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), California Department of Fish and Wildlife (CDFW), and private groups dedicated to the preservation of the environment, including the Natural Heritage Institute and the Bay Institute.

Two scientists, Dr. Bruce Herbold of EPA and Dr. Charles Hanson, an expert retained by the State Water Contractors, took the lead role in developing an experiment to evaluate the role that flow in the lower San Joaquin River and exports had on the survival of outmigrating Chinook salmon smolts. Development of the experiment was an iterative process. As various drafts of the experiment, which became known as the VAMP, were prepared, they were reviewed and revised by researchers and scientists from all sectors, including water users, universities, the state and federal resource agencies, and the environmental community.

In developing the experiment, Dr. Herbold and Dr. Hansen were guided by three principles. First, the experiment had to be designed and conducted in such a way as to protect salmon at least as well as would strict compliance with the 1995 WQCP. Second, the experiment had to provide scientific results that actually reflected upon the relationship between flow, exports, and salmon smolt survival during the spring out migration period. Third, the scientific results had to be verifiable, reliable, and usable so that future decisions based upon them would have the confidence of all of the affected parties. Utilizing these three principles, the VAMP experiment was designed in two phases. The first phase was analytical and focused on identifying what the

experiment should be in terms of flow and exports. The second phase was logistical and focused on the method by which the impact that the experiment had on salmon smolts could be determined.

The analytical framework of the experiment was identified by an examination of the various physical and regulatory constraints on the system. These included the existing limitation that the ratio of flow to exports be 2:1, a ceiling on flows of 7500 cfs at Vernalis due to the installation of a barrier at the head of Old River, and minimum export requirements. Once this framework was in place, additional flow to export ratios were added in an effort to avoid the problem, seen in the historical data, that the flow and export numbers would vary together. Similarly, additional flow rates were added to assist in determining the interaction between flow rate, exports and salmon smolt survival. The result was a matrix of flows and export rates that enabled an evaluation of four levels of flow and three levels of export.

Relying upon the seasonal pattern of outmigration and factors influencing such migration, including water temperature, the scientists identified April 15 through May 15 as the time during which the experiment should be conducted. During this time period, the flows and exports would be managed in accordance with the matrix discussed above. By managing the flow and exports, the reliability of the data would be increased, since variation in both was identified as a primary weakness of prior studies regarding the impact that flows and exports had on smolt survival. Further, it would enable the researchers to differentiate between the impact that flows and export rates had individually, which prior studies could not due to the variability of each.

In addition to the consistent management of flows and exports in accordance with the protocols of the experiment, the experiment relies upon the consistent installation and operation of a barrier at the head of Old River. The primary benefit of the barrier is that it directs outmigrating smolts away from the Old River channel and the state and federal export pumps, and keeps them in the main stem of the San Joaquin River, greatly increasing their chance of survival. However, while the installation and operation of the barrier is an integral aspect of the experiment, the researchers recognized that the barrier might not be installed under all conditions. As such, they developed a contingency plan for those years in which the barrier is not installed and operated which will enable the experiment to take place and to still provide valuable data utilizing the general protocols of the overall experiment.

Having identified the time frame for the experiment, as well as the flow and export rates that would be used, all that remained was the process by which the level of smolt survival could be evaluated. After reviewing past efforts and identifying their strengths and weaknesses, the researchers decided to release salmon smolts containing coded wire tags from four locations in the southern and eastern Delta during the April-May pulse flow period and to sample/recapture such smolts at two locations in the western Delta. Results of the recapture, identifying the number caught from each release location, as well as general operating and environmental conditions occurring during the recapture, were documented.

To manage the flow at Vernalis in accordance with the experiment's matrix, one needed the participation of several water right holders located upstream of Vernalis. To manage the exports, one needed the participation of the USBR and CDWR. To install and operate the barrier at the head of Old River required the consent and cooperation of the CDWR. The transport, release

and recapture of the coded-wire tagged salmon smolts required the participation and consent of the State Water Project, CDFW, and USFWS.

It was at this point that the members of the SJRGA stepped in and made an offer. They, as the holders of the largest and most senior water rights to the Stanislaus, Tuolumne and Merced rivers, would make the water available necessary to achieve the April-May pulse flow called for in the experiment as their contribution to the 1995 WQCP. In exchange, the USBR and CDWR would agree to meet all other flow related requirements of the San Joaquin Basin and to limit exports as called for in the experiment. Additionally, the CDWR would install the barrier at the head of Old River, and CDFW and USFWS would assist in the release and recapture of the test smolts. The parties agreed in concept to this idea, and began to draft an agreement that could then be presented to the SWRCB for review and consideration at the SWRCB's water right hearings. This became the San Joaquin River Agreement (SJRA).

The SJRA was a 12-year performance agreement that contained a package of flow and non-flow actions that was undertaken by the parties to implement the VAMP experiment. First, it established a schedule by which the SJRGA's members provided up to 110,000 AF of water each year, in excess of the existing flow, to meet the April-May pulse flow. Second, the SJRA required the USBR and CDWR to reduce exports during the pulse flow period, with the level of reduction based upon the flow at Vernalis. Third, the SJRA provided that CDWR install the barrier at the head of Old River each year.

In addition to providing the framework by which the VAMP experiment was conducted, the SJRA also called for additional water to be made available for environmental benefits in other parts of the year. The Merced Irrigation District and the Oakdale Irrigation District provided this water. The SJRA contained far more than just the basics of the actions taken; it created a comprehensive process by which the experiment was conducted. It established a technical committee, comprised of one technical specialist designated by each party, whose purpose was to meet each year to develop the flow and export rates, to determine the best management of flow released during the pulse flow period, and to coordinate the flow releases, export reductions, and release and recapture of salmon smolts. The technical committee was also responsible for conducting the sampling and monitoring effort, including the protocols for the transport, tagging, release, and recapture of salmon smolts, and compilation and evaluation of the data. The SJRA also included detailed requirements for dealing with any disputes. The performance of the SJRA was contingent upon approval of certain conditions by the SWRCB. Specifically, the SWRCB had to find that the USBR and CDWR were responsible for meeting all of the flow requirements for the San Joaquin Basin established in the 1995 WQCP, and that the sole responsibility of the SJRGA's members was to assist the USBR and CDWR in meeting their requirements by performing in accordance with the flow provisions of the SJRA. The SWRCB also had to agree to amend the water rights of the SJRGA's members in accordance with Water Code sections 1707 and 1735 to enable them to release water for the environmental purpose of meeting the pulse flow requirements at Vernalis. Thus, prior to becoming an enforceable contract, the parties to the SJRGA had to submit the SJRA to the SWRCB for review and consideration at its water rights hearing.

The VAMP experimental plan began in 1999 and extended through 2011. The Districts provided their share of the water to the lower Tuolumne River to support meeting the pulse flow called for

of up to an additional 110,000 AF per year at Vernalis. The VAMP experiment was not extended beyond 2011.

1.1.3 Coordination of Operations with Electrical Systems

As public utilities, the Districts provide reliable electric retail energy to homes, farms, and businesses in the Central Valley area of California. The Project switchyard is located atop the powerhouse at elevation 340 ft. The switchyard provides power delivery and electrical protection to the Districts' transmission systems. The switchyard includes isolated phase buses, circuit breakers, and four transformers that raise the 13.8 kilovolt (kV) generator voltage to 69 kV transmission voltage. Transformers 1, 2, and 3 are rated at 55 megavolt amperes (MVA) and Unit 4 at 44 MVA. While Units 1, 2, and 4 are direct connected to TID's system and Unit 3 to the MID system, the switchyard has recently been configured to allow interconnection across the two systems when needed. This system, when operating in an interconnected fashion, acts as a pathway for electricity flows across the two systems, providing system benefits to both districts.

TID operates as its own Control Area operator responsible for meeting applicable North American Electric Reliability Council (NERC) standards. MID has contracted with the Sacramento Municipal Utility District (SMUD) to provide certain control area responsibilities through its interconnection with the CAISO. As required by the CAISO, both Districts, as power generators, must meet certain electrical system performance and monitoring requirements as part of their role in supporting the interconnected grid. Both TID and MID have fully met and complied with all such requirements.

1.2 Need for Project Electricity

The electricity production at the Don Pedro Project serves a wide customer base including residential, commercial, industrial, and agricultural customers. The need for electricity is expected to increase over the term of the new license. The California Energy Commission (CEC) issued an Updated California Energy Demand Forecast 2011-2022 in May 2011. The staff report presented an update to the 2009 California Energy Demand electricity forecast adopted for the 2009 Integrated Energy Policy Report in December 2009. The updated forecast was meant to provide the CEC's best estimate of the effect of worsened economic conditions on energy demand since the 2009 forecast was published. The updated forecast presents low, mid, and high forecasts for the state. Average annual growth rates for electricity consumption for 2010-2022 is 1.13 percent, 1.28 percent, and 1.53 percent, respectively (CEC 2011).

Historical and projected numbers of MID and TID electricity sales by customer class are presented in the sections below.

1.2.1 Turlock Irrigation District

TID serves 100,345 customer accounts across 14 communities in a service area of 662 mi^2 in Stanislaus, Merced, Tuolumne, and Mariposa counties. The communities served include Ballico, Ceres, Crows Landing, Delhi, Denair, Diablo Grande, Hickman, Hilmar, Hughson, Keyes, La Grange, Patterson, South Modesto, and Turlock. The composition of these accounts is shown in Table 1.2-1.

Table 1.2-1. TID customer accounts, by type of account.

Type of Account	Number of Accounts	Percent of Accounts
Residential	72,033	72%
Municipal/street lighting	16,367	16%
Commercial	6,983	7%
Agricultural	2,508	2%
Other	1,656	2%
Industrial	798	1%
Total	**100,345**	**100%**

TID's historical and projected electricity sales by customer class are presented in Table 1.2-2. As depicted in Table 1.2-2, electricity needs are projected to increase over time.

Table 1.2-2. TID historical and projected electricity sales by customer class.

Year	Residential (MWh)	Commercial (MWh)	Industrial (MWh)	Agricultural (MWh)	Other (MWh)	Total Customers (MWh)
2011	693,659	124,820	729,239	199,331	196,628	1,943,677
2012	713,915	126,608	738,693	221,584	222,577	2,023,376
2013	728,912	128,695	760,690	223,722	213382	2,055,402
2014	742,166	130,277	776,686	226,774	214,736	2,090,639
2015	755,477	131,531	782,603	229,898	216,123	2,115,632
2016	768,819	132,798	793,937	233,091	217,605	2,146,251
2017	782,246	133,630	804,653	236,507	219,051	2,176,087
2018	795,778	134,311	815,504	240,152	220,655	2,206,400
2019	809,378	135,540	827,206	243,889	222,218	2,238,230
2020	823,016	137,603	840,016	247,717	223,807	2,272,158
2021	836,762	139,533	852,913	251,800	225,491	2,306,499
2022	850,508	140,536	864,712	255,988	227,202	2,338,947
2023	864,274	141,890	877,233	260,433	228,940	2,372,780
2024	878,099	143,733	890,359	264,857	230,707	2,407,755
2025	891,864	145,642	903,844	269,725	232,503	2,443,579
2026	905,649	147,887	917,796	274,554	234,329	2,480,215
2027	919,413	149,858	931,609	279,694	236,255	2,516,820
2028	933,138	151,593	945,377	284,979	238,141	2,253,228
2029	946,781	153, 318	959,359	290,417	240,133	2,590,008
2030	960,344	155,227	973,697	296,200	242,157	2,627,625
2031	973,936	157,323	988,425	301,963	244,217	2,665,864
2032	987,447	159,470	1,003,431	308,289	246,327	2,704,965
2033	1,000,918	161,976	1,018,990	314,611	248,481	2,744,976

1.2.2 Modesto Irrigation District

MID provides electrical service to seven communities in Stanislaus and San Joaquin counties, comprising about 114,000 customer accounts in a service territory of 560 mi^2. The composition of these accounts is shown in Table 1.2-3.

Table 1.2-3. MID customer accounts, by type of account.

Type of Account	Number of Accounts	Percent of Accounts
Residential	94,119	82.6%
Commercial	12,265	10.8%
Industrial	157	0.1%
Agricultural	1,819	1.6%
Other	5,571	4.9%
Total	**113,931**	**100.0%**

MID's historical and projected electricity sales by customer class are presented in Table 1.2-4. As depicted in Table 1.2-4, electricity needs are expected to increase over time.

Table 1.2-4. MID historical and projected energy sales by customer class.

Year	Residential (MWh)	Commercial (MWh)	Industrial (MWh)	Agricultural (MWh)	Other (MWh)	Total Customers (MWh)
2011	857,822	717,323	758,316	96,869	15,562	2,445,892
2012	905,523	731,011	762,398	98,208	15,698	2,512,838
2013	914,763	738,127	763,717	99,350	15,836	2,531,791
2014	927,602	744,669	770,907	100,499	15,975	2,559,653
2015	944,537	751,324	771,780	101,657	16,116	2,585,413
2016	962,513	759,147	772,023	102,822	16,259	2,612,764
2017	983,313	768,596	774,077	103,995	16,403	2,646,384
2018	1,004,089	779,604	780,928	105,176	16,548	2,686,344
2019	1,025,865	792,059	785,978	106,365	16,695	2,726,962
2020	1,047,536	805,381	790,955	107,561	16,844	2,768,277
2021	1,073,450	827,709	798,294	108,767	16,994	2,825,215
2022	1,100,794	851,359	806,292	109,980	17,146	2,885,572
2023	1,129,429	876,217	815,153	111,202	17,300	2,949,300
2024	1,159,413	902,389	824,127	112,431	17,455	3,015,816
2025	1,190,680	929,758	832,817	113,669	17,613	3,084,538
2026	1,223,331	958,646	840,826	114,916	17,771	3,155,489
2027	1,257,329	988,979	848,254	116,171	17,932	3,228,665
2028	1,292,665	1,020,921	855,405	117,434	18,094	3,304,519
2029	1,329,501	1,054,521	862,380	118,706	18,258	3,383,367
2030	1,367,764	1,089,757	869,283	119,986	18,424	3,465,214
2031	1,410,558	1,127,922	876,254	121,277	18,592	3,554,604
2032	1,455,012	1,168,402	883,361	122,576	18,762	3,648,113
2033	1,501,069	1,211,101	894,819	123,884	18,934	3,749,808

1.2.3 Cost and Availability of Alternative Sources of Power

The Don Pedro Hydroelectric Project provides reliable and affordable electricity to TID's and MID's customers in the San Joaquin River Valley area of California. In addition to renewable electricity, the Don Pedro Project provides water storage for the beneficial use of irrigation of

over 200,000 acres of prime San Joaquin River Valley farmland and for the use of M&I customers in the City of Modesto.

If the Project's license is not renewed, the installed capacity of 168 MW would need to be replaced with an alternative source. One possible alternative source of power would be the construction of a combined-cycle, natural gas-fired generating facility. A combined-cycle natural gas-fired generating facility generates electricity using both a natural gas cycle and a steam cycle. Construction of a combined-cycle natural gas-fired generating facility would be expected to result in substantially greater cost than the cost of the hydropower generation at Don Pedro (Table 1.2-5).

The California Public Utilities Commission (CPUC) published Market Price Referents (MPR) in 2011 (Table 1.2-5). The rates are set and adjusted by Time of Use factors as authorized by CPUC. The MPR in Table 1.2-5 is the predicted annual average cost of production for a combined-cycle natural gas fired generating facility.

Table 1.2-5. Adopted 2011 market price referents based on combined-cycle facility (nominal – dollars/kWh).

Contract Start Date	10-Year	15-Year	20-Year	25-Year
2012	0.07688	0.08353	0.08956	0.09274
2013	0.08103	0.08775	0.09375	0.09695
2014	0.08454	0.09151	0.09756	0.10081
2015	0.08804	0.09520	0.10132	0.10464
2016	0.09156	0.09883	0.10509	0.10848
2017	0.09488	0.10223	0.10859	0.11206
2018	0.09831	0.10570	0.11218	0.11572
2019	0.10186	0.10928	0.11587	0.11946
2020	0.10550	0.11296	0.11965	0.12326

Source: CPUC 2012.

California's Renewable Portfolio Standard (RPS) was initially established in 2002 under Senate Bill 1078, accelerated under Senate Bill 107, and expanded in 2011 under Senate Bill 2. The RPS requires investor-owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 33 percent of total procurement by 2020 (see CA Health and Safety Code 38500-38599). To meet the 33 percent total procurement, required entities must adopt the new RPS goals of 20 percent of retail sales from renewables by the end of 2013, 25 percent by the end of 2016, and 33 percent by the end of 2020. Under California law, large hydropower such as the Don Pedro Hydroelectric Project does not qualify as a renewable. Therefore, both the existing Don Pedro generation and generation from a natural gas source would be required to purchase greenhouse gas allowances, the current price of which is about $7/MWh (http://arb.ca.gov/cc/capandtrade/auction/auction.htm).

1.2.4 Replacement Power Costs

Based on CPUC's published MPR in 2011 (Table 1.2-5) for a combined-cycle natural gas fired generating facility, replacement power would be costly compared to the current Project power costs. The Project's current 2012 total estimated annual cost of power production is $8.25

million resulting in the current cost of the power generated at Don Pedro being approximately $13/MWh. Including a greenhouse gas allowance price of $7/MWh, the current cost of Don Pedro generation would be about $20/MWh. Therefore, replacement power costs with a combined-cycle natural gas fired generating facility would be approximately four to five times greater than the current cost of power, thus significantly and adversely impacting the Districts' customers. Exhibit D of this application provides additional information on costs and financing.

Another potential power source to replace the generation provided by the Don Pedro hydroelectric production would be wind power. To replace the 622,440 MWh per year generated by the Don Pedro hydropower facilities, the Districts estimate that a wind plant with an installed capacity of approximately 400 MW, operating at a plant factor between 15 and 20 percent, would be required. The capital cost of such a plant would be between $1 billion and $1.2 billion and cost of energy is estimated to be roughly $140/MWh, exclusive of incentives. This cost would be about seven times greater than the current cost of the Don Pedro Hydroelectric Project generation.

1.2.5 Effects of Alternative Sources of Power

1.2.5.1 Effects on Customers

Alternatives to Project power would impact the local and regional economy, since alternative sources may be significantly more costly as indicated in Section 1.2.2 above. The additional direct cost to the Districts' electricity customers have not been estimated at this time. However, there are a large number of industrial, food processing, and manufacturing concerns in the Districts' service territories whose economics of operation are highly sensitive to electricity costs, especially the food processing and cold-storage businesses. These industries compete in the world market for agricultural products, a market where relatively small changes in cost can have a major effect on whether a business succeeds or fails. Employment in these industries generally requires lower skill, and therefore are lower wage. Therefore, low income families are likely to be disproportionately impacted as a result. If the hydropower generation at Don Pedro were to be replaced by gas-fired generation, a substantial quantity of greenhouse gas emissions would result.

However, it is important to note that the primary purpose of the Don Pedro Project is to provide water storage for irrigation of over 200,000 acres of high-value farmland served by the Districts; water for municipal and industrial purposes; flood control; and support for CCSF's water supply for the Bay Area. All of these Don Pedro Project functions would continue even if the hydropower generation ceased. While a low-cost source of electricity supply would be lost, overall Don Pedro Project operations would largely remain unchanged if hydropower generation was discontinued.

1.2.5.2 Effects on the Applicant's Operating and Load Characteristics

The Districts' operating and load characteristics would be minimally affected by increasing purchases of replacement power or installing a combined cycle unit. Some flexibility would be lost because a combined cycle unit does not possess the same rapid-response characteristics (upramping and downramping capabilities) as hydropower. However, the Districts do not use

the Don Pedro units as either load-following or block-loaded peaking units because water flows are determined by water system needs and constraints and, not hydropower uses.

1.2.5.3 Effects on Communities Served

Alternatives to hydropower generation at Don Pedro would impact the local and regional economy, since alternative sources may be significantly more costly. The effects on the communities served would reflect this loss of income to its citizens, potential increased unemployment, and lower tax revenues in proportion to the higher costs absorbed by local businesses.

1.3 Cost of Production and Alternative Sources of Power

1.3.1 Average Annual Cost of Power

The Project's average annual energy production since 1997 is 622,440 MWh. Based on the 2012 total estimated annual cost of $8.25 million, the current annual value of the Project power is approximately $13.25/MWh. This increases to approximately $20/MWh when the current approximate cost of greenhouse gas allowances of $7/MWh is included, as California's regulations require large hydropower facilities to purchase greenhouse gas allowances. This FLA includes several proposed measures that would require new capital and annual costs associated with these proposed PM&E measures. Exhibit D of this application provides further information on the description of the measures, their costs, and their effect on the cost of generation.

1.3.2 Projected Resources Required to Meet Capacity and Energy Requirements

The Districts release water from the Don Pedro Project for purposes of providing reliable water supplies, flood flow management, and meeting the downstream flow requirements of the FERC license. Through the care, custody, and control exercised in operating the Don Pedro Project, the Districts also ensure dam safety and comply with all other FERC license requirements.

1.3.2.1 Turlock Irrigation District

TID forecasts its total load requirements over the short and long term. These load requirements are identified in Table 1.3-1 through 2032.

Table 1.3-1. TID total load requirements.

Year	Total Requirement (MW)
2013	535.45
2014	545.15
2015	551.90
2016	560.06
2017	568.08
2018	576.21
2019	584.66
2020	593.53
2021	602.51
2022	611.11

Year	Total Requirement (MW)
2023	619.98
2024	629.10
2025	638.37
2026	647.82
2027	657.26
2028	666.64
2029	676.09
2030	685.69
2031	695.42
2032	705.32

TID meets load requirements through a variety of available resources that vary between low demand periods and high demand periods. These varying load requirements are depicted by TID's resource plan for January (Figure 1.3-1), a low demand period, and resource plan for July (Figure 1.3-2), a high demand period. TID maintains system reserve margin requirements in accordance with the Western Electricity Coordinating Council Regional Standard "BAL-STD-002-0" which states that the minimum operating reserve is the sum of regulating reserve, contingency reserve, additional reserves for interruptible imports and additional reserves for on-demand obligations. TID also complies with NERC Standard "BAL-002-1a" and is an active participant of the Northwest Power Pool reserve sharing group. TID is required to carry enough contingency reserve to be able to properly respond to qualifying events.

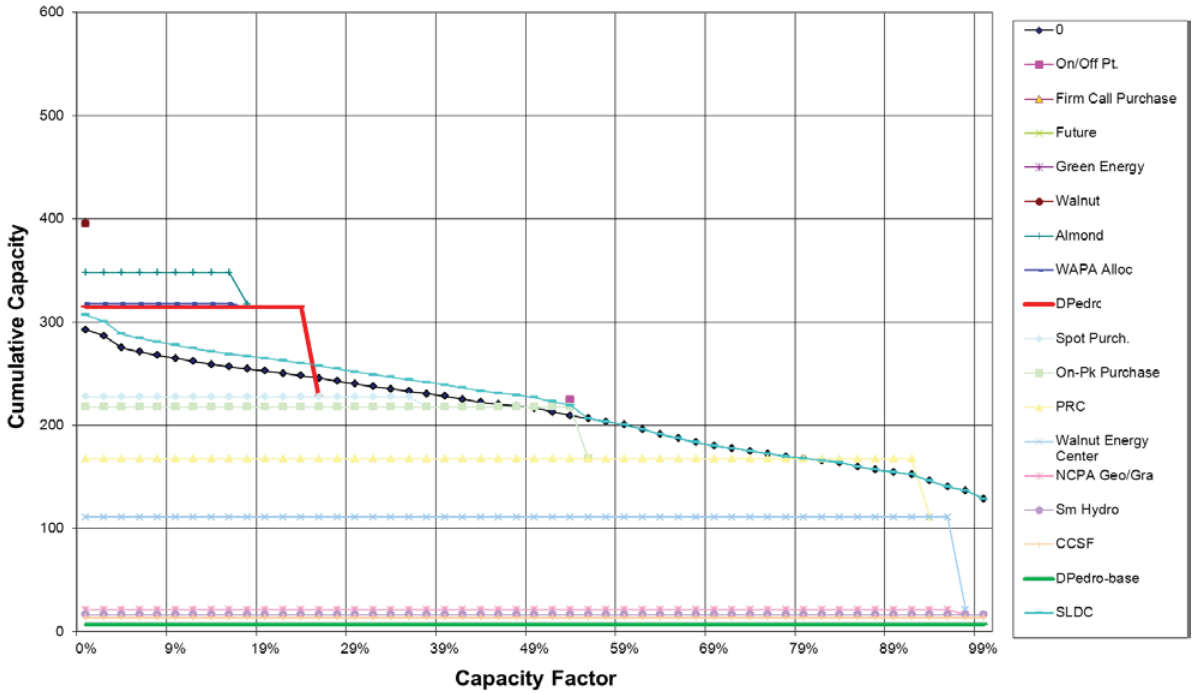

Figure 1.3-1. Load requirements in megawatts - January resource plan.

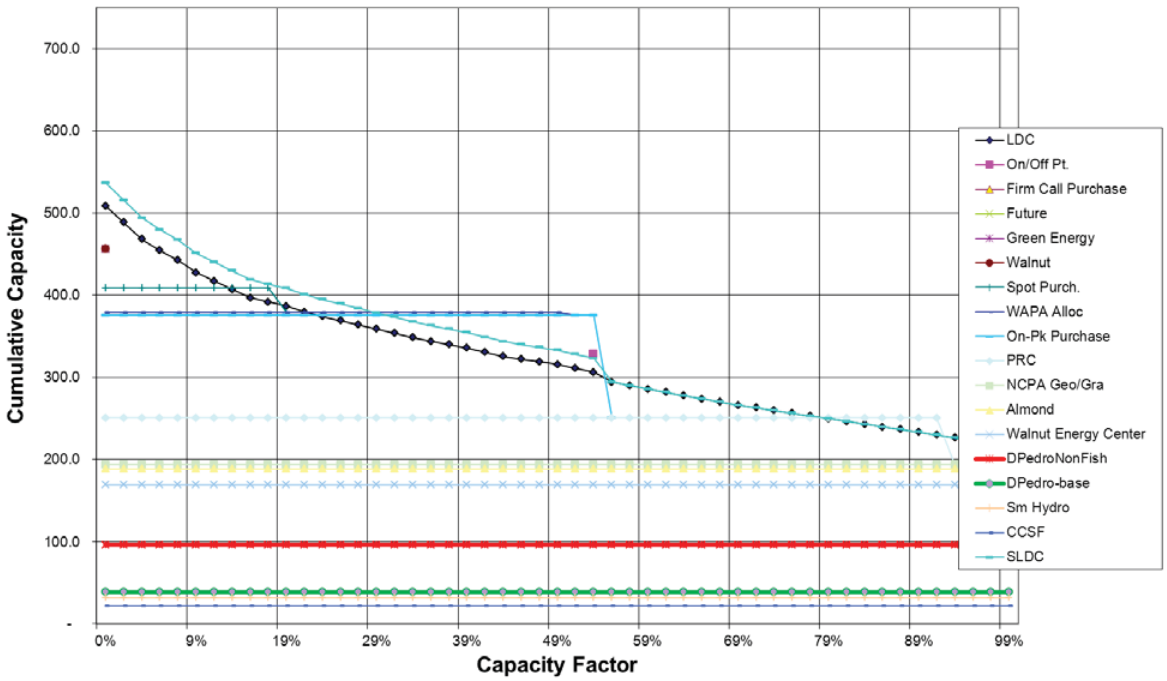

Figure 1.3-2. Load requirements in megawatts - July resource plan.

1.3.2.2 Modesto Irrigation District

MID projects gross demand, energy efficiency, net load requirements, reserves, and total load requirements over the long and short term. Total load requirement is met through a combination of short term purchases, long term purchases, hydroelectric, natural gas, and coal. Table 1.3-2 identifies these loads through 2032.

Table 1.3-2. MID capacity balance - demand and supply.

Year	Projected Gross Demand (MW)	Energy Efficiency (MW)	Reduction (Solar) (MW)	Net Load Requirement (MW)	Reserves (MW)	Total Requirement (MW)
2014	709	31	9	669	94	763
2015	722	35	10	677	96	773
2016	736	38	11	686	97	783
2017	749	40	12	698	99	796
2018	763	42	13	709	100	809
2019	778	43	14	721	102	823
2020	793	47	14	731	104	835
2021	809	48	15	746	106	852
2022	826	49	16	761	108	869
2023	844	50	17	777	110	887
2024	862	51	18	793	113	906
2025	880	52	19	809	115	925
2026	899	53	19	826	118	944
2027	918	55	20	843	120	963
2028	938	56	21	861	123	983
2029	958	58	22	878	126	1004

Year	Projected Gross Demand (MW)	Energy Efficiency (MW)	Reduction (Solar) (MW)	Net Load Requirement (MW)	Reserves (MW)	Total Requirement (MW)
2030	979	60	23	896	128	1025
2031	1022	61	24	917	131	1049
2032	1026	63	25	938	135	1073

1.4 Use of Power for Applicant-Owned Industrial Facility

The Districts do not use power generated by the Project to supply their own industrial facilities or related operations. Therefore, this section is not applicable.

1.5 Need for Power if Applicant is an Indian Tribe

The Districts are not Indian tribes applying for a license for a project on a tribal reservation; therefore, this section is not applicable.

1.6 Effect on Transmission System

The Districts each own and operate transmission systems. The Project switchyard is designed to permit flexibility in how the units are interconnected to the two transmission systems. Based on previous transmission studies, contingency analysis, and the projected TID load forecast, there would be a variety of effects on the transmission system if a license was not received for continuing generation at the Don Pedro Project. If a license was not received, TID would not be able to serve its entire customer load during June, July, August, and September whenever load exceeds 600 MW. To meet customer demand, without the Project, new, firm generation of approximately 100 MW would be needed on the east side of the TID transmission system to mitigate transmission delivery shortfalls. MID would have similar issues and would need firm replacement capacity of approximately 50 MW.

1.6.1 Effects of Redistribution of Power Flows

Project generation also provides system benefits to both TID and MID due to its location near the end of their electrical systems. System stability and control is strengthened by having a significant and reliable source of generation at this location. The loss of Don Pedro generation may require some transmission system changes to maintain stability and power quality for both the TID and MID systems.

1.6.2 Single-Line Diagram

The Project's Single-Line Diagram is attached as Appendix H-2.

1.7 Modifications Conforming with Comprehensive Plans

Section 10(a)(2) of the Federal Power Act requires FERC to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or

conserving a waterway or waterways affected by a project. The Districts are proposing certain PM&E measures and modifications to generation at the Project as part of this FLA. None of these changes are anticipated to change the operations of the Don Pedro Project, except allowing for the release of more water through the turbines if the upgrade is completed as currently planned. The Districts have reviewed the FERC's Revised List of Comprehensive Plans dated April 2013 and identified certain plans as topically or geographically relevant to the Project relicensing. Consistency with these plans is discussed in further detail in Exhibit E, Section 6.

1.8 Impact of Plan to Modify the Project

The Districts are proposing to upgrade existing Units 1, 2, and 3. This upgrade is anticipated to increase generation by approximately 20,000 MWh/yr. The upgrade will not result in any significant changes to Don Pedro Project operations. As explained in the Executive Summary, there are several environmental studies still in progress. Once all studies are completed, the Districts will evaluate the potential for any modifications to operations to enhance natural resources. Any proposed changes and/or additional PM&E measures would be outlined in an amendment to this final license application.

The Districts are proposing to modify the current ACOE 1972 Flood Control Manual in a minor fashion, as described in Exhibit B of this application, by changing the initial date when the full flood storage pool must be available from October 7 to November 7. This change will have no impact on flood flow management benefits, but will benefit fall-Chinook salmon by conserving water storage for use during the fall pulse flow period.

1.9 Financial and Personnel Resources

The Districts are in a superior position to continue operation and maintenance of the Don Pedro Project. The Districts have owned and operated the Don Pedro Project for over 40 years. TID was established in June 1887 and was California's first publicly-owned irrigation district and MID was established in July 1887. The Districts' excellent record of performance demonstrates that they possess the financial and personnel resources to meet the operation, maintenance, and capital requirements of the Project. The Districts have been producing hydroelectric power on the Tuolumne River since 1923 when the old Don Pedro facility was constructed.

1.9.1 Financial Resources

The Districts operate the Don Pedro Project in a safe, efficient, and environmentally responsible manner to provide water storage for irrigation and municipal use, flood control, recreation, fish and wildlife, and power generation. The Project's past performance demonstrates that the Districts have the financial resources to meet the operation, maintenance, and capital requirements of the Project. The financial resources of each District are described below.

1.9.1.1 Turlock Irrigation District

As a municipal public entity, TID financing is primarily through the issuance of bonds. TID's most recent bond offering was in 2011 for $206,940,000. The 2011 Bonds were issued for a variety of purposes including (1) providing funds to retire the $190,950,000 outstanding

principal amount of TID's Series 2010 notes, (2) to make a deposit into the 2011 Debt Service Reserve Fund, and (3) to fund capitalized interest on the 2011 bonds. Standard and Poor, Moody's, and Fitch have assigned ratings of "A", "A2" and "A+", respectively to TID's 2011 Bonds. TID's Don Pedro Project costs are included in TID's rate bases for water and power services.

1.9.1.2 Modesto Irrigation District

As a municipal public entity, MID financing is primarily through the issuance of bonds. MID's most recent bond offering was also in 2011 for $141,455,000 comprised of $125,380,000 electric system refunding revenue bonds (Series 2011A) and $16,075,000 taxable electric system refunding revenue bonds (2011B). MID also has $32,840,000 electric system refunding revenue bonds (Series 2011C).

Standard & Poor's Ratings Services, a Standard & Poor's Financial Services LLC business and Moody's Investors Service, Inc. assigned MID's 2011 Bonds the ratings of "A+" and "A2", respectively. MID's Don Pedro Project costs are included in MID's rate bases for water and power services.

1.9.2 Personnel Resources

Employees of TID are responsible for the day-to-day operation and maintenance of the Don Pedro Project, including ensuring compliance with obligations under the current license. Both TID and MID provide management oversight through a joint operations committee. The Districts have operated and maintained the Don Pedro Project in a safe, reliable, and efficient manner since operations began in 1971. Its superior performance during this term has demonstrated the Districts' ability to operate the Project in accordance with the license terms and conditions.

1.9.2.1 Turlock Irrigation District

As of 2013, TID employs 6 dedicated employees to support hydropower production at the Don Pedro Project. This total includes one Power Plant Supervisor and five Power Plant Technicians. Project support is also provided by various engineering, technical, and administrative departments of TID, as needed. TID's power supply administration employs a total of 81 employees. A number of these employees may at times support and coordinate Don Pedro Project operations and power supply. The following is a breakdown of power supply administration division personnel resources at TID:

- Assistant General Manager, Power Supply,
- Administrative Assistant,
- Civil Engineering Department Manager,
- Combustion Turbine Department Manager,
- Hydroelectric Department Manager,
- Energy Strategy Department Manager,

- Director of Energy Markets,
- Strategic ISS & Plan Department Manager,
- Resource Planning Department Manager, and
- Senior Electrical Engineer.

Support personnel are under the management of the above power supply administration division personnel resources.

The Don Pedro Recreation Agency (DPRA), an agency of TID, employs 48 full and part-time employees with the following breakdown:

- 1 Recreation Department Manager,
- 1 Administrative Assistant,
- 1 Customer Service Rep,
- 2 Recreation Division Managers,
- 1 Chief Ranger,
- 5 Rangers,
- 1 Park Maintenance Division Manager,
- 1 Sewer/Water Treatment Technician,
- 1 Park Maintenance Worker, and
- 34 Seasonal personnel.

These employees support and coordinate daily operations and maintenance of the recreation facilities. TID's employees are certified and trained in their relevant and appropriate fields to ensure the reliable operations. Training courses completed by personnel are discussed in further detail in Section 2.1.1 below.

1.9.2.2 Modesto Irrigation District

As of 2013, MID employed a total of 72 employees in the electric resources division. A number of these employees may at times support and coordinate Don Pedro Project operations and electricity supply and distribution. Below is a breakdown of electric division personnel resources at MID:

- 1 Assistant General Manager of Electric Resources and 1 Secretary,
- 7 employees in Resource Planning,
- 28 employees in Operations,
- 34 employees in Generation, and
- 1 Power Contract Specialist.

MID's employees are certified and trained as appropriate to ensure the reliable supply and delivery of retail electric service to its customers. Training courses completed by personnel are discussed in further detail in Section 2.1.2.

1.10 Project Boundary Expansion Notification

The Districts are not proposing to expand the Project Boundary to encompass additional lands; therefore this section is not applicable.

1.11 Electricity Consumption Efficiency Improvement Program

The Districts offer and promote a number of energy efficiency programs to help customers save both money and energy. Both MID and TID offer customers a variety of educational materials to better understand and manage home energy use and costs. TID and MID's energy efficiency and conservation programs are described below.

1.11.1 Turlock Irrigation District

1.11.1.1 TID Energy Efficiency Rebates Program

The energy efficiency rebates program was implemented after the TID Board of Directors adopted an aggressive 10-year plan to promote conservation. TID offers rebates to residential and business customers to promote conservation. Rebates for residential customers include the following: compact fluorescent light rebate, room air conditioner rebate, refrigerator rebate, clothes washer rebate, sun screen rebate, whole house fan rebate, solar attic fan rebate, radiant barrier and living green residential new construction rebate. Rebates available to business customers include the following: custom rebate, network PC management software rebate, commercial lighting rebate, residential new construction rebate, commercial motors rebate, commercial refrigeration rebate, dairy design assistance program, and advance power strip program.

1.11.1.2 TID Energy Audits and Meter Manager

TID offers free on-site energy audits to commercial, industrial, and agricultural customers who have concerns, questions, or an interest in implementing measures to manage their usage and reduce consumption. Energy audits are also available to residential customers. Additionally, TID offers an on-line energy management tool for business customers so they can monitor their energy usage and utilize that information to more efficiently manage their energy consumption.

1.11.1.3 Vending/Cooling Misers for Commercial Customers

TID has contracted with service providers to install cooler misers for customers with refrigerated vending machines and/or glass front coolers. Additionally, the program aids in the installation of spray valves, aerators and showerheads for customers who have electric water heating.

1.11.2 Modesto Irrigation District

1.11.2.1 MID Weatherization Program

The Weatherization Program provides energy efficient measures to rental or owner occupied low-income customer homes. Work may include replacement of broken windows, refrigerator, microwave, swamp coolers, and the installation of sunscreens, weather-stripping, and some repairs.

1.11.2.2 MID Shave the Energy Program

Shave the Energy Program (STEP) is a voluntary program for MID residential customers with central air conditioners to help reduce energy use at peak times during hot summer days. With this program, MID installs a small "load control" device on the customer's air conditioner unit at no cost to the customer. When STEP is needed, MID will signal the air conditioner to cycle off. Overall power usage is reduced through the controlled cycling of thousands of air conditioners. Customers enrolled in STEP receive a $5 a month discount for the four-month period June through September each year.

1.11.2.3 MID Free Energy Audit Program

MID offers free energy audits for its customers. Through this program, a MID energy specialist will visit the customer's residence and help the customer learn ways to save energy in the home. The audit allows the customer to see how electricity is used in the home including the most and least-cost effective uses. At the conclusion of the audit, the MID energy specialist offers suggestions on ways to reduce energy consumption including no cost and low cost measures.

1.12 Indian Tribe Names and Mailing Addresses

There are no Indian reservation lands within the Project Boundary or in the immediate vicinity. Based on the Districts' outreach program to tribes as a part of relicensing, the following tribes have been identified as potentially having an interest in the FERC relicensing process:

Buena Vista Rancheria
Roselynn Lwenya, Ph.D
Environmental Resources Director
1418 20th Street, Suite 200
Sacramento, CA 95811

Buena Vista Rancheria
Rhonda Morningstar Pope
Chairperson
1418 20th Street, Suite 200
Sacramento, CA 95811

Central Sierra Me-Wuk Cultural & Historic
Reba Fuller, Spokesperson
PO Box 699
Tuolumne, CA 95379

Chicken Ranch Rancheria of Me-Wuk
Lloyd Mathiesen, Chairperson
P.O. Box 1159
Jamestown, CA 95327

Chicken Ranch Rancheria of Me-Wuk
Melissa Powell, Cultural Resources Coordinator
P.O. Box 1159
Jamestown, CA 95327

Picayune Rancheria of the Chukchansi Indians
Mary Motola, Cultural Specialist
46575 Road 417 #A
Coarsegold, CA 93614

Southern Sierra Miwuk Nation
Lois Martin, Chairperson
P.O. Box 1200
Mariposa, CA 95338

Southern Sierra Miwuk Nation
Anthony Brochini, Cultural Resources Representative
P.O. Box 1200
Mariposa, CA 95338

Tuolumne Band of Me-Wuk Indians
Stanley Rob Cox, Cultural Resources Department
P.O. Box 699
Tuolumne, CA 95379

Tuolumne Band of Me-Wuk Indians
Reba Fuller, Spokesperson
P.O. Box 699
Tuolumne, CA 95379

Picayune Rancheria of the Chukchansi Indians
Nancy Ayala, Chairperson
46575 Road 417 #A
Coarsegold, CA 93614

Southern Sierra Miwuk Nation
Jay Johnson, Spiritual Leader
5235 Allred Road
Mariposa, CA 95338

Southern Sierra Miwuk Nation
Les James, Spiritual Leader
P.O. Box 1200
Mariposa, CA 95338

Tuolumne Band of Me-Wuk Indians
Kevin Day, Chairperson
P.O. Box 699
Tuolumne, CA 95379

Tuolumne Band of Me-Wuk Indians
Vicki Stone, Cultural Coordinator
P.O. Box 699
Tuolumne, CA 95379

2.0 INFORMATION TO BE SUPPLIED BY APPLICANTS THAT ARE EXISTING LICENSEES

2.1 Safe Management, Operation, and Maintenance

Safe management, operation, and maintenance of the Don Pedro Project are top priorities of the Districts. The Districts provide employees with appropriate and relevant training and equipment to operate all facilities safely. Specific training programs are described below.

2.1.1 Turlock Irrigation District

As the operating entity of the Don Pedro Project, TID cooperates fully with FERC during inspections of Project facilities such as the annual FERC inspections, five-year Part 12 Dam Safety Inspections, and Environmental and Public Use Inspections, and in other similar safety-related areas such as the development and provision of the appropriate Emergency Action Plan (EAP) and Public Safety Plan.

All Don Pedro Project facilities are maintained to ensure safe and reliable operations. TID operates all facilities consistent with their commitment to public and employee safety. TID achieves their safety goals by:

1) training operations and maintenance personnel,
2) inspecting all Don Pedro Project facilities regularly and monitoring indicators of condition and safety,
3) implementing a rigorous inspection and maintenance program for operating equipment and facilities vital to safety,
4) limiting public access and providing warning signs where Don Pedro Project operations could endanger the public, and
5) complying with all applicable local, state, and federal laws and regulations regarding the safe operation of industrial and electric utility facilities.

TID recognizes that it is important for the key individuals who are ultimately responsible for dam safety and the day-to-day operation and general maintenance to be well trained in the field of dam safety. As a result, it is the policy of TID that the Chief Dam Safety Engineer (DSE), Hydro Department Manager, and Power Plant Supervisor shall complete the USBR's Safety Evaluation of Existing Dams (SEED) training seminar. The Chief DSE, Hydro Department Manager, and Power Plant Supervisor will also attend a dam safety refresher course every five years at a minimum (Mead & Hunt 2012).

In addition to formal training discussed above, the Chief DSE, Hydro Department Manager, and Power Plant Supervisor will receive training updates and refreshers with respect to issues related to dam safety through active participation in the following exercises:

- annual EAP updates,
- annual FERC inspections,
- annual Division of Safety of Dams inspections, and
- review of Potential Failure Modes in conjunction with the Part 12D inspections.

TID encourages the sharing of information learned from outside seminars and training courses among all individuals who are accountable for dam safety. As a result, the Chief DSE, Hydro Department Manager, and Power Plant Supervisor will debrief these individuals regarding key aspects of the SEED training and refresher courses after completion (Mead & Hunt 2012).

TID recognizes the importance of plant technicians having a thorough understanding of dam safety because they observe the Don Pedro Project on a daily basis and are the first line of defense in identifying potential concerns. In addition to the information passed on by the Chief DSE, Hydro Department Manager, and Power Plant Supervisor, plant technicians shall receive hands-on dam safety training through participation in an informal mentoring program (Mead & Hunt 2012). Training includes:

- review of organizational policies regarding dam safety and regulatory compliance,
- general and site-specific training focused on dam safety awareness,
- review of project elements to be addressed during surveillance,
- potential signs of structural distress or movement, and
- purpose of instrumentation and rationale for established threshold values and action levels.

Dam safety training for new employees is administered by the Chief DSE. The Chief DSE will ensure that training of all individuals is documented with records kept to ensure that training goals and requirements are being met, and also to assure regulators, inspectors, and other responsible parties can assess the training that has taken place (Mead & Hunt 2012).

TID's employees complete a variety of training to ensure safe practices in management and maintenance of the Don Pedro Project. Training includes the following:

- accident investigation,
- accident review,
- aerial lift safety,
- American Heart Association- first aid, cardiopulmonary resuscitation (CPR), automated external defibrillator (AED),
- basic industrial electricity I and II,
- bently 3500 operation and maintenance,
- bloodborne pathogens,
- Cal/ Occupational Safety and Health Administration (OSHA) inspections,

- combi-laser operations,
- confined space,
- confined space entrant attendant and supervisor,
- confined space rescue,
- exposure and access to medical records,
- fire prevention and extinguishers,
- forklift,
- hazard communications,
- hazpower 40-hour,
- heat illness prevention,
- hot work permit,
- hydraulics training and troubleshooting,
- infra-red camera operation,
- labview training,
- ladder safety,
- lifting and rigging,
- lockout/tagout/blockout,
- machinery diagnostics - vibration,
- managers and supervisors conference,
- NERC compliance,
- overhead crane and hoist operator,
- propane handling,
- qualified electrical worker,
- qualified work training-substation,
- respirator fit test,
- respirator medical clearance,
- sexual harassment, drug free work place, and IT acceptable use,
- troubleshooting electrical control circuits, and
- valve and instrument technician.

2.1.2 Modesto Irrigation District

MID's employee trainings and dedication to employee and public safety illustrate MID's top priority for safety related to the management, operations, and maintenance of the Don Pedro

Project. MID's journeyman dispatchers, dispatching shift supervisors, and power system schedulers are NERC certified as transmission operators. Additionally, all of the employees in these positions are required to receive 32 continuing education hours (CEHs) in emergency operations annually, as well as receive a total of 140 CEHs of training pertaining to NERC standards of the three year certification period. The dispatchers and dispatching shift supervisors are required to review the Don Pedro EAP each year and participate in the annual Don Pedro EAP drill.

2.1.3 Operations During Flood Conditions

The Don Pedro Project is located about four miles upstream of the town of La Grange and 30 miles east of Modesto, California in the foothills of the Sierra Nevada. The Don Pedro Dam and Reservoir are on the Tuolumne River, which rises in the high elevations of Yosemite National Park and discharges into the San Joaquin River southwest of Modesto. The reservoir is designed to reach elevation 852 ft under design flood conditions. Don Pedro Dam is constructed across a deep canyon of the Tuolumne River. The reservoir covers approximately 13,000 acres of surface area and contains 2,030,000 AF of storage at a water level of 830 ft.

Flood management operations and flood control are managed by the guidelines embodied in the 1972 ACOE Flood Control Manual (Appendix H-3). The ACOE participated financially in the building of the Don Pedro Dam in exchange for the Districts setting aside 340,000 AF of flood control storage space. This space occurs between elevations 801.9 and 830.0 ft and is currently kept vacant from October 7 through at least April 27 of the next year. Encroachment into the flood storage zone is allowed during the flood control period, but must be evacuated within a short period of time. The maximum reservoir level experienced at Don Pedro during the term of the initial license was 831.4 feet which occurred on January 2, 1997.

Reservoir flood management at Don Pedro allows for winter and spring capture of both rain and snowmelt floods, and is part of the ACOE system for flood control operations along the San Joaquin River which includes the other "rim reservoirs" that surround the eastern rim of California's Central Valley. Don Pedro Reservoir's flood control storage requirements increase from zero on September 8 to the maximum reservation of 340,000 AF by October 7. The flood control storage is maintained at 340,000 AF through April 27 after which, unless additional reserved space is indicated by snowmelt parameters, it can decrease uniformly to zero by June 3. Exhibit B provides a detailed graphical depiction of the flood control rule curve for the Don Pedro Project. As described in Exhibit B, the Districts are proposing to extend the first availability of full flood storage volume from the current date of October 7 to November 7.

In addition to flood control space needs within the reservoir, downstream flow restrictions also affect flood management operations. The primary downstream flow guideline cited in the 1972 ACOE Flood Control Manual is that flow in the Tuolumne River at Modesto (as measured at the 9th Street Bridge) should not exceed 9,000 cfs. Flows in excess of 9,000 cfs have the potential to cause significant damage to property in this area of the Tuolumne River and Dry Creek, a tributary of the Tuolumne River. Between La Grange Dam and 9th Street in Modesto, the single largest contributor of local flow to the Tuolumne River is Dry Creek. The Dry Creek watershed has its headwaters in the foothills just northeast of Don Pedro Dam. It is a flashy watershed; once the soil is saturated, any rainfall can result in a rapid increase in runoff. Significant flows,

on the order of 6,000 cfs or higher, can occur when there is significant rainfall between Modesto and the upper end of the Dry Creek watershed. Because these flows from Dry Creek enter the Tuolumne River above the Modesto 9th Street USGS river gage, Dry Creek flows must be taken into account when making releases from Don Pedro designed to maintain total flow at Modesto below 9,000 cfs. Flood flow management operations are further discussed in Exhibit B.

Controlled and uncontrolled spillways are located west of the main dam on the right abutment ridge between the Tuolumne River and Gasburg Creek. The discharge capacity of the controlled spillways, with the three gates fully open, is 78,000 cfs with water surface at elevation 830 ft, and 172,500 cfs with reservoir water surface at elevation 850 ft. The discharge capacity of the uncontrolled emergency spillway is 300,000 cfs with reservoir water surface at elevation 850 ft. In addition to the main dam, the Don Pedro Project includes four dikes identified as Dikes A, B, and C and the Gasburg Creek Dike located downstream of the main spillway, southwest of the Don Pedro Dam. Gasburg Creek Dike is not an impounding structure, but was constructed to prevent flooding along Gasburg Creek during times of spill.

An EAP for the Don Pedro Project has been filed with FERC to comply with requirements of 18 CFR § 12.25. The EAP includes plant operating directives, definition of supervisor-in-charge hierarchy, and communications flowcharts to be followed during an emergency at the Don Pedro Project. The primary purpose of the EAP is to define the requirements needed to warn the public, public safety agencies, and property owners in the event of an imminent or occurring failure (Condition A); potentially hazardous situation developing (Condition B); or a non-failure flood emergency (Condition C). In general, the notification of an emergency, and the implementation of the EAP, will be made by the Senior District Official of TID. The EAP is, and will continue to be, reviewed annually, with respect to conditions both upstream and downstream on the Tuolumne River that may necessitate changes in the plan. Implementation of the plan requires cooperation and clear communication among different agencies. The Districts will continue to work in coordination with these officials to ensure that the plan is responsive to any change in uses or conditions below or in the vicinity of the Don Pedro Project.

2.1.4 Downstream Warning Devices

Public access immediately below the powerhouse is discouraged. A floating boom located approximately 1,000 ft downstream of the powerhouse is in place year round to keep river users out of harm's way near the powerhouse. The boom extends completely across the river channel and is labeled "Restricted Area-Keep Out."

2.1.5 Operational Changes that Might Affect the Emergency Action Plan

No operational changes are proposed that might affect the existing EAP. The plan is reviewed and tested annually, and updated as required. There are no known or planned changes to the plant facilities that would affect the EAP.

2.1.6 Monitoring Devices

There are remote sensing instruments located throughout and downstream of the Don Pedro Project to detect abnormal conditions. Headwater level, tailwater level, and seepage weir level

signals are input to the Supervisory Control and Data Acquisition (SCADA) system. This information is transmitted to the Power Control Center every ten minutes or immediately upon an event (digital alarms) or every four seconds (analog data). The Districts' engineers, hydrographers, and senior management officials evaluate the data supplied by visual observation, real-time dam instrumentation, manually inspected dam instrumentation, watershed data, and downstream river flow data. Alarms are triggered when any of the following events occur.

- When the reservoir elevation exceeds 825.0 ft, which is five feet below the top elevation of the ungated ogee spillway, the "Don Pedro Reservoir High Water Level Alarm" is sounded.
- When the reservoir level falls at a rate greater than .084 inches per minute (10 ft in a 24-hour period), the "Don Pedro Reservoir High Rate of Change Alarm" is sounded.
- When the tailwater level below the dam exceeds 304.5 ft, the "Don Pedro Tailwater High Level Alarm" is sounded.
- When the tailwater level rises at a rate greater than three feet per minute, the "Don Pedro Tailwater High Rate of Change Alarm" is sounded.
- If the seepage weir elevation is less than 0.2 ft, the "Seepage Weir Low Level Alarm" is sounded.

When any of the above alarms occur, the alarm is displayed in flashing mode on the Power Control Center screen, an audible bell is sounded in the Power Control Center, as well as at the powerhouse. The alarm stays in effect until the condition is corrected at the site. An alarm is also sounded if communication is lost between the powerhouse and the Power Control Center. This condition is known as a "response alarm" and triggers the Power Control Center to dispatch the on-site, on-call technician to the plant until communication is restored.

The current instrumentation monitoring program measures seepage, deformation, and hydrostatic pressure within the dam and foundation. Current dam safety related instrumentation at the Don Pedro Project are described below.

2.1.6.1 Piezometers

Located in the dam and in the spillway structure, the piezometer devices are used to measure the hydrostatic pressure within the dam. The piezometers are read four times each year and these results, along with reservoir elevation readings, are compared to previously collected data. The data provides information on the pore pressures in the core, the rapidity of drainage of the upstream shell under draw down conditions, the effectiveness of the downstream drain, the pore pressures along the embankment/foundation interface and the pore pressures in the foundation. Combined, the collected data evaluates the effectiveness of the grout curtain. There are 33 operating piezometers in the Don Pedro Dam and dikes and four piezometers at the spillway.

2.1.6.2 Crossarms

Located in the dam, these devices are used to measure internal settlement of the dam. The crossarms are read once a year and are compared to previous data. There are a total of seven crossarm settlement devices at the Don Pedro Project.

2.1.6.3 Surface Markers

Located on both the upstream and downstream faces of the dam, survey triangulation of these devices is used to measure dam surface movement. The surface markers are measured once each year and compared to previous data. There are a total of 63 surface markers along the dam.

2.1.6.4 Seepage Measuring Weir

Located in the powerhouse, this device measures the total flow of water through the dam and foundations. The weir is read twice each month and is continuously monitored by the Power Control Center. The flow is correlated with the reservoir elevation and rainfall, and the data is compared to previous data. In addition, the elevation of water going through the weir is read every four seconds by the SCADA and checked for alarm conditions.

2.1.7 Employee Safety and Public Safety Record

The Districts manage the Don Pedro Project consistent with their long-standing commitment to employee and public safety. This commitment begins with compliance with applicable local, state, and federal regulations regarding the safe operation of industrial and electrical facilities. As a result of the rigorous safety programs implemented, TID, the operator of the Don Pedro Project, has not received a single OSHA citation for or related to the Don Pedro Project.

The DPRA manages resources while providing for recreational opportunities at the Don Pedro Project. The DPRA promotes the safety and security of visitors and employees. In an effort to assure safety and security of visitors, all the Don Pedro recreation areas have a set of regulations and ordinances to govern its facilities addressing topics of general regulations, safety, vehicles, recreation area use, and natural resources. These regulations and ordinances are attached as Appendix H-4.

The Don Pedro Reservoir is a large and popular recreation area that supports boating, fishing, skiing and swimming within the reservoir. As described above, the Districts have various warning devices in place to inform the public of dangers relative to boating, swimming, skiing, and fishing in the immediate vicinity of any project-related facilities. Fatalities have occurred in the reservoir, the majority of which were due to boating accidents or mishaps. A record of fatalities that occurred between 1995 and 2013 is provided in Table 2.1-1.

Table 2.1-1. Serious injuries and fatalities occurring within the Don Pedro Project Boundary (1995-2013).

Date	General Location	Remarks
August 13, 2013	Lone Gulch	Fatality- drowning while attempting to tie two boats together
October 13, 2012	Stent Jacksonville Bridge	Fatality- jump from bridge, drowning
July 21, 2012	Gardner Falls	Serious injury- shoreline fall, broken wrist, laceration to abdomen
September 8, 2011	Moccasin Bay	Fatality- drowning
July 20, 2011	Fleming Meadows Campsite	Fatality- heart attack
June 28, 2011	Gardner Falls	Fatality- drowning
June 27, 2011	Green Bay	Serious injury- vessel accident

Date	General Location	Remarks
July 25, 2010	Kanaka Creek	Serious injury- fall on a houseboat
June 27, 2010	South Bay	Serious injury- vessel fall, back/neck injury
November 28, 2009	Moccasin/Tuolumne River Arm	Fatality- drowning
July 4, 2009	Lake Don Pedro Marina (Fleming Meadows)	Serious injury- hand contact with boat propeller
June 26, 2009	Graveyard Creek	Serious injury- jump from houseboat, spinal injury
May 31, 2009	Lake near Moccasin Point	Serious injury- personal water craft accident, head injury
August 8, 2008	School House Point	Fatality- drowning
August 3, 2007	Big Creek	Serious injury- high speed vessel accident, multiple injuries to driver
June 16, 2007	Lake near Fleming Meadows	Serious injury- boat/tube accident, neck injury
June 14, 2007	Middle Bay	Serious injury- personal water craft accident, head injury
July 28, 2006	Hatch Creek	Serious injury- wakeboard accident, fractured femur
June 10, 2006	Six-Bit Gulch	Serious injury- wakeboard accident, head/face injuries in collision with shore
May 31, 2006	Gardner Falls Upper Bay	Serious injury- wakeboard accident, fractured femur
June 6, 2005	Railroad Canyon	Serious injury- boat collision, head injury
June 24, 2004	Kanaka Creek	Serious injury- near drowning while swimming with friend
May 29, 2004	Blue Oaks Campground	Serious injury- fall into campfire, 2nd and 3rd degree burns
November 28, 2003	Highway 120/49 bridge	Fatality- jump from bridge
September 5, 2003	Gardner Falls	Fatality- jump/fall from rocks
July 20, 2003	Lake near Fleming, Private Houseboat Dock	Serious injury- contact with boat propeller, severe leg laceration
June 29, 2003	Lake near Fleming Meadows	Serious injury- wakeboard accident, profuse bleeding, concussion
September 30, 2000	Tuolumne River Arm	Fatality- presumed drowned
August 8, 2000	Moccasin	Fatality- possible heart attack
July 2, 2000	South Bay	Fatality- presumed drowned
July 24, 1999	West Bay	Fatality- drowning
July 12, 1999	Gardner Falls	Fatality- houseboat, injuries resulting from fall
July 3, 1999	Fleming Meadows	Fatality- heart attack
May 30, 1999	Blue Oaks Ramp	Fatality- possible heart attack
June 24, 1995	Blue Oaks Ramp	Fatality- heart attack

2.2 Current Operations

In general, the Don Pedro Project operates on an annual cycle consistent with managing for and providing a reliable water supply for consumptive use purposes, providing flood flow management, and ensuring delivery of downstream flows to protect anadromous fish. By October 6 of each year, the Don Pedro reservoir is currently lowered to at least elevation 801.9 ft to provide the 340,000 AF of flood control benefits acquired by the ACOE through its financial contribution to construction. Beginning on October 1 of each year, minimum flows provided by the Don Pedro Project to the lower Tuolumne River, as measured at the USGS gage at La Grange, are adjusted to meet license requirements intended to benefit upmigrating adult fall-run Chinook salmon. This includes providing a pulse flow, the amount of which varies depending on the water year type.

Minimum flows to the lower Tuolumne River are adjusted on October 16, the rate of flow dependent on water year type, and these flows are maintained through May 31 of the following year to protect egg incubation, emergence, fry and juvenile development, and smolt outmigration of fall-run Chinook salmon. A spring pulse flow is provided each year to aid smolt outmigration, the amount again depending upon water year type. Irrigation deliveries normally begin in early March, but can begin as early as February to provide early growing season soil moisture in dry winters. Irrigation deliveries ramp up considerably by April and normally reach their peak in July and August.

Throughout the winter months, operators maintain a constant assessment of snow conditions in the upper Tuolumne River watershed and, during years with heavy snow accumulation, may reduce reservoir levels to balance forecasted inflows, outflows, and reservoir storage. The goal of operations is to fill the reservoir by early June; however, greater snowpack volumes can extend this filling into early July if needed for maintenance of the required ACOE flood control space. ACOE flood control guidelines also provide for maintenance of downstream flows on the lower Tuolumne River to less than 9,000 cfs as measured at the USGS gage at Modesto River Mile (RM) 16, almost 40 miles below the Don Pedro Project.

Minimum flows to the lower Tuolumne River are adjusted again on June 1 and extend through September 30. Irrigation and M&I deliveries normally continue through October, but may also extend through November depending on soil moisture conditions. M&I deliveries occur year-round.

Delivery of Don Pedro Project benefits—irrigation water, M&I water, water for the protection of aquatic life, recreation, production of renewable energy, and flood protection—requires careful and skillful management of water. Don Pedro Project operations involve the continuous assessment of known and unknown variables, hydrologic risk assessment, coordination with other water systems, and the balancing of demands and resources. Don Pedro Project operations are discussed in further detail in Exhibit B.

2.3 Project Generation History

Construction of the Don Pedro Project began in 1967 and reservoir filling began in November 1970. Commercial operation commenced in 1971 and the reservoir first filled to the flood storage space of 801.9 feet on March 1974. The current Don Pedro Dam was built approximately 1.5 miles downstream of the original, and much smaller, Don Pedro Dam which had been in operation since 1923.

TID provides irrigation water to 150,000 acres of land and serves approximately 100,000 electric customers in a 662 mi^2 electric service area (TID 2010). MID provides irrigation water to almost 60,000 acres of land and serves approximately 114,000 electric customers in a 560 mi^2 electric service area (MID 2010). MID also supplies treated municipal water to the City of Modesto, and TID and MID provide treated drinking water to the community of La Grange.

On behalf of both Districts, TID operates the four-unit, 168 MW Project. The original powerhouse was constructed with three 45.5 MW units; a fourth, slightly smaller unit was added in 1989. One of the three original units is directly connected to MID's transmission system and

the other three units are connected to TID's transmission system. However, the Project switchyard is designed to permit flexibility in delivering Project generation to the two transmission systems.

Numerous capital improvements have occurred at the Don Pedro Project since commencement of operations in 1971. The largest single improvement was the addition of the fourth hydropower unit in 1989.

2.3.1 Generation Losses Due to Outages Over Previous Five Years

Table 2.3-1 presents the unscheduled outages for the generating units. Outages are presented for a six-year period of time (2008 through 2013). In order to efficiently provide energy production from the facility, the Districts have a consistent record of addressing outages immediately and taking preventative measures to prevent future occurrences.

Table 2.3-1. Outage history of the Don Pedro Project 2008-2013.

Start Date	Duration	Unit	Cause	Corrective Action Taken
July 26, 2013	1 hour	2	Relay failure on high pressure oil lift pump circuit	Replaced relay on high pressure oil lift pump circuit
July 9, 2013	6 hours	2	Transformer nitrogen leak	Substation crew reduced the leak. TID will continue to supply nitrogen until the transformer can be brought out of service for repairs.
January 1, 2013	19 hours	4	Field flashing breaker failure to fully open	Contractor called out to service the field flash breaker for smooth operation
November 15, 2012	4 hours	1,2,3,4	Unit shutdown to facilitate an investigative dive near the power tunnel intake	No corrective action necessary
September 28, 2012	10 hours	3	Testing for autosynchronizer	Test followed new installation
May 31, 2012	24 hours	4	Make hollow jet valve fully available to reduce river flow required	No corrective action necessary
April 30, 2012	19 hours	1	Bad power setter board on mod II governor	Replaced setter board with spare
April 2, 2012	31 hours	3	Excessive vibration	Reduce output 15 MW until further diagnosis
February 24, 2012	2 hours	1	Water leak near the generator air cooler	Repaired the pipe fitting
November 13, 2011	Outage varies by unit from approx. 625 hours for Unit 4 to 3,200 hours for Unit 2. Not all units	1,2,3,4	All four units were removed from service to allow replacement of high pressure valve in the main power conduit; during powerhouse outage, an oil leak was found in the fixed wheel gate hydraulic system. Unit 4 was placed back in service on December 9; Unit 1 on January 9, 2012; Unit 3 on January 19, 2012; and Unit 2 on	High pressure valve cavitation was repaired; oil leak was repaired by fill welds and sleeving the damaged area. Runner repairs on Unit 2 were undertaken to address cavitation.

Start Date	Duration	Unit	Cause	Corrective Action Taken
	required for water delivery purposes.		March 27, 2012.	
November 9, 2011	21 hours	4	Cooling water pressure regulating valve problem	Replaced faulty valve
November 4, 2011	84 hours	4	Cooling water piping leak	Removed and repaired piping
July 26, 2011	1 hour	2	Relay failure on high pressure oil lift pump circuit	Repaired relay
July 19, 2011	4 hours	4	Brush rigging carbon buildup	Cleaned the entire collector ring and brush housing
April 17, 2011	24 hours	4	Water leak on one generator air cooler	Isolate cooler, derate generation, remove and repair
April 8, 2011	8 hours	3	Abnormal air gap reading	Verify sensor installation and repair proximeter
March 21, 2011	4 hours	4	Brush rigging carbon buildup	Cleaned the entire collector ring and brush housing
February 4, 2011	82 hours	1	Carbon dioxide discharge	Change out fire detector
February 4, 2011	81 hours	4	Carbon dioxide discharge	Change out fire detector
January 14, 2011	4 hours	4	Brush rigging carbon buildup	Cleaned the entire collector ring and brush housing
November 19, 2010	22 hours	1	Excitation problem	Replaced a bad relay and timer for the field breaker
August 4, 2010	4 hours	2	Excitation problem	Reset
February 6, 2010	31 hours	2	Wicket gate shear pin	Replaced shear pin
January 25, 2010	1 hour	1,2,3	Battery charger powered down for auxiliary equipment installation	No corrective action necessary
January 5, 2010	34 hours	1,2,3	Blown seal on cooling water line	Repaired seal
November 22, 2009	2,616 hours	4	Field ground trip; stator and rotor contamination from carbon brushes	Unit was taken apart and cleaned thoroughly
March 25, 2008	10.25 hours	1,2,3,4	Inverter failure	Install station power to inverter output until repair was made

2.4 Compliance with Terms and Conditions of Existing License

The Districts have consistently executed their obligations and responsibilities under the current license. Many of the FERC license articles required the Districts to undertake extensive environmental studies, often under challenging deadlines. The Districts have met every one of these requirements and schedules. The Districts maintain complete records of its operations and compliance and proactively cooperate with other river managers and users, including the ACOE, CCSF, U.S. Department of the Interior, Bureau of Land Management (BLM), CDFW, USFWS, and Non-Governmental Organizations (NGOs). The Districts have been in full compliance with the terms of its FERC license throughout the initial license term.

2.5 Actions Affecting the Public

The Districts' operations and maintenance practices ensure the efficient, productive use of the Don Pedro Project's resources to satisfy a number purposes and needs. As a result, the Districts' actions related to the Don Pedro Project affect the public.

The Don Pedro Reservoir provides 2,030,000 AF of total water storage, which provides water for the beneficial use of irrigation of over 200,000 acres of prime farmland in California's Central Valley. Combined, the Districts supply, on average, approximately 850,000 AF of irrigation water per year to their customers.

The Don Pedro Project also provides water storage for the beneficial use of M&I customers. MID provides treated water to the City of Modesto (population: 210,000), and TID and MID jointly provide treated water to the community of La Grange. The Districts provide up to a maximum of 67,500 AF of water per year for M&I use. Consistent with agreements between the Districts and the CCSF, the Don Pedro Project also provides a "water bank" of up to 570,000 AF that CCSF may use to help manage the water supply from its Hetch Hetchy water system while meeting senior water rights of the Districts. CCSF's "water bank" within Don Pedro Reservoir provides significant benefits for its 2.6 million customers in the San Francisco Bay Area.

Another primary use of the Don Pedro Project is providing storage for flood management on the Tuolumne and San Joaquin rivers by providing up to 340,000 AF of storage for the purpose of flood control.

Other important uses supported by the water storage and water supply purposes of the Don Pedro Project are recreation, power generation, and protection of the downstream anadromous fishery. The Don Pedro Reservoir supports three developed recreation areas and other small recreation facilities (restrooms and buoys) outside of the developed areas. The three developed recreation areas are Fleming Meadows Recreation Area, Blue Oaks Recreation Area, and Moccasin Point Recreation Area. In addition to these developed recreation areas, there is boat-in access to much of the shoreline and to the islands within the reservoir. Water-based activities within the Project Boundary include water skiing and wake boarding, boat fishing, jet skiing, canoeing, flat water kayaking, windsurfing, and sailing. Land-based recreation activities include camping, picnicking, and fishing.

2.6 Ownership and Operating Expense Reductions if the Project License was Transferred

If the Districts' ability to generate hydropower at the Don Pedro Project were transferred to another entity, the Districts would have to continue to operate the Don Pedro Project just as it is now in order to continue to deliver water to meet existing and future irrigation and M&I needs. The Don Pedro Project is primarily a water supply project; hydropower is a secondary function. Further, the Districts do not agree that the hydropower operating license could be transferred to another entity without interfering in the Districts' water rights. Operation and maintenance (O&M) expense reduction associated with transfer of hydropower production to another entity would be approximately $3 million.

2.7 Annual Fees for Federal or Indian Lands

There are no Tribal reservation lands within the FERC Project Boundary. The Project Boundary does occupy approximately 4,802 acres of federal land within the Bureau of Land Management's Sierra Resource Management Unit. The fee for this land has been $289,168.01 annually from 2008 to 2012.

3.0 LITERATURE CITED

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