

Draft Environmental Assessment/Initial Study

**Amendment to the Long-Term
Renewal Contract Between the
United States and Corning Water
District Providing Project Water
Service from the Sacramento River
Division for the Purpose of
Relinquishing a Portion of the
Contract Total**

California



U.S. Department of the Interior
Bureau of Reclamation
Sacramento, California

Corning Water District
Corning, California

August 2017

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Abbreviations and Acronyms

AF	acre-feet
APCD	Air Pollution Control District
AQAP	Air Quality Attainment Plan
ATCM	Airborne Toxic Control Measure
CAAQS	California Ambient Air Quality Standard
CARB	California Air Resources Board
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife (after January 1, 2013)
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
cfs	cubic foot per second
CO	carbon monoxide
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CWD	Corning Water District
dB	decibel
dBA	A-weighted decibel
Delta	Sacramento-San Joaquin Delta
DWR	California Department of Water Resources
EA	Environmental Assessment
EIS/EIR	Environmental Impact Statement/Environmental Impact Report
GHG	greenhouse gas
HCP	habitat conservation plan
hp	horsepower
IS	Initial Study
ITA	Indian Trust Asset
lbs/day	pounds per day
Ldn	day-night average sound level
NAAQS	National Ambient Air Quality Standard
NCCP	Natural Community Conservation Pla
NEPA	National Environmental Policy Act
NMFS	National Oceanic and Atmospheric Administration National Marine Fisheries Service
NOx	nitrogen oxides

NRCS	Natural Resources Conservation Service
NSVPA	Northern Sacramento Valley Planning Area
NWR	National Wildlife Refuge
O&M	operations and maintenance
O ₃	ozone
PM _{2.5}	fine particulate matter, particles up to 2.5 microns
PM ₁₀	coarse particulate matter, particles up to 10 microns
Reclamation	United States Department of the Interior, Bureau of Reclamation
ROG	reactive organic gases
Secretary	Secretary of the Interior
SLDMWA	San Luis and Delta Mendota Water Authority
SO _x	sulfur oxides
State	State of California
SWP	State Water Project
SWRCB	State Water Resources Control Board
USC	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VOC	volatile organic compounds
WY	water year
YSRCP	Yuba-Sutter Regional Conservation Plan
Yuba Accord	Lower Yuba River Accord

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Chapter 1

Introduction

This Environmental Assessment (EA) and Initial Study (IS) was prepared by the U.S. Department of the Interior, Bureau of Reclamation (Reclamation) and Corning Water District (CWD). This EA/IS considers the potential environmental effects of executing an Amendment to the Long-Term Renewal Contract Between the United States and Corning Water District Providing Project Water Service from the Sacramento River Diversion, hereinafter Existing Contract, for the purpose of relinquishing a portion of CWD's Contract Total¹ to Reclamation to meet its statutory obligation to provide a water supply to certain wildlife refuges in the Sacramento Valley.

This joint EA/IS document satisfies the requirements of the National Environmental Policy Act (NEPA) (42 United States Code [USC] §4231 et seq.), the Council of Environmental Quality implementing regulations (40 Code of Federal Regulations [CFR] §1500-1508), the Department of the Interior's NEPA regulations (43 CFR Part 46), the California Environmental Quality Act (CEQA), and the Governor's Office of Planning and Research regulations to implement CEQA (California Code of Regulations §15000-15387). Reclamation is the federal lead agency responsible for NEPA review, through the EA, and CWD is the state lead agency responsible for CEQA review, through the IS, for the proposed project/proposed action.

The Department of the Interior (Interior) has initiated a Water Acquisition Program, a joint effort by Reclamation and the U.S. Fish and Wildlife Service (USFWS). Under this program, the agencies propose to acquire water supplies in the Central Valley of California to meet the fish and wildlife habitat restoration and enhancement goals of the Central Valley Project Improvement Act (CVPIA)².

Section 3406(d)(1) of the CVPIA requires the Secretary of the Interior (Secretary) to provide firm delivery of Level 2 water supplies (for full habitat development) to the various refuges' habitat areas identified in Reclamation's Report on Refuge Water Supply Investigations (Reclamation 1989) and the San Joaquin Basin Action Plan/Kesterson Mitigation Plan (Reclamation and

¹ Contract Total is defined as the maximum amount of water to which the Contractor is entitled under subdivision (a) of Article 3 of the Long-Term Renewal Contract Between the United States and Corning Water District Providing Project Water Service from the Sacramento River Diversion, Contract Number 14-06-200-6575-LTR1, executed February 25, 2005.

² The CVPIA was signed into law on October 30, 1992, as Title XXXIV of Public Law 10-575. The CVPIA mandated changes in CVP management, particularly to protect, restore, and enhance fish and wildlife.

California Department of Fish and Game 1989). These reports describe water needs and delivery requirements for each wetland habitat area to accomplish stated refuges management objectives. In the Refuge Water Supply Report, historical deliveries were termed "Level 2," and the quantity of water needed to achieve optimum habitat management was termed "Level 4." Section 3406(d)(2) of the CVPIA further directs the Secretary to provide additional water supplies to meet the Incremental Level 4 (IL4) requirements described in these reports through the acquisition of water from willing sellers. The quantities of water required to meet the IL4 water supplies are to be acquired in increments of not less than 10 percent per year.

The intent of CVPIA is to provide firm Level 4 water supplies. To date, Reclamation has acquired the IL4 water supplies on an annual and permanent basis while continuing to plan for long-term actions. CWD is willing to sell a portion of their Contract Total to Reclamation to help meet its Level 4 obligations.

This EA/IS describes the potential direct, indirect, and cumulative effects of amending the Existing Contract for the purpose of relinquishing a portion of CWD's Contract Total to Reclamation.

1.1 Background

CWD and Reclamation have had a contractual agreement for water service from the CVP since 1957. In 1998, CWD relinquished a portion of its CVP surface water supply to Reclamation to help meet the IL4 refuge water supply requirements. Currently, CWD has a water service contract for 23,000 acre-feet (AF) of CVP water. During recent drought years, CWD's water users received limited CVP supply, leading users to install additional groundwater facilities to allow irrigation to continue for permanent crops. As a result, water users within CWD are purchasing less surface water, and CWD is receiving less income to pay long-term operation and maintenance (O&M) costs to Reclamation. This decrease in revenue has led CWD to consider relinquishing a portion of its Contract Total to Reclamation.

The Proposed Action would assist Reclamation in complying with Section 3406(d)(2) of the CVPIA, which requires Reclamation acquire IL4 water supplies. The difference between water supplies for optimum habitat management (Level 4) and average annual deliveries (Level 2) is related to habitat diversity, duration of late winter flooding, brood water, and pond areas. Table 1-1 shows Level 2, IL4 and full Level 4 quantities of water for Sacramento Valley refuges considered in this document.

CWD is located approximately 17 miles south of Red Bluff, California. The Sacramento Valley refuge areas designated to benefit from the relinquished water are as follows: Sacramento NWR in Glenn and Colusa Counties, Delevan

NWR in Colusa County, Sutter NWR in Sutter County, and Gray Lodge Wildlife Area (WA) in Butte County.

As described in the 1989 Report on Refuge Water Supply Investigations (Reclamation 1989), total available acres of wetlands within the Central Valley have declined from about 4 million acres in 1850 to about 300,000 acres in the 1980s. Federal National Wildlife Refuges (NWRs) and State Wildlife Management Areas comprise approximately one third of this acreage. The refuges in the Central Valley are a critical component of the Pacific Flyway. Maintaining the Pacific Flyway for waterfowl depends on critical wintering habitat in the Central Valley. Waterfowl migration to the Central Valley begins in August with the arrival of the first birds from the north. The wintering waterfowl rapidly increase over the late summer and fall; by late December as many as 10 to 12 million waterfowl migrate to or through the Central Valley for their winter sojourn.

Table 1-1. Sacramento Valley Refuge Water Supply Needs

Refuges	Level 2 (AF)	IL4 (AF)	Full Level 4 (AF)
Sacramento NWR	46,400	3,600	50,000
Delevan NWR	20,950	9,050	30,000
Sutter NWR	23,500	6,500	30,000
Gray Lodge WA	35,400	8,600	44,000
Total	126,250	27,750	154,000

(Source: Reclamation 1989)

Notes:

Water Supply Level 2: "Current average annual water deliveries"

Water Supply Level 4: Optimum management

The Pacific Flyway is unlike other North American flyways in that most wintering waterfowl are concentrated in the relatively small area of the Central Valley. Wildlife habitat includes refuges, riparian vegetation, and uplands. An ideal habitat fulfills all a species' requirements, providing a balance of the food, shelter, water, and sanctuary which it needs to survive. The lack of any essential component can decrease a species' survival or decrease its reproductive success.

Water is needed by the refuges to flood ponds, create marshes, produce waterfowl food plants, and maintain water in ponds and marshes. The majority of water must be delivered in the fall and winter months to provide initial water and circulation water for wintering habitat. The balance is applied during the growing season to produce waterfowl food plants. If adequate water is not available, waterfowl food plants cannot be grown and waterfowl are crowded onto smaller areas. Stressful conditions lead to major outbreaks of waterfowl diseases such as avian botulism and flow cholera.

1.2 Need for Proposal and Project Objectives

The project objectives of this Proposed Action for CWD are to permanently relinquish a portion of CWD's Contract Total in exchange for compensation to put towards debt repayment and day-to-day district expenses.

For Reclamation, the need for this proposal is to comply with Section 3406(d)(2) of the CVPIA and provide IL4 refuge water supply, required for optimum habitat management, to certain refuges within the Sacramento Valley.

1.3 Document Structure

To consider environmental impacts of the Proposed Action pursuant to both NEPA and CEQA, Chapter 2 discusses the project alternatives, as well as the environmental setting within the project area. Chapter 3 includes the analysis of possible effects to resources using an initial study checklist adapted from the CEQA Guidelines, Appendix G. Discussion of potential impacts for the No Action Alternative and Proposed Action are addressed in more detail following each checklist section. The CEQA Checklist does not incorporate all resource areas required by NEPA; therefore, Chapter 4 includes NEPA-specific components.

Chapter 2 Alternatives

2.1 No Action Alternative

The No Action Alternative assumes the CWD would not relinquish 3,000 AF of its Contract Total, would receive no compensation from Reclamation, and would be required to retire its debt to the United States pursuant to its CVP Water Service Contract. CWD's debt obligations would be required to be recovered through rate increases or increased assessments. In this case, CVP water rates to CWD customers would not be competitive versus the costs of pumping groundwater. Increased rates for CVP water would result in a decline in surface water usage as CWD customers would shift to more affordable groundwater supplies. Declines in surface water use by CWD customers would increase CWD's debt obligations and expenses compared to revenues, causing CWD to dissolve. Based on existing reserves, increased surface water rates resulting from debt obligations could cause CWD to dissolve within the next few years. The CWD service area would no longer receive CVP water deliveries and the service area presently served by CWD would rely entirely on groundwater. CWD's Contract Total would revert back to Reclamation and be used for CVP purposes.

Under the No Action Alternative, Reclamation would not have the 3,000 AF of water from CWD available to meet IL4 requirements, and the refuges would not receive the 3,000 AF relinquished by CWD. Reclamation would need to find another source of IL4 supplies to meet the requirements mandated in the CVPIA.

2.2 Proposed Action/Proposed Project

The Proposed Action and Proposed Project (referred to herein as the Proposed Action) is the execution of an Amendment to the Long-Term Renewal Contract Between the United States and Corning Water District Providing Project Water Service from the Sacramento River Division for the purpose of relinquishing a portion of CWD's Contract Total to Reclamation. A portion of the revenue from the sale would be used to eliminate CWD's interest bearing O&M deficit with Reclamation.

Article 3(a) of the Existing Contract provides that Reclamation shall make available for delivery to CWD 23,000 AF of CVP water. As a result of the execution of the contract amendment, the Contract Total would be reduced by 3,000 AF from 23,000 AF to 20,000 AF.

As part of the Proposed Action, Reclamation would pay CWD for the 3,000 AF of relinquished water and use the relinquished water to meet annual IL4 water supply requirements at CVPIA refuges located within the Sacramento Valley identified in Figure 2-1. Except as modified in the Amendatory Contract, the Existing Contract shall be and remain in full force and effect as originally written and executed.

2.2.1 Corning Water District

CWD was established in June 1954 with 17,000 acres within its boundaries and 11,075 acres considered irrigable. When CWD was established, most of the lands were farmed using groundwater; however, the area began to experience a decline in groundwater levels. Once CWD started providing surface water deliveries, groundwater levels improved. The primary irrigation method was flood irrigation but substantial improvements to on-farm water delivery systems have occurred since the formation of CWD. Where feasible, water delivery for permanent crops has been converted from flood irrigation to low volume drip or sprinkler irrigation. Approximately 5,882 district acres have been converted to drip or sprinkler irrigation.

Landowners have continued to convert CWD land to permanent crops. Crops within CWD include olives (2,979 acres), almonds (1,519 acres), pasture (795 acres), walnuts (649 acres), prunes (549 acres), rice (230 acres), and alfalfa (110 acres) (CWD 2009).

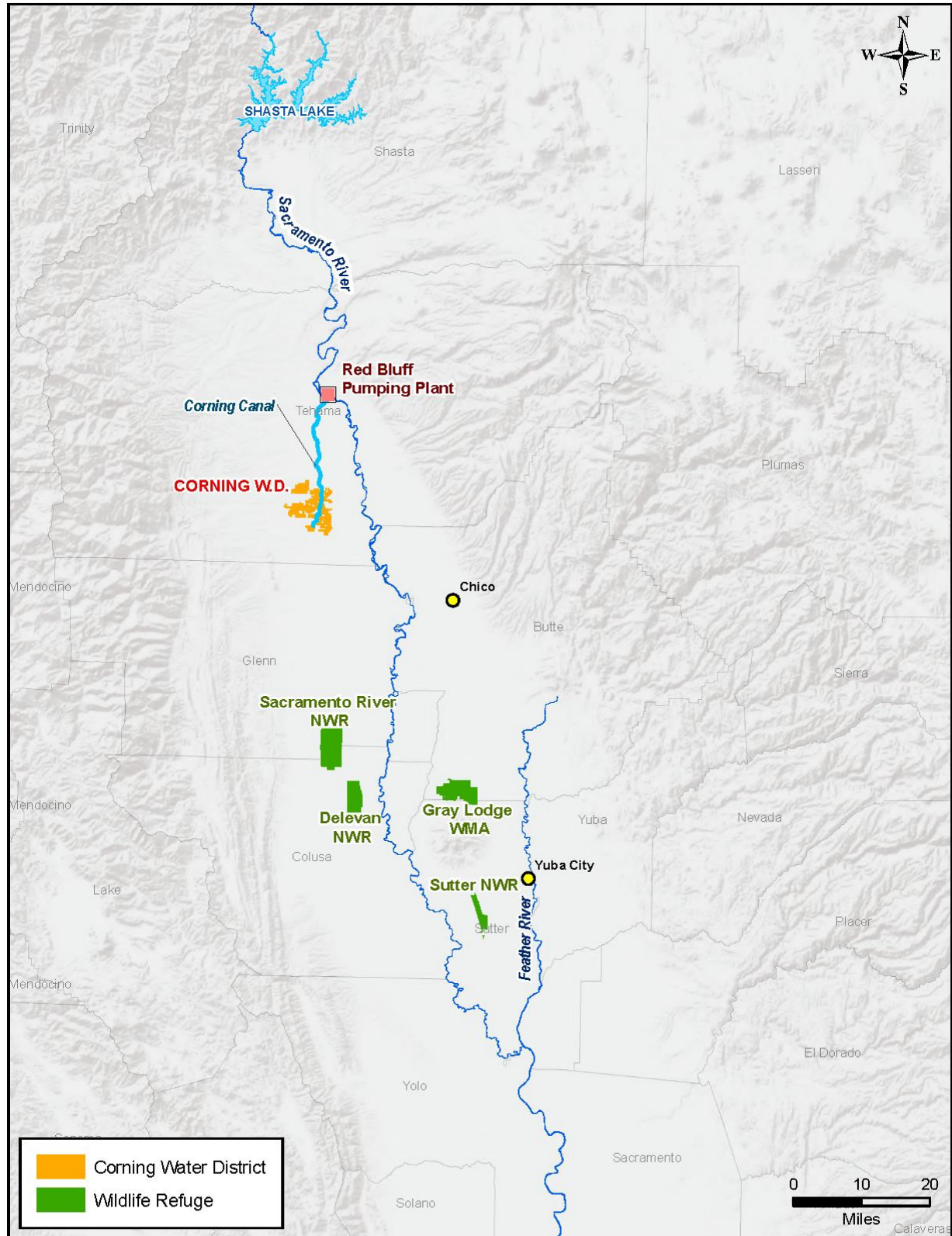
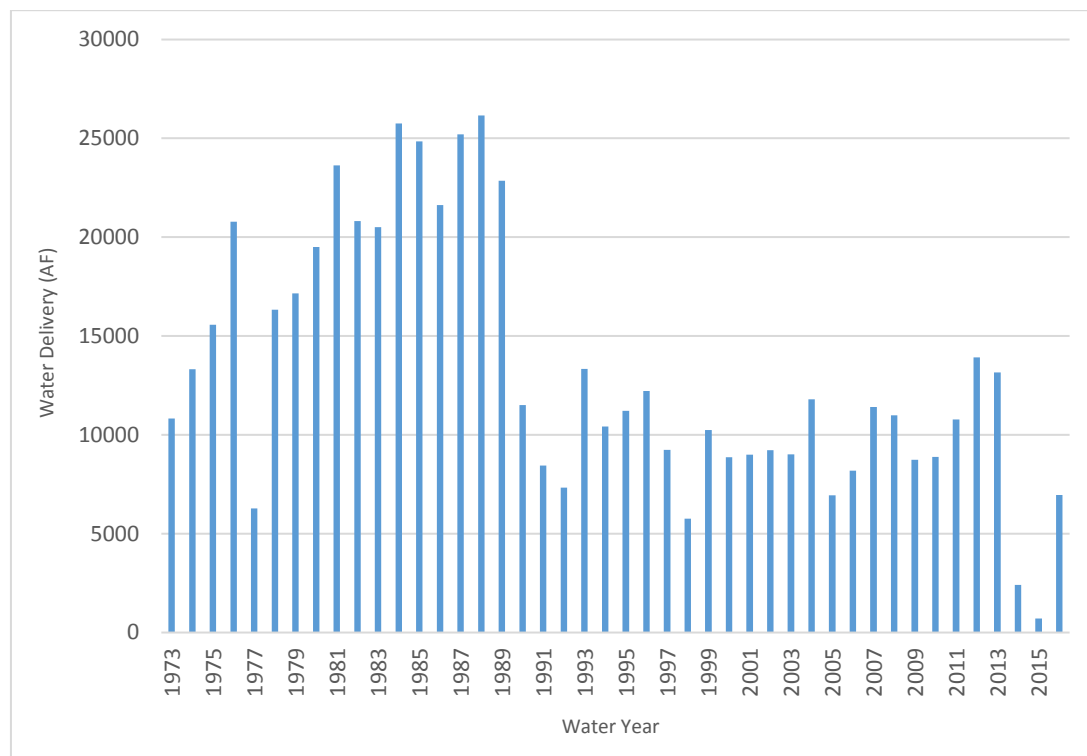


Figure 2-1. Project Study Area

Figure 2-2 presents CWD's CVP water deliveries from Water Years (WYs) 1973 through 2016. Currently CWD is not using its full 23,000 AF allocation, but has had an average annual delivery of 9,260 AF since 1990. CWD has not utilized more than 20,000 AF since 1989.



Source: Reclamation 2017

Figure 2-2. CWD Historical CVP Deliveries

Relinquishing 3,000 AF of water would decrease CWD's Contract Total from 23,000 AF to 20,000 AF. Reclamation allocates water each year to CVP contractors as a percent of their Contract Total (based on hydrologic conditions). In years with a 50 percent CVP allocation or greater, CWD would be able to meet demands for surface water with the available CVP supplies based on historical water use as shown in Figure 2-2. CWD would not be able to fully meet demands for surface water in years with less than a 50 percent allocation. In these years, CWD would explore options to purchase water, or water users would need to pump additional groundwater or leave fields fallow temporarily. In years of CVP allocations of 50 percent or less, water users growing permanent crops are more likely to address the surface water deficit by shifting to groundwater than idling land. However, even in years of CVP allocation of 50 percent or less, the maximum increased demand on groundwater related to the Project would be 1,500 AF or less. This amount of groundwater pumping could be further limited by CWD's acquisition of surface water supplies in the transfer market. In years with a zero allocation from the

CVP, no CVP water would be made available to CWD under the Proposed Action, existing conditions, or the No Action Alternative.

2.2.2 Wildlife Refuges

The CVPIA necessitated the establishment of the Refuge Water Supply Program in order to account for and provide CVP water to NWRs, State Wildlife Areas and the Grasslands Resources Conservation District in the Central Valley of California. This program provides, through water supply and conveyance agreements, reliable water supplies to refuges that previously relied on surplus water, groundwater, or junior water rights to meet their needs. The 1989 Report on Refuge Water Supply Investigations, codified in the CVPIA, defines two Levels of water supply: Level 2 supplies that are required to meet minimum requirements on the refuges, and IL4 supplies are the incremental supplies for optimum habitat management. Refuges use water to maintain wetland habitat for waterfowl nesting and feeding habitat by flooding up the wetlands in the fall and draining in the spring season. The Proposed Action would increase Reclamation's ability to meet IL4 demands at the Sacramento NWR, Delevan NWR, Sutter NWR, and Gray Lodge WA.

2.2.2.1 Sacramento NWR

Established in 1937 with funds from the Emergency Conservation Fund Act of 1933, the Sacramento NWR was created to provide habitat and manage for endangered, threatened, or sensitive species, and provide refuge and breeding habitat for migratory birds and other wildlife. An approximately 70,000-acre complex of wetland, grassland, and riparian habitat, Sacramento NWR provides habitat for a wide range of waterfowl, shorebirds, raptors, water birds, songbirds, reptiles, and mammals (USFWS 2016a).

2.2.2.2 Delevan NWR

Using funds from the Migratory Bird Hunting and Conservation Stamp Act (currently known as the Federal Duck Stamp), Delevan NWR was established in 1962 with the primary goal of providing feeding and nesting areas for migratory birds. Other major objectives for the establishment of the refuge include providing habitat and manage for endangered, threatened, or sensitive species of concern, preserving a natural diversity and abundance of flora and fauna, and providing visitor service activities such as hunting and wildlife observation.

Delevan NWR consists of 5,877 acres of wetlands, with some riparian and grassland habitat. The refuge supports one of the largest known populations of the federally-listed endangered plant species, palmate-bracted birds-beak, as well as supporting substantial breeding colonies of tricolored blackbird. At its peak, the refuge supports approximately 415,000 ducks and over 150,000 geese, with the refuge acting as an important wintering ground for Tule Greater White-fronted Geese (USFWS 2016b).

2.2.2.3 Sutter NWR

In 1945, Sutter NWR was established using funds from the Migratory Bird Hunting and Conservation Stamp Act and the Lea Act. The refuge was created to provide nesting and feeding areas for migratory birds. Consisting of primarily wetlands with a few grasslands and riparian habitat, the 2,591-acre refuge supports wintering populations of more than 200,000 ducks and 100,000 geese. The refuge supplies mixed riparian forest habitat which is essential for migrating and breeding passerine birds, as well as supports a large heron/egret rookery. Sutter NWR offers habitat for numerous Federal and State endangered and threatened species, including the giant garter snake, Chinook salmon, yellow-billed cuckoo, and Swainson's hawk (USFWS 2016c).

2.2.2.4 Gray Lodge WMA

Gray Lodge WMA was established as a wildlife area by the California Fish and Game Commission in 1953. Gray Lodge acts as a provision of seasonally flooded wetlands for migratory birds. The 9,100-acre area is composed of ponds, grassy fields, and riparian habitats, providing food, water and shelter for more than 300 species of mammals, and resident and migrant bird species. The remaining 600 acres of riparian woodlands include cottonwood, willow, blackberry, and wild grape. These areas provide refuge for aquatic and terrestrial species, including the garter snake, great blue heron, ringtail, and river otter (California Department of Fish and Wildlife [CDFW] 2017).

2.3 Environmental Setting

The environmental setting in which implementation of the No Action Alternative or Proposed Action would occur is summarized below for resources that could be affected. Additional details regarding relevant existing environmental conditions are provided in Chapter 3, within the analysis of potential impacts.

2.3.1 Aesthetics

The Central Valley of California is primarily agricultural in nature, with Interstate 5 running from north to south through the valley floor. Views in the region from most major roadways and scenic routes are of agricultural fields or urban landscapes. The mix of orchard and row crop types, fallow fields, rice, and other irrigated crops and dry fields create the visual character for most of the project area. Within CWD, the main urban center is the City of Corning. Corning breaks up the farmland that dominates the views in the area, creating some major nighttime light sources near the city center.

2.3.2 Air Quality

Air quality in California is regulated by the U.S. Environmental Protection Agency (USEPA), the California Air Resources Board (CARB), and locally by Air Pollution Control Districts (APCDs) or Air Quality Management Districts. The Tehama County APCD regulates air quality within CWD.

In the Sacramento Valley Air Basin, ozone (O₃), inhalable particulate matter (PM₁₀), and fine particulate matter (PM_{2.5}) are pollutants of concern because ambient concentrations of these pollutants exceed the California Ambient Air Quality Standards (CAAQS). Additionally, ambient O₃ and PM_{2.5} concentrations exceed the National Ambient Air Quality Standards (NAAQS), while PM₁₀ and carbon monoxide (CO) concentrations recently attained the NAAQS and are designated “Maintenance”. Table 2-1 summarizes the attainment status for Tehama County.

The Sacramento Valley Air Basin is bounded by the North Coast Ranges on the west and the Northern Sierra Nevada Mountains on the east, forming a bowl-shaped valley. The Sacramento Valley has a Mediterranean climate, which is characterized by hot dry summers and mild rainy winters.

Most of CWD service area supports agricultural land uses. Crop cycles, including land preparation and harvest, contribute to pollutant emissions, primarily particulate matter. Groundwater pumping with diesel and natural gas-fueled engines also emits air pollutants through exhaust. The primary pollutants emitted by diesel pumps are nitrogen oxides (NO_x), volatile organic compounds (VOC), CO, PM₁₀, and PM_{2.5}; NO_x and VOCs are precursors to O₃ formation.

Table 2-1. State and Federal Attainment Status

County	O ₃ CAAQS	PM _{2.5} CAAQS	PM ₁₀ CAAQS	O ₃ NAAQS ¹	PM _{2.5} NAAQS	PM ₁₀ NAAQS	CO NAAQS
Tehama	N	U	N	A	A	A	A

Source: 17 California Code of Regulations §60200-60210; 40 CFR 81; CARB 2015; USEPA 2016

Notes:

¹ 8-hour O₃ NAAQS was modified in October 2015, but area designations are still pending; the area designations in the table are for the 2008 standard. States have one year after promulgation of a new NAAQS to submit to the USEPA a list of all areas in the state that should be designated as nonattainment. The USEPA subsequently has two years from the date of the standard revision to promulgate the new area designations (42 USC 7407(d)).

Key:

A = attainment (background air quality in the region is less than [has attained] the ambient air quality standards)

N = nonattainment (background air quality exceeds the ambient air quality standards)

U = unclassified/attainment (area does not have enough monitors to determine the background concentrations; treated the same as attainment)

2.3.3 Biological Resources

The project area includes the Sacramento River watershed. Natural communities associated with the Sacramento River include valley/foothill

riparian and natural seasonal wetland. Valley/foothill riparian natural community generally occurs along river and stream corridors on the east side of the Sacramento Valley. Trees typically associated with the valley/foothill riparian natural community include willows, Fremont cottonwood (*Populus fremontii*), valley oak (*Quercus lobata*), and western sycamore (*Platanus racemosa*). Many species of birds, mammals, reptiles, and amphibians depend on riparian habitats, such as woodpeckers, warblers, flycatchers, owls, and raptors. Other wildlife species that use riparian habitats include western fence lizard (*Sceloporus occidentalis*), Pacific tree frog (*Pseudacris regilla*), western toad (*Anaxyrus boreas*), bullfrog (*Rana catesbeiana*), western skink (*Eumeces skiltonianus*), western whiptail (*Cnemidophorus tigris*), southern alligator lizard (*Elgaria multicarinata*), racer (*Coluber constrictor*), gopher snake (*Pituophis catenifer*), king snake (*Lampropeltis* sp.), garter snake (*Thamnophis* sp.), northern Pacific rattlesnake (*Crotalus oreganus oreganus*), opossum (*Didelphis virginiana*), black-tailed jackrabbit (*Lepus californicus*), western gray squirrel (*Sciurus griseus*), ringtail (*Bassariscus astutus*), river otter (*Lontra canadensis*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), beaver (*Castor canadensis*), mule deer (*Odocoileus hemionus*), and a number of bat species. Wetland natural communities support many species of waterfowl, such as mallard (*Anas platyrhynchos*), northern pintail (*Anas acuta*), American widgeon (*Anas americana*), and Canada goose (*Branta canadensis*), and a variety of wading birds and shorebirds.

Special-status wildlife species with potential to occur in the project area are listed in Appendix A. In addition to these special-status species, migratory birds are protected under the Migratory Bird Treaty Act. Special-status plant species with potential to occur are listed in Appendix B. Based on the analysis presented in the appendix, no special-status plants would be affected by the project.

Impacts on terrestrial species from the project are not anticipated, as surface water deliveries within the CWD service area would be replaced with groundwater during years with less than 50 percent CVP allocation. Furthermore, there would likely be benefits to terrestrial species from additional water supply (3,000 AF) being delivered to the Federal and State wildlife refuges. However, the project could affect storage in Shasta Reservoir and flows in the Sacramento River. Therefore, the discussion of impacts on special status species is focused on the aquatic species with potential to occur in the Shasta Reservoir and Sacramento River within the project area, as described below. Table 2-2 summarizes fish species of concern in the project area.

Table 2-2. Fish Species of Management Concern in the Project Area

Status	Species	Primary Management Consideration
Special-Status	Chinook Salmon (<i>Oncorhynchus tshawytscha</i>) – Winter run	FE, SE
	Chinook Salmon – Spring-run	FT, ST
	Central Valley Steelhead (<i>Oncorhynchus mykiss</i>)	FT, Recreation
	Central California Coast Steelhead	FT
	Green sturgeon (<i>Acipenser medirostris</i>)	FT
	Hardhead (<i>Mylopharodon conocephalus</i>)	SSC
	Sacramento splittail (<i>Pogonichthys macrolepidotus</i>)	SSC
	Chinook Salmon – Fall/late-fall run	SSC, Commercial, Recreation
Other	Striped bass (<i>Morone saxatilis</i>)	Recreation
	American shad (<i>Alosa sapidissima</i>)	Recreation
	White sturgeon (<i>Acipenser transmontanus</i>)	Commercial, Recreation

Source: USFWS 2015; CDFW 2015a; CDFW 2015b

Key:

FE = Federal endangered

FT = Federal threatened

SE = State endangered

ST = State threatened

SSC = State Species of Special Concern

Recreation = non-listed commercially important species of management concern.

Commercial = non-listed recreationally important species of management concern.

The California drought that started in 2012 has resulted in limited water storage and a corresponding reduction of the cold water pool in Shasta Reservoir. The drought has also resulted in elevated temperatures in the upper reaches of the Sacramento River, which contributed to low survival rates for wild juvenile winter-run Chinook salmon in 2014 and 2015 (California Department of Water Resources [DWR] and State Water Resources Control Board [SWRCB] 2015). The National Marine Fisheries Service (NMFS) has identified Sacramento River winter-run Chinook salmon as a “Species in the Spotlight” because it is one of the eight most at-risk species in the country (NMFS 2016). NMFS developed a five-year action plan to identify priority actions to help the species, including:

- Temperature management at Shasta Reservoir;
- Restoration of (and access to) Battle Creek habitat;
- Salmon reintroduction in the McCloud River;
- Improvements to fish habitat in the Yolo Bypass; and
- Management of Delta conditions in winter and early spring to improve juvenile survival.

The Sacramento River Temperature Management Plan, which is required annually, guides the release of water from Shasta Reservoir to maintain healthy fisheries during summer and fall when temperatures rise. In 2015 and 2016, Reclamation, in coordination with NMFS, USFWS, DWR, CDFW, and the SWRCB, modified the previous Shasta Temperature Management Plans to better utilize the current cold-water resource and manage the seasonal temperature risks to winter-run Chinook salmon. These plan updates incorporated lessons learned from drought years in 2014 and 2015 to improve temperatures for winter-run Chinook salmon. Reclamation is currently implementing the 2017 Temperature Management Plan (Reclamation 2017).

2.3.4 Geology and Soils

The Central Valley consists of mostly flat terrain associated with low gradient river valleys. There are some earthquake faults in the region, but earthquakes are generally associated with coastal California, west of the Central Valley. Strong seismic shaking is not common in the Central Valley, and liquefaction and other seismic-related ground failure are not major hazards in the region. Landslides and other hazards associated with unstable soil are uncommon due to the flat terrain. Dust from agricultural activities, such as plowing, grading, and discing, is a common occurrence in the Central Valley agricultural area, including the project area, and is a normal part of the agriculture practice in the region.

CWD is within the Tehama Formation, one of six principle geologic units within The Great Valley Province. The Tehama Formation consists of fine grained sand, silts, and clays originating from the coastal mountains. Soil erodibility is dependent on composition as sands and clays are generally less erodible as compared to silts (Resource Conservation District of Tehama County 2006).

2.3.5 Greenhouse Gas Emissions

The greenhouse gas (GHG) analysis focuses on the following three pollutants: carbon dioxide, methane, and nitrous oxide. The other two pollutant groups commonly evaluated in various GHG reporting protocols, hydrofluorocarbons and perfluorocarbons, are not expected to be emitted in large quantities because the Proposed Action does not involve refrigeration or manufacturing and they are not discussed further in this section.

Agricultural emissions represented approximately 8 percent of California's GHG emissions in 2014 (CARB 2016). Agricultural emissions represent the sum of emissions from agricultural energy use (from pumping and farm equipment), agricultural residue burning, agricultural soil management (the practice of using fertilizers, soil amendments, and irrigation to optimize crop

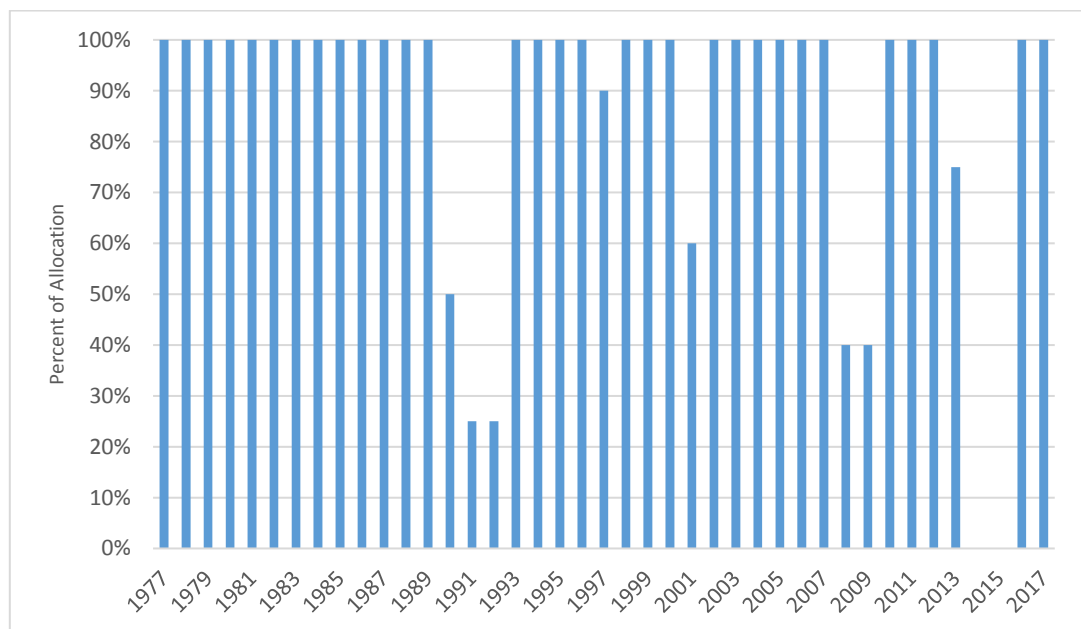
yield), enteric fermentation (fermentation that takes place in the digestive system of animals), histosols (soils that are composed mainly of organic matter) cultivation, manure management, and rice cultivation.

2.3.6 Hydrology and Water Quality

2.3.6.1 Surface Water

The Sacramento River flows south for 447 miles through the northern Central Valley and enters the Sacramento-San Joaquin Delta (Delta) from the north. The major tributaries to the Sacramento River are the Feather, Yuba, and American rivers. Reclamation owns and operates the CVP, which has major reservoirs on the Sacramento River (Shasta Reservoir) and American River (Folsom Reservoir). DWR owns and operates the State Water Project (SWP), which has a major reservoir on the Feather River (Oroville Reservoir).

Reclamation allocates water to CVP contractors based on hydrologic conditions and water availability. Partial allocation of CVP water supply has been uncommon for CWD. Figure 2-3 summarizes CWD's CVP water allocations for the past 40 years, indicating only six years (1991, 1992, 2008, 2009, 2014, and 2015) when CWD received a CVP allocation less than 50 percent. These reduced allocation years are largely due to the 1987-91 and 2012-16 drought periods within California. CWD was allocated no water in two years (2014 and 2015).



Source: Corning Water District 2017a

Figure 2-3. CWD CVP Water Allocation History

2.3.6.2 Surface Water Quality

While surface water quality in the Sacramento River system is generally good, several water bodies within the area of analysis have been identified as impaired by certain constituents of concern and appear on the most recent 303(d) list of impaired waterways under the Clean Water Act (SWRCB 2010). Table 2-3 summarizes the 303(d) listed impaired waterways within the area of analysis.

Table 2-3. 303(d) Listed Impaired Waterways in the Project Area

Water Body	Pollutant(s)
Shasta Lake	<i>Mercury</i>
Sacramento River (Keswick Dam to Cottonwood Creek)	<i>Unknown Toxicity</i>
Sacramento River (Cottonwood Creek to Red Bluff)	<i>Mercury, Unknown Toxicity</i>
Sacramento River (Red Bluff to Knights Landing)	<i>DDT, Dieldrin, Mercury, PCBs, Unknown Toxicity</i>

Source: SWRCB 2010

2.3.6.3 Groundwater

Sacramento Valley Groundwater Basin (Corning Sub-basin) Since the 1920s, DWR, Reclamation, and the United States Geological Survey have been measuring groundwater levels within Tehama County. Presently, DWR and Tehama County Flood Control and Water Conservation District work jointly to monitor groundwater levels across a system of approximately 160 monitoring wells covering the valley floor. Within Tehama County, groundwater quality has historically been high quality and relatively stable over time (Tehama County Flood Control and Water Conservation District 2012).

Due to extraction operations, infiltration and downward percolation from precipitation, surface water sources and irrigation, and subsurface inflows and outflows, groundwater levels fluctuate on an annual basis. In Tehama County, groundwater levels show a significant seasonal variation due to high irrigation use during the summer months. Appendix C includes information from DWR about longer-term changes in groundwater throughout the Sacramento Valley and groundwater monitoring well data within the Corning Sub-basin in the greater Sacramento Valley Groundwater Basin.

Long-term trends in static groundwater levels indicate the influence of drought. During the 1976-77, 1987-91, and 2012-2016 drought periods, groundwater levels were lowest since the 1920s. DWR analysis of groundwater levels from spring 2004 through spring 2016 showed an average decline in groundwater levels of 9.5 feet in Tehama County (up to 39.5 feet in certain areas) (see Plate 1S-A and 1S-B in Appendix C). These decreases in groundwater levels have caused wells to go dry, particularly during the driest years of 2014 and 2015. Data collected by University of California, Davis, reported 34 wells as dry within Tehama County.

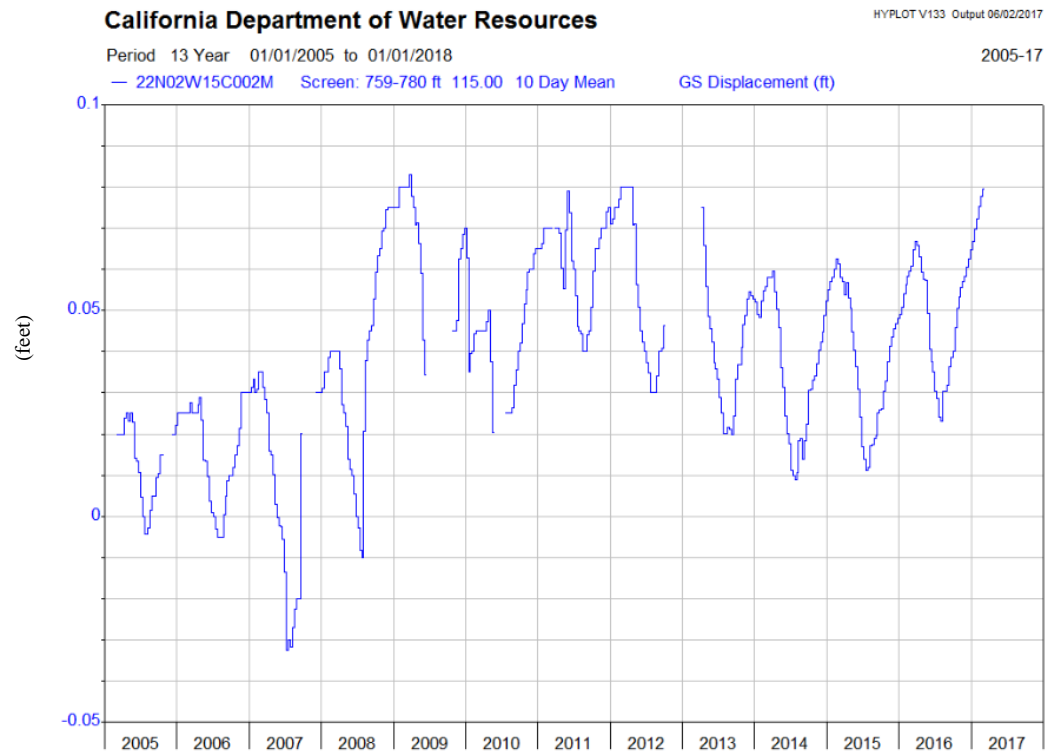
Persistent dry weather conditions since 2006 have been partially responsible for these steep declining trends. WY 2011 was the only year since 2006 classified as a wet year, and wetter conditions in early 2017 did not persist long enough to make substantial changes to groundwater levels. Currently, groundwater levels have begun to recover with an increase of 3.8 feet (see Plate 1 in Appendix C).

Analyses conducted in 2005 by the DWR Northern Region Land and Water Use Section indicated that about 69 percent (257,000 AF) of Tehama County's total annual water demand is from groundwater. Groundwater extraction occurs throughout the valley floor of Tehama County and groundwater use is intermingled with surface water supplies from water districts. CWD obtains its water supply from the CVP Corning Canal (Tehama County Flood Control and Water Conservation District 2012).

Surveys conducted in 1993, 1994, and 1995 estimated annual groundwater extraction in the Corning Sub-basin to be 152,000 AF for agricultural use and 6,600 AF for municipal and industrial use (DWR 2006). Based on estimates of specific yield for the Sacramento Valley, the storage capacity of Corning sub-basin is approximately 2,572,950 AF to a depth of 200 feet. The estimated specific yield for Corning Sub-basin is 6.7 percent (DWR 2006).

Land Subsidence. Corning Sub-basin is within a California Statewide Groundwater Elevation Monitoring (CASGEM) medium priority land subsidence basin (DWR 2017a). An active extensometer, approximately 12 miles southeast of CWD, observed land subsidence at 0.05 feet from 2005 to 2016. Subsidence within the area has stayed relatively consistent throughout the past decade, except for a sharp increase in 2008 to 2009 shown in Figure 2-4 (DWR 2017b). Subsidence in this region is generally related to groundwater pumping and subsequent consolidation of loose aquifer sediments.

Groundwater Quality. Groundwater quality in the Corning Sub-basin is generally good and sufficient for municipal, agricultural, domestic, and industrial uses. However, there are some localized groundwater quality issues in the basin with high calcium (DWR 2006).



Source: DWR: Groundwater Information Center 2017a

Figure 2-4. Observed Land Subsidence within Corning Sub-Basin

Chapter 3 Environmental Impacts

The following sections use the checklist from Appendix G of the CEQA Guidelines as a template to assess potential environmental effects under both CEQA and NEPA. The discussion for each resource focuses on potential impacts; resources that would not be affected are briefly discussed. Discussions for the No Action Alternative and Proposed Action are combined when the effects are the same.

I. Aesthetics

– Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings, or other locally recognized desirable aesthetic natural feature within a city-designated scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a, b, d) No Impact. The No Action Alternative and Proposed Action would not affect any scenic vista, damage scenic resources, or create a new light source. The Proposed Action would not affect scenic vistas relative to rivers or reservoirs because there would be no changes beyond historical or seasonal fluctuations in flows or water levels. The Proposed Action does not include any construction or new structures that could damage scenic resources (i.e., trees, rock outcroppings, historic buildings, etc.) or produce notable sources of light or glare.

c) Less than Significant. The No Action Alternative has the potential to increase cropland idling as CVP surface water supplies become more expensive; however, most water users would convert to less expensive groundwater pumping. Under the Proposed Action, CVP surface water deliveries to CWD would be adequate to meet demands for surface water in years with at least a 50 percent allocation. In years with less than a 50 percent allocation, some users that currently use surface water would not receive surface water. Water users could increase groundwater pumping and crop idling in response to decreased surface water deliveries, but are more likely to shift to groundwater pumping because most land in CWD is planted with permanent crops. Years with partial CVP allocations historically have been rare, occurring only six times within the past 40 years (see Section 2.4.6.1).

Fallowed fields are typical features of agricultural landscapes as part of normal cultivation practices. Although fallowed fields are a possibility with both the No Action Alternative and Proposed Action, conversion to groundwater pumping is much more likely. This impact would be less than significant as there would be no substantial changes or degradation to the visual character or quality of the sites and their surroundings.

II. Agriculture and Forest Resources:

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a, b) No Impact. The No Action Alternative has the potential for cropland idling to occur as CVP deliveries become more expensive, but the more likely scenario would be increased groundwater pumping. The Proposed Action would not affect the long-term agricultural uses of the land. If growers do not plant because of decreased surface water supplies, the effects would be similar to fallowing a field under a normal crop rotation and would not convert any land to non-agricultural use. Cropland idling would not affect Williamson Act contracts or the long-term designations of Prime Farmland or other Farmland Mapping and Monitoring Program classifications.

c, d) No Impact. The No Action Alternative and Proposed Action would have no impact to existing forest lands or timber, as the Proposed Action does not pertain to such lands or resources.

e) No Impact. The No Action Alternative and the Proposed Action could result in increased cropland idling. Temporary cropland idling would not convert any agricultural land to non-agricultural use. The No Action Alternative and the

Proposed Action would not affect existing forest land and would therefore not convert any forest land to non-forest use.

III. Air Quality

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

a) Less than Significant Impact

No Action Alternative: Under the No Action Alternative, growers could pump groundwater to supplement surface water supplies or idle fields, if CVP supplies become economically uncompetitive. Cropland idling actions could increase fugitive dust emissions, but these increases are offset by the reduction in emissions from field preparation equipment and dust emissions. Groundwater pumping could increase emissions, but most wells (about 90 percent) have electric engines and new wells have been electric-powered (CWD 2017b). Although there could be emission increases under the No Action Alternative,

the emissions would be consistent with existing trends in air quality; therefore, emissions could not impede implementation of any air quality plan.

Proposed Action: The Tehama County Air Pollution Control District (Tehama County APCD) and air districts associated with the counties of Shasta, Glenn, Butte, Colusa, Sutter, and Yuba comprise the Northern Sacramento Valley Planning Area (NSVPA). The NSVPA has jointly committed to preparing and adopting an Air Quality Attainment Plan (AQAP) to achieve and maintain healthful air in these counties. As part of this plan, several control measures were adopted by the various counties to attain and maintain air quality standards. These control measures are then promulgated in the rules and regulations at each air district; therefore, if a Proposed Action is consistent with the air districts' and State regulations, then the project is in compliance with the AQAP.

The Proposed Action would not have direct impacts to air quality, but may have indirect effects. During years with full CVP allocations, the Proposed Action would not have an effect to surface water use within CWD's boundaries. During partial allocation years, however, the reduction in CWD's Contract Total would reduce the amount that CWD members receive. These years are rare, with only six instances of a partial allocation in the past 40 years. As a result, growers may shift to groundwater wells as an alternate source. Groundwater wells could use a combination of electric, diesel, and propane driven groundwater pumps, but most wells in CWD are electric-powered. All diesel-fueled engines are subject to CARB's Airborne Toxic Control Measure (ATCM) for Stationary Ignition Engines (17 California Code of Regulations 93115). The ATCM does not expressly prohibit the use of diesel engines for agricultural purposes; therefore, diesel engines may be used for groundwater pumping as long as they are replaced when required by the compliance schedule.

All pumps potentially used by CWD water users would operate in compliance with all rules and regulations at the federal, state, and local levels; therefore, any activities associated with the water reallocation would be consistent with the AQAPs and the ATCM. As such, impacts would be less than significant.

b) Less than Significant Impact

No Action Alternative: Under the No Action Alternative, growers could leave some fields idle in response to decreased CVP supplies, which could leave bare soils susceptible to fugitive dust emissions from windblown dusts. Growers would more likely pump groundwater to supplement for irrigation, which releases emissions if diesel pumps are used. Growers within CWD have been increasingly shifting to groundwater use during the recent dry years, and the new wells are generally electric. Most new groundwater pumping in the No Action Alternative would likely be electric, which would limit the air quality impacts.

Proposed Action: To assess whether a proposed project would violate any air quality standards or contribute substantially to an existing or projected air quality violation, Tehama County APCD developed significance thresholds for mass daily and/or annual emission rates of criteria pollutants, shown in Table 3-1.

Table 3-1. Thresholds of Significance for Criteria Pollutants of Concern

Pollutant	Significance Threshold
NOx	≤ 25 lbs/day
ROG	≤ 25 lbs/day
PM ₁₀	≤ 80 lbs/day

Source: Tehama County APCD 2015

Key:

lbs/day = pounds per day

NOx = Nitrogen Oxides

PM₁₀ = Inhalable Particulate Matter

ROG = Reactive Organic Gases

In addition to the CEQA significance thresholds, the federal general conformity regulations apply to a proposed federal action in a nonattainment or maintenance area if the total of direct and indirect emissions of the relevant criteria pollutants and precursor pollutants caused by the proposed action equal or exceed certain de minimis amounts (40 CFR 93.153). Conformity means that such federal actions must be consistent with a state implementation plan's (SIP's) purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving expeditious attainment of those standards. CWD is in an area that is in attainment for all pollutants; therefore, a general conformity evaluation is not applicable.

In the Proposed Action, under full CVP allocations, CWD would still be able to deliver adequate surface water to meet demands. In years with no allocation, the Proposed Action would be no different than existing conditions (or the No Action Alternative). In years with a partial CVP allocation, CWD would receive less water from the CVP because the Contract Total would be less. (In other words, a 50 percent allocation of the existing Contract Total of 23,000 AF would make available for delivery to CWD 11,500 AF, but under the Proposed Action, only 10,000 AF would be made available.) These years have been rare historically, with only six years of partial allocation in the last 40 years.

During partial allocation years, most users would likely use groundwater as an alternate source for the decrease in surface water. CWD would also consider water transfers to supply additional water to meet demands, but the analysis of air quality emissions assumes that the decreased water supply would be made up with groundwater. Groundwater pumping could increase air emissions, but most wells (90 percent) within CWD are electric and have smaller emissions than diesel engines. Users could also choose to idle additional fields, which would reduce vehicle exhaust emissions but increase fugitive dust emissions.

This section analyzes impacts from groundwater pumping to estimate the maximum potential emissions that could occur under the Proposed Action.

CWD estimated 90 percent of groundwater pumps within the district have electric engines. Table 3-2 summarizes the unmitigated estimated emissions from utilizing diesel engines for 10 percent of groundwater pumping within CWD.

Table 3-2. Unmitigated Estimated Emissions from Groundwater Pumping

Pollutant	Emission Factor	Emissions		Threshold	
	(g/hp-hr)	(lbs/day)	(tpy)	(lbs/day)	Significant?
VOC	0.2	1	0.0	25	no
NOx	4.7	23	0.7	25	no
CO	2.6	12	0.4	N/A	N/A
SOx	0.93	4	0.1	N/A	N/A
PM ₁₀	0.15	1	0.0	80	No
PM _{2.5}	0.15	1	0.0	N/A	N/A

Source: CARB 2011

Notes:

Emission factors assume engines were:

-uncertified prior to publication of the rule

-200 horsepower (HP) engine size

-currently in compliance.

Key:

g/hp-hr = grams per horsepower per hour; lbs/day = pounds per day; N/A = not applicable; NOx = nitrogen oxides; PM₁₀ = inhalable particulate matter; PM_{2.5} = fine particulate matter; SOx = sulfur oxides; tpy = tons per year; VOC = volatile organic compound

As shown in Table 3-2, CWD would not exceed the daily thresholds for any pollutant when 10 percent of the decreased surface water supply in the Proposed Action is converted to groundwater pumping with diesel engines. Groundwater would be pumped only during years of less than 50 percent CVP allocation, which are uncommon within CWD. Because groundwater pumping would be rare and most pumping would use electric engines, the indirect effects to air emissions would be below the CEQA significance thresholds.

c) Less than Significant

No Action Alternative: As described previously, the No Action Alternative could increase emissions relative to existing emissions because users may shift to less expensive groundwater if CVP water rates increase. Because most of these air sources would be electric, the No Action Alternative would not result in a cumulative impact to air quality.

Proposed Action: Tehama County is located in a designated nonattainment area for the PM₁₀ and O₃ CAAQS. Nonattainment status represents a cumulatively significant impact within the area. O₃ is a secondary pollutant, meaning that it is formed in the atmosphere from reactions of precursor compounds under certain conditions. Primary precursor compounds that lead to O₃ formation include VOCs and NO_x; therefore, the significance thresholds established by the air districts for VOC and NO_x are intended to maintain or attain the O₃ CAAQS and NAAQS. Because no single project determines the nonattainment status of a region, individual projects would only contribute to the area's designation on a cumulative basis.

Tehama County APCD developed significance thresholds to determine if a project's individual emissions could result in a cumulatively considerable adverse contribution to the existing air quality conditions. Therefore, if an alternative would produce air quality impacts that are individually significant, then the alternative would also be cumulatively considerable. Conversely, if the alternative's emissions would be less than the significance thresholds, then the alternative would not be expected to result in a cumulatively considerable contribution to the existing significant cumulative impact (Tehama County APCD 2015).

The Proposed Action would not exceed significance criteria for any pollutants, when using 10 percent diesel engine pumps. No mitigation measures are required and air quality impacts would not be expected to result in cumulatively considerable contributions to the existing significant cumulative impact.

d) Less than Significant

No Action Alternative and Proposed Action: The proposed engines would be on existing agricultural land. The engines would not be located within one-quarter mile of a sensitive receptor.

e) Less than Significant

No Action Alternative and Proposed Action: The use of diesel engines for groundwater pumping may generate near-field odors that are considered a nuisance. Diesel equipment emits a distinctive odor that may be considered offensive to certain individuals. Tehama County APCD has rules that prohibit emissions that could cause nuisance or annoyance to a considerable number of people; however, this provision does not apply to odors emanating from agricultural operations (Tehama County APCD 1971). In addition, only 10 percent of the groundwater would be pumped using diesel engines; the rest of the groundwater supply would be pumped using electric engines. Therefore, the proposed operation of any diesel-fueled engines would have a less than significant impact associated with the creation of objectionable odors affecting a substantial number of people.

IV. Biological Resources

– Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in City or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

a) Less than Significant Impact

No Action Alternative: Continued dry hydrologic conditions could affect special status fish species. Reclamation and DWR currently operate the CVP and SWP based on the Biological Opinions on the Continued Long-term Operations of the CVP/SWP and SWRCB Decision-1641 (D-1641). In compliance with the SWRCB Water Rights Orders 90-5 and 91-1 and in coordination with the Sacramento River Temperature Task Group, Reclamation annually develops a Temperature Management Plan for the Sacramento River, generally submitted to SWRCB mid-year. Reclamation is currently implementing the most recent Temperature Management Plan for 2017 (Reclamation 2017). The Temperature Management Plan establishes monthly average releases from Keswick Dam, monitoring, and compliance points for temperatures in the Sacramento River. This is consistent with the objective of the SWRCB Orders to provide suitable habitat temperatures for winter-run Chinook salmon and other listed species in the Sacramento River. Reclamation and DWR would continue to coordinate closely with the SWRCB to balance the need to provide water supplies south of the Delta and protect water quality in the Delta.

Proposed Action:

Fishery Resources

Under the Proposed Action, relinquished water would likely be released from Shasta Reservoir in the fall. Reclamation would continue to comply with the SWRCB Water Rights Orders 90-5 and 91-1. The Orders establish in-stream temperature criteria to manage the cold water storage within Shasta Reservoir and make cold water releases from Shasta Reservoir to provide suitable habitat temperatures for winter-run Chinook salmon, spring-run Chinook salmon, California Central Valley steelhead, and the Southern Distinct Population Segment of North American green sturgeon in the Sacramento River between Keswick Dam and Bend Bridge, while retaining sufficient carryover storage to manage for the following year's winter-run Chinook salmon cohort. In addition, to the extent feasible, another objective is to manage for suitable temperatures and stabilize flows for naturally-spawning fall-run/late-fall-run Chinook salmon.

Under the Proposed Action, carryover storage in the Shasta Reservoir could decrease by a maximum of 3,000 AF because waters that CWD did not divert in previous water years would be diverted by Reclamation for wildlife purposes. This is a small amount compared to the total storage in Shasta Reservoir (typically 3 million AF). The small volume and the timing of release would avoid effects on cold water storage used for temperature management to support listed fish species.

Releases of 3,000 AF have the potential to influence Sacramento River flows in the quantity of about 25 cubic feet per second (cfs) for a period of roughly 60

days. This change in Sacramento River flows would not be substantial enough to affect special status fish species.

Adult migration by special status fish species, including Chinook salmon, steelhead, and green sturgeon, would not be affected by slightly altered flows. This magnitude of flow change would not reduce spawning habitat availability and incubation, increase dewatering or juvenile stranding, or reduce the suitability of habitat conditions during juvenile rearing of these species. In addition, Reclamation would continue to comply with the SWRCB Orders under a Temperature Management Plan to meet temperature requirements in the Sacramento River.

Because of the timing and the small magnitude of the change in flow in the Sacramento River, temperatures would be maintained to protect winter-run Chinook salmon and other listed species. The Proposed Action would not affect special status aquatic species in the Sacramento River. Reclamation is consulting frequently with USFWS and NMFS on CVP and SWP operations relative to special status fish species.

Special status fish species in the Delta would not be affected by the Proposed Action because flows would not change from the No Action Alternative.

Groundwater Pumping

Water users could pump groundwater under the Proposed Action during less than 50 percent CVP allocation years, which are rare events, occurring six times within the last 40 years. Any reduction in groundwater levels would be small and infrequent. Therefore, effects on surface water flows in rivers and creeks are not anticipated. There would be no effects on special status fish species.

Terrestrial Resources

Adverse impacts on terrestrial species from the Proposed Action are not anticipated, as surface water within the CWD service area would be replaced with groundwater during years with partial allocations. Furthermore, there would likely be benefits to terrestrial species in those years from additional water supply (3,000 AF) delivered to the wildlife refuges.

b, c) Less than Significant Impact

No Action Alternative: Wetlands and riparian communities in the project area have benefited from increased precipitation during the 2016/2017 rainy season as compared to previous drought conditions. However, it is uncertain if these conditions would continue.

Proposed Action: Under the Proposed Action, Reclamation would likely deliver the reallocated relinquished water to wildlife refuges in the fall. Water deliveries to wildlife refuges would benefit fish and wildlife, and adverse effects to the cold water pool in Shasta Reservoir are not anticipated because the water would likely be released in the fall. The change in the timing and quantity of

flows in the Sacramento River associated with the Project would be small and would not result in adverse effects.

Changes in flow in the Sacramento River would be about 25 cfs likely in the fall. Minimum flows in the Sacramento River downstream of the Red Bluff Diversion Dam were over 3,500 cfs in September and October in the past 3 years (DWR 2017c). This small potential change in flow under the Proposed Action would not result in noticeable effects to any riparian habitat near the rivers. There would not be any dewatering of root zones to such an extent to cause die back of riparian tree and shrub foliage, branches or entire plants. Therefore, impacts would be less than significant.

As discussed in (a), users may pump groundwater in partial allocation years, but these years would be rare and the maximum 1,500 AF increased groundwater demand attributable to the Project would be unlikely to result in streamflow depletion in rivers and creeks. Therefore, there would be no effects on natural communities.

d) Less Than Significant Impact

No Action Alternative: The lack of available water due to critically dry conditions could affect movement corridors or nursery sites for fish and wildlife. Wildlife that is dependent on water as a means of moving from one area to another may be unable to relocate due to the parched landscape. The 2016/2017 rainy season provided a substantial amount of water to surface waters in the project area as compared to previous drought conditions. However, it is uncertain if these conditions would continue.

Proposed Action: Water deliveries to wildlife refuges would benefit fish and wildlife. Adverse effects to the cold water pool in Shasta Reservoir are not anticipated because the water would likely be released in the fall. The change in flow in the Sacramento River would be small and would not be anticipated to result in adverse effects. Therefore, impacts would be less than significant.

e, f) Less Than Significant Impact

No Action Alternative: The Yuba-Sutter Regional Conservation Plan (YSRCP) is applicable to the project area. The YSRCP is both a state Natural Community Conservation Plan (NCCP) and a Federal Habitat Conservation Plan (HCP). Sutter County serves as the lead in coordination and preparation of the YSRCP working with the other permit applicants of Yuba County, City of Yuba City, City of Wheatland, and City of Live Oak. The Sutter NWR and a small portion of the Gray Lodge Wildlife Area are within the geographical area covered by the YSRCP (YSRCP 2017). Specifically, the YSRCP considers the habitat function and value of agricultural lands for covered species and establishes a process for protection of agricultural areas and important habitat.

Proposed Action: The Proposed Action would not have an adverse effect on the natural communities that are covered in the plans because it would provide increased refuge water supplies that would help the natural communities. Moving the water to the refuges could change Shasta Reservoir storage and Sacramento River flows, but the changes would be minimal, as described above for Impacts b and c. The small change in flows would not adversely affect riparian habitat or wetlands associated with the Sacramento River, Shasta Reservoir, or small streams or have adverse effects to special status species covered that use these habitats. The Proposed Action would not conflict with HCP and NCCP provisions and could help accomplish them. Impacts would be less than significant.

V. Cultural Resources

– Would the project

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in State CEQA §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to State CEQA §15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a-d) No Impact

No Action Alternative. The No Action Alternative would not include ground disturbing activities, land alteration, or construction that could disturb historical, archeological, or paleontologic resources or potential burial sites.

Proposed Action. There would be no ground disturbing activities, land alteration, or construction proposed that could disturb historical, archeological, or paleontologic resources associated with the Proposed Action. Thus, there would be no disturbance impacts to existing or potential burial sites, cemeteries, or human remains interred outside of formal cemeteries.

A Reclamation archaeologist was consulted to ensure the Proposed Action would have no adverse impact on any historic properties. It was determined that this type of activity does not have the potential to cause effects on historic properties, if present, and Reclamation has no further obligation under National Historic Preservation Act Section 106, pursuant to 36 CFR Part 800.3(a)(1).

VI. Geology and Soils

– Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a) No Impact. There are no new facilities or construction proposed for the No Action Alternative or Proposed Action, and no existing facilities fall within an Alquist-Priolo Earthquake Fault Zone, as shown in the Interim Revision of Special Publication 42 of the Division of Mines and Geology, Fault Rupture Zones in California (California Department of Conservation 2007). Therefore, the No Action Alternative and Proposed Action would not expose people or structures to impacts related to fault rupture, ground shaking, ground failure, liquefaction, or landslides.

b) Less than Significant

No Action Alternative: The increasing costs of CVP supplies could cause water users to increase the number of fields idled; however, most CWD customers would pump groundwater to replace or supplement more expensive CVP water supply. The soils within CWD consist of clay, gravelly loam, sandy loam, and clay loam (United States Department of Agriculture [USDA] Natural Resources Conservation Service [NRCS] 2016). These soils are susceptible to wind erosion but have a low to moderate wind erodibility index. The NRCS estimated that approximately 0.75 tons per acre of topsoil are eroded annually by wind from cultivated land and 0.65 tons per acre of topsoil are eroded annually from non-cultivated land (USDA 2015).

Agricultural practices determine the amount of wind erosion to a greater extent than climate in the Sacramento Valley. Farming operations such as plowing, leveling, planting, weeding, mowing, cutting, and baling all increase wind erosion by stirring up or exposing top soil. Fallow fields experience a net reduction in wind erosion by avoiding these practices. Fine soils such as sand and silts erode at a higher rate than the clays and loam found in the project area. Therefore, the soils in the project area have a relatively low to moderate risk of wind erosion when left in a dry and unplanted condition.

Proposed Action: Cropland idling within CWD due to partial CVP water allocation during drought years would be limited because most of CWD is planted with permanent crops. If it occurs, cropland idling would not be likely to substantially increase wind erosion of sediments. Users are likely to use pump groundwater in years when CVP supplies are not adequate to meet demands. The soils underlying these fields have a low to moderate risk of wind erosion; therefore, continued cultivation is not likely to substantially increase erosion.

c) Less than Significant. The project area is underlain by clay and loam and is located on flat terrain, as well as being located within the Tehama formation (DWR 2006). No new construction or ground disturbing actions are proposed for either the No Action Alternative or the Proposed Action that could result in on- or off-site landslide, lateral spreading, liquefaction, or collapse. Increased groundwater pumping in years with reduced surface water under the No Action Alternative and Proposed Action could reduce groundwater levels, which could decrease pore-water pressure and result in a loss of structural support for clay and silt beds. This impact is analyzed in more detail in the groundwater section of Hydrology and Water Quality. The analysis finds that the potential for land subsidence from increased groundwater pumping (under the No Action Alternative and the Proposed Action) would be small.

d, e) No Impact. There are no expansive soils known to exist in the project area. There are no septic tanks or alternative waste water disposal systems proposed or required for the No Action Alternative or Proposed Action. The Proposed Action does not include new construction and thus no new waste water generation. Therefore, there would be no impact resulting from the implementation of the Proposed Action.

VII. Greenhouse Gas Emissions

– Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

a, b) Less than Significant: Future hydrologic conditions may cause an increase in groundwater pumping and cropland idling under the No Action Alternative. This is in response to increasing CVP water rates for CWD

customers compared to less expensive groundwater pumping. During the rare partial CVP allocation years, CWD water users may resort to idling cropland; however, users would more likely pump groundwater pumping under the Proposed Action. The Proposed Action would only increase groundwater pumping in partial allocation years, which have occurred in six out of the past 40 years. During these years, users could offset the decreased supplies with groundwater pumping, which could result in greenhouse gas emissions. The amount of pumping would be very small and would not occur frequently; therefore, the effects related to greenhouse gas emissions would be less than significant.

VIII. Hazards And Hazardous Materials

– Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a-h) No Impact. The No Action Alternative and Proposed Action would not involve the transport or use of hazardous materials, nor change in any way public exposure to hazards or hazardous materials. The No Action Alternative and Proposed Action would not occur on a hazardous materials site and therefore would not create a risk to the public or environment. The No Action Alternative and Proposed Action would not affect a public airport or private air strip. The No Action Alternative and the Proposed Action would not interfere with an adopted emergency response plan or emergency evacuation plan. There are no new structures or buildings included in the Proposed Action; therefore, no people or structures would be exposed to a significant risk of loss, injury or death, such as wildland fires, as a result of implementation.

IX. Hydrology and Water Quality

– Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
j) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a) Less than Significant

No Action Alternative: The No Action Alternative would not violate any waste discharge requirements as no changes to waste discharges to surface waters would occur. CVP and SWP operations in the Delta would be managed to meet water quality standards.

Proposed Action: Under the Proposed Action, CWD would permanently relinquish 3,000 AF of the Contract Total to Reclamation for Reclamation to use as a water supply to refuges within the Sacramento Valley. This operation would result in a small decrease in flow within the Sacramento River of approximately 25 cfs. Changes in flows would not violate any existing water quality standards or worsen any water quality and flow standard violation.

b) Less than Significant

No Action Alternative: In the past, multi-year dry conditions have limited the quantity of water delivered to CVP water service contractors. In the Sacramento Valley, supply reductions have historically resulted in increased groundwater pumping and decreased groundwater levels. However, groundwater levels have typically rebounded quickly after the dry periods (see Appendix C for historical groundwater monitoring data). Groundwater pumping within CWD would increase under the No Action Alternative because of the increasing price of CVP surface water supplies, which could cause groundwater levels to decline in addition to this variation during recent years.

Proposed Action: Groundwater pumped in lieu of reduced surface water could affect groundwater hydrology. The potential effects could be short-term declines in local groundwater levels. Potential effects to water quality are discussed in Section (f) below.

Increased groundwater pumping during years with a CVP allocation of less than 50 percent could result in temporary declines of groundwater levels compared to existing conditions; however, partial CVP allocations are rare within CWD.

Historical allocation data (Figure 2-3) indicates only six years within the past 40 years (1991, 1992, 2008, 2009) with less than 50 percent CVP allocation.

The Proposed Action could result in pumping of less than 3,000 AF during years with partial allocation; the current groundwater pumping in the Corning sub-basin is estimated as 152,000 AF for agricultural use and 6,600 AF for municipal and industrial use (DWR 2006). Compared to the No Action Alternative, the Proposed Action would maintain more users on surface water as service rates will not increase as a result, unlike the No Action Alternative. The amount of groundwater pumped as a result of the Proposed Action would be minimal and well within historical limits, as well as only occurring in rare partial allocation years. Compared to the No Action Alternative, the Proposed Action would maintain result in more users staying on with surface water as the source of supply because the No Action Alternative would cause users to shift to groundwater because due to increasing CWD water rates.

There would be no substantial impacts to groundwater recharge within the area. Because the groundwater pumping would be small compared to existing and historical groundwater pumping, the Proposed Action would not cause long-term groundwater level declines, groundwater quality concerns, or land subsidence.

c) Less than Significant

Under normal farming practices, growers leave fields fallow during some cropping cycles in order to make improvements such as land leveling and weed abatement or to reduce pest problems and build soils. Growers manage potential soil erosion impacts to avoid substantial loss of soils and to protect soil quality (USDA NRCS 2009). While growers would not be able to engage in management practices that result in a consumptive use of water on an idled field, they could continue such erosion control techniques as surface roughening tillage to produce clods, ridges, and depressions to reduce wind velocity and trap drifting soil; establishment of barriers at intervals perpendicular to wind direction; or application of mulch (USDA NRCS 2009). Therefore, cropland idling under the No Action Alternative and Proposed Action would not result in substantial soil erosion or sediment deposition into waterways. Impacts to water quality would be less than significant.

d, e, g, h, i, j) No Impact. The Proposed Action and No Action Alternative would not involve any actions that would result in flooding or create runoff water that would exceed the capacity of existing drainage systems or provide a substantial source of polluted runoff.

f) Less Than Significant. In general, changes in groundwater levels and the potential change in groundwater flow directions could cause a change in groundwater quality through a number of mechanisms. One mechanism is the potential mobilization of areas of poorer quality water, drawn down from

shallow zones, or drawn up into previously unaffected areas. Changes in groundwater gradients and flow directions could also cause (or speed) the lateral migration of poorer quality water.

No Action Alternative: Surface water shortages, during years of CVP allocations of less than 50 percent, would likely cause some water users to pump additional groundwater. The groundwater pumping could cause water quality concerns associated with the migration of poorer quality water.

Proposed Action:

Sacramento Valley Groundwater Basin. Groundwater quality in the Sacramento Valley Groundwater Basin is generally good and sufficient for municipal, agricultural, domestic, and industrial uses. However, there are some localized groundwater quality issues in the basin. Within the Corning Sub-basin, there are localized areas with high calcium (DWR 2006).

Increases in groundwater extraction under the Proposed Action would be limited to years with partial CVP allocation, which are infrequent. Groundwater extraction under the Proposed Action would be limited to short-term withdrawals during the irrigation season and extraction near areas of reduced groundwater quality would not be expected to result in a permanent change to groundwater quality conditions. Consequently, effects from the migration of reduced groundwater quality would be less than significant.

X. Land Use and Planning

– Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

a, b) No Impact. The No Action Alternative and Proposed Action would not involve any construction or new structures that could divide a community or conflict with land use plans, policies, or zoning.

c) Less than Significant Impact. The No Action Alternative and Proposed Action would not conflict with local policies protecting biological resources or habitat conservation plans. Section IV, Biological Resources, discusses effects to HCPs and NCCPs in the project area.

XI. Mineral Resources

– Would the project

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a, b) No Impact. The No Action Alternative and Proposed Action do not require construction or other activities that would result in the loss of availability of known mineral resources or mineral resource recovery sites.

XII. Noise

– Would the project result in:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a, b, c, e, f) No Impact. The No Action Alternative and Proposed Action would not result in the development of any new noise-emitting devices. The Proposed Action would only rely on existing facilities and equipment. No new construction activities would be associated with the Proposed Action and no ground-disturbing actions with the potential to generate groundborne vibrations would occur. The Proposed Action Area is not located within an airport land use plan. For private airstrips, the Proposed Action would not expose people in the vicinity to excessive noise levels.

d) No Impact. The No Action Alternative would cause users to shift to groundwater pumping as CVP water rates increase. During rare years when CWD would receive partial CVP allocation, the Proposed Action would result in users shifting to groundwater pumping to augment water supplies for irrigation. Groundwater pumping is currently being used throughout the CWD service area as groundwater pumping has become a cheaper alternative and therefore continued pumping would not generate a substantial difference in noise levels within the area. Groundwater pumping would occur in rural areas, which are generally removed from noise-sensitive receptors or in a farm setting with typical noise from agricultural operations. There would be no noise impacts from groundwater pumping as a result of the No Action Alternative or Proposed Action.

XIII. Population and Housing

– Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a) No Impact. The No Action Alternative and Proposed Action would not induce population growth. The Proposed Action would not increase the maximum acreage under production or require more farm workers to meet labor demands. No housing would be constructed, demolished, or replaced.

b, c) No Impact. The No Action Alternative and Proposed Action would not include construction, demolition, or other activities that could displace existing housing or people and necessitate the construction of replacement housing.

XIV. Public Services

Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
d) Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a-e) No Impact. The No Action Alternative and Proposed Action would not create any new demand for public services or require any existing public facilities to be altered. The relinquished water would be transported to four of the Sacramento Valley refuges using existing conveyance facilities and pumping stations and would not require the use of area roads, so there would be no impact to roads or other government facilities. The Proposed Action would not affect the supplies available to municipalities or other jurisdictions for fire protection, parks, or school use. Therefore, there would be no impact to public services or public facilities as a result of this project.

XV. Recreation

– Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a, b) No Impact. The No Action Alternative and Proposed Action would not affect any recreation facilities or require construction or expansion of recreation facilities.

XVI. Transportation/Traffic

– Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a-f) No Impact. The No Action Alternative and Proposed Action would not conflict with applicable transit plans or create any new demand on transportation services. The Proposed Action has no construction activities that would increase the traffic on roads in the project area. There would be no impact to the level of service or air traffic patterns in the project area, nor would there be an increase in hazards due to design features, inadequate emergency

access or parking capacity, or conflict with adopted policies supporting alternative transportation.

XVII. Utilities And Service Systems

– Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a-g) No Impact. The No Action Alternative and Proposed Action would not create any new demand on utilities or service systems. There would be no impact to utility or service systems resulting from implementing the Proposed Action. The Proposed Action would not require the construction of new water or wastewater treatment facilities and would be done using existing facilities.

There would be no increase in demand for wastewater treatment facilities that could exceed existing capacities, and no new storm water drainage facilities would be required under the Proposed Action. The Proposed Action would be done within the existing entitlements and resources.

There would be no solid waste generated as a result of the Proposed Action, and, therefore, no landfill would be required. Thus, there would be no impact to utilities or other service systems as a result of the Proposed Action.

XVIII. Mandatory Findings of Significance –

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

a) Less than Significant. The Proposed Action would not have substantial incremental effects to habitat or species relative to the conditions that would occur in response to the dry hydrologic conditions. Because the relinquished water would be delivered to wildlife refuges, there would be a beneficial effect as a result of the Proposed Action. The Proposed Action would not degrade the quality of the environment or eliminate examples of California history or prehistory.

b) Less than Significant. This cumulative impacts analysis identifies past, present, and reasonably foreseeable future projects with the potential to contribute to cumulative effects, when combined with the Proposed Action. Information used in this cumulative impacts analysis is based on the best information available at this time. A future project is considered “reasonably foreseeable” if it has completed public draft or final environmental documentation. The projects below are considered in the analysis.

Refuge Water Supply Program

Section 3406 (d) of the CVPIA contributes to the maintenance, restoration and enhancements of wetlands and waterfowl habitat. The CVPIA directs Interior to: provide, either directly or through contractual agreements with other appropriate parties, firm water supplies of suitable quality to maintain and improve wetland habitat areas on 19 federal, state and private lands, collectively referred to as “refuges.” The Refuge Water Supply Program’s (RWSP) goal is to provide 555,515 AF of water annually, comprised of 422,251 AF of Level 2 water, which also includes 26,007 AF of replacement water, and 133,264 AF of IL4 water. Full Level 4 water is the sum of Level 2 and IL4 water supplies.

The RWSP allocates water on a contract year (CY) basis (aka “water year”) starting in March and continuing through February of the following year. Table 3-3 shows IL4 supplies that the RWSP has acquired. These supplies are delivered as water supply, primarily in the fall, to enhance wetlands and waterfowl habitat.

Table 3-3. RWSP Acquisitions for IL4 Supplies

Water Source	Water Type	Permanent or Temporary?	Quantity (AF)
Anderson-Cottonwood Irrigation District	Surface water	Permanent	3,000
Proberta Water District	Surface water	Permanent	2,000
Thomes Creek Water District	Surface water	Permanent	2,000
Corning Water District	Surface water	Permanent	2,300

Long-Term Water Transfers

The Long-Term Water Transfers Environmental Impact Statement/Environmental Impact Report (EIS/EIR), prepared by San Luis and Delta Mendota Water Authority (SLDMWA) and Reclamation, analyzed potential CVP-related transfers from 2015 to 2024.

Water transfer methods could include cropland idling (a seller idles fields to make transfer water available), groundwater substitution (a seller pumps groundwater in lieu of surface water deliveries), conservation (a seller takes a conservation action to reduce irrecoverable water losses), and stored reservoir water (releases of water that would have remained in storage in non-CVP or

SWP reservoirs). Water transfers would make water available from the Sacramento Valley and would be sold to buyers in the San Joaquin Valley or the San Francisco Bay area. Water would be stored in upstream storage reservoirs early in the agricultural season, and moved through the Sacramento River and the Delta from July through September (Reclamation and SLDMWA 2015).

Shasta Lake Water Resources Investigation

Reclamation is leading the Shasta Lake Water Resources Investigation to study the potential benefits and impacts of modifying Shasta Dam and Reservoir to increase survival of anadromous fish populations in the upper Sacramento River; increase water supply reliability to agricultural, municipal and industrial, and environmental purposes; and, to the extent possible through meeting these objectives, include features to benefit other identified ecosystem, flood damage reduction, and related water resources needs. Anticipated alternatives for expansion of Shasta Lake include, among other features, raising the dam from 6.5 to 18.5 feet above current elevation, which would result in additional storage capacity of 256,000 to 634,000 acre-feet, respectively. The increased capacity is expected to improve water supply reliability and increase the cold water pool, (Reclamation 2013),

The Proposed Action could have potential cumulatively considerable impacts to air quality, biological resources, and groundwater resources. The cumulative analysis for these resources follows. The Proposed Action would not have cumulatively considerable impacts to other resources evaluated in this EA/IS.

Air Quality

Tehama County is in an area designated nonattainment for the PM₁₀ and O₃ CAAQS. Nonattainment status represents a cumulatively significant impact within the area. O₃ is a secondary pollutant, meaning that it is formed in the atmosphere from reactions of precursor compounds under certain conditions. Primary precursor compounds that lead to O₃ formation include volatile organic compounds and nitrogen oxides; therefore, the significance thresholds established by the air districts for VOC and NO_x are intended to maintain or attain the O₃ CAAQS and NAAQS. Because no single project determines the nonattainment status of a region, individual projects would only contribute to the area's designation on a cumulative basis.

The significance thresholds developed by Tehama County APCD serve to evaluate if a proposed project could either 1) cause or contribute to a new violation of a CAAQS or NAAQS in the study area or 2) increase the frequency or severity of any existing violation of any standard in the area. Air districts recognize that air quality violations are not caused by any one project, but are a cumulative effect of multiple projects. Therefore, Tehama County APCD has developed guidance that indicates a proposed project would be cumulatively considerable if the air quality impacts are individually significant.

The Proposed Action's individual impacts would be less than significant according to Tehama County APCD's criteria. Therefore, air quality impacts would not be cumulatively considerable.

Biological Resources

Managing the cold water pool in Shasta Reservoir and temperatures in the Sacramento River is important for fishery resources in the Sacramento River. The Proposed Action could change water flows by holding water in Shasta Reservoir during the summer and releasing it later in the season (when fish are not present in the river) to deliver it to refuges. The Shasta Lake Water Resources Investigation would increase the size of Shasta Lake, which could increase the cold water pool and flexibility to manage temperatures. Water transfers also alter flows in the Sacramento River, but the changes are made in collaboration with NMFS to avoid effects to fishery resources. The Proposed Action, along with the cumulative projects, would not result in a cumulatively significant impact to fishery resources.

Groundwater Resources

In the cumulative condition, existing groundwater pumping demands, groundwater substitution transfers, and the Proposed Action could contribute to declining groundwater levels. Groundwater substitution transfers include a mitigation measure to monitor for effects to groundwater and mitigate for any detected effects (with actions such as reducing or ending the water transfer). The Proposed Action would involve a small amount of groundwater pumping in the rare years when CWD receives a partial allocation. Because of the small amount of groundwater pumping under the Proposed Action and the mitigation measures implemented for water transfers, the Proposed Action would not result in a cumulatively considerable contribution to effects on groundwater.

c) No Impact. The Proposed Action would not result in environmental effects that cause substantial adverse impacts to human beings. The Proposed Action would be used to meet refuge IL4 water supply requirements and a portion of the revenue from the relinquished water would help to eliminate CWD's O&M deficit with Reclamation. No increase in CWD's Contract Total would occur. Therefore, there would be no contribution to growth-inducing impacts.

Chapter 4

Other Federal Environmental Compliance Requirements

In addition to resources analyzed in Chapter 3, Department of the Interior Regulations, Executive Orders, and Reclamation guidelines require a discussion of the following additional items when preparing environmental documentation.

4.1 Indian Trust Assets (ITAs)

ITAs are defined as legal interests in property held in trust by the U.S. government for Indian tribes or individuals, or property protected under U.S. law for federally recognized Indian tribes or individuals. ITAs can include land, minerals, federally-reserved hunting and fishing rights, federally-reserved water rights, and in-stream flows associated with a reservation or Rancheria. By definition, ITAs cannot be sold, leased, or otherwise encumbered without approval of the U.S. The closest ITA to the Project study area is the Paskenta Band of Nomlaki Indians, approximately 1 mile to the west of CWD.

The Proposed Action would not have direct effects on ITAs, but could have indirect impacts caused by groundwater pumping. Under the No Action Alternative, groundwater pumping could increase because increasing CVP surface water rates could force CWD water users to shift to more affordable groundwater alternatives. CWD may dissolve if it cannot meet its debt obligation to Reclamation, which would cause additional users to shift to groundwater. Changes in water supplies under the No Action Alternative could cause groundwater levels in the area of the Paskenta Band of Nomlaki Indians to decline.

Under the Proposed Action, CVP surface water deliveries to CWD would be adequate to meet demands for surface water in years with at least a 50 percent allocation. In years with less than a 50 percent CVP allocation, some users that currently use surface water would not receive water. These users would likely shift to groundwater pumping to offset the reduction in surface water supply. Partial allocation years of less than 50 percent are uncommon within CWD, occurring 4 times within the past 40 years. The Proposed Action would maintain more users on surface water than the No Action Alternative, which would cause users to shift to groundwater because of increasing water rates. Groundwater levels under the Proposed Action would not decline as described for the No Action Alternative near the Paskenta Band of Nomlaki Indians; therefore, the Proposed Action would improve conditions.

The Proposed Action would not have any other impacts on ITAs, as the planned activities are not within an area that would affect Indian hunting or fishing resources or water rights, nor is the Proposed Action within actual Indian lands.

4.2 Indian Sacred Sites

As defined by Executive Order 13007: Indian Sacred Sites, a sacred site “means any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately authoritative representative of an Indian religion has informed the agency of the existence of such a site.” The Proposed Action would provide water to Federal refuges, which occur on Federal land and present the potential for Indian Sacred Sites. The Proposed Action would not limit access to or ceremonial use of Indian Sacred Sites on federal lands by Indian religious practitioners or significantly adversely affect the physical integrity of such sacred sites.

4.3 Socioeconomics

Table 4-1 summarizes the regional economy in 2015 for Tehama County, where CWD is located. As shown in Table 4-1, agriculture is not the primary industry within Tehama County. Tehama County is ranked 28th in the State for Gross Value of Agricultural Production at \$321 million in 2015. (California Department of Food and Agriculture 2016).

CWD provides water to agricultural water users near the city of Corning. Under the No Action Alternative, water users would reduce surface water use because of increasing costs. CWD may dissolve, which would eliminate surface water supplies within CWD. Facing a water shortage, growers would take actions to protect permanent crops first to protect their investments. The majority of crops within CWD are permanent, with less than 1,000 acres of field crops (CWD 2009). Growers would likely pump groundwater to substitute for reduced surface water supplies. The costs of pumping groundwater are generally similar to (or less than) the surface water costs, so shifting to groundwater would not have an adverse economic effect.

Under the Proposed Action, CWD would not be able to meet demands for surface water supplies during partial allocation years. As under the No Action Alternative, growers would likely use groundwater in place of surface water during the times that it is not available. Years of partial CVP allocation are infrequent, as discussed in Section 2.4.6.1, and the cost of shifting to groundwater would not likely have an adverse economic effect.

Table 4-1. Summary of 2015 Regional Economy in Tehama County

	Tehama Employment	Tehama Earnings¹
Total	24,158	\$1,138,110
Farm	2,477	\$113,661
Nonfarm	21,681	\$1,024,449
Private nonfarm	17,835	\$753,796
Forestry, fishing, and related activities	961	\$9,681
Mining	41	\$462
Utilities	109	\$17,194
Construction	1,069	\$83,051
Manufacturing	1,969	\$113,489
Wholesale trade	484	\$20,475
Retail trade	2,382	\$78,936
Transportation and warehousing	1,691	\$100,629
Information	94	\$5,905
Finance and insurance	503	\$15,078
Real estate and rental and leasing	673	\$14,016
Professional, scientific, and technical services	661	\$18,128
Management of companies and enterprises	83	\$4,621
Administrative and waste management services	835	\$18,815
Educational services	128	\$1,753
Health care and social assistance	2,968	\$132,601
Arts, entertainment, and recreation	298	\$3,836
Accommodation and food services	1,430	\$31,662
Other services, except public administration	1,456	\$48,208
Government and government enterprises	3,846	\$270,653

Source: U.S. Bureau of Economic Analysis 2015

¹ Thousands of dollars

Under the Proposed Action, no permanent adverse regional economic effects would occur to businesses and individuals who support farming activities, such as farm workers, fertilizer and chemical dealers, wholesale and agricultural service providers, truck transport, and others involved in crop production and processing. Crop idling would occur only in rare years of partial CVP allocation and when groundwater levels are low or unavailable. The majority of crops within CWD are permanent. Only a small portion of field crops would be idled, and this would be temporary until CWD received full CVP allocation or groundwater levels restored. Cropland idling would not result in direct effects to employment, labor income, and output. The 3,000 AF of relinquished water would be used to increase Level 4 supplies within Sacramento Valley refuges, and the revenue received as a result of relinquishing 3,000 AF would help CWD eliminate its existing debt with Reclamation.

At the regional level, the direct and secondary economic effects would not be substantial. Relative to the baseline economy, the effects would be minor. Further, the Proposed Action would only see effects during years of partial CVP allocation, which are infrequent and rare. Therefore, economic effects from cropland idling would be minor and temporary.

4.4 Environmental Justice

The 1994 Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires all Federal agencies to conduct “programs, policies, and activities that substantially affect human health or the environment, in a manner that ensures that such programs, policies, and activities do not have the effect of excluding persons (including populations) from participation in, denying persons (including populations) the benefits of, or subjecting persons (including populations) to discrimination under, such programs, policies, and activities, because of their race, color, or national origin.” Cropland idling could affect farm labor employment by temporarily reducing the amount of agricultural land in production or the number of farm workers needed to work existing land. Table 4-2 shows demographics and income within Tehama County. In 2016, Tehama County had a Hispanic population of 24.7 percent, with a lower median household income compared to the State. Tehama County had slightly higher unemployment rates than the State. These statistics indicate a low potential for environmental justice effects in the study area.

Table 4-2. Demographics and Income in Tehama County, 2016 Estimate

	CA	Tehama
Population	39,250,017	63,276
Ethnicity¹ (%)		
Hispanic or Latino	38.9%	24.7%
Race² (%)		
White	72.7%	
African American	6.5%	
American Indian	1.7%	
Asian	14.8%	
Pacific Islander	0.5%	
Multirace	3.8%	
Poverty Rate (2011-2015)³ (%)	15.3%	22.5%
Unemployment Rate (%) (2015)	6.2%	7.1%
Median Household Income (2011-2015)⁴	\$61,818	\$41,001

Source: U.S. Census Bureau 2011-2015, 2016

Notes:

¹ The U.S. Census Bureau classifies Hispanic or Latino as an ethnicity, and surveys for this percentage across all races; therefore, the actual percentage of persons of only Hispanic or Latino origin could be smaller than the stated percentage (U.S. Census Bureau 2016).

² A minority is defined as a member of the following population groups: American Indian/Alaskan Native, Asian or Pacific Islander, Black (non-Hispanic), or Hispanic (U.S. Census Bureau 2016).

³ The U.S. Census Bureau classifies families and persons as *below poverty* "if their total family income or unrelated individual income was less than the poverty threshold" as defined for all parts of the country by the federal government (U.S. Census Bureau 2011-2015).

⁴ Household income is defined by the U.S. Census Bureau as "the sum of money income received in the calendar year by all household members 15 years old and over" (U.S. Census Bureau 2011-2015).

Table 4-3 shows 2004-2015 farm employment in Tehama County where idling cropland could occur. Farm employment would be the most directly affected by cropland idling transfers.

Table 4-3. Farm Employment, 2004-2016

	Tehama	Annual Percent Change
2004	1,290	--
2005	1,200	- 6.9%
2006	1,170	- 2.6%
2007	1,230	5.1%
2008	1,270	3.3%
2009	1,310	3.1%
2010	1,440	9.9%
2011	1,450	0.7%
2012	1,450	0.0%
2013	1,430	- 1.4%
2014	1,470	2.8%
2015	1,750	19.0%
2016	1,790	2.3%

Source: Employment Development Department (EDD) 2016

Economic effects within CWD if use of CVP surface water supplies decline under the No Action Alternative are described in Section 4.3. These effects would also be relevant for environmental justice issues. Under the No Action Alternative, field crops would likely be idled in response to unaffordability of surface water supply and available groundwater water supplies would be shifted to irrigate permanent crops. There would be some losses in employment of low income and minority workers on field crops, but employment needs for labor-intensive permanent crops would remain unchanged. Effects in CWD would be minimal under the No Action Alternative.

In years of less than 50 percent of the Contract Total being made available for delivery to CWD, under the Proposed Action, cropland idling would not disproportionately or adversely affect minority and low-income farm workers. Farm employment within Tehama County has fluctuated from 2004 to 2016, with the greatest decline of 6.9 percent in farm employment in 2005 and the greatest increase of 19 percent in 2015 (EDD 2016). The region is familiar with farm industry fluctuation. Field crops would be idling during years of partial CVP allocation and when groundwater pumping is low or unavailable. Available surface water would be utilized to irrigate permanent crops. A temporary loss of employment to low income, minority field crop workers, as a result of crop idling, would not cause a high effect to farm employment. All farm worker effects would be temporary and only occur during infrequent, partial CVP allocation years. Cropland idling under the Proposed Action would not result in an adverse and disproportionately high effect to farm employment.

4.5 Consultation and Coordination

4.5.1 Resource Agency Coordination

The analysis of potential impacts to biological resources in Chapter 3 found that the Proposed Action would not have adverse effects on terrestrial resources in CWD, and could benefit terrestrial species in the refuges that would receive increased water supplies. Chapter 3 also indicated that the Proposed Action would not affect fishery resources in Shasta Reservoir or the Sacramento River. Reclamation is coordinating with the United States Fish and Wildlife Service and National Marine Fisheries Service, but does not expect to have a formal consultation under the Endangered Species Act.

4.5.2 Public Comments

Reclamation and CWD released the Draft EA/IS for public review period beginning on August 4, 2017. Reclamation has a 14-day review period with comments due on August 18, 2017. CWD has a 30-day review period with comments due on September 5, 2017.

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Appendix A

Special Status Wildlife Species List

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Appendix A
Special Status Wildlife Species with Potential to Occur

Special Status Species With Potential to Occur

Common Name Scientific Name	Federal Special Status*	State Special Status*	Distribution	Habitat Association	Seasonal Occurrence	Potential Impact
Invertebrates						
Conservancy fairy shrimp <i>Branchinecta conservation</i>	E, X	--	Northern two-thirds of the Central Valley. It ranges from Vina Plains of Tehama County; Sacramento NWR in Glenn County; Jepson Prairie Preserve and surrounding area east of Travis Air Force Base, Solano County; Mapes Ranch west of Modesto, Stanislaus County.	Inhabits the ephemeral water of swales and vernal pools. It is most commonly found in grass or mud bottomed swales, earth sump, or basalt flow depression pools in unplowed grasslands.	Has been collected from early December to early May.	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action
Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i>	T, X	--	Central Valley and surrounding foothills below 3,000 feet elevation.	Dependent on elderberry shrubs (host plant) as a food source. Potential habitat is shrubs with stems 1 inch in diameter within Central Valley.	Year round for host plant and exitholes; March-June for adults	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action
Vernal pool fairy shrimp <i>Branchinecta lynchi</i>	T, X	--	Endemic to the Central Valley, Central Coast Mountains, and South Coast Mountains of California. It ranges from the Stillwater Plain in Shasta County through most of the length of the Central Valley to Paisley in Tulare County, and along the central Coast Range from northern Solano County to Pinnacles National Monument in San Benito County. Disjunct populations were also reported to occur in San Luis Obispo County, Santa Barbara County, and Riverside County	Inhabits the ephemeral water of swales and vernal pools. It is most commonly found in grassed or mud bottomed swales, earth sump, or basalt flow depression pools in unplowed grasslands.	Has been collected from early December to early May.	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action
Vernal pool tadpole shrimp <i>Lepidurus packardii</i>	E, X	--	Endemic to the Central Valley of California, with the majority of the populations occurring in the Sacramento Valley. This species has also been reported from the Sacramento River Delta to the east side of San Francisco Bay, and from a few scattered localities in the San Joaquin Valley from San Joaquin County to Madera County	Found in a variety of natural and artificial seasonally ponded habitat types including: vernal pools, swales, ephemeral drainages, stock ponds, reservoirs, ditches, backhoe pits, and ruts caused by vehicular activities.	Has been collected from early December to early May.	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action
California tiger salamander <i>Ambystoma californiense</i>	T ¹ , E ² , X	CE, SSC	Found in annual grassland habitat, grassy understories of valley-foothill hardwood habitats, and uncommonly along stream courses in valley-foothill riparian habitats. Occurs from near Petaluma, Sonoma Co., east through the Central Valley to Yolo and Sacramento Counties and south to Tulare Co.; and from the vicinity of San Francisco Bay south to Santa Barbara County.	Lives in vacant or mammal-occupied burrows, occasionally other underground retreats, throughout most of the year, in grassland, savanna, or open woodland habitats. Lays eggs on submerged stems and leaves, usually in shallow ephemeral or semi permanent pools and ponds that fill during heavy winter rains, sometimes in permanent ponds; breeding takes place in fish free pools and ponds.	Migrates up to about 2 km between terrestrial habitat and breeding pond. Migrations may occur from November through April.	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.

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Common Name Scientific Name	Federal Special Status*	State Special Status*	Distribution	Habitat Association	Seasonal Occurrence	Potential Impact
Reptiles						
Giant gartersnake <i>Thamnophis gigas</i>	T	T	Sacramento and San Joaquin Valleys from Butte County in the north to Kern County in the south.	Primarily associated with marshes, sloughs, and irrigation ditches. Generally absent in larger rivers.	Year round	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action
Western pond turtle <i>Actinemys marmorata</i>	Under review	SSC	Ranged from extreme western Washington and British Columbia to northern Baja California, mostly to the west of the Cascade-Sierra crest.	The western pond turtle occupies a wide variety of wetland habitats including rivers and streams (both permanent and intermittent), lakes, ponds, reservoirs, permanent and ephemeral shallow wetlands, abandoned gravel pits, stock ponds, and sewage treatment.	Year round	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action
Birds						
Bald eagle <i>Haliaeetus leucocephalus</i>	D, BGEPA	E	Throughout California.	Riparian areas near coasts, rivers, and lakes. Nesting generally occurs in large old-growth trees in areas with little disturbance.	Year round	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action
Bank swallow <i>Riparia riparia</i>	--	T, SSC	A neotropical migrant found primarily in riparian and other lowland habitats in California west of the deserts during the spring-fall period. Breeding population in California occurs along banks of the Sacramento and Feather rivers in the northern Central Valley.	Requires vertical banks and cliffs with fine-textured or sandy soils near streams, rivers, ponds, lakes, and the ocean for nesting. Feeds primarily over grassland, shrub land, savannah, and open riparian areas during breeding season and over grassland, brushland, wetlands, and cropland during migration.	March-mid-September	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Black-crowned night heron <i>Nycticorax nycticorax</i>	SC	Nesting colonies protected	Resident in lowlands and foothills throughout most of California, including the Salton Sea and Colorado River areas, and very common locally in large nesting colonies.	Feeds along the margins of lacustrine, large riverine, and fresh and saline emergent habitats. Nests and roosts in dense-foliaged trees and dense emergent wetlands.	Year round	Suitable habitat is present within the project area. Any impacts to this species would be positive as refuges would receive increased water supply as a result of the Proposed Action.
Burrowing owl <i>Athene cucularia</i>	--	SSC	Central and southern coastal habitats, Central Valley, Great Basin, and deserts.	Open annual grasslands or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Dependent upon burrowing mammals (especially California ground squirrel) for burrows.	Year round	There is little potential for this species to occur as no scrubland habitat is present within the associated refuges. However impacts to this species would be beneficial because the refuges would be receiving more water supply as a result of the Proposed Action.

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Common Name Scientific Name	Federal Special Status*	State Special Status*	Distribution	Habitat Association	Seasonal Occurrence	Potential Impact
California black rail <i>Laterallis jamaicensis coturniculus</i>	FP	T	Majority found within the tidal salt marshes of the northern San Francisco Bay region, freshwater marshes in the foothills of the Sierra Nevada, and in the Colorado River Area.	Inhabits freshwater marshes, wet meadows, and shallow margins of saltwater marshes bordering larger bays. Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat.	Year round	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Great blue heron <i>Ardea herodias</i>	--	Nesting colonies protected	Throughout California	Found in shallow estuaries, fresh and saline emergent wetlands, along riverine and rocky marine shores, in croplands, pastures, salt ponds, and in mountains above foothills. Nests roosts in large trees.	Year round	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action..
Great egret <i>Ardea alba</i>	--	Nesting colonies protected	Throughout California	Feeds and rests in fresh, and saline emergent wetlands, along the margins of estuaries, lakes, and slow-moving streams, on mudflats and salt ponds, and in irrigated croplands and pastures. Nests roosts in large trees.	Year round	Wetlands are present within the project area. Impacts to this species would be beneficial as a result of the Proposed Action.
Greater sandhill crane <i>Grus canadensis tabida</i>	--	T, FP	Breeds only in Siskiyou, Modoc and Lassen counties and in Sierra Valley, Plumas and Sierra counties. Winters primarily in the Sacramento and San Joaquin valleys from Tehama south to Kings Counties.	In summer, this species occurs in and near wet meadow, shallow lacustrine, and fresh emergent wetland habitats. Frequents annual and perennial grassland habitats, moist croplands with rice or corn stubble, and open, emergent wetlands. It prefers relatively treeless plains.	Migration southward is September-October and northward is March-April.	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Mountain plover <i>Charadrius montanus</i>	-	SSC	Breeds in the central United States. Winters in southern portions of California and Arizona, and into Mexico.	Found within short grasslands, freshly plowed fields, and newly sprouting grain fields. Prefers bare ground with short vegetation and flat topography, as well as grazed areas with burrowing rodents.	Wintering populations within California	Suitable habitat is present within the project area. Any impacts to this species would be positive as refuges would receive increased water supply as a result of the Proposed Action.
Northern harrier <i>Circus cyaneus</i>	--	SSC	Throughout lowland California, concentrated in the Central Valley and coastal valleys.	Breeds in annual grasslands and wetlands. Prefers marshes and grasslands for foraging and nesting. Also uses agricultural fields for nesting and foraging, although nests may be destroyed by agricultural activities.	Year round	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.

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Common Name Scientific Name	Federal Special Status*	State Special Status*	Distribution	Habitat Association	Seasonal Occurrence	Potential Impact
Osprey <i>Pandion haliaetus</i>	--	WL	Northern California from Cascade Ranges south to Lake Tahoe, and along the coast south to Marin County.	Associated strictly with large, fish-bearing waters, primarily in ponderosa pine through mixed conifer habitats.	Year round	There is little potential for this species to occur as ponderosa pine habitat is not present within the Sacramento Valley refuges. However, any impacts to this species as a result of this Proposed Action would be beneficial.
Song sparrow ("Modesto" population) <i>Melospiza melodia</i>	-	SSC	Throughout the United States and Canada, this specific population is found within the City of Modesto, California.	Open habitat, including marsh edges, overgrown fields, backyards, desert washes, and forest edges. Song sparrows commonly visit bird feeders and build nests in residential areas.	Year round	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Swainson's hawk <i>Buteo swainsoni</i>	SC, MNBMC	T	Lower Sacramento and San Joaquin Valleys, the Klamath Basin, and Butte Valley.	Nests in mature trees, including valley oaks or cottonwoods in or near riparian habitats; forages in grasslands, irrigated pastures, and grain and row crop fields.	Spring and Summer; small wintering population in the Delta	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Tricolored blackbird <i>Agelaius tricolor</i>	--	SSC	A resident in California found throughout the Central Valley and in coastal districts from Sonoma County south.	Breeds near fresh water, preferably in emergent wetlands with tall, dense cattails or tules, but also in thickets of willow, blackberry, wild rose, tall herbs. Feeds in grassland and cropland habitats.	Year round	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Western yellow-billed cuckoo <i>Coccyzus americanus</i>	T	E	Uncommon to rare summer resident in scattered locations throughout California.	Deciduous riparian thickets or forests with dense, low-level or understory foliage, and which abut on slow-moving watercourses, backwaters, or seeps. Willow almost always a dominant component of the vegetation. In Sacramento Valley, also utilizes adjacent orchards, especially of walnut. Nests in sites with some willows, dense low-level or understory foliage, high humidity, and wooded foragingspaces.	Summer migration is from June-September.	There is potential for this species to occur as riparian vegetation is present. However impacts to this species would be beneficial because the refuges would be receiving more water supply as a result of the Proposed Action.
White-faced ibis <i>Plegadis chihi</i>	--	WL	Uncommon summer resident in sections of southern California, a rare visitor in the Central Valley, and is more widespread in migration.	Feeds in fresh emergent wetlands, shallow lacustrine waters, muddy grounds of wet meadows, and irrigated or flooded pastures and croplands. Nests in dense, fresh emergent wetlands.	Present in California from April-October.	Wetlands are present within the project area. Impacts to the species would be positive as a result of the Proposed Action.

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Special Status Wildlife Species with Potential to Occur

Common Name Scientific Name	Federal Special Status*	State Special Status*	Distribution	Habitat Association	Seasonal Occurrence	Potential Impact
Mammals						
American badger <i>Taxidea taxus</i>	-	SSC	Found in the majority of the central and western United States, as well as parts of Canada and Mexico.	Drier open stages of shrub, forest, and herbaceous habitats, with friable soil. Requires sufficient foots and open, uncultivated ground. Preys on burrowing rodents.	Year-round	Suitable habitat is present within the Sacramento Valley refuges. Any impact toward the species would be beneficial as a result of the Proposed Action.
Western red bat <i>Lasiurus blossevillii</i>	-	SSC	Found throughout most of California from Shasta County all the way to the Mexican border.	Habitat edges and mosaics with trees that are protected from above and clear below with open areas for foraging. Primarily roosts within trees 2-40 feet above the ground.	Migration between summer (regions of Northern California) and winter ranges (Southern California/Mexico)	There is potential for this species to occur, however any impact to this species as a result of the Proposed Action would be beneficial as

¹Central CA DPS

²Santa Barbara and Sonoma Counties

Green Shading: potential to be affected, further evaluated in Chapter 3

*** Status explanations:**

Federal

E = listed as endangered under the federal Endangered Species Act

T = listed as threatened under the federal Endangered Species Act

C = Candidate for listing as threatened or endangered

SC = species of concern; formerly Category 2 candidate for federal listing

BGEPA = Bald and Golden Eagle Protection Act

MNBMC = Fish and Wildlife Service: Migratory Nongame Birds of Management Concern

-- = no designations

X = critical habitat

PX = potential critical habitat

D = delisted

State

E = listed as endangered under the California Endangered Species Act

T = listed as threatened under the California Endangered Species Act

CE = candidate endangered under the California Endangered Species Act

FP = fully protected under the California Fish and Game Code

SSC = species of special concern

WL = Watch List

-- = no designations

Appendix B

Special Status Plant Species List

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Common Name Scientific name	Special Status* (F/S/CNPS)	Distribution	Habitat Association	Blooming Period	Potential Impact
Baker's navarretia <i>Navarretia leucocephala ssp. bakeri</i>	-/-/1B	Dispersed throughout northern California	Meadows and vernal pools	April- July	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Barstow woolly sunflower <i>Eriophyllum mohavense</i>	-/-/1B	Concentrated in the southern regions of California	Chenopod scrub, Mojavean desert scrub, and playas	March- May	There is little potential for this species to occur as no chenopod scrub, desert scrub, and playas habitat are present within the Sacramento Valley refuges. If the species were to occur within the project area, there would be a positive impact as a result of the Proposed Action.
Bent-flowered fiddleneck <i>Amsinckia lunaris</i>	-/-/1B	Western Central Valley and adjacent foothills, Delta region	Coastal bluff scrub, Cismontane woodland, valley and foothill grassland	March-June	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact on this species as a result of the Proposed Action.
Brazilian watermeal <i>Wolffia brasiliensis</i>	-/-/2B	Found within the Sacramento Valley.	Wetland-riparian	April-December	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Brittlescale <i>Atriplex depressa</i>	-/-/1B	Western Central Valley and valleys of adjacent foothills.	Alkali grassland, alkali meadow, alkali scrub, and vernal pools.	April-October	There is a potential for this species to occur within one of the Sacramento Valley refuges. Due to the increase in water supply as a result of the Proposed Action, this species would be positively affected.

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Common Name Scientific name	Special Status* (F/S/CNPS)	Distribution	Habitat Association	Blooming Period	Potential Impact
California alkali grass <i>Puccinellia simplex</i>	-/-/1B	Dispersed throughout the Sacramento and Central Valley. Also in the southern and eastern mountain ranges.	Valley grassland, wetland-riaprian.	March-May	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Caper-fruited tropidocarpum <i>Tropidocarpum capparideum</i>	-/-/1B	Found throughout the Central Valley and coast of California	Valley grassland	March-April	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Colusa grass <i>Neostapfia colusana</i>	T/E/1B	Southern Sacramento Valley, and northern San Joaquin Valley.	Vernal pools.	May-July	There is a potential for this species to occur within one of the Sacramento Valley refuges. Due to the increase in water supply as a result of the Proposed Action, this species would be positively affected.
Colusa layia <i>Layia septentrionalis</i>	-/-/1B	Populations are concentrated in the Sacramento Valley and associated foothills	Sandy, serpentinite soils of chaparral, cismontane woodland, valley, and foothill grasslands.	April-May	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Coulter's goldfields <i>Lasthenia glabrata</i> <i>ssp. coulteri</i>	-/-/1B	Dispersed throughout California, concentrated in the southern coastal ranges and Central Valley of California	Marshes and swamps (coastal salt), playas, and vernal pools.	February- June	Suitable habitat is present within one of the Sacramento Valley refuges. The species will be positively impacted due to the increase in water supply to the refuges as a result of the Proposed Action.

Common Name Scientific name	Special Status* (F/S/CNPS)	Distribution	Habitat Association	Blooming Period	Potential Impact
Ferris' milk-vetch <i>Astragalus tener</i> var. <i>ferrisiae</i>	-/-/1B	Sacramento Valley.	Subalkaline flats and areas around vernal pools.	March-June	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Greene's tuctoria <i>Tuctoria greeni</i>	E/SSC/1B	Butte, Colusa, Fresno, Glenn, Madera, Merced, Modoc, Shasta, San Joaquin, Stanislaus, Tehama, and Tulare Counties.	Vernal pools.	May-July	Suitable habitat is present within one of the Sacramento Valley refuges. The species will be positively impacted due to the increase in water supply to the refuges as a result of the Proposed Action.
Hairy Orcutt grass <i>Orcuttia pilosa</i>	E/E/1B	Northern Sacramento Valley, Pit River Valley; isolated populations in Lake and Sacramento counties.	Vernal pools.	May-September	There is a potential for this species to occur within one of the Sacramento Valley refuges. Due to the increase in water supply as a result of the Proposed Action, this species would be positively affected.
Hartweg's golden sunburst <i>Pseudobahia bahiifolia</i>	E/E/1B	Scattered throughout the Central Valley	Found within clay, often acidic soils of Cismontane woodland, Valley and Foothill grassland	March- April	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Heartscale <i>Atriplex cordulata</i>	-/-/1B	Western Central Valley and valleys of adjacent foothills.	Alkali grasslands, alkali meadows, and alkali scrub.	May-October	Suitable habitat is present within the project area, however any impacts to the species would be positive, as water supplies within the refuges will increase as a result of the Proposed Action.

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Heckard's pepper-grass <i>Lepidium latipes</i> var. <i>heckardii</i>	-/-/1B	Glenn, Solano, and Yolo Counties.	Valley and foothill grassland alkaline flats.	March-May	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Hoover's spurge <i>Chamaesyce hooveri</i>	T/-/ 1B	Scattered in Glenn, Butte, Colusa, Merced, Stanislaus, Tehama, and Tulare Counties.	Vernal pools.	July-September	There is likely to be a positive impact on this species because of the increased water supply to the Sacramento Valley refuges, as a result of the Proposed Action.
Lesser saltscale <i>Atriplex minuscule</i>	-/-/1B	Found within mid to southern portions of the Central Valley	Shadscale Scrub, Valley Grassland, Alkali Sink. Usually occurs in non-wetlands, but occasionally found in wetlands.	May- October	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Palmate-bracted bird's-beak <i>Cordylanthus palmatus</i>	E/E/1B	Found in Glenn and Colusa Counties and within the Central Valley.	Alkali meadow, alkali scrub, valley and grasslands.	May-October	There is a potential for this species to be present as the Sacramento Valley refuges have suitable habitat. There would be a positive impact due to the increase in water supply within the refuges as a result of the Proposed Action.
Pappose tarplant <i>Centromadia parryi</i> ssp. <i>parryi</i>	-/-/1B	Found within the Sacramento Valley and Delta	Found within alkaline chaparral, coastal prairie, meadows and seeps, marshes and swamps, and valley and foothill grassland (vernally mesic)	May- November	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Peruvian dodder <i>Cuscuta obtusiflora</i> var. <i>glandulosa</i>	-/-/2B	Found scatter throughout the Central Valley	Marshes and swamps (freshwater)	July-October	Suitable habitat is present within one of the Sacramento Valley refuges. The species will be positively impacted due to the increase in water supply to the refuges as a result of the Proposed Action.

Common Name Scientific name	Special Status* (F/S/CNPS)	Distribution	Habitat Association	Blooming Period	Potential Impact
Pink creamsacs <i>Castilleja rubicundula</i> var. <i>rubicundula</i>	-/-/1B	Found mostly within the Sacramento Valley	Chaparral, Cismontane woodland, meadows and seeps, valley and foothill grasslands	April-June	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Recurved larkspur <i>Delphinium recurvatum</i>	-/-/1B	Disbursed throughout the Sacramento and Central Valley.	Chenopod scrub, cismontane, valley and foothill grasslands (alkali).	March-June	Suitable habitat is present, however the impact would be beneficial as the refuges receive increased water supply as a result of the Proposed Action.
Round-leaved filaree <i>California macrophylla</i>	-/-/1B	Dispersed throughout the coastal regions of California, excluding the most northern counties	Valley grassland, Foothill Woodland	March-May	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
San Joaquin spearscale <i>Atriplex joaquiniana</i>	-/-/1B	Western Central Valley and valleys of adjacent foothills.	Alkali grasslands, and alkali scrub.	April-September	Suitable habitat is present within one of the Sacramento Valley refuges. The species will be positively impacted due to the increase in water supply to the refuges as a result of the Proposed Action.
Sanford's arrowhead <i>Sagittaria sanfordii</i>	-/-/1B	Central Valley.	Freshwater marshes, shallow streams, and ditches.	May-August	There is likely to be a positive impact on this species because of the increased water supply to the Sacramento Valley refuges, as a result of the Proposed Action.
Subtle orache <i>Atriplex subtilis</i>	-/-/ 1B	Found mostly within the southern counties of the Central Valley	Alkaline valley and foothill grasslands	June, August, September, October	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.

Common Name Scientific name	Special Status* (F/S/CNPS)	Distribution	Habitat Association	Blooming Period	Potential Impact
Veiny monardella <i>Monardella venosa</i>	-/-/1B	Found scattered throughout the Sacramento Valley.	Found within heavy clay soils of Cismontane woodlands and Valley/Foothill grasslands	May-July	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Vernal pool smallscale <i>Atriplex persistens</i>	-/-/1B	Found dispersed throughout the Central Valley	Alkaline vernal pools	June-October	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Water star-grass <i>Heteranthera dubia</i>	-/-/2B	Found scattered throughout the Delta, Sacramento Valley, and Modoc County	Requires a pH of 7 or higher, usually in slightly eutrophic waters. Marshes and swamps (alkaline, still, or slow-moving water)	July -October	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Watershield <i>Brasenia schreberi</i>	-/-/2B	Found scattered throughout Northern California	Freshwater marshes and swamps	June-September	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Woolly rose-mallow <i>Hibiscus lasiocarpus</i> <i>var. occidentalis</i>	-/-/1B	Found within the northern portion of the Central Valley	Freshwater marshes and swamps, often found within rip rap on sides of levees	June-September	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.
Wright's trichocornis <i>Trichocoronis</i> <i>wrightii var. wrightii</i>	-/-/2B	Scattered throughout the Central Valley	Alkaline soils of meadows and seeps, marshes and swamps, riparian forest, and vernal pools	May-September	There is potential for this species to occur within one of the Sacramento Valley refuges, however there will be a positive impact to this species as a result of the Proposed Action.

Source: Calflora 2017

***Status explanations:**

F=Federal

E=Endangered

T=Threatened

SC= Special Concern

S=State

E=Endangered

T=Threatened

SSC=Species of Special Concern

CNPS=California Native Plant Society

1B=Rare, threatened, or endangered in California and elsewhere

2=Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere

3=Plants about which we need more information - A review list

Appendix C

Groundwater Existing Conditions

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Appendix C

Groundwater Existing Conditions

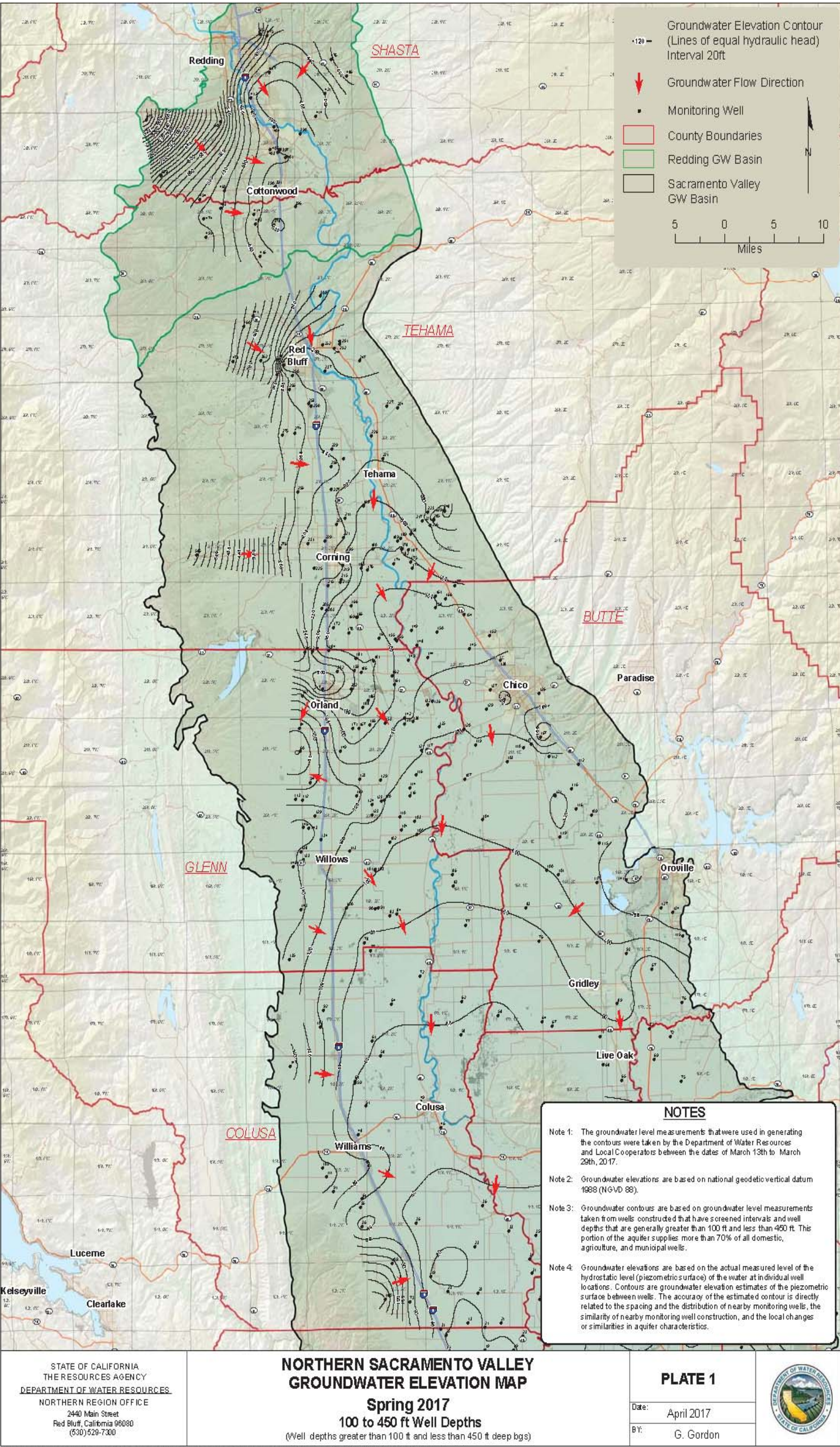
This appendix includes the following figures:

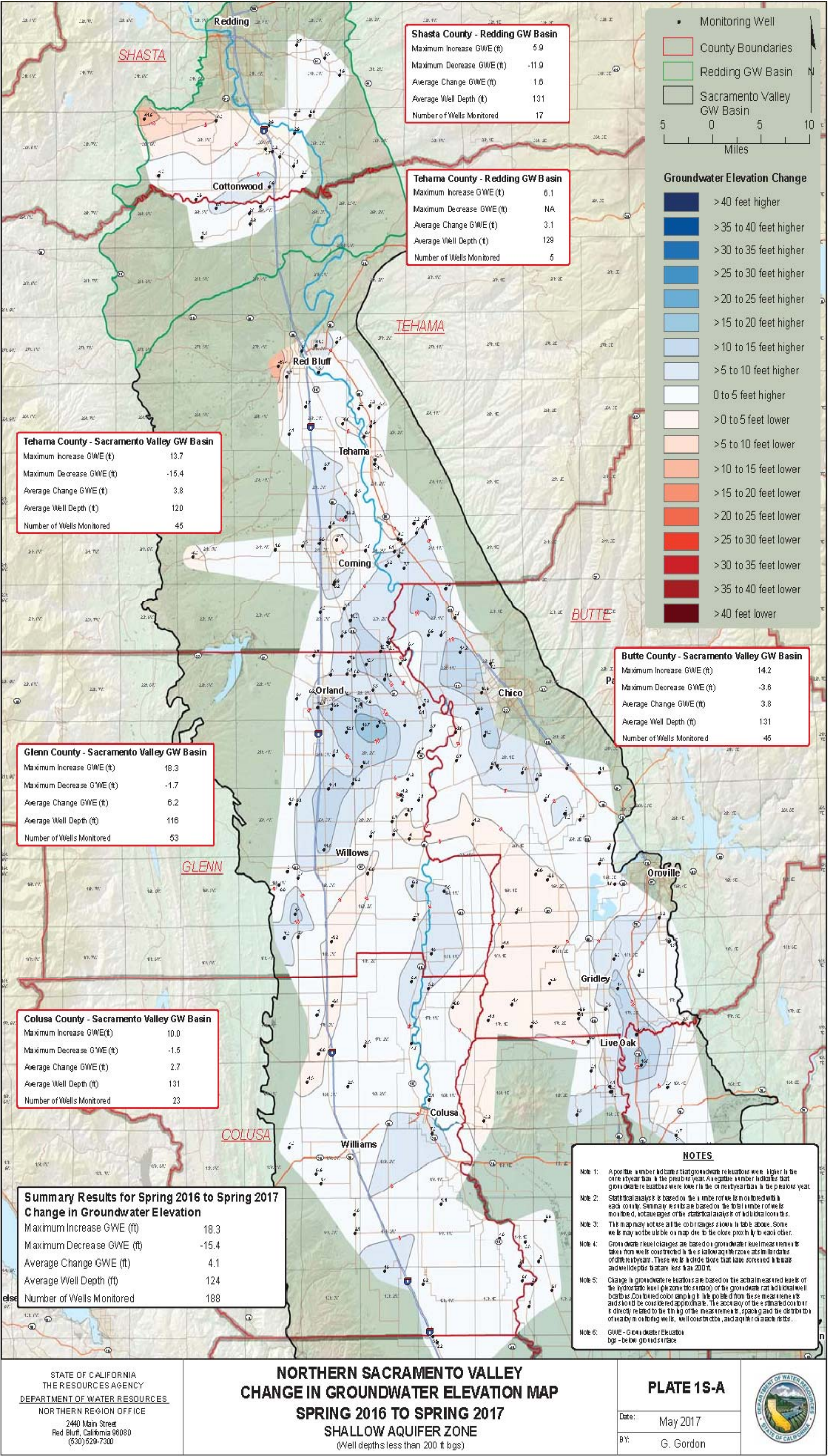
1. Spring 2017 groundwater elevation in shallow (<200 feet bgs), intermediate (200-600 feet bgs), and deep (>600 feet bgs) wells. These figures were retrieved from DWR's Groundwater Information Center (http://www.water.ca.gov/groundwater/maps_and_reports/northern_region/GroundwaterLevel/gw_level_monitoring.cfm)
2. Spring 2016 to Spring 2017 change in groundwater elevation in shallow (<200 feet bgs), intermediate (200-600 feet bgs), and deep (>600 feet bgs) wells. These figures were retrieved from DWR's Groundwater Information Center (http://www.water.ca.gov/groundwater/maps_and_reports/northern_region/GroundwaterLevel/gw_level_monitoring.cfm)
3. Spring 2004 to Spring 2016 change in groundwater elevation in shallow aquifer zone (<200 feet bgs). These figures were retrieved from DWR's Groundwater Information Center (http://www.water.ca.gov/groundwater/maps_and_reports/northern_region/GroundwaterLevel/gw_level_monitoring.cfm)
4. Groundwater monitoring data for wells within Corning Groundwater Sub-basin. DWR's Water Data Library website and was used to obtain the monitoring data. The process to query out the groundwater level data is explained below. A map is included depicting the locations of the groundwater monitoring wells within Corning Groundwater Sub-basin.

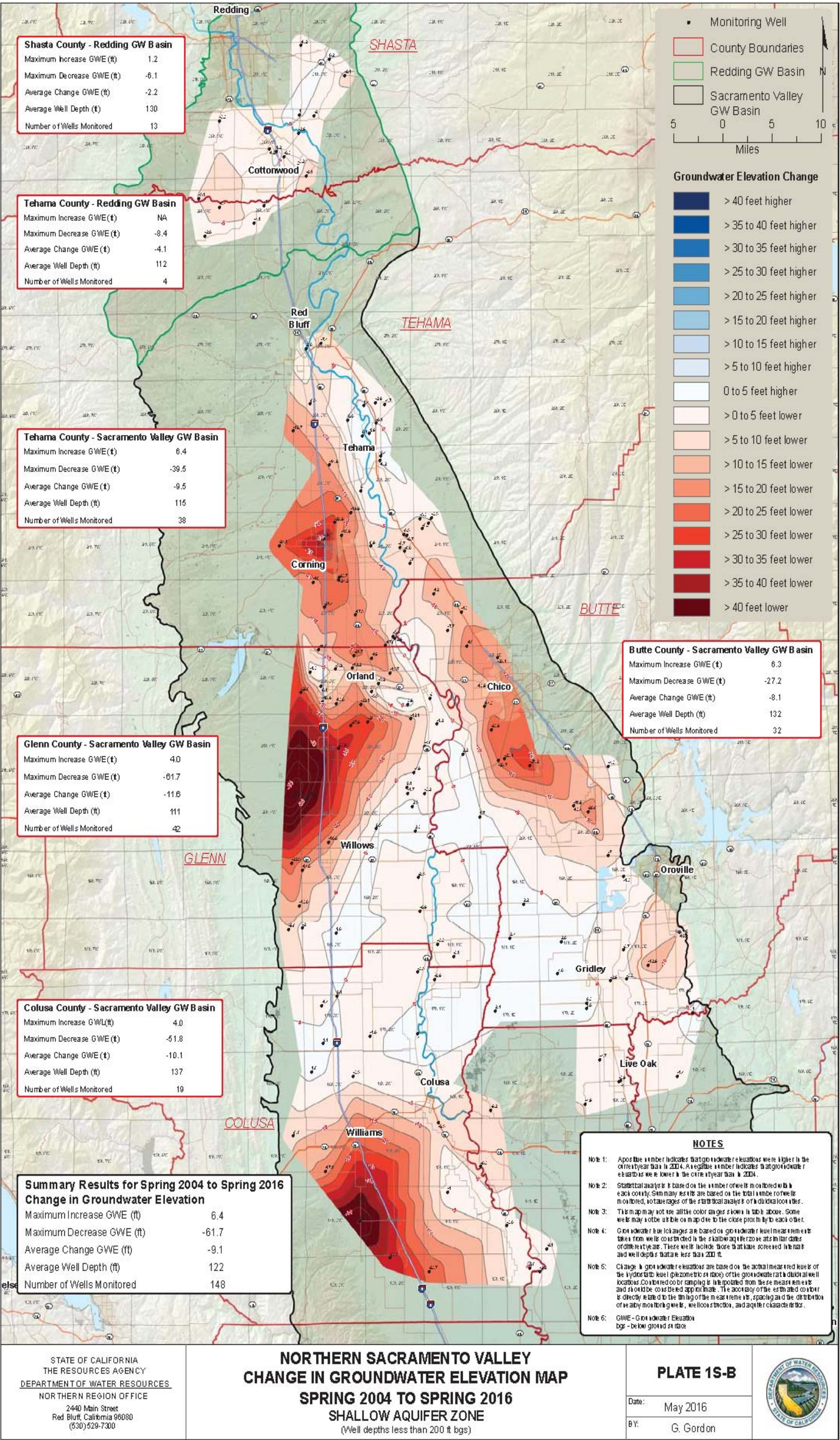
Direction to manually lookup groundwater level data from DWR's Data Water Library:

1. Go to Water Data Library website:
<http://www.water.ca.gov/waterdatalibrary/index.cfm>
2. Select Groundwater Level Data on the left side Panel> Data by Groundwater Basin
3. Select Hydrologic Region> Groundwater Basin> Township
4. Select State Well Number>Submit

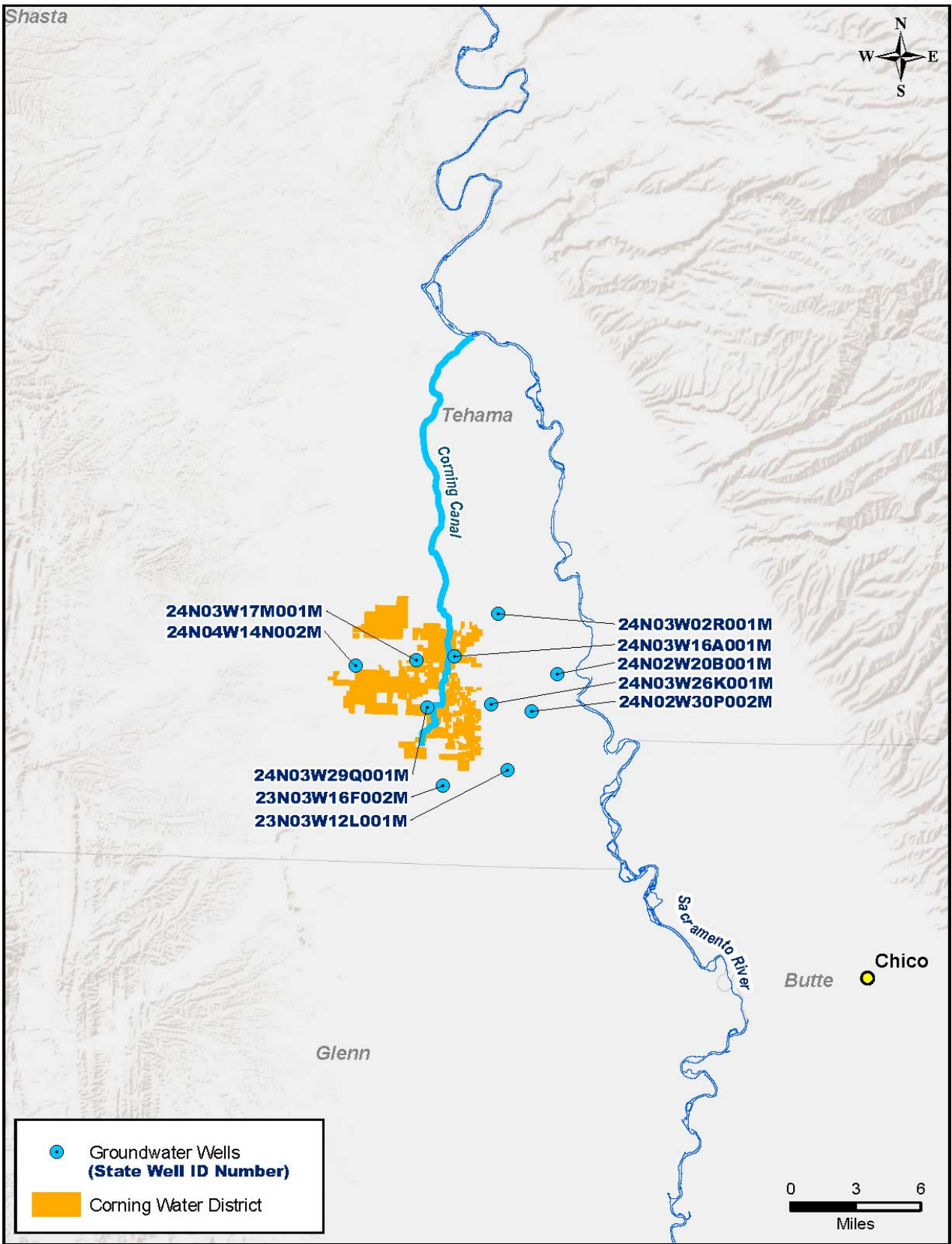
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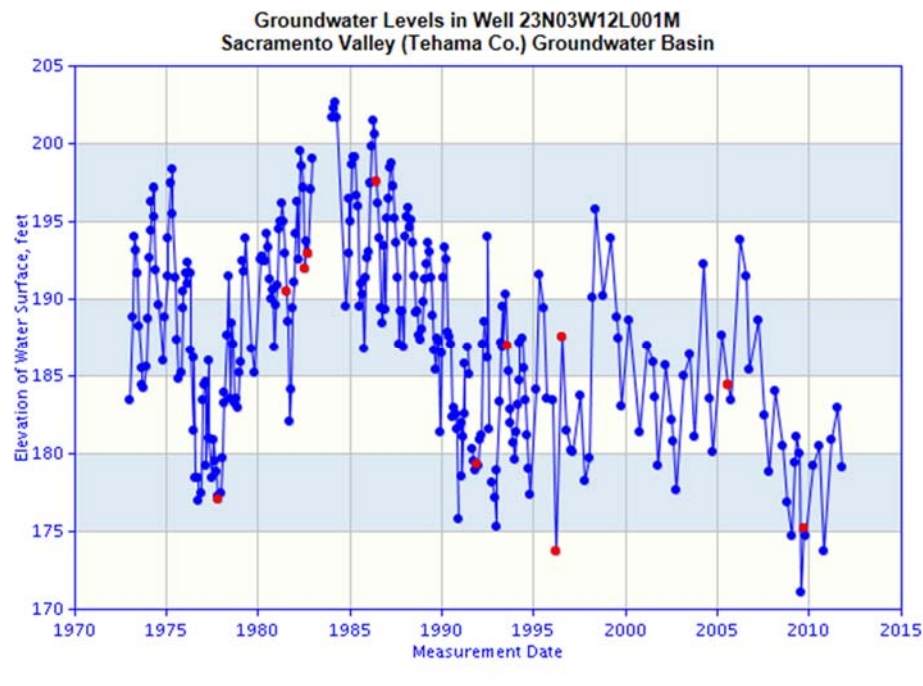




Source: http://www.water.ca.gov/groundwater/data_and_monitoring/northern_region/GroundwaterLevelGw_level_monitoring.cfm

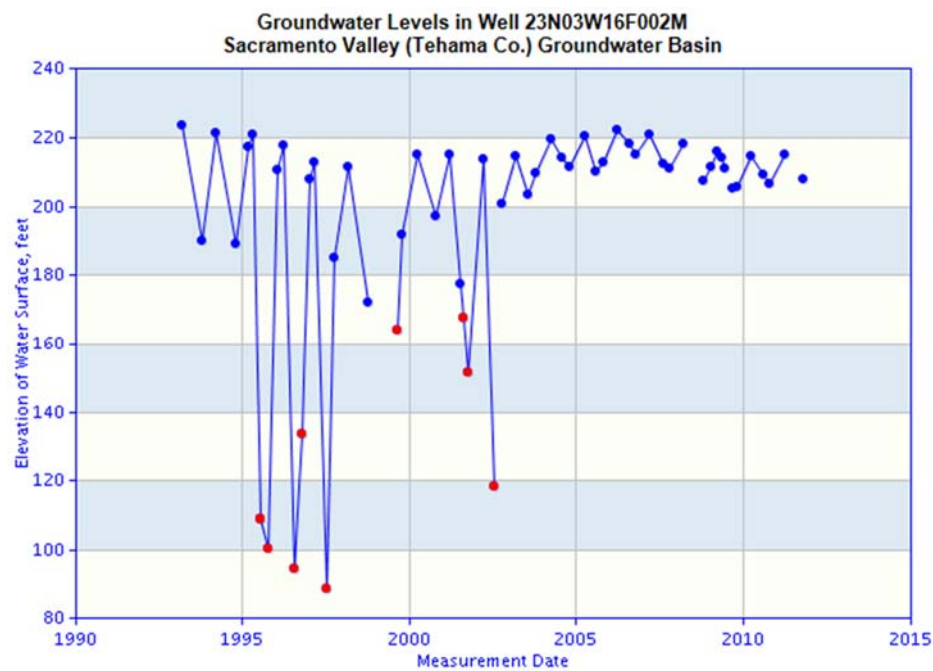


Corning Groundwater Sub-basin
State Well ID 23N03W12L001M



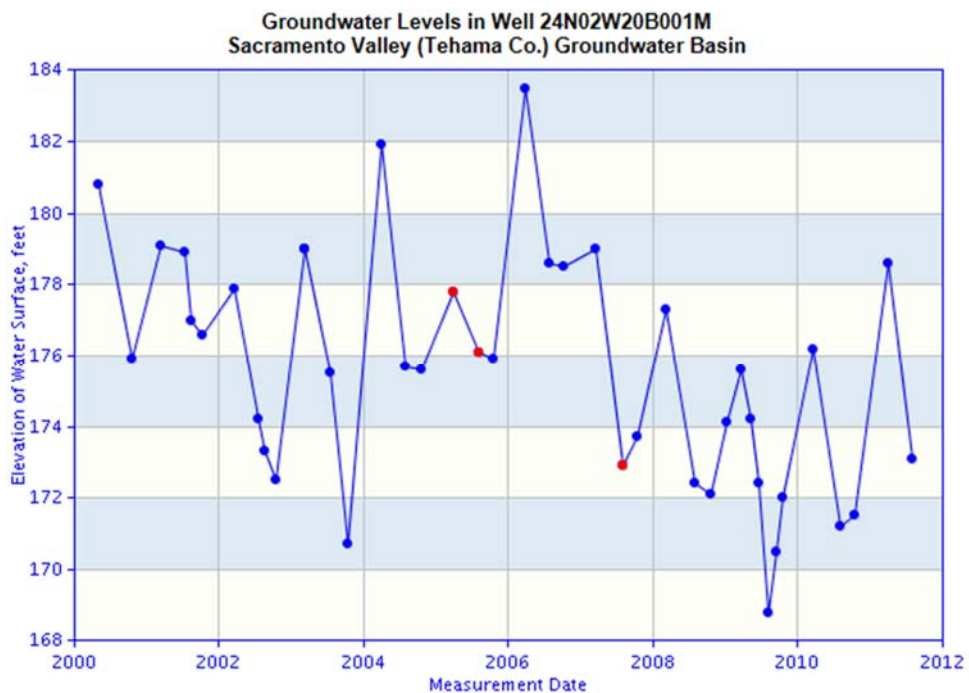
Source: DWR's Water Data Library.

State Well ID 23N03W16F002M



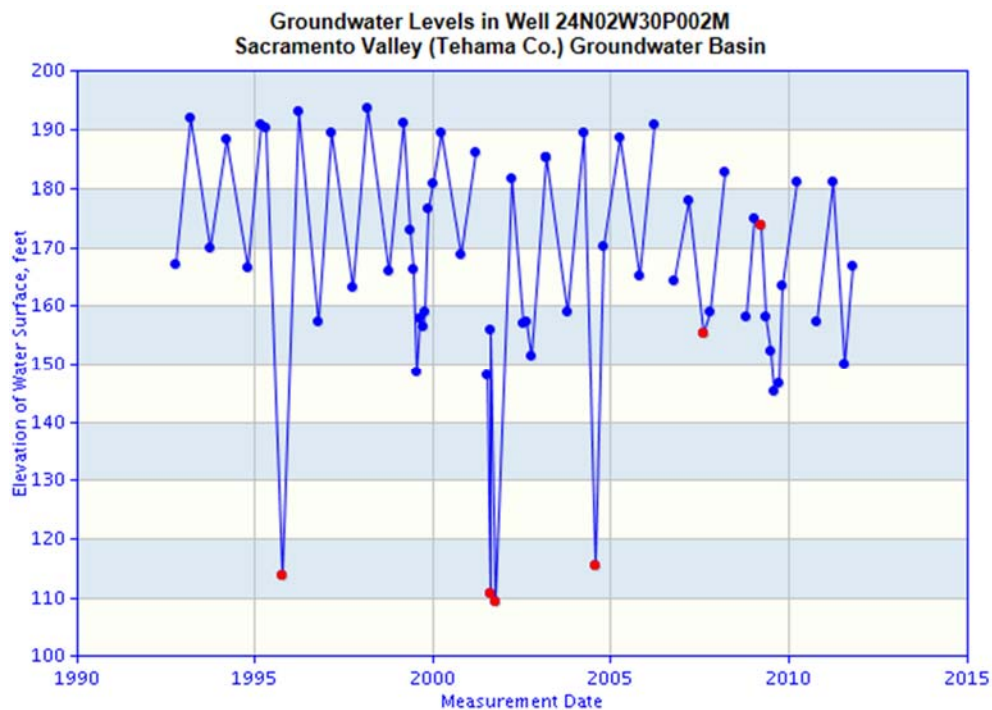
Source: DWR's Water Data Library

State Well ID 24N02W20B001M



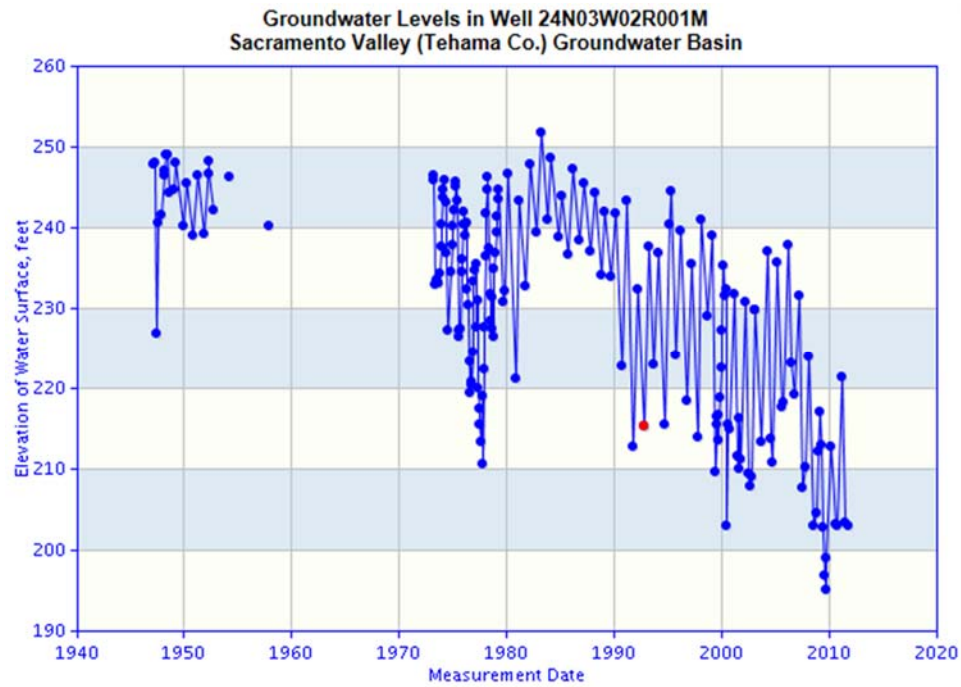
Source: DWR's Water Data Library.

State Well ID 24N02W30P002M



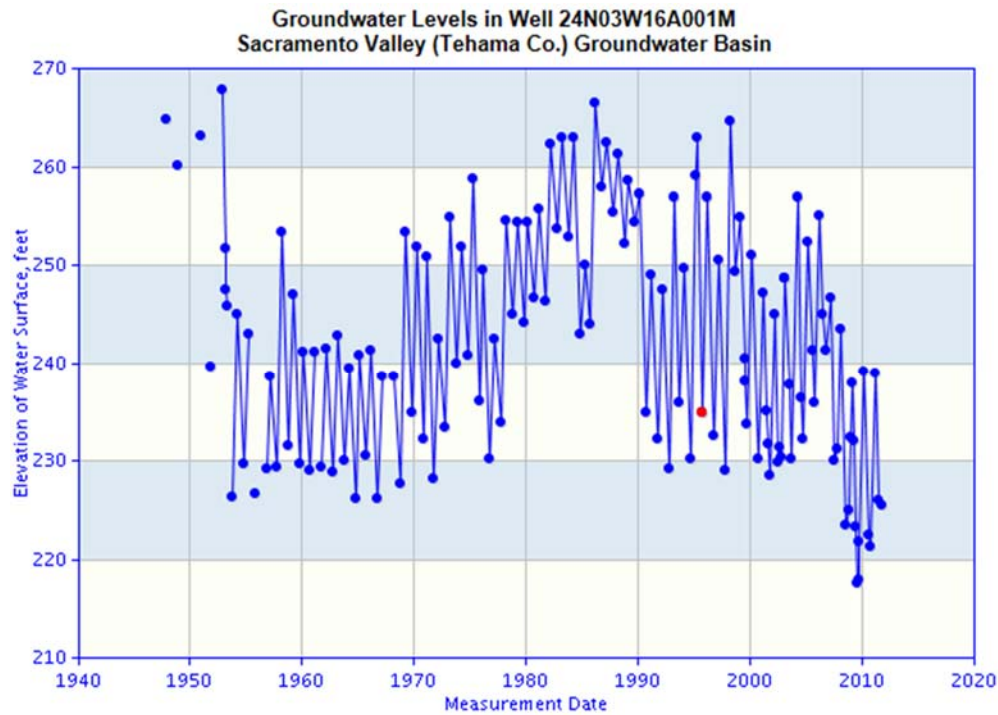
Source: DWR's Water Data Library.

State Well ID 24N03W02R001M



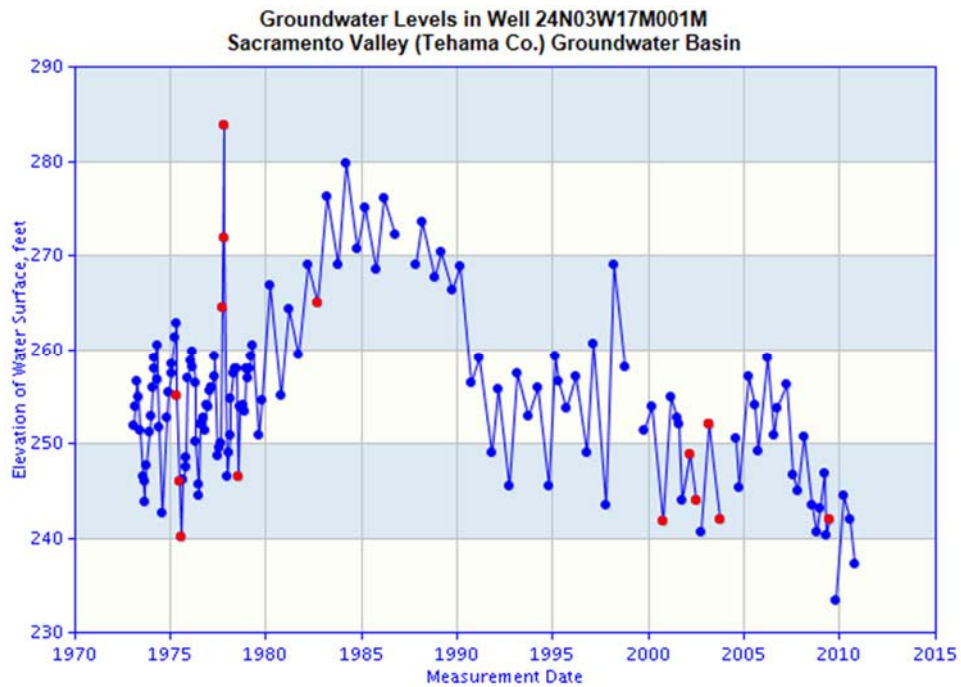
Source: DWR's Water Data Library.

State Well ID 24N03W16A001M



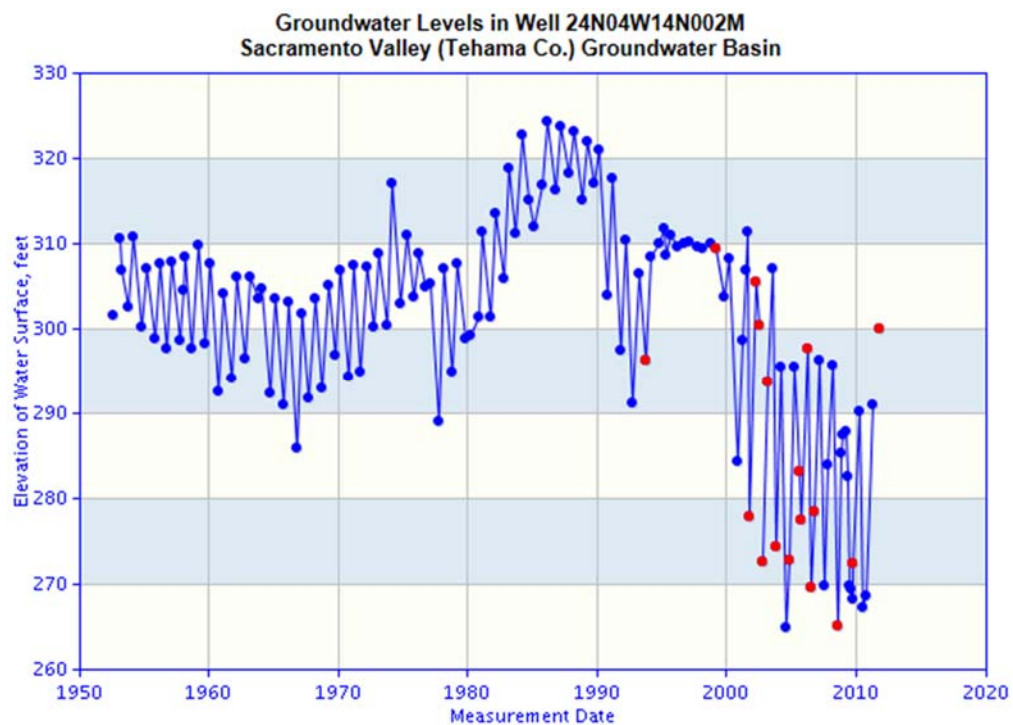
Source: DWR's Water Data Library.

State Well ID 24N03W17M001M



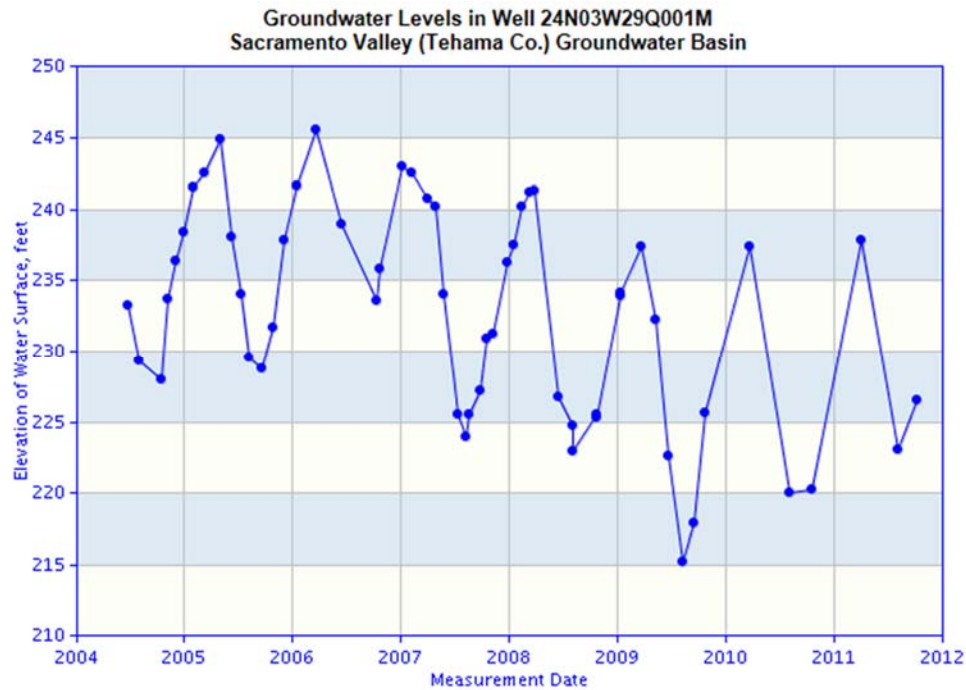
Source: DWR's Water Data Library.

State Well ID 24N04W14N002M



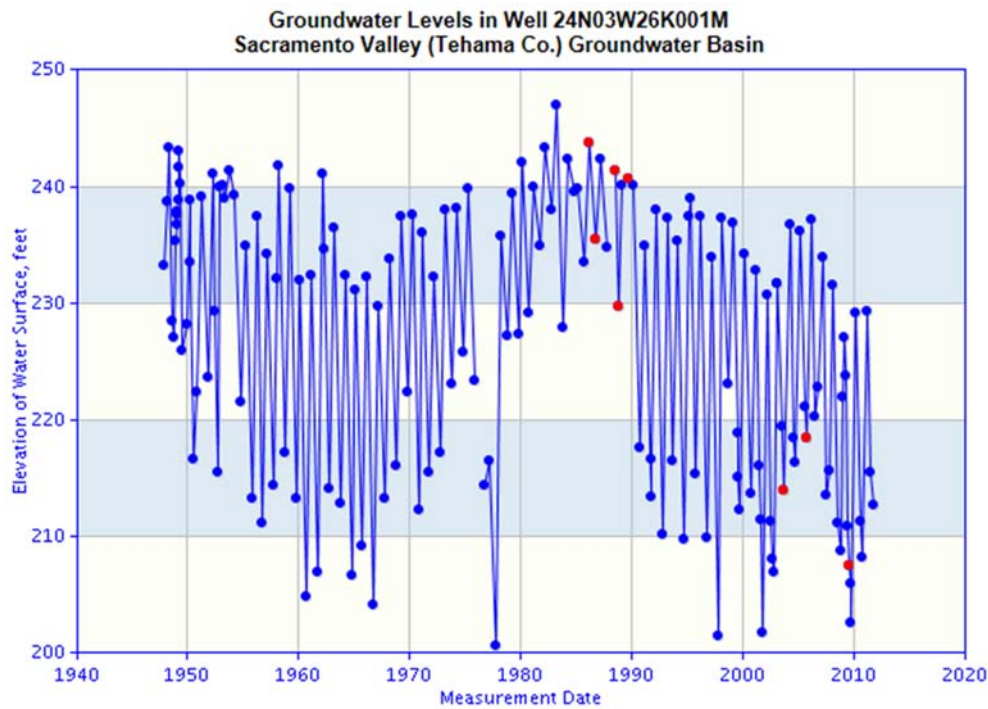
Source: DWR's Water Data Library.

State Well ID 24N03W29Q001M



Source: DWR's Water Data Library

State Well 24N03W26K001M



Appendix D

Detailed Groundwater Pumping Emissions Calculations

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Groundwater Pumping Emissions

Pumping Volume

300 acre-feet/project
2,500 gallons per minute (estimated)

Engine Size 200 hp (estimated)
Operation 652 hours per project
1 years of project
60 days per year
11 hours per day (assumes 100% water transferred in one year with multiple engines)

Table B-13. Unmitigated Estimated Emissions from Diesel Pump

Pollutant	Emission Factor	Emissions			Threshold	Significant?
	(g/hp-hr)	(lbs/day)	(ton/project)	(tpy)	(lbs/day)	
VOC	0.2	1	0	0.0	25	no
NOx	4.7	23	1	0.7	25	no
CO	2.6	12	0	0.4	n/a	n/a
SOx	0.93	4	0	0.1	n/a	n/a
PM10	0.15	1	0	0.0	80	no
PM2.5	0.15	1	0	0.0	n/a	n/a

Table B-14. Mitigated Estimated Emissions from Diesel Pump

Pollutant	Emission Factor	Emissions			Threshold	Significant?
	(g/hp-hr)	(lbs/day)	(ton/project)	(tpy)	(lbs/day)	
VOC	0.14	1	0	0.0	25	no
NOx	0.30	1	0	0.0	25	no
CO	2.61	13	0	0.4	n/a	n/a
SOx	0.93	4	0	0.1	n/a	n/a
PM10	0.01	0	0	0.0	80	no
PM2.5	0.01	0	0	0.0	n/a	n/a

Mitigated Hours of Operation

11 hours per day

Conversions

453.6 grams per pound
2,000 pounds per ton
325,851 gallons per acre-foot
60 minutes per hour

http://www.water.ca.gov/pubs/dwrnews/california_water_facts_card/waterfactscard.pdf