


**BUTTE WATER DISTRICT**

# TEMPORARY WATER TRANSFERS FROM 2026 TO 2030

# ENVIRONMENTAL IMPACT REPORT

## GRIDLEY, CALIFORNIA
## FEBRUARY 2026

**PREPARED FOR:**
**Butte Water District**
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# ACRONYMS & ABBREVIATIONS

AB ---------- Assembly Bill
AF ---------- acre feet
AFY ---------- acre feet per year
APCD ---------- air pollution control district
AQMD ---------- air quality management district
BCAQMD ---------- Butte County Air Quality Management District
BMP ---------- Best Management Practices
BWD ---------- Butte Water District
C&D ---------- construction & demolition
CAA ---------- Clean Air Act
CAAQS ---------- California Ambient Air Quality Standard
CAFE ---------- Corporate Average Fuel Economy
CalEEMod ---------- California Emissions Estimator Modeling (software)
CalFIRE ---------- California Department of Forestry and Fire
Caltrans ---------- California Department of Transportation
CARB ---------- California Air Resources Board
CCAA ---------- California Clean Air Act
CCR ---------- California Code of Regulations
CDFW ---------- California Fish and Wildlife
CEQA ---------- California Environmental Quality Act
CERCLA ---------- Comprehensive Environmental Response, Compensation, and Liability Act
CESA ---------- California Endangered Species Act
CFS ---------- cubic feet per second
$CH_4$ ---------- Methane
CNDDB ---------- California Natural Diversity Database
CNPS ---------- California Native Plant Society
CO ---------- Carbone Monoxide
$CO_2$ ---------- Carbon dioxide
$CO_2e$ ---------- Carbon dioxide-equivalents
Cortese List ---------- Hazardous Waste and Substances Sites List
CRHR ---------- California Register of Historical Resources
CRP ---------- Conservation Reserve Program
CVP ---------- Central Valley Project
CVRWQCB ---------- Central Valley Regional Water Quality Control Board
CWA ---------- Clean Water Act
DDT ---------- Dichlorodiphenyltrichloroethane
DEIR ---------- Draft Environmental Impact Report
DOC ---------- Department of Conservation
DTSC ---------- Department of Toxic Substances Control
DWR ---------- Department of Water Resources
EIR ---------- Environmental Impact Report
EO ---------- Executive Order
EPCRA ---------- Emergency Planning Community Right-to-Know Act
ESA ---------- Endangered Species Act
ETAW ---------- Evapotranspiration Rate of Applied Water
FEIR ---------- Final Environmental Impact Report
FEMA ---------- Federal Emergency Management Agency
FIRM ---------- Flood Insurance Rate Maps

FMMP ---------- Farmland Mapping and Monitoring Program
FRAQMD ---------- Feather River Air Quality Management District
FSA ---------- Farm Service Agency
GHG ---------- Greenhouse Gas
GIS ---------- Geographic Information System
GPM ---------- gallons per minute
GSA ---------- Groundwater Sustainability Agency
GSP ---------- Groundwater Sustainability Plan
GWP ---------- Global Warming Potential
HCP ---------- Habitat Conservation Plan
HVA ---------- High Vulnerability Areas
IPaC ---------- U.S. Fish and Wildlife Service's Information for Planning and Consultation system
IS ---------- Initial Study
IS/MND ---------- Initial Study/Mitigated Negative Declaration
km ---------- kilometers
LHMP ---------- Local Hazard Mitigation Plan
LUCI ---------- Land Use and Climate Innovation
MBTA ---------- Migratory Bird Act
MCL ---------- Maximum Contaminant Level
MLD ---------- Most Likely Descendant
MND ---------- Mitigated Negative Declaration
MOU ---------- Memorandum of Understanding
mpg ---------- miles per gallon
$MTCO_2e$ ---------- Metric Tons of Carbon Dioxide Equivalent
NAAQS ---------- National Ambient Air Quality Standards
NAHC ---------- Native American Heritage Commission
NCCP ---------- Natural Community Conservation Plan
ND ---------- Negative Declaration
NEIC ---------- Northeast Information Center
NEPA ---------- National Environmental Policy Act
NHPA ---------- National Historic Preservation Act
$NO_2$ ---------- Nitrogen dioxide
NOP ---------- Notice of Preparation
NOx ---------- Oxides of nitrogen
NPDES ---------- National Pollutant Discharge Elimination System
NRCS ---------- Natural Resources Conservation Service
NRHP ---------- National Register of Historic Places
$O_3$ ---------- Ozone
OES ---------- Office of Emergency Services
OSHA ---------- Occupational Safety and Health Administration
O&M ---------- Operations & Maintenance
Pb ---------- Lead
PCB ---------- Polychlorinated biphenyls
PFC ---------- Perfluorocarbons
PG&E ---------- Pacific Gas & Electric
$PM_{10}$ ---------- particulate matter 10 microns in size
$PM_{2.5}$ ---------- particulate matter 2.5 microns in size
ppb ---------- parts per billion
ppm ---------- parts per million
PRC ---------- Public Resources Code

Project ---------- Temporary Water Transfers from 2026 to 2030 Project
RCRA ---------- Resource Conservation and Recovery Act
Reclamation ---------- United States Bureau of Reclamation
RMA ---------- Risk Management Agency
ROG ---------- Reactive Organic Gases
RWQCB ---------- Regional Water Quality Control Board
SARA ---------- Superfund Amendments and Reauthorization Act
SCH ---------- State Clearinghouse
SDF ---------- streamflow depletion factor
SDS ---------- Safety Data Sheets
SDWA ---------- Safe Drinking Water Act
SGMA ---------- Sustainable Groundwater Management Act
SHMP ---------- State Hazard Mitigation Plan
SHPO ---------- State Historic Preservation Officer
SIP ---------- State Implementation Plan
$SO_2$ ---------- Sulfur Dioxide
SVAB ---------- Sacramento Valley Air Basin
SWP ---------- State Water Project
SWRCB ---------- State Water Resources Control Board
TDS ---------- total dissolved solids
TMDL ---------- Total Maximum Daily Loads
TSCA ---------- Toxic Substances Control Act
USACE ---------- United States Army Corps of Engineers
USBR ---------- United States Bureau of Reclamation
USC ---------- United States Code
USEPA ---------- United States Environmental Protection Agency
USFWS ---------- United States Fish and Wildlife Service
USC ---------- United States Code
USDA ---------- United States Department of Agriculture
USFA ---------- United States Fire Administration
USGS ---------- United States Geological Survey
UST ---------- underground storage tank
µg/m3 ---------- micrograms per cubic meter
Valley Water ---------- Santa Clara Valley Water District
WEAP ---------- Worker Environmental Awareness Program

# EXECUTIVE SUMMARY

## INTRODUCTION

The Butte Water District (BWD or District) has prepared this Draft Environmental Impact Report (DEIR) for the proposed Temporary Water Transfers from 2026 to 2030 Project (Project) in compliance with the California Environmental Quality Act (CEQA).

## PROJECT DESCRIPTION SUMMARY

The DEIR has been prepared to examine the potential environmental impacts of BWD's temporary water transfers from 2026 to 2030. The following is a summary of the full project description that can be found in Chapter 2 of the DEIR.

The District is preparing for potential one-year water transfers over a five-year period from 2026 through 2030. The transfers may be for environmental enhancement or for one or more buyers with temporary unmet consumptive water demands. Santa Clara Valley Water District (Valley Water) would have the first right of refusal for the water transfers from BWD. The Project water transfers would include short-term transfers of up to 24,000 AF in any year. This includes up to 14,000 acre feet (AF) from crop idling transfers and up to of 10,000 AF from groundwater substitution transfers. The EIR analyzes water transfers as if the full amount would be transferred every year during the five-year transfer period; however, transfers may be less frequent and smaller in volume over this period.

Water transfers must comply with all applicable State and federal laws. Moreover, under the 1969 Diversion of Water Agreement with the State of California, BWD's water entitlement is subject to a drought reduction under certain circumstances related to dry hydrologic conditions. If BWD's entitlement is curtailed 50 percent for an irrigation season, pursuant to the 1969 Agreement, BWD has not historically participated in a land idling transfer. However, in the event of a lesser reduction, the District may still participate in a land idling transfer. BWD may participate in a groundwater substitution transfer for its lands located in Sutter County under any drought reduction scenario. Annual approval of transfers is required by BWD, the end user, and Department of Water Resources (DWR), regardless of the EIR term or the duration of a water transfer contract.

Land idled for the purpose of the potential transfers would primarily be drawn from the rice acreage within the District. However, those crops suitable for idling as laid out in Table 2-1 of DWR's *DRAFT Technical Information for Preparing Water Transfer Proposals in 2019* within the District would also have the potential to be idled for the sake of transfers.[1] Crop idling acreages for transfers would be to the exclusion of habitat of the giant garter snake. Adjoining areas, non-rice land, other irrigated lands, drains, wetlands, and waterfowl habitat would not be affected. Water would be available on the same pattern during the growing season as it would have been consumed had a crop been planted. For the groundwater substitution transfers, the Project would extract up to 10,000 AF of groundwater from two BWD production wells.

No new construction or improvements by BWD, Valley Water or other potential buyers, or DWR would be necessary for the production and transfer of water resulting from the Project. However, a third production well could be installed during the five-year Project duration and would likely be used for Project activities if completed.

[1] (Department of Water Resources, 2019)

## PROJECT OBJECTIVES

The temporary water transfers project is intended to accomplish the following objectives:

- Meet the need of willing buyers for a water supply that is immediately implementable and flexible and can respond to hydrologic conditions, climate variability, watershed use, and regulatory requirements that affect water supply availability;
- Continue to support the existing level of water supply reliability throughout the state provided by the supplemental water for contractors of the Central Valley Project (CVP) and the State Water Project (SWP), for instream use, water supply reliability, and to other potential transferees consistent with the 1969 Agreement on Diversion of Water from the Feather River;
- Develop supplemental water supply for willing buyers from a willing seller during periods of water shortages where there is a gap between available supplies and existing demand, including demand for instream use and water supply reliability such as enhancing carryover storage; and
- Continue to generate non-rate revenue to support BWD's operations and various projects and programs needed to be able to continue to serve its customers with reliable and affordable water.

## PROJECT ALTERNATIVES SUMMARY

Alternatives have been created to provide decision makers with a reasonable range of options to consider. Analyzing these options helps demonstrate to decision makers and the general public the effects of pursuing water transfers over the course of five years, from 2026 to 2030. A summary of each alternative is provided below.

### ALTERNATIVE 1: NO PROJECT.

Under the No Project Alternative, BWD would continue normal operations within the existing water supply framework, under the terms of the 1969 Agreement on Diversion of Water from the Feather River and the 1970 Joint Operating Agreement, and no transfer of conserved water would occur. Individual growers may still choose to fallow land and reduce the surface water demands within BWD in certain years, resulting in reduced water orders within BWD.

### ALTERNATIVE 2: FULL RANGE OF TRANSFERS.

Alternative 2 would involve the potential transfers outlined in the Project Description and identified as the "Project", between BWD and Valley Water, or other willing buyers if Valley Water does not elect to receive transfer supplies. Water would be made available for transfer through cropland shifting/idling, groundwater substitution, or a combination of both. The upper limit of transfers would be 24,000 AF in any year, including up to 14,000 AF from crop idling and up to 10,000 AF from groundwater substitution.

### ALTERNATIVE 3: CROPLAND IDLING ALTERNATIVE.

Alternative 3 would include making water available for transfer between BWD and Valley Water, or other willing buyers if Valley Water does not elect to receive transfer supplies, only through cropland idling or crop shifting. It would not include any groundwater substitution pumping as a method of making water available for transfer. Land idled for the purpose of the potential transfers would primarily be drawn from the rice acreage within the District. However, those crops suitable for idling as laid out in Table 2-1 of DWR's *DRAFT Technical Information for Preparing Water Transfer Proposals in 2019* within the District would also

have the potential to be idled for the sake of transfers. The upper limit of water made available for transfer, through cropland idling, in any one year is 14,000 AF.

### ALTERNATIVE 4: GROUNDWATER SUBSTITUTION TRANSFER.

Alternative 4 would include making water available for transfer between BWD and Valley Water, or other willing buyers if Valley Water does not elect to receive transfer supplies, only through groundwater substitution pumping. It would not include any cropland idling or crop shifting as methods of making water available for transfer. BWD would make water available for transfer by utilizing groundwater, in compliance with County Ordinance and GSA policies, in-lieu of surface water. The upper limit of water made available for transfer, through groundwater substitution pumping, in any one year is 10,000 AF.

### ALTERNATIVE 5: REDUCED CROPLAND IDLING.

Alternative 5 would involve transfers from both cropland idling and groundwater substitution pumping; however, the available AF for transfer from idling would be reduced by 50% from the upper limit of 14,000 AF annually as discussed in the Project Description to 7,000 AF. Groundwater substitution transfers would comprise up to 10,000 AF of water available for transfer in any one year.

### ALTERNATIVE 6: REDUCED GROUNDWATER SUBSTITUTION.

Alternative 6 would involve transfers from both cropland idling and groundwater substitution; however, the available AF for transfer from groundwater substitution would be reduced by 50% from the upper limit of 10,000 AF annually as discussed in the Project Description to 5,000 AF. Cropland idling transfers would comprise up to 14,000 AF of water available for transfer in any one year.

## AREAS OF KNOWN CONTROVERSY

In accordance with CEQA Guidelines Section 15082, BWD circulated a Notice of Preparation (NOP) of a DEIR for the proposed Temporary Water Transfers from 2026 to 2030 Project on August 28, 2025, to trustee and responsible agencies, the State Clearinghouse (SCH), and the public. The 30-day public review period for the NOP ended on September 29, 2025. A scoping meeting was held on September 17, 2025. The scoping meeting was held publicly at the Butte Water District office and was not attended by any public participants. There were no issues of concern raised at the scoping meeting as it pertained to the NOP.

## GROWTH INDUCEMENT

CEQA Guidelines Section 15126.2(e) states: “A project is identified as growth-inducing if it “would foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment.” The Project would not induce growth as it would not foster economic or population growth or the construction of additional housing, either directly or indirectly. The Project involves transferring water using existing conveyance infrastructure and a new well.

## UNAVOIDABLE SIGNIFICANT IMPACTS

There were no significant and unavoidable impacts identified for the Project for which additional proposed mitigation measures could not reduce impacts to a less than significant level.

## SUMMARY OF ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Table ES-1 summarizes the identified environmental impacts of the Project, the required mitigation measures, and residual impacts or significance after mitigation. Impacts are defined as:

- *Significant, unavoidable adverse impacts that require a statement of overriding consideration, pursuant to Section 15093 of the CEQA Guidelines if the proposed Project is approved;*
- *Significant, adverse impacts that can be feasibly mitigated to less than significant levels and that require findings to be made under Section 15091 of the CEQA Guidelines;*
- *Adverse impacts that are less than those allowed by adopted significance thresholds; and*
- *No impact.*

## CUMULATIVE IMPACTS

Pursuant to CEQA Guidelines Section 15130, the Project is required to include a discussion regarding potential cumulative impacts. The analysis of cumulative impacts within this EIR includes the impacts of the Project plus all other pending or approved projects within the affected area or with potential effects to the area for each applicable resource. Not all of these projects or programs will be relevant to every individual resource area as the geographic scope of each resource area's cumulative analysis may differ. In addition, the EIR found impacts to not be cumulatively considerable in terms of significance after mitigation is incorporated, where applicable. The other projects or programs taken into account, which are discussed in greater detail in Chapter 3, include:

- *Other SWP and CVP Water Supply Transfers;*
- *Long-Term Water Transfers EIS/EIR;*
- *2026-2027 North to South Water Transfers;*
- *Lower Yuba River Accord;*
- *Healthy Rivers and Landscapes Program;*
- *CVP Municipal and Industrial Water Shortage Policy; and*
- *Butte Water District Lateral Heading and Turnout Measurement Modernization Project.*

Table ES-1: Summary of Environmental Impacts, Mitigation Measures and Residual Impacts

| Impact | Level of Significance Before Mitigation | Mitigation Measures | Level of Significance After Mitigation Measures |
|---|---|---|---|
| **AESTHETICS** | | | |
| Threshold 1: Have substantial adverse effect on a scenic vista? | No Impact | None | No Impact |
| Threshold 2: Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? | No Impact | None | No Impact |
| Threshold 3: In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality? | No Impact | None | No Impact |
| Threshold 4: Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? | No Impact | None | No Impact |
| **AGRICULTURAL AND FORESTRY RESOURCES** | | | |
| Threshold 1: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and | Less than Significant Impact | None | Less than Significant Impact |

| Impact | Level of Significance Before Mitigation | Mitigation Measures | Level of Significance After Mitigation Measures |
|---|---|---|---|
| Monitoring Program of the California Resources Agency, to non-agricultural use? | | | |
| Threshold 2: Conflict with existing zoning for agricultural use, or a Williamson Act contract? | Less than Significant Impact | None | Less than Significant Impact |
| Threshold 3: 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))? | No Impact | None | No Impact |
| Threshold 4: Result in the loss of forest land or conversion of forest land to non-forest use? | No Impact | None | No Impact |
| Threshold 5: Involve other changes in the existing environment which, due to the DEIR location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use? | Less than Significant Impact | None | Less than Significant Impact |
| **AIR QUALITY** | | | |
| Threshold 1: Would the project conflict with or obstruct implementation of the applicable air quality plan? | No Impact | None | No Impact |
| Threshold 2: Would the project result in a cumulatively considerable net increase of any | Less than Significant Impact | None | Less than Significant Impact |

| Impact | Level of Significance Before Mitigation | Mitigation Measures | Level of Significance After Mitigation Measures |
|---|---|---|---|
| criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard? | | | |
| Threshold 3: Would the project expose sensitive receptors to substantial pollutant concentrations? | No Impact | None | No Impact |
| Threshold 4: Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people? | Less than Significant Impact | None | Less than Significant Impact |
| **BIOLOGICAL RESOURCES** | | | |
| Threshold 1: Would the project 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? | Potentially Significant Impact | BIO-1 – BIO-14 | Less than Significant Impact |
| Threshold 2: Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? | Less than Significant Impact | None | Less than Significant Impact |
| Threshold 3: Would the project have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean | Less than Significant Impact | None | Less than Significant Impact |

| Impact | Level of Significance Before Mitigation | Mitigation Measures | Level of Significance After Mitigation Measures |
|---|---|---|---|
| Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? | | | |
| Threshold 4: Would the project 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? | No Impact | None | No Impact |
| Threshold 5: Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? | Less than Significant Impact | None | Less than Significant Impact |
| Threshold 6: Would the project conflict with provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? | Less than Significant Impact | None | Less than Significant Impact |
| **CULTURAL RESOURCES** | | | |
| Threshold 1: Would the project cause a substantial adverse change in the significance of a historical resource pursuant to in Section 15064.5? | Less than Significant Impact | None | Less than Significant Impact |
| Threshold 2: Would the project cause a substantial adverse change in the significance of | Less than Significant Impact | None | Less than Significant Impact |

| Impact | Level of Significance Before Mitigation | Mitigation Measures | Level of Significance After Mitigation Measures |
|---|---|---|---|
| an archaeological resource pursuant to Section 15064.5? | | | |
| Threshold 3: Would the project disturb any human remains, including those interred outside of dedicated cemeteries? | Less than Significant Impact | None | Less than Significant Impact |
| **ENERGY** | | | |
| Threshold 1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? | Less than Significant Impact | None | Less than Significant Impact |
| Threshold 2: Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? | No Impact | None | No Impact |
| **GEOLOGY AND SOILS** | | | |
| Threshold 1: Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving 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. | No Impact | None | No Impact |
| Threshold 2: Would the project directly or indirectly cause potential substantial adverse | No Impact | None | No Impact |

| Impact | Level of Significance Before Mitigation | Mitigation Measures | Level of Significance After Mitigation Measures |
|---|---|---|---|
| effects, including the risk of loss, injury, or death involving strong seismic ground shaking? | | | |
| Threshold 3: Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction? | No Impact | None | No Impact |
| Threshold 4: Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides? | No Impact | None | No Impact |
| Threshold 5: Would the project result in substantial soil erosion or the loss of topsoil? | Less than Significant Impact | None | Less than Significant Impact |
| Threshold 6: Would the project 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? | Less than Significant Impact | None | Less than Significant Impact |
| Threshold 7: Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property? | No Impact | None | No Impact |

| Impact | Level of Significance Before Mitigation | Mitigation Measures | Level of Significance After Mitigation Measures |
|---|---|---|---|
| Threshold 8: Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater? | No Impact | None | No Impact |
| Threshold 9: Would the project directly or indirectly destroy a unique paleontological resource or site or unique geological feature? | No Impact | None | No Impact |
| **GREENHOUSE GAS EMISSIONS** | | | |
| Threshold 1: Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? | Less than Significant Impact | None | Less than Significant Impact |
| Threshold 2: Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? | No Impact | None | No Impact |
| **HAZARDS AND HAZARDOUS MATERIALS** | | | |
| Threshold 1: Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? | Less than Significant Impact | None | Less than Significant Impact |
| Threshold 2: Would the project create a significant hazard to the public or the environment through reasonably foreseeable | Less than Significant Impact | None | Less than Significant Impact |

| Impact | Level of Significance Before Mitigation | Mitigation Measures | Level of Significance After Mitigation Measures |
|---|---|---|---|
| upset and accident conditions involving the release of hazardous materials into the environment? | | | |
| Threshold 3: Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? | No Impact | None | No Impact |
| Threshold 4: Would the project 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? | No Impact | None | No Impact |
| Threshold 5: 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 or excessive noise for people residing or working in the project area? | No Impact | None | No Impact |
| Threshold 6: Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? | No Impact | None | No Impact |

| Impact | Level of Significance Before Mitigation | Mitigation Measures | Level of Significance After Mitigation Measures |
|---|---|---|---|
| Threshold 7: Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires? | No Impact | None | No Impact |
| **HYDROLOGY AND WATER QUALITY** | | | |
| Threshold 1: Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality? | Potentially Significant Impact | **HYD-1** and **HYD-2** | Less than Significant Impact |
| Threshold 2: Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? | Potentially Significant Impact | **HYD-1** and **HYD-2** | Less than Significant Impact |
| Threshold 3: Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:<br>• result in substantial erosion or siltation on- or off-site;<br>• substantially increase the rate or amount of surface runoff in a | Less than Significant Impact | None | Less than Significant Impact |

| Impact | Level of Significance Before Mitigation | Mitigation Measures | Level of Significance After Mitigation Measures |
|---|---|---|---|
| manner which would result in flooding on- or off-site;<br><br>• create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or<br><br>• impede or redirect flood flows? | | | |
| Threshold 4: Would the project in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundations? | No Impact | None | No Impact |
| Threshold 5: Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? | Potentially Significant Impact | HYD-1 and HYD-2 | Less than Significant Impact |
| **LAND USE AND PLANNING** | | | |
| Threshold 1: Would the project physically divide an established community? | No Impact | None | No Impact |
| Threshold 2: Would the project cause a significant environmental conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect? | No Impact | None | No Impact |

| Impact | Level of Significance Before Mitigation | Mitigation Measures | Level of Significance After Mitigation Measures |
|---|---|---|---|
| **MINERAL RESOURCES** | | | |
| Threshold 1: Would the project 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? | No Impact | None | No Impact |
| Threshold 2: Would the project 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? | No Impact | None | No Impact |
| **NOISE** | | | |
| Threshold 1: Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? | Less than Significant Impact | None | Less than Significant Impact |
| Threshold 2: Would the project result in generation of excessive ground borne vibration or ground borne noise levels? | Less than Significant Impact | None | Less than Significant Impact |
| Threshold 3: For a project located within the vicinity of a private airstrip or 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 | No Impact | None | No Impact |

| Impact | Level of Significance Before Mitigation | Mitigation Measures | Level of Significance After Mitigation Measures |
|---|---|---|---|
| people residing or working in the project area to excessive noise levels? | | | |
| **POPULATION AND HOUSING** | | | |
| Threshold 1: Would the project induce substantial unplanned 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)? | No Impact | None | No Impact |
| Threshold 2: Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? | No Impact | None | No Impact |
| **PUBLIC SERVICES** | | | |
| Threshold 1: Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:<br><br>Fire protection?<br><br>i. Police protection? | No Impact | None | No Impact |

| Impact | Level of Significance Before Mitigation | Mitigation Measures | Level of Significance After Mitigation Measures |
|---|---|---|---|
| ii. Schools?<br>iii. Parks?<br>iv. Other public facilities? | | | |
| **RECREATION** | | | |
| Threshold 1: Would the project 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? | No Impact | None | No Impact |
| Threshold 2: 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? | No Impact | None | No Impact |
| **TRANSPORTATION** | | | |
| Threshold 1: Would the project conflict with a plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities? | No Impact | None | No Impact |
| Threshold 2: Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3 subdivision (b)? | No Impact | None | No Impact |
| Threshold 3: Substantially increase hazards due to a geometric design feature (e.g., sharp curves | No Impact | None | No Impact |

| Impact | Level of Significance Before Mitigation | Mitigation Measures | Level of Significance After Mitigation Measures |
|---|---|---|---|
| or dangerous intersections) or incompatible uses (e.g., farm equipment)? | | | |
| Threshold 4: Would the project result in inadequate emergency access? | No Impact | None | No Impact |
| **TRIBAL CULTURAL RESOURCES** | | | |
| Threshold 1: Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:<br><br>ii. Listed or eligible for listing in the California Register of Historical Resources, or in the local register of historical resources as defined in Public Resources Code section 5020.1(k), or<br><br>iii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the | Less than Significant Impact | None | Less than Significant Impact |

| Impact | Level of Significance Before Mitigation | Mitigation Measures | Level of Significance After Mitigation Measures |
|---|---|---|---|
| significance of the resource to a California Native American tribe. | | | |
| **UTILITIES AND SERVICE SYSTEMS** | | | |
| Threshold 1: Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas or telecommunications facilities, the construction or relocation of which could cause significant environmental effects? | Less than Significant Impact | None | Less than Significant Impact |
| Threshold 2: Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years? | Less than Significant Impact | None | Less than Significant Impact |
| Threshold 3: Would the project 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? | No Impact | None | No Impact |
| Threshold 4: Would the project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? | No Impact | None | No Impact |

| Impact | Level of Significance Before Mitigation | Mitigation Measures | Level of Significance After Mitigation Measures |
|---|---|---|---|
| Threshold 5: Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste? | No Impact | None | No Impact |
| **WILDFIRE** | | | |
| Threshold 1: Would the project substantially impair an adopted emergency response plan or emergency evacuation plan? | No Impact | None | No Impact |
| Threshold 2: Would the project, due to slope, prevailing winds, and other factors, exacerbate wildfire risks and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire? | No Impact | None | No Impact |
| Threshold 3: Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? | No Impact | None | No Impact |
| Threshold 4: Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes? | No Impact | None | No Impact |

# CHAPTER 1 INTRODUCTION

Provost & Pritchard Consulting Group (Provost & Pritchard) has prepared this Environmental Impact Report (EIR) on behalf of Butte Water District (BWD) to address the environmental effects of the Temporary Water Transfers from 2026 to 2030 Project (Project). This document has been prepared in accordance with the California Environmental Quality Act (CEQA), Public Resources Code Section 21000 et seq. The BWD is the CEQA lead agency for this Project.

The site and the Project are described in detail in Chapter 2 Project Description.

## 1.1 PURPOSE OF THE DRAFT ENVIRONMENTAL IMPACT REPORT

This Draft Environmental Impact Report (DEIR) is prepared in conformance with CEQA (California Public Resources Code Section 21000, et seq.) and the CEQA Guidelines (California Code of Regulations [CCR], Title 14, Chapter 3, Section 15000, et seq.) to evaluate the potential environmental impacts associated with the implementation of the proposed Project.

The purpose of this DEIR is to inform decision-makers, representatives of affected or responsible agencies, the public, and other interested parties of the potential environmental effects that may result from implementation of the Project. This DEIR describes potential impacts relating to a wide variety of environmental issues and along with methods by which these impacts can be mitigated or avoided.

This summary is provided in accordance with the CEQA Guidelines Section 15123. As stated in CEQA Guidelines Section 15123(a), "an environmental impact report (EIR) shall contain a brief summary of the proposed actions and its [*sic*] consequences. The language of the summary should be as clear and simple as reasonably practical." As required by the Guidelines, this DEIR includes (1) a summary description of the Project; (2) a discussion of the areas of controversy associated with the project; (3) identification of the alternatives evaluated and the environmentally superior alternative; and (4) a synopsis of environmental impacts and recommended mitigation measures.

## 1.2 DOCUMENT FORMAT

This EIR contains seven chapters in addition to the Executive Summary: Chapter 1 Introduction, provides an overview of the Project and the CEQA process Chapter 2 Project Description, provides a detailed description of proposed Project components and objectives. Chapter 3 Environmental Impact Analysis presents the CEQA checklist and environmental analysis for all impact areas, mandatory findings of significance, and feasible mitigation measures. If the Project could have a potentially significant impact on a resource, the issue area discussion provides a description of potential impacts, and appropriate mitigation measures and/or permit requirements that would reduce those impacts to a less than significant level. Chapter Chapter 4 Analysis of Alternatives provides a comparison and discussion highlighting the differences and similarities among the alternatives and identifies the environmentally superior alternative as required by CEQA. Chapter Chapter 5 Other CEQA Considerations gives the other various CEQA requirements for an EIR, including a discussion of significant environmental effects of a proposed project; significant environmental effects which cannot be avoided if a proposed project is implemented; significant irreversible changes which would be involved in implementation of a proposed project; and growth-inducing impacts of a proposed project. This chapter also discusses those resources in which effects or impacts were not found to be significant as a result of the analysis in the subsequent chapter, Chapter 6. Chapter Chapter 6 Initial Study provides the Initial Study (IS) performed to analyze any potentially significant impacts of the Project and decide whether an EIR was necessary. If the Project does not have the potential to significantly impact a given issue area, the relevant section provides a brief discussion of the reasons why no impacts are expected. Finally, Chapter 7 References details the documents and reports this document relies upon to provide its analysis.

The Notice of Preparation (NOP) is included as Appendix A. The Air Quality and Greenhouse Gas Emissions California Emissions Estimator Modeling (software) (CalEEMod) results, Biological Evaluation, Cultural Resources Search Results, and Groundwater Technical Report are also provided as technical appendices at the end of this document.

## 1.3 METHODOLOGY

The DEIR has been developed using the template provided in Appendix G of the CEQA Guidelines. The Project has been analyzed based on current thresholds, rules, and regulations governing environmental protection within the Project Area. Each individual resource topic contained within Chapter 3 of the DEIR includes a more specific account of the methodology and thresholds for each given resource topic. Additionally, each of these individual resource topics contains a section in which cumulative impacts of the Project are considered. An IS, contained as Chapter 6 of this document, was conducted for the Project in order to determine the appropriate level of environmental review required and if there were any environmental topics from Appendix G that could be eliminated from further discussion. Based on this IS, and after consideration of comments received during the scoping process, the following topics have been removed from further environmental analysis in the DEIR: Aesthetics, Agriculture and Forestry Resources, Air Quality, Cultural Resources, Energy, Geology and Soils, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Land Use and Planning, Mineral Resources, Noise, Population and Housing, Public Services, Recreation, Transportation, Tribal Cultural Resources, Utilities and Service Systems, and Wildfire.

## 1.4 USE OF THE DRAFT ENVIRONMENTAL IMPACT REPORT

If found adequate, the DEIR will be certified as a Final Environmental Impact Report (FEIR) by the BWD for the purpose of disclosing potential environmental impacts resulting from the construction and operation of the Project. The FEIR will incorporate responses to all comments received on the DEIR and will also identify all mitigation measures the BWD is required to implement to reduce potential impacts. The FEIR may also be used by various other public agencies including responsible and trustee agencies when considering their own discretionary actions for the Project. Responsible agencies whose approval may be required are discussed in Chapter 2.

## 1.5 PUBLIC INVOLVEMENT

The development of the EIR from draft to final is designed to involve the public and other potentially affected parties and agencies in the decision-making process. The CEQA process requires open discussion and interaction to determine the scope of a Project and environmental topics that are of potential concern. The following sections identify the public processes that have been undertaken for the Project.

### 1.5.1 NOTICE OF PREPARATION AND NOTICE OF SCOPING OF THE DEIR

In accordance with CEQA, the BWD circulated a Notice of Preparation (NOP) of an EIR for 30 days beginning on August 29, 2025, and ending on September 29, 2025 (Appendix A). The purpose of the NOP was to inform public agencies and the local public of the District's intention to prepare an EIR for the Project, to solicit comments to assist the BWD in determining environmental impacts relating to the Project, and to identify potential feasible and reasonable mitigation for such impacts or alternatives that should be considered in this EIR. The NOP was published in the *Gridley Herald* on August 29, 2025. It was filed with the State Clearinghouse (SCH) of the Governor's Office of Land Use and Climate Innovation (LUCI) on August 29, 2025. In addition, the NOP was posted in 55 of the 58 counties within the State. Counties that did not receive a copy of the NOP for posting include Humbolt County, Modoc County, and Monterey County

A public scoping meeting was held in Gridley at the BWD office on September 17, 2025, allowing for members of the public to provide comments on the Project as it was presented in the NOP. No members

of the public attended the scoping meeting, and, as such, no comments were received as a result of the scoping meeting.

Two comment letters were received in response to the NOP. The letters were from the Native American Heritage Commission (NAHC) dated August 29, 2025, and the California Department of Fish and Wildlife (CDFW) dated September 26, 2025. Comments received as a result of the NOP are attached as a part of Appendix A hereto and helped direct the analysis presented in this EIR.

### 1.5.2 NOTICE OF AVAILABILITY AND DISTRIBUTION OF THE DEIR

A Notice of Completion was submitted to the SCH in the Governor's Office of LUCI on August 29, 2025. The Notice of Availability was published on the same day in the *Gridley Herald*.

The DEIR is now available for review and comment by public agencies and the general public for a 45-day public review period beginning on Friday February 13th, 2026. The BWD welcomes comments received on or before 5:00 p.m. on March 30, 2026. Any written comments should be directed to:

Donnie Stinnett, Butte Water District General Manager
735 Viriginia Street, Gridley, CA 95948
Phone: (530) 846-3100
Email: donnie@buttewater.net

Dawn E. Marple, Principal Planner, Environmental Project Manager
Provost & Pritchard Consulting Group
2561 California Park Drive, Suite 200
Chico, CA 95928
Phone: (559) 636-1166 ext.537
Email: dmarple@ppeng.com

Additional copies of this DEIR are available for review at the following locations:

Butte Water District website at https://buttewaterdistrict.org/

## 1.6 FINAL ENVIRONMENTAL IMPACT REPORT

Following the closure of the 45-day DEIR public review period, the BWD will review comments received, prepare written responses, make any necessary changes to the DEIR, and prepare and publish the FEIR. The FEIR will be the document considered by the BWD for certification. The FEIR, pursuant to CEQA Guidelines Section 15132, will incorporate:

- The DEIR or a revision of the draft;
- Comments and recommendations received on the DEIR either verbatim or in summary;
- A list of persons, organizations, and public agencies commenting on the DEIR;
- The responses of the Lead Agency to significant environmental points raised in the review and consultation process; and
- Any other information added by the Lead Agency.

If the BWD chooses to certify the EIR and approve the Project, it will be required to adopt findings relating to significant impacts. If impacts remain significant and unavoidable despite mitigation to the greatest extent feasible, the District will be required to make findings pursuant to CEQA Guidelines Section 15091

and determine that the benefits of the project outweigh the impacts through the adoption of a Statement of Overriding Considerations pursuant to CEQA Guidelines Section 15093.

If the BWD chooses not to certify the FEIR and denies the Project, no additional CEQA review would be required.

# CHAPTER 2 PROJECT DESCRIPTION

## 2.1 PROJECT BACKGROUND

### 2.1.1 PROJECT TITLE

Temporary Water Transfers from 2026 to 2030 Project

### 2.1.2 LEAD AGENCY NAME AND ADDRESS

Butte Water District
735 Virginia Street
Gridley, CA 95948

### 2.1.3 CONTACT PERSON AND PHONE NUMBER

Donnie Stinnett
Butte Water District, General Manager
(530) 682-9205

### 2.1.4 CEQA CONSULTANT

Provost & Pritchard Consulting Group
Dawn E. Marple, Environmental Project Manager
(559) 636-1166

### 2.1.5 PROJECT LOCATION

The Project area, from which the water for the Project's proposed water transfer would be made available, is defined by the BWD boundaries, which is situated approximately 50 miles north of Sacramento and 85 miles south of Redding (see Figure 2-1 and Figure 2-2).

#### 2.1.5.1 SITE AND SURROUNDING LAND USES AND SETTING

The Project area consists of lands within the BWD boundaries, which comprises approximately 32,505 acres in the northern Sacramento Valley in both Butte and Sutter Counties. Of that acreage, 24,638 acres are irrigable. Within the BWD boundaries approximately 5,958 acres are dedicated primarily to the production of rice.

### 2.1.6 DESCRIPTION OF THE PROJECT

#### 2.1.6.1 DISTRICT BACKGROUND

The Butte Water District (BWD) was formed in 1956 and may divert up to 133,200 acre-feet (AF) of water during the defined irrigation season under the terms of a 1969 Agreement on Diversion of Water from the Feather River with the State of California, acting by and through the Department of Water Resources (DWR) and allocated through a 1970 Joint Operating Agreement with Butte Water District, Richvale Irrigation District, Biggs-West Gridley Water District, and Sutter Extension Water District, known collectively as the Joint Water Districts. As a result of these agreements, BWD's water is diverted from the Thermalito Afterbay, part of the Oroville Complex. The 1969 Diversion of Water agreement requires written approval from DWR before any of the districts can transfer water outside the service areas of the Joint Board. An agreement between DWR and the proposed water purchasers to store or transport the water through the State Water Project (SWP) or Central Valley Project (CVP) facilities may also be required to implement a water transfer.

#### 2.1.6.2 WATER TRANSFERS

The District is preparing for potential one-year water transfers over a five-year period from 2026 through 2030. The transfers may be for environmental enhancement or for one or more buyers with temporary unmet consumptive water demands. Santa Clara Valley Water District (Valley Water) would have the first right of refusal for the water transfers from BWD.

A water transfer temporarily moves water from a willing seller (BWD) to an environmental purpose or willing buyer. To make new water available, the seller must take an action to reduce consumptive use, use a substitute water supply such as groundwater, or use water in storage. Additionally, water transfers must comply with all applicable State and federal laws. Moreover, under the 1969 Diversion of Water Agreement with the State of California, BWD's water entitlement is subject to a drought reduction under certain circumstances related to dry hydrologic conditions. If BWD's entitlement is curtailed 50 percent for an irrigation season, pursuant to the 1969 Agreement, BWD has not historically participated in a land idling transfer. However, in the event of a lesser reduction, the District may still participate in a land idling transfer. BWD may participate in a groundwater substitution transfer for its lands located in Sutter County under any drought reduction scenario.

This EIR analyzes water transfers as if the full amount would be transferred every year during the five-year transfer period; however, transfers may be less frequent and smaller in volume over this period. Annual approval of transfers is required by BWD, the end user, and DWR, regardless of the EIR term or the duration of a water transfer contract.

#### 2.1.6.3 WATER TRANSFER AVAILABILITY

The water transfers would include short-term transfers of up to 24,000 AF in any year. This includes up to 14,000 AF from crop idling transfers and up to 10,000 AF from groundwater substitution transfers. Water made available by crop idling and/or groundwater substitution within the boundaries of the District would be retained and stored by the DWR at Lake Oroville for delivery to Valley Water (or a different buyer if Valley Water refuses, as further discussed below), pending approval from DWR.

The Project area, from which the water for the potential transfers would be made available, is defined by the District boundaries, which encompass approximately 32,505 acres in the northern Sacramento Valley in both Butte and Sutter Counties. Land idled for the purpose of the potential transfers would primarily be drawn from the rice acreage within the District. However, those crops suitable for idling as laid out in Table 2-1 of DWR's *DRAFT Technical Information for Preparing Water Transfer Proposals in 2019* within the District would also have the potential to be idled for the sake of transfers.[2] Crop idling acreages for transfers would be to the exclusion of habitat of the giant garter snake. Adjoining areas, other irrigated lands, drains, wetlands, and waterfowl habitat would not be affected, as those areas would receive their normal entitlement, and canals and drains would operate at normal operating capacity. Water would be available on the same pattern during the growing season as it would have been consumed had a crop been planted.

#### 2.1.6.4 WATER TRANSFER TYPE

Cropland idling water transfers make water available by reducing the consumptive use of surface water applied for irrigation. In a groundwater substitution program, groundwater is pumped and used for agricultural purposes in lieu of surface water supplies. The equivalent surface water supplies are then not diverted and are made available for transfer. Groundwater pumping, if applicable, would only occur within that portion of the District boundaries that lie within Sutter County and in a manner consistent with the Groundwater Sustainability Plan (GSP) developed under the Sustainable Groundwater Management Act (SGMA) and would only utilize BWD wells. The District's proposed water transfers would fully comply with

[2] (Department of Water Resources, 2019)

DWR's *DRAFT Technical Information for Preparing Water Transfer Proposals in 2019* where applicable regarding land idling and groundwater substitution transfers as well as monitoring and reporting for groundwater conditions before, during, and after the transfer period.[3]

The quantity of transfer water made available through crop idling is currently calculated based on the pattern of Evapotranspiration Rate of Applied Water (ETAW).[4] In the absence of technical information supporting an alternate method, the quantity of transfer water will continue to be calculated based on ETAW for any crop acreage idling. Consistent with the provisions contained in California Water Code Section 1018, potential participating landowners would be encouraged to cultivate or retain non-irrigated cover crops or natural vegetation into their cropland idling transfer to protect habitat value in the area to be idled. In addition, only 20 percent of irrigable acres may be idled under a crop idling water transfers according to DWR's *DRAFT Technical Information for Preparing Water Transfer Proposals in 2019*.[5]

For the groundwater substitution transfers, the Project would extract up to 10,000 AF of groundwater from BWD production wells. Two existing wells have approximate production capacities of 3,500 gallons per minute (GPM) and 4,000 GPM, respectively. BWD is also in the process of purchasing land for the future installation of a third production well that would also be used if completed within the five-year project duration, which would bring the total water available for transfer from groundwater substitutions to up to 10,000 AF. BWD also owns three groundwater monitoring wells and uses these wells, among others that are not owned by the District (such as those defined in transfer agreements and DWR's Water Transfer Information Management System, among others), to monitor groundwater levels in the vicinity of the production wells to ensure that no substantial depletion of groundwater supplies occurs as a result of groundwater production. The District has operated these wells in the past at similar production rates and, consistent with extensive monitoring and reporting for such past usage, BWD has not observed any substantial impacts on groundwater levels, groundwater supplies, or to third parties or other environmental resources (see Appendix G).

#### 2.1.6.5 WATER TRANSFER OPERATIONS

No new construction or improvements by BWD, Valley Water or other potential buyers, or DWR would be necessary for the production and transfer of water resulting from the Project. However, the aforementioned third production well could be installed during the five-year Project duration and would likely be used for Project activities if completed. As mentioned above, BWD receives water from Oroville Reservoir under a Diversion Agreement with the State of California. Normal operations involve DWR releasing water from the Oroville Reservoir to the Thermalito Afterbay to be diverted by BWD. For water transfers, DWR reduces what it releases, and, as a result, BWD also reduces its water diversions. Water would be stored in the Oroville Reservoir if capacity is available and stored water follows DWR's applicable policies and regulations. Storing transfer water could not affect the ability of DWR to meet environmental commitments or water deliveries and would not be possible if flood releases were being made from the Oroville Reservoir as no capacity would be available. Water would become available for transfer on the same schedule that it would have been delivered to BWD. In most cases, this would involve water accruing in storage at the Oroville Reservoir in May and June before being conveyed downstream in July through September.

[3] Ibid.

[4] ETAW is defined as the portion of the total evapotranspiration that is provided by irrigation. The portion of evapotranspiration met by precipitation occurring during the growing seasons or stored as soil moisture within the root zone before the growing season does not qualify as transferable water. ETAW values used for water transfer calculations are based upon crop water demands reflecting average rainfall and evaporative demand.

[5] (Department of Water Resources, 2019)

#### 2.1.6.6 SANTA CLARA VALLEY WATER DISTRICT

It is anticipated that a key recipient of BWD's transfer supplies will be Valley Water, who has the first right of refusal of water transfers as a part of the Project. In the event that Valley Water does not elect to receive the transferred water, the District may pursue transfers to the environment or other buyers where BWD can utilize existing water infrastructure to convey transfer water. If both Valley Water and direct conveyance route for the transfer water are not available, BWD may pursue a simultaneous water exchange to convey water to the environment or other buyers. BWD may also transfer water for environmental enhancement, such as for purposes like the Healthy Rivers and Landscapes program if it were to be adopted during the five-year period.

Valley Water has contracts for 100,000 AF per year (AFY) of SWP water and 152,500 AFY of CVP water. However, water availability and environmental conditions impact the actual amount of water delivered. As a result, Valley Water receives an average of approximately 170,000 AFY from the two sources combined. During periods of water shortage when contract allocations are low, Valley Water has historically participated in water transfers to secure supplemental water supplies. In addition, Valley Water's Anderson Reservoir is currently restricted to deadpool due to seismic concerns, which, in turn, takes away substantial drinking water resources for Santa Clara County. The Anderson Dam is presently undergoing a seismic retrofit, but the project is not anticipated to be completed until 2033.[6] As such, Valley Water's dependence on water transfers is expected to be higher until project completion.

Since 1996, Valley Water has participated in a water banking and exchange program with the Semitropic Water Storage District located in Kern County. In wet years, Valley Water stores excess Delta-conveyed water in the Semitropic Groundwater Bank for later use, such as during dry years.

To meet current and future demands, Valley Water has also implemented a long-term water conservation program. With a target of saving 100,000 AFY by 2030, the long-term program offers a variety of incentives and rebates that achieve sustainable water savings. The program saved approximately 85,000 AF in 2024.

### 2.1.7 OTHER PUBLIC AGENCIES WHOSE APPROVAL MAY BE REQUIRED

- Department of Water Resources
- Santa Clara Valley Water District
- United States Bureau of Reclamation

### 2.1.8 CONSULTATION WITH CALIFORNIA NATIVE AMERICAN TRIBES

Public Resources Code Section 21080.3.1, *et seq. (codification of Assembly Bill (AB) 52, 2013-14)*) requires that a lead agency, within 14 days of determining that it will undertake a project, must notify in writing any California Native American Tribe traditionally and culturally affiliated with the geographic area of the project if that Tribe has previously requested notification about projects in that geographic area. The notice must briefly describe the project and inquire whether the Tribe wishes to initiate request formal consultation. Tribes have 30 days from receipt of notification to request formal consultation. The lead agency then has 30 days to initiate the consultation, which then continues until the parties come to an agreement regarding necessary mitigation or agree that no mitigation is needed, or one or both parties determine that negotiation occurred in good faith, but no agreement will be made.

Butte Water District has not received any written correspondence from a Tribe pursuant to Public Resources Code Section 21080.3.1 requesting notification of a proposed project.

[6] (Santa Clara Valley Water District, 2024)

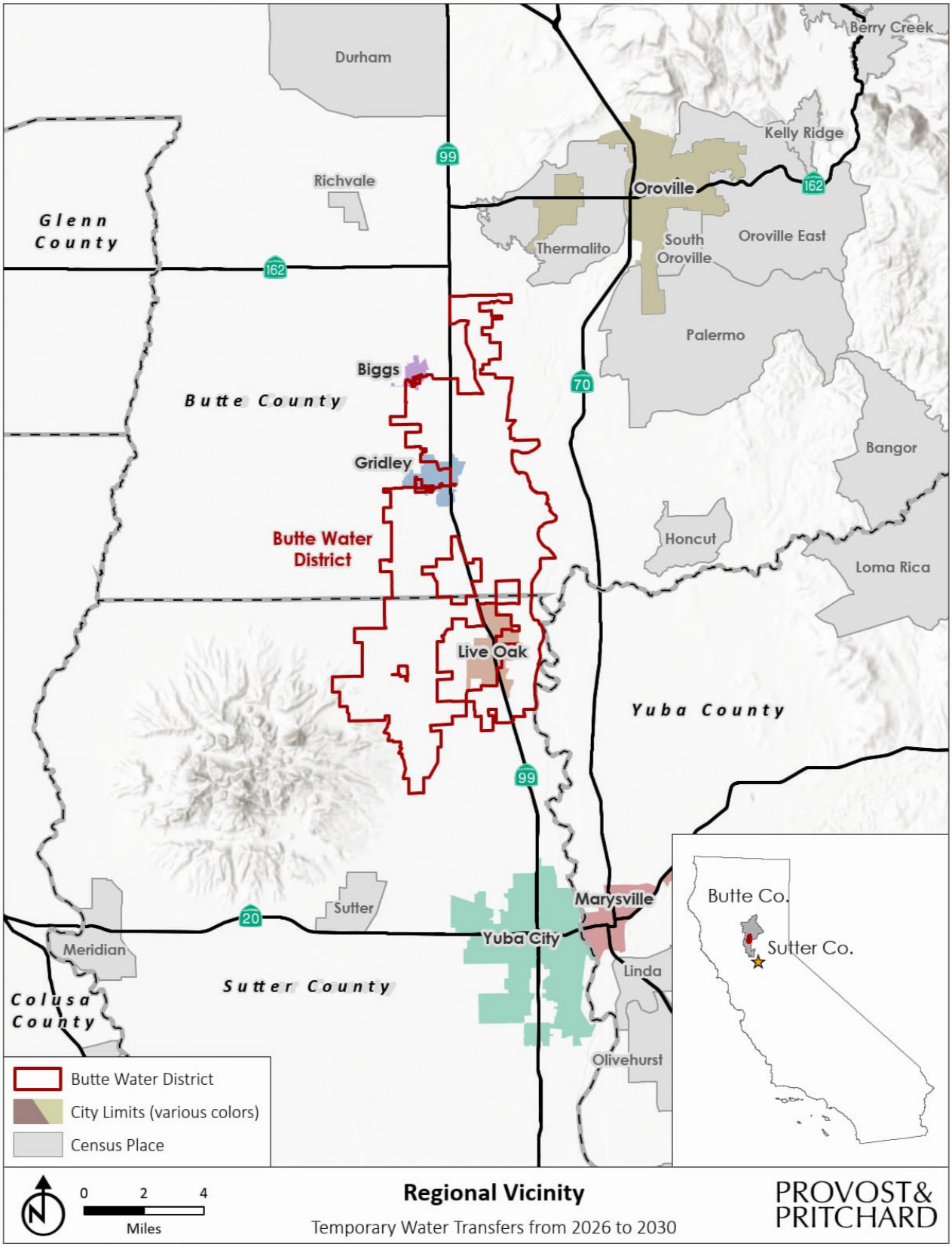



Figure 2-1: Regional Location Map

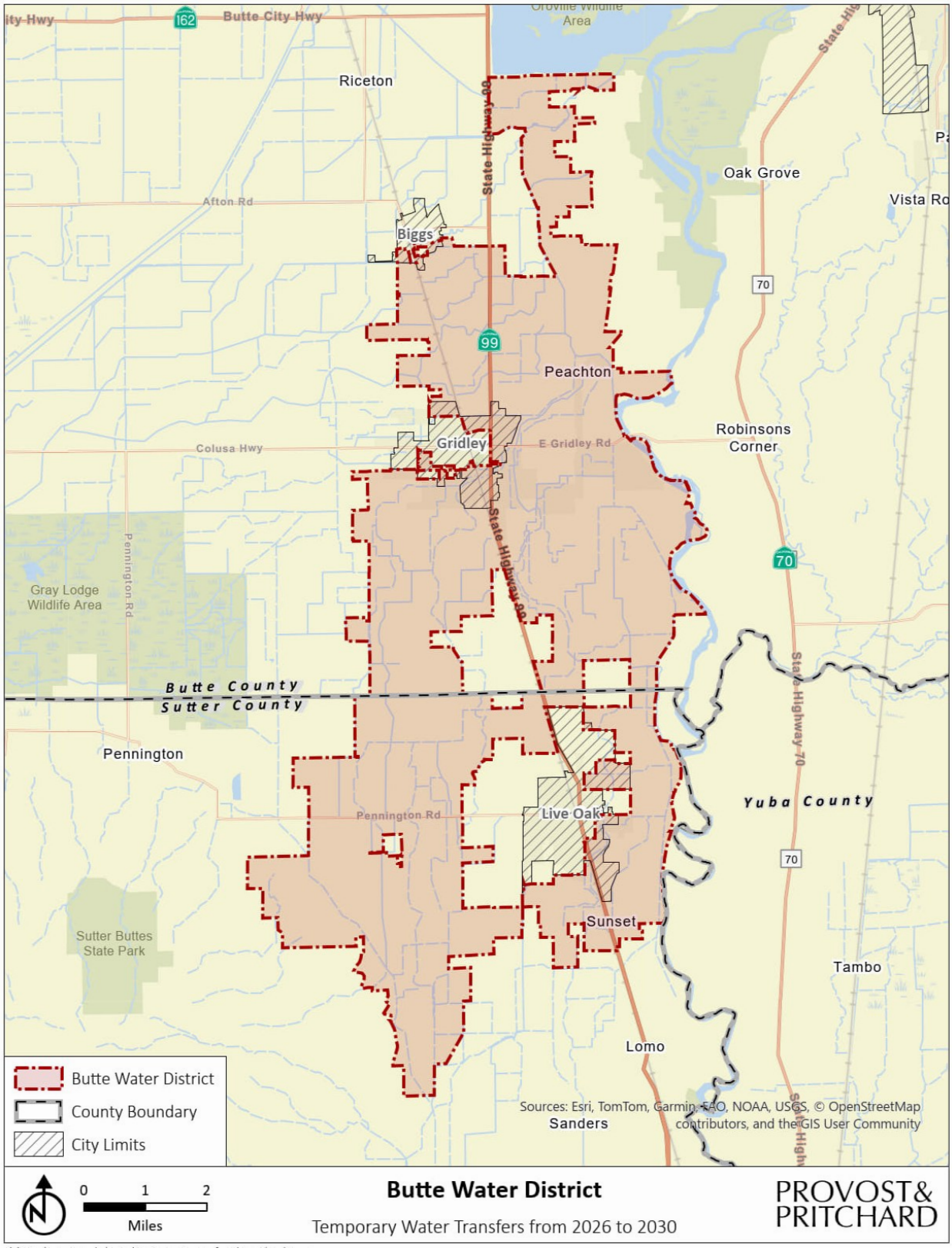



Figure 2-2: Aerial Site Map

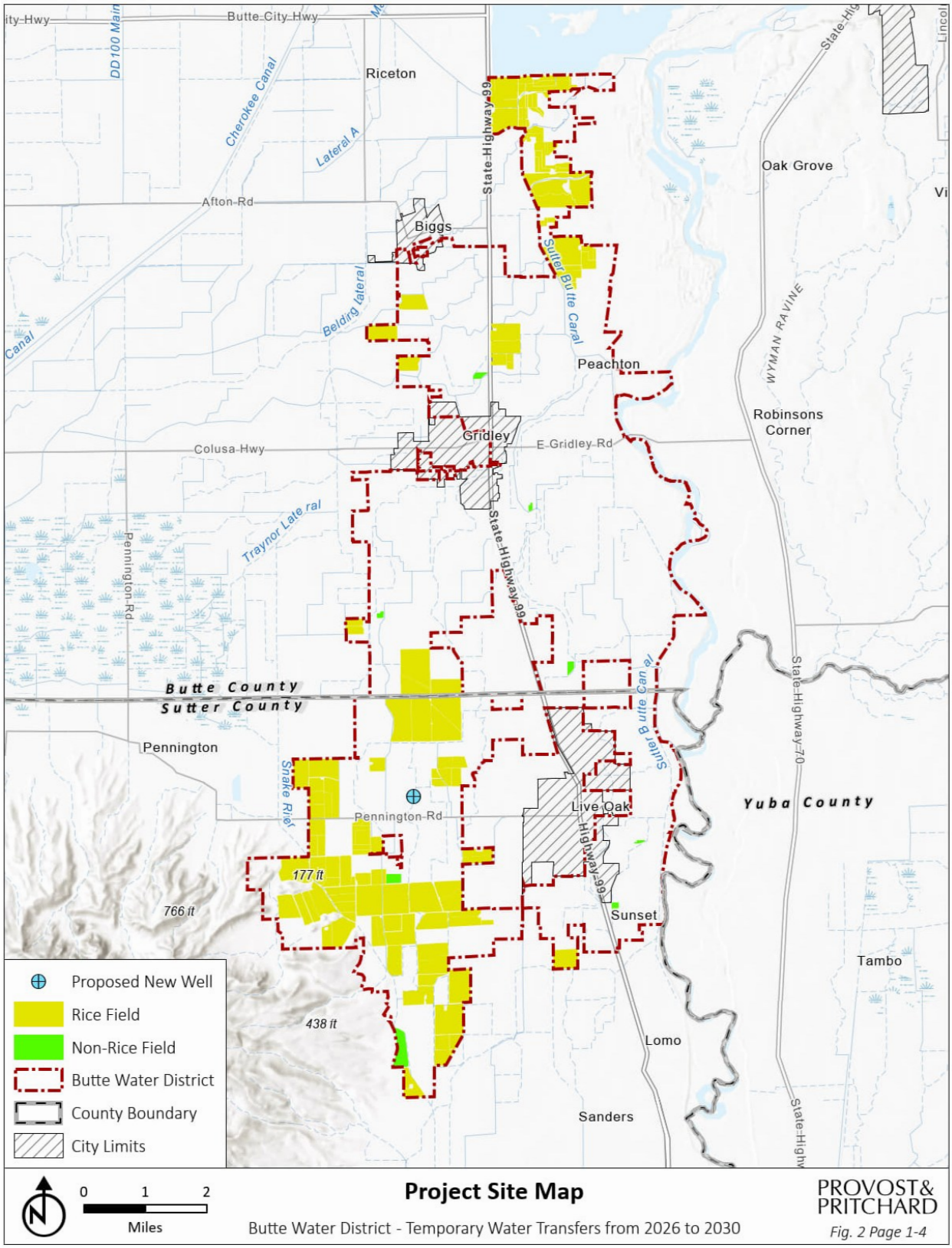



Figure 2-3: Project Site Map

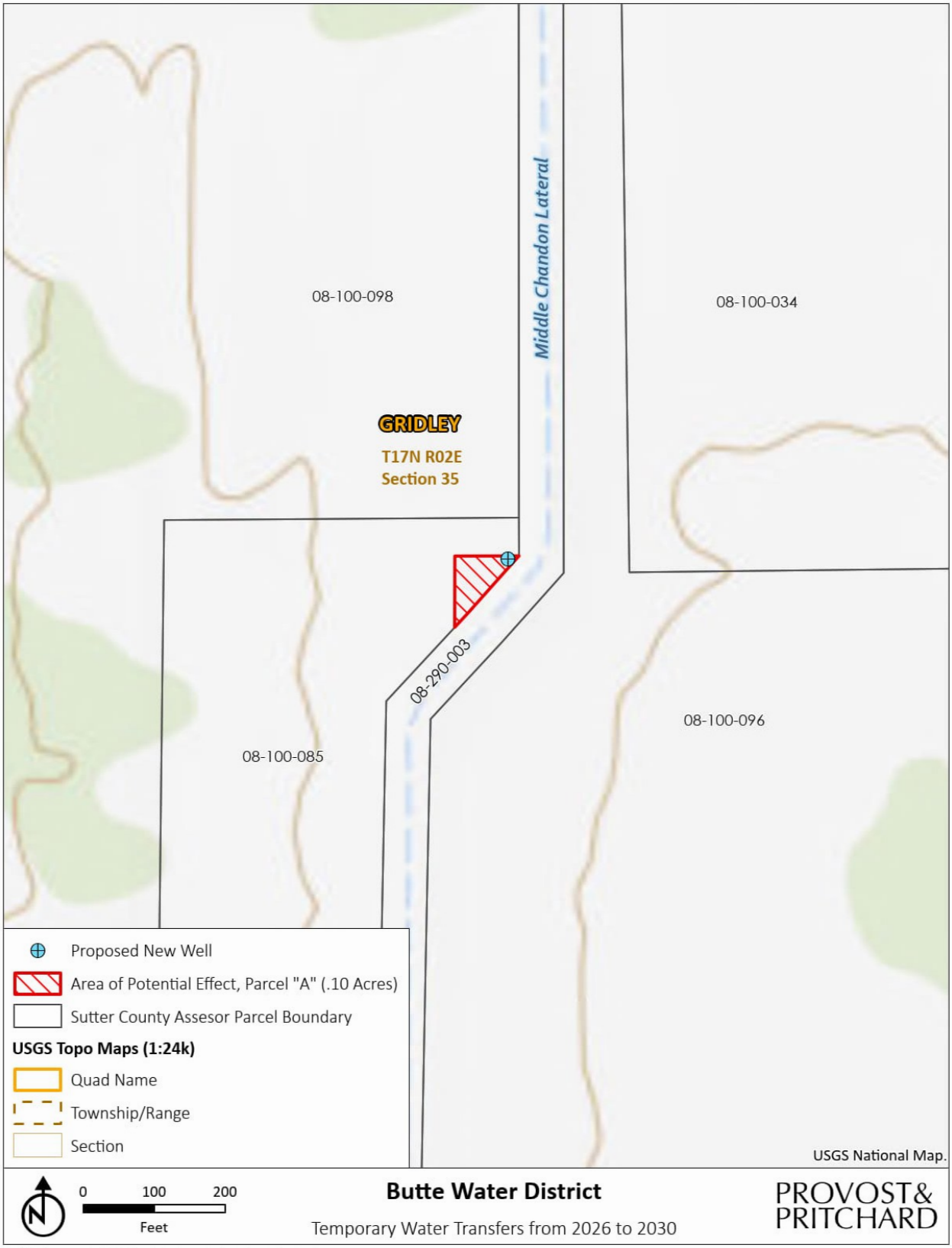



Figure 2-4: New Well Location Map

# CHAPTER 3 ENVIRONMENTAL IMPACT ANALYSIS

## 3.1 INTRODUCTION

The purpose of this chapter is to inform decision makers and the public of the type and magnitude of the change to the existing environment that would result from the Project. The environmental impact analysis sections identify mitigation measures intended to reduce potentially significant environmental impacts to a less than significant level or to the greatest extent feasible. Several impacts were not found to be significant within the issue areas of Aesthetics, Agriculture and Forestry Resources, Air Quality, Cultural Resources, Energy, Geology and Soils, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Land Use and Planning, Mineral Resources, Noise, Population and Housing, Public Services, Recreation, Transportation/Traffic, Tribal Cultural Resources, Utilities and Service Systems, and Wildfire. These resources are discussed in Chapter Chapter 6 in the Initial Study as well as briefly in Section 5.4 Effects Found Not to Be Significant and are not discussed further in the EIR. The Biological Resources and Hydrology and Water Quality resource sections are analyzed at greater length below in Section 3.2 and Section 3.3, respectively.

### 3.1.1 ENVIRONMENTAL SETTING/BASELINE CONDITIONS

CEQA Guidelines Section 15125 states that "An EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time the environmental analysis is commenced, from both a local and regional perspective. The environmental setting will normally constitute the baseline physical conditions by which a Lead Agency determines whether an impact is significant. The description of the environmental setting shall be no longer than is necessary to [provide] an understanding of the significant effects of the proposed project and its alternatives." The CEQA Guidelines and case law recognize that the date for establishing an environmental baseline cannot be rigid (CEQA Guidelines Sections 15146, 15151, 15204). Environmental conditions may vary from year to year, and in some cases, it is necessary to consider conditions over a range of time periods. Additional details regarding the environmental setting for the Project are provided in the individual resource sections throughout Chapter 3 and Chapter 6 (Initial Study).

### 3.1.2 REGULATORY FRAMEWORK

The Regulatory Framework subsections in Chapter 3 and Chapter 6 (Initial Study) provide an overview of the existing federal, State, and local laws and regulations applicable to each resource area. The Project must comply with these legal requirements.

### 3.1.3 THRESHOLDS OF SIGNIFICANCE

The Thresholds of Significance subsections in Chapter 3 explain how an impact is judged to be significant in this EIR. These thresholds are based on the environmental checklist in Appendix G of the State CEQA Guidelines. All elements of the environmental checklist were considered during development of the EIR, but the analysis focuses on those that are relevant to the analysis of the water transfers as proposed by the Project.

### 3.1.4 IMPACT ANALYSIS

The Project Impacts Analysis discussion includes an overview of potential impacts of the Project and explains why impacts were found to be significant or less than significant. Within this section are impact determinations and suggested mitigation measures that would mitigate each impact, where such measures are necessary and/or available. If impacts are considered significant prior to mitigation, mitigation measures have been suggested that would reduce significant impacts.

### 3.1.5 CUMULATIVE IMPACTS

Pursuant to CEQA Guidelines Section 15130, the Project is required to include a discussion regarding potential cumulative impacts. Individual projects that do not present significant impacts still have the potential to result in cumulatively considerable significant impacts. As a result, the discussion must consider past, present, and reasonably foreseeable future projects that could, together with completion of the Project, result in cumulatively considerable significant environmental impacts. Impacts that are found to be incremental need not be examined by lead agencies beyond a brief explanation of why the effect has been found to be incremental. The discussion regarding cumulative impacts should be representative of the severity of the cumulative impacts and the likelihood of their occurrence. CEQA Guidelines Section 15130(b) states that in order to adequately assess cumulative impacts of a project, projects should include the following information:

- *Either:*
    - *A list of past, present, and probable future projects producing related or cumulative impacts, including, if necessary, those projects outside the control of the agency; or*
    - *A summary of projections contained in an adopted local, regional or statewide plan, or related planning document, that describes or evaluates conditions contributing to the cumulative effect. Such plans may include: a general plan, regional transportation plan, or plans for the reduction of greenhouse gas emissions. A summary of projections may also be contained in an adopted or certified prior environmental document for such a plan. Such projections may be supplemented with additional information such as a regional modeling program. Any such document shall be referenced and made available to the public at a location specified by the lead agency.*
- *When utilizing a list, factors to consider when determining whether to include a related project should include the nature of each environmental resource being examined, the location of the project and its type. Location may be important, for example, when water quality impacts are at issue since projects outside the watershed would probably not contribute to a cumulative effect. Project type may be important, for example, when the impact is specialized, such as a particular air pollutant or mode of traffic.*
- *Lead agencies should define the geographic scope of the area affected by the cumulative effect and provide a reasonable explanation for the geographic limitation used.*
- *A summary of the expected environmental effects to be produced by those projects with specific reference to additional information stating where that information is available; and*
- *A reasonable analysis of the cumulative impacts of the relevant projects. An EIR shall examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.*

The discussion of cumulative impacts in this EIR focuses on whether the impacts of the Project are cumulatively considerable. A cumulative significant impact does not necessarily mean that the Project-related contribution to the cumulative impact analysis is significant as well. Instead, under CEQA, a Project-related contribution to a significant cumulative impact is only significant if the contribution is "cumulatively considerable." To support each significance conclusion, this EIR provides a cumulative impact analysis; where Project-specific impacts have been identified that, together with the effects of other related projects, could result in cumulatively significant impacts, these potential impacts are documented.

The analysis of cumulative impacts within this EIR includes the impacts of the Project plus all other pending or approved projects within the affected area or with potential effects to the area for each applicable

resource. Not all of these projects or programs will be relevant to every individual resource area as the geographic scope of each resource area's cumulative analysis may differ.

### Other Water Transfers

Other SWP and CVP water supply transfers could occur from 2026 to 2030. For instance, the SWP stores and delivers water to 29 water contractors, including both agricultural and municipal and industrial (M&I) users. In addition to transfers from BWD, SWP contractors also implement transfers from agencies north of the Delta to SWP contractors south of the Delta. The voluntary water transfers are accomplished through the use of groundwater substitution, cropland idling/crop shifting, and reservoir storage release. The contractors generally serve areas along the Feather River and receive SWP supplies from Oroville Reservoir. The CVP is operated by the U.S. Bureau of Reclamation (USBR) and governed by the U.S. Fish and Wildlife Agency, Endangered Species Act, Biological Opinions, State Water Resources Control Board, and the California Department of Fish and Wildlife. It delivers federally managed water from Northern California's Shasta and Folsom Lakes, primarily for agricultural use. Specific water transfers that have the potential to occur during the Project period are described below.

### Long-Term Water Transfers EIS/EIR

The Long-Term Water Transfers is an Environmental Impact Statement (EIS) under NEPA and EIR under CEQA that assessed water transfers over a 10-year period concluding in 2024. However, it is reasonably foreseeable that USBR would complete a follow-up EIS/EIR along similar lines within the five-year Project timeline. The water transfer methods assessed included groundwater substitution, reservoir release, cropland idling, crop shifting, and conservation. The potential transfers, according to the EIS/EIR, would not occur every year, but only in years when there is demand from buyers (see Table 3-1) and pumping capacity available to convey the transfers (generally dry and critical years).

Table 3-1: Potential Water Available for Transfer by Seller (Upper Volume Limit)

| Potential Seller (Transferor) | Maximum Annual Potential Transfer (acre-feet) |
|---|---|
| **Sacramento River Area of Analysis** | |
| Anderson-Cottonwood Irrigation District | 5,225 |
| Conaway Preservation Group | 35,000 |
| Cranmore Farms | 8,000 |
| Eastside Mutual Water Company | 2,230 |
| Glenn-Colusa Irrigation District | 91,000 |
| Natomas Central Mutual Water Company | 30,000 |
| Pelger Mutual Water Company | 3,750 |
| Pleasant Grove-Verona Mutual Water Company | 18,000 |
| Reclamation District 108 | 35,000 |
| Reclamation District 1004 | 17,175 |
| River Garden Farms | 9,000 |
| Sycamore Mutual Water Company | 20,000 |
| Te Velde Revocable Family Trust | 7,094 |
| **American River Area of Analysis** | |
| City of Sacramento | 5,000 |
| Placer County Water Agency | 47,000 |
| Sacramento County Water Agency | 15,000 |
| Sacramento Suburban Water District | 30,000 |
| **Yuba River Area of Analysis** | |
| Browns Valley Irrigation District | 8,100 |
| Cordua Irrigation District | 12,000 |
| **Feather River Area of Analysis** | |
| Butte Water District | 17,000 |

| Potential Seller (Transferor) | Maximum Annual Potential Transfer (acre-feet) |
|---|---|
| Garden Highway Mutual Water Company | 14,000 |
| Gilsizer Slough Ranch | 3,900 |
| Goose Club Farms and Teichert Aggregates | 10,000 |
| South Sutter Water District | 15,000 |
| Tule Basin Farms | 7,320 |
| **Merced River Area of Analysis** | |
| Merced Irrigation District | 30,000 |
| **Delta Region Area of Analysis** | |
| Reclamation District 2068 | 7,500 |
| Pope Ranch | 2,800 |
| **TOTAL** | **511,094** |

The following entities were included in the project as potentially interested in buying water made available for transfer: Contra Costa Water District, East Bay Municipal Utility District, and San Luis & Delta Mendota Water Authority Participating Members.

### 2026-2027 North to South Water Transfers

The 2026-2027 North to South Water Transfers project appears to be an interim solution between the conclusion of the former and aforementioned Long-Term Water Transfers (2015-2024) project and prior to the release of a new long-term water transfer led by USBR. The project includes a range of potential transfers of up to 250,000 AF annually for the two-year period. Table 3-2 presents the agencies that have expressed interest in making water available through groundwater substitution and reservoir release actions as a part of the project in contract years 2026 and 2027. While the entity making water available may request approval to shift the volume of water made available during a particular period to a different period for transfer, the overall amount of water transferred would not exceed the maximum volumes listed.

Table 3-2: Potential Water Available for Transfer by Seller (Upper Volume Limits)

| Potential Seller (Transferor) | Maximum Annual Potential Transfer (acre-feet) |
|---|---|
| **Sacramento River Area of Analysis** | |
| Anderson-Cottonwood Irrigation District | 4,900 |
| Andreotti | 2,500 |
| Giusti Farms | 1,000 |
| Glenn-Colusa Irrigation District | 23,600 |
| Henle Family Ltd. Partnership | 600 |
| Meridian Farms Water Company | 6,000 |
| Natomas Central Mutual Water Company | 30,000 |
| Pelger Mutual Water Company | 4,750 |
| Pelger Road 1700 LLC | 5,600 |
| Pleasant Grove-Verona Mutual Water Company | 18,000 |
| Princeton-Codora-Glenn Irrigation District | 8,000 |
| Provident Irrigation District | 11,500 |
| Reclamation District 108 | 15,000 |
| Reclamation District 1004 | 7,175 |
| Roberts Ditch Irrigation Company | 3,460 |
| RRG Garden Properties LLC | 10,000 |
| Sutter Mutual Water Company | 50,000 |
| Te Velde Revocable Family Trust | 7,094 |
| Windswept Land and Livestock | 1,175 |

| Potential Seller (Transferor) | Maximum Annual Potential Transfer (acre-feet) |
|---|---|
| **American River Area of Analysis** | |
| El Dorado Irrigation District | 8,000 |
| Placer County Water Agency | 47,000 |
| Sacramento County Water Agency | 15,000 |
| Sacramento Suburban Water District | 30,000 |
| **Yuba River Area of Analysis** | |
| Browns Valley Irrigation District | 5,000 |
| Cordua Irrigation District | 12,000 |
| **Feather River Area of Analysis** | |
| Butte Water District | 6,000 |
| Garden Highway Mutual Water Company | 14,000 |
| Gilsizer Slough Ranch | 3,200 |
| Nevada Irrigation District | 15,000 |
| South Sutter Water District | 15,000 |
| Tule Basin Farms | 6,000 |
| **Stanislaus River Area of Analysis** | |
| Oakdale Irrigation District / South San Joaquin Irrigation District | 50,000 |
| **Merced River Area of Analysis** | |
| Merced Irrigation District | 30,000 |
| **TOTAL** | **467,154** |

The following entities were included in the project as potentially interested in buying water made available for transfer: Contra Costa Water District, East Bay Municipal Utility District, and San Luis & Delta Mendota Water Authority Participating Members. Not all of these potential Buyers may end up actually purchasing water from the Sellers. Purchase decisions depend on several factors, including, but not limited to, hydrology, water demands, availability of other supplies, and transfer costs. USBR may be asked to reoperate the CVP to deliver the water made available for transfer, and the reoperation could be limited based on specific hydrologic conditions, biological conditions, or water quality issues. USBR cannot guarantee that it will be able to reoperate the CVP at specific times to accommodate water transfers

### Lower Yuba River Accord

The Lower Yuba River Accord (Yuba Accord) is an existing Water Transfer Program made up of a set of three agreements that resolve litigation over in-stream flow requirements on the Lower Yuba River. The three agreements include a Fisheries Agreement, a Water Purchase Agreement, and Conjunctive Use Agreements. The Fisheries Agreement establishes higher in-stream flow requirements and a flow schedule during specific periods of the year to meet fish needs. The agreement also requires a groundwater substitution program to increase surface flows in the Lower Yuba River and calls for studies of Lower Yuba River fish or fish habitat, monitoring of flows or temperatures and salmon fry studies. The Water Purchase Agreement establishes conditions when the Yuba County Water Agency would make water available for water supply reliability and fish and wildlife purposes. The Conjunctive Use Agreements require Yuba County Water Agency and seven participating member districts to implement conjunctive use measures to provide local water supplies in dry years to facilitate storage operations to meet in-stream flow requirements in the Lower Yuba River, as defined in the Fisheries Agreement.

The Yuba Accord Water Transfer Program consists of:

- Storage water transfers of up to 200,000 AF per year;
- Groundwater substitution water transfers of up to 90,000 AF per year and up to 180,000 AF in a three-year period;

- Rediversion of transfer water at authorized points of rediversion;
- Use of transfer water within the SWP and CVP service areas; and
- Use of transfer water for authorized purposes of use (irrigation and municipal uses).

The Yuba Accord Water Transfer Program expired on December 31, 2025. However, Yuba County Water Agency proposes to continue the Yuba Accord Water Transfer Program through December 31, 2050, by extending the relevant agreements and petitioning the State Water Resources Control Board to extend the approval of the place of use, purposes of use, and points of rediversion for the Yuba Accord Water Transfer Program. The proposed extension is a continuation of the current program under its existing conditions.

### Healthy Rivers and Landscapes Program

If the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Watershed is updated to include the Healthy Rivers and Landscapes (HRL) and becomes effective during the five-year period from 2026 to 2030, available transfer supplies may be reduced during "Above Normal", "Below Normal", and "Dry" year types. If the HRL program were approved, DWR would contribute 60,000 AF in the defined call years. For the Feather River, environmental enhancement as a part of the HRL program would include restoration of the following amounts of habitat by the end of year eight: 15 acres of spawning habitat, 5.25 acres of instream rearing habitat, and 1,655 acres of floodplain rearing habitat.[7] For the HRL program, a portion of Feather River flow commitments may be provided through groundwater substitution and may only be provided in a manner that does not have redirected impacts on fish and wildlife and is consistent with the Sustainable Groundwater Management Act (SGMA). Any reduction in instream flows that result from groundwater substitution shall be accounted for and deducted from flow contributions.

### CVP Municipal and Industrial Water Shortage Policy

Allocation of CVP water supplies for any given water year is based upon forecasted reservoir inflows and Central Valley hydrologic conditions, amounts of storage in CVP reservoirs, regulatory requirements, and management of Section 3406(b)(2) resources and refuge water supplies in accordance with implementation of the Central Valley Project Improvement Act. In some cases, M&I water shortage allocations may differ between CVP divisions due to regional CVP water supply availability, system capacity, or other operational constraints.

The purposes of the M&I Water Shortage Policy (WSP) are to:

- Define water shortage terms and conditions applicable to all CVP M&I contractors.
- Establish a water supply level that (a) with M&I contractors' drought water conservation measures and other water supplies will sustain urban areas during droughts, and (b) during severe or continuing droughts will, as far as possible, protect public health and safety.
- Provide information to help M&I contractors develop drought contingency plans.

The M&I WSP and implementation guidelines are intended to provide detailed, clear, and objective guidelines for the distribution of CVP water supplies during water shortage conditions, thereby allowing CVP water users to know when, and by how much, water deliveries may be reduced in drought and other low water supply conditions. This increased level of predictability is needed by water managers and the entities that receive CVP water to better plan for and manage available CVP water supplies, and to better integrate the use of CVP water with other available non-CVP water supplies.

The USBR developed the CVP M&I WSP Guidelines and Procedures to ensure consistent and equitable implementation of the M&I WSP.

[7] (Department of Water Resources, 2019)

### Other Construction Projects

Other projects that have recently been constructed, are in process of construction, or are reasonably foreseeable to be constructed within or adjacent to the District boundaries could have cumulative impacts when considered with the Project. One such project, described below, fits this description.

### Butte Water District Lateral Heading and Turnout Measurement Modernization Project

The Lateral Heading and Turnout Measurement Modernization Project consists of a combination of infrastructure modernization improvements and implementation of a canal operations decision support system (CODSS). The infrastructure improvements include flow measurement improvements to two lateral heading structures and 46 customer delivery turnouts to provide accurate delivery measurement. Lateral heading measurement improvements will be integrated into BWD's supervisory control and data acquisition (SCADA) system for real-time monitoring. The CODSS will be implemented using the canal management capability of BWD's existing delivery measurement and water order tracking system to provide operators with tools needed to improve canal operations and reduce spillage. The District anticipates the project to be completed in March 2027.

## 3.2 BIOLOGICAL RESOURCES

### 3.2.1 BASELINE CONDITIONS

#### 3.2.1.1 TOPOGRAPHY

The District is located within the *Biggs*, *Pennington*, *Gridley*, and *Sutter* United States Geological Survey (USGS) 7.5-minute quadrangles, and the new well site is within the *Gridley* USGS quadrangle within the southeast portion of Section 35, Township 17 North, Range 02 East. The topography of the District is relatively flat; although, elevations decrease from the north to the south and range from approximately 40 to 785 feet above mean sea level.

#### 3.2.1.2 CLIMATE

Like most of California, the site experiences a Mediterranean climate. Warm, dry summers are followed by cool, moist winters. In the summer, average high temperatures range between 82- and 96-degrees Fahrenheit (°F), but rarely exceed 104 °F, and the humidity is generally low. Winter temperatures are often below 55 °F during the day and rarely exceed 65 °F. On average, the City of Gridley receives approximately 31 inches of precipitation in the form of rain yearly, most of which occurs between September and June, and the District would be expected to receive similar amounts of precipitation.[8]

#### 3.2.1.3 HYDROLOGY

Many small streams and canals run through the BWD's boundaries but would not be directly impacted during the Project as the water transfers and new well site would not include any work within these waterways. Streams and canals that run through BWD mainly receive water diverted from the Feather River and other small streams from upland areas, and the Feather River is along and adjacent to much of the eastern border of BWD. Areas where these surface water features are in connection with the underlying aquifer system may experience impacts as a result of the Project. These potential impacts are discussed further in Section 3.3, Hydrology and Water Quality. However, DWR and Reclamation have assessed an assumed, agreed upon streamflow depletion factor (SDF) on BWD transfers of between 12% and 20%. Future transfers would continue to be subject to an assumed, agreed upon SDF between BWD, DWR, and Reclamation. Additionally, only 20 percent of irrigable acres may be idled under crop idling water transfers according to DWR's *DRAFT Technical Information for Preparing Water Transfer Proposals in 2019*. Under California Water Code Section 1018, landowners are encouraged to cultivate or retain non-irrigated cover crops or natural vegetation into their cropland idling transfer to protect habitat value in the area to be

[8] (WeatherSpark, 2025)

idled. Combined, these aspects of the Project design would limit potentially significant impacts to surface water features and associated habitats.

#### 3.2.1.4 SOILS

Soils across BWD include clay, silty clay, clay loam, sandy clay loam, loam, sandy loam, and fine sandy loam. Some major and minor soils across BWD are considered hydric. The new well site contains one soil type: Oswald Clay, 0 to 2 percent slopes. Oswald Clay soils are poorly drained, have slow permeability, have very low runoff, and are considered predominantly hydric (see Appendix C for the Web Soil Survey Report). This soil is mainly used for irrigated rice and row crops.

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions such that under sufficiently wet conditions, hydrophytic vegetation can be supported. Hydric soil ratings are derived from specific soil properties as well as climate, parent material, vegetation, landform type, and biological activity of a certain location.

#### 3.2.1.5 BIOTIC HABITATS

Representative areas within the BWD's boundaries were chosen for analysis, including the new well site, and six biotic habitats were observed and included agricultural, non-native grassland, canal, riverine/marshland, residential, and ruderal. The new well site contains canal and ruderal habitats. These habitats and their constituent plant and animal species are described in more detail in the following sections.

#### 3.2.1.6 AGRICULTURAL

Agricultural fields and orchards are the main habitat type within the BWD's boundaries. Crop idling would mainly occur on rice fields with some idling of other crops. Agricultural fields surveyed included rice, watermelon, unknown crops, and an orchard. All fields were freshly tilled and contained minimal vegetation. Vegetation found across the various fields visited included sparse non-native grasses, fiddle dock (*Rumex pulcher*), curly dock (*Rumex crispus*), horseweed (*Erigeron canadensis*), rice (*Oryza* sp.), grasses (*Bromus* sp.), flatsedge (*Cyperus* spp.), watermelons (*Citrullus lanatus*), common sowthistle (*Sonchus oleraceus*), Fremont's cottonwood (*Populus fremontii*), broadleaf cattail (*Typha latifolia*), Johnson grass (*Sorghum halepense*), spurge (*Euphorbia* sp.), dallis grass (*Paspalum dilatatum*), field bindweed (*Convolvulus arvensis*), Himalayan blackberry (*Rubus armeniacus*), wild radish (*Raphanus raphanistrum*), and wild oat (*Avena fatua*).

The survey of the various agricultural fields resulted in the identification of numerus bird species including red-tailed hawk (*Buteo jamaicensis*), white-crowned sparrow (*Zonotrichia leucophrys*), house finch (*Haemorhous mexicanus*), lesser goldfinch (*Spinus psaltria*), northern harrier (*Circus hudsonius*), sandhill crane (*Antigone canadensis*), red-winged blackbird (*Agelaius phoeniceus*), western meadowlark (*Sturnella neglecta*), common raven (*Corvus corax*), great egret (*Ardea alba*), savannah sparrow (*Passerculus sandwichensis*), killdeer (*Charadrius vociferus*), yellow-rumped warbler (*Setophaga coronata*), and great blue heron (*Ardea herodias*).

The agricultural habitat within the Project site is highly disturbed by agricultural activities. While the rice fields provide habitat for giant garter snake during the growing season, only disturbance-tolerant species and foraging birds would be expected to utilize this habitat.

#### 3.2.1.7 NON-NATIVE GRASSLAND

Small portions of non-native grassland were located along access roads. Vegetation across the various fields visited included non-native grasses, Johnson grass, horseweed, Himalayan blackberry, rattlesnake grass (*Briza maxima*), great mullein (*Verbascum thapsus*), Peruvian pepper tree (*Schinus molle*), and tall fescue

(*Festuca arundinacea*). The survey of this habitat resulted in the identification of western meadowlark and common raven.

The non-native grassland habitat within the Project site is moderately disturbed by agricultural and anthropogenic activities. The non-native grasslands may provide habitat to a variety of wildlife year-round and likely serves foraging birds, including raptors, during the day, as well as bats, coyotes, and other nocturnal animals at night.

#### 3.2.1.8 CANAL

Various canals flow through the BWD's boundaries though the water transfers would not include any work activities within these waterways. Vegetation found within the canals included Johnson grass, Himalayan blackberry, horseweed, common duckweed (*Lemna minor*), Brazilian vervain (*Verbena brasiliensis*), shortpod mustard (*Hirschfeldia incana*), narrowleaf willows (*Salix exigua*), velvetleaf (*Abutilon theophrasti*), American pokeweed (*Phytolacca decandra*), eucalyptus (*Eucalyptus* sp.), a valley oak tree (*Quercus lobata*), scarlet pimpernel (*Anagallis arvensis*), dallis grass, Johnson grass, field bindweed, Bulbous canary-grass (*Phalaris aquatica*), flatsedge, English plantain (*Plantago lanceolata*), curly dock, and broadleaf cattail.

The survey of the various canals resulted in the identification of sandhill cranes, black phoebe (*Sayornis nigricans*), Lincoln sparrow (*Melospiza lincolnii*), red-shouldered hawk (*Buteo lineatus*), turkey vulture (*Cathartes aura*), common raven, red-tailed hawk, white-crowned sparrow, great blue heron, and chinook salmon (*Oncorhynchus tshawytscha)*.

The canal habitat within BWD is highly disturbed by irrigation activities but provides habitat for wildlife when water is present. Chinook salmon are known to occur within canals in the area but mainly occur within the Feather River outside of the Project site. The Feather River is critical habitat for various special status fish species including Chinook salmon; however, no construction would occur near this waterway. Additionally, Project design and components related to crop idling constraints and the SDF agreement would minimize potential impacts to canal habitats.

#### 3.2.1.9 RIVERINE/MARSHLAND

Riverine habitat within BWD's boundaries includes various streams though the water transfers would not include any work activities within these waterways. Vegetation within various streams in the District included broadleaf cattail, Johnson grass, Himalayan blackberry, valley oak, horseweed, curly dock, Fremont cottonwood, narrowleaf willow, and Brazilian vervain.

The survey of the riverine/marshland habitat resulted in the observation of black phoebe, red-winged blackbird, mallard (*Anas platyrhynchos*), pied-billed grebe (*Podilymbus podiceps*), Sierran treefrog (*Pseudacris sierra*), and North American river otter (*Lontra canadensis*).

Riverine habitat within BWD's boundaries is marginally disturbed by agricultural and irrigation activities in the area but provides expansive high-quality habitat to a variety of wildlife, year-round. This habitat serves amphibians, fish, foraging birds, as well as bats, coyotes, and other nocturnal animals at night.

#### 3.2.1.10 RESIDENTIAL

Rural residential houses are located within BWD's boundaries but would not be impacted by the Project, and vegetation observed included ornamental plants surrounding the houses. The survey of the residential habitat resulted in the observation of California scrub jay (*Aphelocoma californica*), California ground squirrels (*Otospermophilus beecheyi*), chickens (*Gallus domesticus*), a horse (*Equus ferus caballus)*, and dogs (*Canis lupus familiaris*). The residential habitat within the District boundaries is highly disturbed by anthropogenic activities, and only disturbance-tolerant species and foraging birds would be expected to utilize this habitat.

#### 3.2.1.11 RUDERAL

The ruderal habitat of the Project site contained dirt access roads and paved roads throughout BWD. Most ruderal areas were bare or contained minimal vegetation. Vegetation throughout this habitat included non-native grasses, field bindweed, Johnson grass, shortpod mustard, Himalayan blackberry, horseweed, dallis grass, and American pokeweed (*Phytolacca decandra*). The survey of the ruderal habitat resulted in the observation of American kestrel (*Falco sparverius*), coyote (*Canis latrans*) tracks, common racoon (*Procyon lotor*) tracks, small mammal burrows, unidentified crayfish carcasses, and an unidentified snake shed at the entrance of a burrow.

The ruderal habitat is highly disturbed by agriculture, irrigation, and anthropogenic activities in the area. Only disturbance-tolerant species, foraging birds, or transient nocturnal species would be expected to utilize this habitat.

#### 3.2.1.12 NATURAL COMMUNITIES OF SPECIAL CONCERN AND RIPARIAN HABITAT

Natural communities of special concern are those that are of limited distribution, distinguished by significant biological diversity, or home to special status species. CDFW has classified and mapped all natural communities in California. These natural communities of special concern can be found within the California Natural Diversity Database (CNDDB). While there are no recorded observations of a natural community of special concern mapped within BWD, and no natural communities of special concern were observed during the field survey, eight recorded observations are within the vicinity of the District and include:

- Coastal and Valley Freshwater Marsh (located seven miles west of BWD boundary).
- Great Valley Cottonwood Riparian Forest (located along the Feather River, adjacent to the BWD boundary).
- Great Valley Mixed Riparian Forest (located one mile east of the BWD boundary).
- Great Valley Valley Oak Riparian Forest (located three miles east of the BWD boundary).
- Great Valley Willow Scrub (located eight miles east of the BWD boundary).
- Northern Basalt Flow Vernal Pool (located 10.5 miles east of the BWD boundary).
- Northern Hardpan Vernal Pool (located 2.5 miles east of the BWD boundary).
- Northern Volcanic Mud Flow Vernal Pool (located six miles east of the BWD boundary).

Riparian habitat is composed of plant communities that occur along the banks, and sometimes over the banks, of most waterways and is an important habitat for numerous wildlife species. CDFW has jurisdiction over most riparian habitat in California. Various waterways and areas with riparian habitat are located within the District's boundaries, though the water transfers and the new well would not include any work activities within these waterways.

#### 3.2.1.13 DESIGNATED CRITICAL HABITAT

The United States Fish and Wildlife Service (USFWS) often designates areas of "critical habitat" when it lists species as threatened or endangered. Critical habitat is a specific geographic area that contains features essential for the conservation of a threatened or endangered species, which may require special management and protection. According to the USFWS Information for Planning and Consultation system (IPaC), designated critical habitat is absent from the site. While not within the site, 10 species contain critical habitat within the vicinity of the site and include:

- Butte County meadowfoam (critical habitat located five miles north of the District boundary).
- California tiger salamander (critical habitat located 28 miles southwest of the District boundary).

- California red-legged frog (critical habitat located 22 miles west/northwest of the District boundary).
- Chinook salmon (critical habitat located within the Feather River adjacent to the eastern portion of the District boundary).
- Foothill yellow-legged frog (proposed critical habitat located 12 miles north of the District boundary).
- Green sturgeon (critical habitat located within the Feather River adjacent to the eastern portion of the District boundary).
- Steelhead (critical habitat located within the Feather River adjacent to the eastern portion of the District boundary).
- Vernal pool fairy shrimp (critical habitat located 14 miles southeast of the District boundary).
- Vernal pool tadpole shrimp (critical habitat located 4 miles north, 14 miles southeast, and 14 miles southwest of the District boundary).
- Yellow-billed cuckoo (critical habitat located 14 miles west of the District boundary).

#### 3.2.1.14 WILDLIFE MOVEMENT CORRIDORS AND NATIVE WILDLIFE NURSERY SITES

Wildlife movement corridors are routes that animals regularly and predictably follow during seasonal migration, dispersal from native ranges, daily travel within home ranges, and inter-population movements. Movement corridors in California are typically associated with valleys, ridgelines, and rivers and creeks supporting riparian vegetation.

The District mainly consists of agricultural fields with irrigation canals, streams, paved and unpaved roads, and small areas with non-native grasslands. Surrounding lands include agricultural fields, residential neighborhoods, various cities, and the Feather River. The streams and canals may act as corridors for aquatic wildlife, although the water transfers and construction of the new well site would not impact these potential corridors. Additionally, Project design and components related to Section 1018, crop idling constraints, and the SDF agreement would minimize potential impacts to surface water and cropland habitats.

Native wildlife nursery sites are areas where a species or group of similar species raise their young in a concentrated place, such as maternity bat roosts. The streams and canals within the Project area may be used as wildlife nursery sites for amphibian species such as Pacific tree frogs or fish species such as Chinook salmon, which were observed during the survey. The water transfers and new well site would not directly impact these potential native wildlife nursery sites; however, groundwater substitute pumping water transfers may result in impacts to interconnected surface water bodies. Conversely, Project design and components related to crop idling constraints and the SDF agreement would minimize potential impacts to surface water habitats.

#### 3.2.1.15 SPECIAL STATUS PLANTS AND ANIMALS

California contains several rare plant and animal species. In this context, “rare” is defined as a species known to have low populations or limited distributions. Conversion of habitats to accommodate human population growth in turn reduces the already-limited suitable habitat for rare species. This results in rare and sensitive species becoming increasingly more vulnerable to extirpation. State and federal regulations have provided the CDFW and USFWS with mechanisms for conserving and protecting the diversity of plant and animal species native to California. Numerous native plants and animals have been formally designated as “threatened” or “endangered” under state and federal endangered species legislation. Other formal designations include “candidate” for listing or “species of special concern” by CDFW. The California Native

Plant Society (CNPS) has its list of native plants considered rare, threatened, or endangered. Collectively these animals and plants are referred to as "special status species."

A query of the CNDDB for occurrences of special status plant and animal species was conducted for the *Biggs*, *Gridley*, *Pennington*, and *Sutter* USGS 7.5-minute quadrangles that contains the District, and for the 14 surrounding USGS quadrangles: *Butte City*, *Gilsizer Slough*, *Honcut*, *Meridian*, *Nelson*, *Olive Hurst*, *Oroville*, *Palermo*, *Sanborn Slough*, *Shippee*, *Sutter Buttes*, *Tisdal Weir*, *West of Biggs*, and *Yuba City*. A query of the IPaC was also completed for the entire site. These species, and their potential to occur within the site, are listed in Table 3-3 and Table 3-4, below. Other special status species that did not show up in the CNDDB query, but have the potential to occur in the vicinity, are also included in Table 3-4. Species lists obtained from CNDDB and IPaC are available in Appendix C. All relevant sources of information, as discussed in the Study Methodology section of Biological Evaluation report (see Appendix C), as well as field observations, were used to determine if any special status species have the potential to occur within the site.

**Table 3-3: List of Special Status Plants with Potential to Occur Onsite and/or in the Vicinity**

| Species | Status* | Habitat | Occurrence within the Project Site |
|---|---|---|---|
| Adobe-lily (*Fritillaria pluriflora*) | CNPS 1B | Found in chaparral, cismontane woodland, valley, and foothill grasslands. Usually on clay soils; sometimes serpentine. Found at elevations between 145 and 3,100 feet. Blooms February – April. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 9.5 miles north of the site in 1897. |
| Ahart's dwarf rush (*Juncus leiospermus* var. *ahartii*) | CNPS 1B | Located within valley and foothill grasslands at vernal pool margins, swales, and gopher mounds. Found at elevations between 100 and 750 feet. Blooms March – May. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately two miles east of the site in 2008. |
| Ahart's paronychia (*Paronychia ahartii*) | CNPS 1B | Found in valley and foothill grassland, vernal pools, and cismontane woodland. Occurs on stony, nearly barren clay of swales and higher ground around vernal pools at elevations below 1,640. Blooms February – June. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately four miles north of the site in 2004. |
| Baker's navarretia (*Navarretia leucocephala* ssp. *bakeri*) | CNPS 1B | Found in meadows, seeps, vernal pools and swales within cismontane woodland, valley and foothill grassland, and lower montane coniferous forest with adobe or alkaline soils at elevations between 10 and 5,510 feet. Blooms April – July. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity of the Project site was at an unknown location in 1936. |
| Bent-flowered fiddleneck | CNPS 1B | Found in cismontane woodland, valley and foothill grassland, and coastal bluff | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable |

| Species | Status* | Habitat | Occurrence within the Project Site |
|---|---|---|---|
| (*Amsinckia lunaris*) | | scrub at elevations between 10 and 2,600 feet. Blooms March – June. | for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately seven miles west of the site in 2013. |
| Big-scale balsamroot (*Balsamorhiza macrolepis*) | CNPS 1B | Found in open, grassy, or rocky slopes within chaparral, grassland, and cismontane woodland habitats at elevations less than 5,000 feet. Blooms March – July. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 9.5 miles north of the site in 1897. |
| Brazilian watermeal (*Wolffia brasiliensis*) | CNPS 2B | Found in wetlands, marshes, and swamps. Occurs mainly in shallow freshwater marshes at elevations below 330 feet. Blooms late spring to early fall. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species may be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 0.5 miles west of the site in 2012. |
| Broadleaf pondweed (*Stuckenia striata*) | CNPS 2B | Found in marshes and swamps. Occurs in lakes, ponds, rivers, and drainage canals at elevations below 4,757 feet. Blooms July – August. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 11 miles west of the site in 2019. |
| Butte County golden clover (*Trifolium jokerstii*) | CNPS 1B | Found in valley and foothill grasslands and vernal pools. Occurs in mesic sites in grassland at elevations below 1,310 feet. Blooms March – May. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately six miles north of the site in 2020. |
| Butte County meadowfoam (*Limnanthes floccosa* ssp. *californica*) | CNPS 1B | Found in vernal pools, and valley and foothill grassland. Occurs in wet or flowing drainages and depressions; often not in discrete vernal pools; soils are usually Redding clay with rocks. Found at elevations below 330 feet. Blooms March – May. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately four miles north of the site in 1999. |
| California alkali grass (*Puccinellia simplex*) | CNPS 1B | Found in the San Joaquin Valley and other parts of California in saline flats and mineral springs within valley grassland and wetland-riparian communities at | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within |

| Species | Status* | Habitat | Occurrence within the Project Site |
|---|---|---|---|
| | | elevations below 3,000 feet. Blooms March – May. | the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 3.5 miles west of the site in 1991. |
| Colusa layia (Layia septentrionalis) | CNPS 1B | Found in chaparral, cismontane woodland, valley, and foothill grasslands. Generally occurs on grassy slopes in sandy or serpentine soil at elevations between 50 and 3,600 feet. Blooms April – June. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 4.5 miles southwest of the site in 1930. |
| Ferris' milk-vetch (*Astragalus tener* var. *ferrisiae*) | CNPS 1B | Found in meadows, seeps, valley grasslands, and foothill grasslands. Often occurs on subalkaline flats on overflow land in the Central Valley; usually seen in dry, adobe soil at elevations below 260 feet. Blooms March – June. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 2.5 miles west of the site in 2001. |
| Greene's tuctoria (*Tuctoria greenei*) | FE, CNPS 1B | Found in the San Joaquin Valley and other parts of California in vernal pools within valley grassland, wetland, and riparian communities at elevations below 3,500 feet. Blooms May – September. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 2.5 miles north of the site in 2011. |
| Hartweg's golden sunburst (*Pseudobahia bahifolia*) | FE, CE, CNPS 1B | Found in valley and foothill grassland and cismontane woodland communities in clay soils that are often acidic. Occurs predominantly on northern slopes, but also along shady creeks and near vernal pools at elevations between 300 and 650 feet. Blooms March – May. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately three miles south of the site in 1847 but was listed as extirpated in 1990. |
| Heartscale (*Atriplex cordulata* var. *cordulata*) | CNPS 1B | Found in the Central Valley in saline or alkaline soils within shadscale scrub, valley grassland, and wetland-riparian communities at elevations below 250 feet. Blooms June – July. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 3.5 miles west of the site in 2012. |
| Lesser saltscale (*Atriplex minuscula*) | CNPS 1B | Found in the San Joaquin Valley in sandy, alkaline soils in alkali scrub, valley and foothill grassland, and alkali sink communities at elevations below 750 feet. Blooms April – October. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any |

| Species | Status* | Habitat | Occurrence within the Project Site |
|---|---|---|---|
| | | | construction impacts. The nearest recorded observation of this species within the vicinity was approximately 3.5 miles west of the site in 1998. |
| Pappose tarplant (*Centromadia parryi* ssp. *parryi*) | CNPS 1B | Found in chaparral, coastal prairie, meadows and seeps, coastal salt marsh, valley, and foothill grassland. Occurs in vernally mesic, often alkaline sites at elevations below 1,310 feet. Blooms June – October. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 3.5 miles west of the site in 1998. |
| Peruvian dodder (*Cuscuta obtusiflora* var. *glandulosa*) | CNPS 2B | An annual vine located in marshes and swamps. Found on herbs including *Alternanthera*, *Dalea*, *Lythrum*, *Polygonum*, and *Xanthium.* Found at elevations below 1,640 feet. Blooms July – October. | **Absent.** This species is extirpated from California, and the Project site does not contain suitable habitat. |
| Pink creamsacs (*Castilleja rubicundula* var. *rubicundula*) | CNPS 1B | Found in chaparral, cismontane woodland, meadows and seeps, valley grasslands, and foothill grasslands. Often found on serpentine soil at elevations from 65 and 3,000 feet. Blooms April – June. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately three miles west of the site in 1988. |
| Recurved larkspur (*Delphinium recurvatum*) | CNPS 1B | Occurs in chenopod scrub, cismontane woodland, and grassland habitats on poorly drained, fine, alkaline soils; often in valley saltbush or valley chenopod scrub communities at elevations between 100 and 2,600 feet. Blooms March – June. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 5.5 miles northwest of the site in 1987. |
| Red Bluff dwarf rush (*Juncus leiospermus* var. *leiospermus*) | CNPS 1B | Found in chaparral, valley and foothill grassland, cismontane woodland, vernal pools, meadows and seeps. Occurs on vernally mesic sites and on the edges of vernal pools at elevations between 920 and 1,640 feet. Blooms April – June. | **Absent.** The site is outside of the elevational range for this species. |
| Sanford's arrowhead (*Sagittaria sanfordii*) | CNPS 1B | This species is an aquatic plant and is found in the San Joaquin Valley and other parts of California in freshwater marshes, ponds, canals, and ditches at elevations below 1,000 feet. Blooms May – October. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species may be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species was within the site in 2015. |
| Slender Orcutt grass (*Orcuttia tenuis*) | FT, CE, CNPS 1B | Occurs in vernal pools and wetlands. Often found in gravelly substrate at elevations between 656 and 3,610 feet. Blooms May – October. | **Absent.** The site is mainly outside of the elevational range for this species. |

| Species | Status* | Habitat | Occurrence within the Project Site |
|---|---|---|---|
| Spicate calycadenia (*Calycadenia spicata*) | CNPS 1B | Found in valley and foothill grassland and cismontane woodland. Occurs on dry, adobe, clay, gravelly, rocky, and disturbed areas, often in openings and roadsides at elevations between 100 and 4,600 feet. Blooms May – September. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately two miles north of the site in 2012. |
| Subtle orache (*Atriplex subtilis*) | CNPS 1B | Found in the San Joaquin Valley in saline depressions in alkaline soils within valley and foothill grassland communities at elevations below 300 feet. Blooms June – October. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 3.5 miles west of the site in 1998. |
| Veiny monardella (*Monardella venosa*) | CNPS 1B | Found in valley grassland, foothill grassland, and cismontane woodland communities. Occurs in heavy clay, mostly with grassland associates. Found at elevations between 200 and 1,400 feet. Blooms June – July. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately three miles south of the site in 1854. |
| Watershield (*Brasenia schreberi*) | CNPS 2B | Found in marshes and swamps, as well as near artificial waterbodies at elevations below 2,200 feet. Blooms April – October. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately eight miles west of the site in 1946. |
| Water star-grass (*Heteranthera dubia*) | CNPS 2B | Found in marshes and swamps in alkaline, still, or slow-moving water. Requires a pH of 7 or higher, usually in slightly eutrophic waters. Found at elevations between 50 and 5,000 feet. Blooms July – August. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately seven miles west of the site in 1946. |
| Woolly rose-mallow (*Hibiscus lasiocarpos* var. *occidentalis*) | CNPS 1B | Occurs in marshes and swamps in moist, freshwater-soaked riverbanks and low peat islands in sloughs. Can also occur on riprap and levees. In California, known from the delta watershed at elevations below 500 feet. Blooms July – November. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately three miles west of the site in 1983. |

| Species | Status* | Habitat | Occurrence within the Project Site |
|---|---|---|---|
| Wright's trichocoronis (*Trichocoronis wrightii* var. *wrightii*) | CNPS 2B | Found in marshes and swamps, riparian forest, meadows and seeps, and vernal pools. Occurs in mud flats of vernal lakes, drying riverbeds, and alkali meadows at elevations below 1,640 feet. Blooms May – September. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 16 miles southwest of the site in 1997. |

Table 3-4: List of Special Status Animals with Potential to Occur Onsite and/or in the Vicinity

| Species | Status* | Habitat | Occurrence within the Project Site |
|---|---|---|---|
| American badger (*Taxidea taxus*) | CSSC | Prefers drier open stages of shrub, forest, and herbaceous habitats with friable soils to burrow, but can be found within numerous habitats throughout California, including the margins of agricultural lands. Needs a sufficient prey base of burrowing rodents. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 9.5 miles northwest of the site at an unknown date. |
| Bald eagle (*Haliaeetus leucocephalus*) | CE, CFP | Resides in old growth forests as well as lower montane coniferous forests. Can also be found in open uplands in the winter. Nests are generally found in large trees within a mile of water. Nests and winters along ocean shores, lake margins, and rivers. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was adjacent to the east portion of the site in 2010. |
| Bank swallow (*Riparia riparia*) | CT | Nests colonially in burrows constructed along vertical banks and bluffs near waterbodies. This disturbance tolerant species is also known to nest in human-made sites, such as quarries, mounds of gravel or dirt, and road cuts. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was adjacent to the east portion of the site in 2010. |
| Burrowing owl (*Athene cunicularia*) | CCE, CSSC | Resides in open, dry grasslands, deserts, scrublands, and other areas with low growing vegetation. Nests and roosts underground in existing burrows created by mammals, most often by ground squirrels, and human-made structures. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site. No suitable burrows or signs of this species were observed during the field survey and habitat features required by this species were absent. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species |

| Species | Status* | Habitat | Occurrence within the Project Site |
|---|---|---|---|
| | | | within the vicinity was approximately 2.5 miles north of the site in 2006. |
| California black rail (*Laterallus jamaicensis coturniculus*) | CT | Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering large bays. Requires water depths of about 1 inch that does not fluctuate during the year and dense vegetation for nesting habitat. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 4.5 miles west of the site in 1962. |
| California condor (*Gymnogyps californianus*) | FE, CE, CFP | Typically nests in cavities in canyon or cliff faces but has also been recorded nesting in giant sequoias in Tulare County. Requires vast expanses of open savannah, grassland, and/or foothill chaparral in mountain ranges of moderate altitude. Forages for carrion up to 100 miles from their roost/nest sites. | **Unlikely.** While this species could forage within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. There are no recorded observations of this species on the CNDDB within the regional vicinity of the Project. |
| California tiger salamander – central California DPS (*Ambystoma californiense*) | FT, CT | Requires vernal pools or seasonal ponds for breeding and small mammal burrows for aestivation. Generally found in grassland and oak savannah plant communities in central California from sea level to 1,500 feet in elevation. Can migrate up to 1.3 miles to breed. | **Unlikely.** The District mainly consists of agricultural habitat which is unsuitable for this species. The new well site is located in agricultural habitat, and the water transfers would not result in any construction or impacts to waterways. Suitable habitat is present in areas outside of the District and this species would not be expected to be impacted by Project activities. The nearest recorded observation of this species within the vicinity was approximately one mile west of the site in 1965. |
| Chinook salmon - Central Valley spring-run ESU (*Oncorhynchus tshawytscha* pop. 11) | FT, CT | Spring-run Chinook Salmon enter the Sacramento River from late March through September. Adults hold in cool water habitats through the summer, then spawn in the fall from mid-August through early October. Juveniles migrate soon after emergence as young-of-the-year or remain in freshwater and migrate as yearlings. Now only remnant runs remain in Butte, Mill, Deer, Antelope, and Beegum Creeks, tributaries to the Sacramento River. In the mainstem Sacramento River and the Feather River, early-running Chinook Salmon occur, but significant hybridization with fall run has occurred. Adult numbers depend on pool depth and volume, amount of cover, and proximity to gravel. Water temps >27 C are lethal to adults. | **Present**. This species was observed within the Snake River which runs through the southwest portion of the District. While within the boundaries of the District this species would not be impacted by the water transfers or construction of the new well site. Project design and components related to crop idling constraints and the SDF agreement would minimize potential impacts to surface water habitats.<br><br>The nearest recorded observation of this species within the vicinity was within the Feather River, adjacent to the east portion of the site in 2015. |
| Coast horned lizard | CSSC | Found in grasslands, coniferous forests, woodlands, and chaparral, primarily in open areas with patches of loose, sandy | **Unlikely.** The District mainly consists of agricultural habitat which is unsuitable for this species. The new well site is located in |

| Species | Status* | Habitat | Occurrence within the Project Site |
|---|---|---|---|
| (*Phrynosoma blainvillii*) | | soil and low-lying vegetation in valleys, foothills, and semi-arid mountains. Frequently found near ant hills and along dirt roads in lowlands along sandy washes with scattered shrubs. | agricultural habitat, and the water transfers would not result in any construction or impacts to waterways. Suitable habitat is present in areas outside of the District and this species would not be expected to be impacted by Project activities. The nearest recorded observation of this species within the vicinity was approximately 11.5 miles north of the site in 2002. |
| Crotch's bumble bee (*Bombus crotchii*) | CCE | Occurs throughout coastal California, as well as east to the Sierra Nevada-Cascade crest, and south into Mexico. Food plant genera include snapdragons, scorpionweeds, primroses, poppies, and buckwheats. Nests are often located underground in abandoned rodent nests, or above ground in tufts of grass, old bird nests, rock piles, or cavities in dead trees. This species overwinters under leaf litter or soft soil. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 2.5 miles southwest of the site in 2024. |
| Foothill yellow-legged frog - Feather River Distinct Population Segment (*Rana boylii* pop. 2) | FT, CT | Frequents rocky streams and rivers with rocky substrate and open, sunny banks in forests, chaparral, and woodlands. Occasionally found in isolated pools, vegetated backwaters, and deep, shaded, spring-fed pools. | **Unlikely.** While this species could occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 8.5 miles northeast of the site in 1912 but is listed as extirpated. |
| Foothill yellow-legged frog - north Sierra Distinct Population Segment (*Rana boylii* pop. 3) | CT | Frequents rocky streams and rivers with rocky substrate and open, sunny banks in forests, chaparral, and woodlands. Occasionally found in isolated pools, vegetated backwaters, and deep, shaded, spring-fed pools. | **Unlikely.** While this species could occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 1.5 miles southwest of the site in 2007 but is listed as extirpated. |
| Giant gartersnake (*Thamnophis gigas*) | FT, CT | Occurs in marshes, sloughs, canals, ditches, rice fields, and adjacent uplands. Prefers locations with emergent vegetation for cover and open areas for basking. This species uses small mammal burrows adjacent to aquatic habitats for hibernation in the winter and to escape from excessive heat in the summer. | **Likely.** While this species occurs within the District's boundaries, work will only occur at the new well site. This species could occur in the canal adjacent to the new well site or could be found basking within the marginal habitat of the new well site. While water transfers would not result in any construction related impacts to waterways or this species, crop idling rice fields may temporarily reduce available habitat for this species. Suitable habitat is available in the surrounding areas and crop idling would not be |

| Species | Status* | Habitat | Occurrence within the Project Site |
|---|---|---|---|
| | | | expected to significantly impact this species. The nearest recorded observation of this species was within the site in 2014. |
| Greater sandhill crane (*Antigone canadensis tabida*) | CT, CFP | Nests in wetland habitats in northeastern California and winters in the Central Valley. Grain fields within 4 miles of a shallow body of water are used as a communal roost site and irrigated pastures are used as loafing sites. | **Present.** While this species occurs within the District's boundaries, work will only occur at the new well site, and this species would only be expected to forage in croplands. While water transfers would not result in any construction related impacts to waterways or this species, crop idling rice fields may temporarily reduce available habitat for this species. Suitable habitat is available in the surrounding areas and crop idling would not be expected to significantly impact this species. The nearest recorded observation of this species was within the site in 1924. |
| Green sturgeon - southern Distinct Population Segment (*Acipenser medirostris* pop. 1) | FT, CSSC | Spawning occurs primarily in cool (51- 59 °F) sections of mainstem rivers in deep pools (26- 30 feet) with substrate containing small to medium sized sand, gravel, cobble, or boulders. | **Possible**. This species may occur within streams that flow through the District. While within the boundaries of the District this species would not be impacted by the water transfers or construction of the new well site. The nearest recorded observation of this species within the vicinity was within the Feather River, adjacent to the east portion of the site in 2020. |
| Least Bell's vireo (*Vireo bellii pusillus*) | FE, CE | This migratory species breeds in southern California. Breeding habitat consists of dense, low, shrubby, riparian vegetation in the vicinity of water or dry river bottoms. By the early 1980s, this species was extirpated from most of its historic range in California, including the Central Valley. | **Absent.** This species was extirpated from most of its historic range in California, including the Central Valley and would not be expected to occur within the Project site. The nearest recorded observation of this species within the vicinity was approximately seven miles northwest of the site in 1906. |
| Loggerhead shrike (*Lanius ludovicianus*) | CSSC | Frequents open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low herbaceous cover. In the Central Valley, this species nests in riparian areas, desert scrub, and agricultural hedgerows. | **Possible**. This species may forage or nest within trees along streams that flow through the District. While within the boundaries of the District this species would not be impacted by the water transfers or construction of the new well site. The nearest recorded observation of this species within the vicinity was approximately 9.5 miles north of the site in 2002. |
| Marysville California kangaroo rat (*Dipodomys californicus eximius*) | CSSC | Known only from the Sutter Buttes area. This species occurs in the grass-forb stages of chaparral habitat and requires friable soils. | **Unlikely.** While this species could occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately three miles west of the site in 1983. |

| Species | Status* | Habitat | Occurrence within the Project Site |
|---|---|---|---|
| Monarch butterfly (*Danaus plexippus*) | FPT | Roosts in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby. Larval host plants consist of milkweeds. Winter roost sites extend along the Pacific Coast from northern Mendocino to Baja California, Mexico. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. While this species could travel through the site and forage, roosting habitat was absent. Water transfers would not result in any construction or impacts to waterways or this species. There are no recorded observations of this species on the CNDDB within the regional vicinity of the Project. |
| Northern harrier (*Circus hudsonius*) | CSSC | Nests and forges in various grasslands, including salt grass in desert sinks, riparian scrub, and wetland edges. Nests are constructed on the ground from sticks in wet areas, usually on the edge of marshes. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately two miles north of the site in 1986. |
| Northwestern pond turtle (*Actinemys marmorata*) | FPT, CSSC | An aquatic turtle of ponds, marshes, slow-moving rivers, streams, and irrigation ditches with riparian vegetation. Requires adequate basking sites and sandy banks or grassy open fields to deposit eggs. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site. This species could occur in the canal adjacent to the new well site or could be found basking within the marginal habitat of the new well site. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species was within the site in 2016. |
| Pallid bat (*Antrozous pallidus*) | CSSC | Found in grasslands, chaparral, and woodlands, where it feeds on ground- and vegetation-dwelling arthropods, and occasionally takes insects in flight. Prefers to roost in rock crevices, but may also use tree cavities, caves, bridges, and other human-made structures. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and lacks roosting habitat. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 2.5 miles west of the site in 2003. |
| Song sparrow ("Modesto" population) (*Melospiza melodia*) | CSSC | This population is endemic to the north-central portion of the Central valley of California. This species has an affinity for emergent freshwater marshes and is associated with Scirpus *spp*. and *Typha spp*. Known to nest in riparian oak forests (Gardali, 2008). | **Unlikely.** While this species could occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 6.5 miles southeast of the site in 1915. |
| Steelhead – Central Valley DPS | FT | This winter-run fish begins migration to fresh water during peak flows during December through February. The | **Possible**. This species may occur within streams that flow through the District. While within the boundaries of the |

| Species | Status* | Habitat | Occurrence within the Project Site |
|---|---|---|---|
| (*Oncorhynchus mykiss irideus* pop.11) | | spawning season is typically from February to April. After hatching, this species will move to deeper, mid-channel habitats in late summer and fall. In general, both juveniles and adults prefer complex habitat with boulders, submerged clay, undercut banks, and large woody debris. | District this species would not be impacted by the water transfers or construction of the new well site. The nearest recorded observation of this species within the vicinity was within the Feather River, adjacent to the east portion of the site in 2012. |
| Swainson's hawk (*Buteo swainsoni*) | CT | Nests in large trees in open areas adjacent to grasslands, grain or alfalfa fields, or livestock pastures suitable for supporting rodent populations. | **Possible**. This species may forage or nest within trees throughout the District. While large trees occur within half a mile of the well site, construction of the new well would not result in more impacts than normal agricultural activities in the area. Therefore, this species would not be impacted by the water transfers or construction of the new well site. The nearest recorded observation of this species within the vicinity was adjacent to the east portion of the site in 2016. |
| Townsend's big-eared bat (*Corynorhinus townsendii*) | CSSC | Occurs in a variety of habitats, but prefers cool, dark roost sites, and is often found in caves and mines. They roost in the open, hanging from walls and ceilings. Western populations typically forage on moths in areas of dense foliage. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and lacks roosting habitat. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 5.5 miles northeast of the site in 1990. |
| Tricolored blackbird (*Agelaius tricolor*) | CT, CSSC | Nests colonially near fresh water in dense cattails or tules, or in thickets of riparian shrubs. Forages in grassland and cropland. Large colonies are often found foraging in dairy farm feed fields. | **Possible**. This species may forage or nest throughout the District. Construction of the new well would not result in more impacts than normal agricultural activities in the area. Therefore, this species would not be impacted by the water transfers or construction of the new well site. The nearest recorded observation of this species was within the site in 2011. |
| Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) | FT | Lives in mature elderberry shrubs in the Central Valley and adjacent foothills from Tehama County south through Merced and Mariposa Counties with two scattered populations in Madera and Fresno Counties. Adults are active from March to June. | **Unlikely.** While this species could occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species was along the east portion of the site in 2011. |
| Vernal pool fairy shrimp (*Branchinecta lynchi*) | FT | Occupies vernal and seasonal pools, with clear to tea-colored water, in grass or mud-bottomed swales, and basalt depression pools. | **Unlikely.** The District mainly consists of agricultural habitat which is unsuitable for this species. The new well site is located in agricultural habitat, and the water transfers would not result in any construction or impacts to waterways. Suitable habitat is present in areas outside of the District and this species would not be expected to be impacted by project |

| Species | Status* | Habitat | Occurrence within the Project Site |
|---|---|---|---|
| | | | activities. The nearest recorded observation of this species within the vicinity was approximately 1.5 miles east of the site in 2009. |
| Vernal pool tadpole shrimp (*Lepidurus packardi*) | FE | Occurs in vernal pools, clear to tea-colored water, in grass or mud-bottomed swales, and basalt depression pools. | **Unlikely.** The District mainly consists of agricultural habitat which is unsuitable for this species. The new well site is located in agricultural habitat, and the water transfers would not result in any construction or impacts to waterways. Suitable habitat is present in areas outside of the District and this species would not be expected to be impacted by Project activities. The nearest recorded observation of this species within the vicinity was approximately 1.5 miles east of the site in 2009. |
| Western mastiff bat (*Eumops perotis californicus*) | CSSC | Found in open, arid to semi-arid habitats, including dry desert washes, flood plains, chaparral, oak woodland, open ponderosa pine forest, grassland, and agricultural areas, where it feeds on insects in flight. Roosts most commonly in crevices in cliff faces but may also use high buildings and tunnels. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and lacks roosting habitat. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 5.5 miles northeast of the site in 1973. |
| Western red bat (*Lasiurus blossevillii*) | CSSC | Roosts primarily in trees, 2–40 feet above ground, from sea level up through mixed conifer forests. Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and lacks roosting habitat. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 10.5 miles southwest of the site in 1999. |
| Western spadefoot (*Spea hammondii*) | FPT, CSSC | The majority of the time this species is terrestrial and occurs in small mammal burrows and soil cracks, sometimes in the bottom of dried pools. Prefers open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Vernal or seasonal pools, that hold water for a minimum of three weeks, are necessary for breeding. | **Unlikely.** The District mainly consists of agricultural habitat which is unsuitable for this species. The new well site is located in agricultural habitat, and the water transfers would not result in any construction or impacts to waterways. Suitable habitat is present in areas outside of the District and this species would not be expected to be impacted by project activities. The nearest recorded observation of this species within the vicinity was approximately four miles east of the site at an unknown date. |
| Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) | FT, CE | Suitable nesting habitat in California includes dense riparian willow-cottonwood and mesquite habitats along a perennial river. Once common in the California Central Valley, as well as coastal valleys and riparian habitats east of the Sierra Nevada, habitat loss now constrains | **Possible**. This species may forage or nest within trees throughout the District. While within the boundaries of the District this species would not be impacted by the water transfers or construction of the new well site. The nearest recorded observation of this species within the vicinity was |

| Species | Status* | Habitat | Occurrence within the Project Site |
|---|---|---|---|
| | | the California breeding population to small numbers of birds. | approximately eight miles west of the site in 2017. |
| White-tailed kite (*Elanus leucurus*) | CFP | Occurs in rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Often occurs in open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching. | **Possible**. This species may forage or nest within trees throughout the District. While within the boundaries of the District this species would not be impacted by the water transfers or construction of the new well site. The nearest recorded observation of this species within the vicinity was approximately 12 miles southeast of the site in 2003. |
| Yellow warbler (*Setophaga petechia*) | CSSC | Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders. Also nests in montane shrubbery in open conifer forests in the Cascades and Sierra Nevada ranges. | **Possible**. This species may forage or nest within trees throughout the District. While within the boundaries of the District this species would not be impacted by the water transfers or construction of the new well site. The nearest recorded observation of this species within the vicinity was approximately 9.5 miles north of the site in 2002. |

***EXPLANATION OF OCCURRENCE DESIGNATIONS AND STATUS CODES**

| | |
|---|---|
| Present: | Species observed on the site at time of field surveys or during recent past. |
| Likely: | Species not observed on the site, but it may reasonably be expected to occur there on a regular basis. |
| Possible: | Species not observed on the site, but it could occur there from time to time. |
| Unlikely: | Species not observed on the site, and would not be expected to occur there except, perhaps, as a transient. |
| Absent: | Species not observed on the site and precluded from occurring there due to absence of suitable habitat. |

**STATUS CODES**

| | | | |
|---|---|---|---|
| FE | Federally Endangered | CE | California Endangered |
| FT | Federally Threatened | CT | California Threatened |
| FC | Federal Candidate | CCT | California Threatened (Candidate) |
| | | CFP | California Fully Protected |
| | | CSSC | California Species of Concern |
| | | CCE | California Endangered (Candidate) |

**CNPS LISTING**

| | | | |
|---|---|---|---|
| 1B | Plants Rare, Threatened, or Endangered in California and elsewhere. | 2B | Plants Rare, Threatened, or Endangered in California, but more common elsewhere. |

## 3.2.2 APPLICABLE REGULATIONS

### 3.2.2.1 FEDERAL

#### ENDANGERED SPECIES ACT

Permits may be required from the USFWS if activities associated with a Project have the potential to result in the “take” of a species listed as threatened or endangered under the Endangered Species Act (ESA). The ESA provides a program for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The law requires federal agencies, in consultation with the USFWS and/or the National Oceanic Atmosphere Administrations Fisheries Service, to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. The law also prohibits any action that causes the “taking" of any listed species of endangered fish or wildlife. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct (16 United States Code (USC), Section 1532(19), 50 CFR, Section 17.3). Likewise, import, export, interstate, and foreign commerce of listed species are all generally prohibited.

#### DESIGNATED CRITICAL HABITAT

When species are listed as threatened or endangered, the USFWS often designates areas of "Critical Habitat" as defined by section 3(5)(A) of the ESA. Critical Habitat is a term defined in the ESA as a specific geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical Habitat is a tool that supports the continued conservation of imperiled species by guiding cooperation with the federal government. Designations only affect federal agency actions or federally funded or permitted activities. Critical Habitat does not prevent activities that occur within the designated area. Only activities that involve a federal permit, license, or funding and are likely to destroy or adversely modify Critical Habitat will be affected.

#### MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA: 16 USC 703-712) prohibits killing, possessing, or trading in any bird species covered in one of four international conventions to which the United States is a party, except in accordance with regulations prescribed by the Secretary of the Interior. The name of the act is misleading, as it actually covers almost all birds native to the United States, even those that are non-migratory. The MBTA encompasses whole birds, parts of birds, and bird nests and eggs. In addition, California Fish and Game Code makes it unlawful to take or possess any non-game birds covered by the MBTA (Section 3513), as well as any other native non-game birds (Section 3800).

#### BALD AND GOLDEN EAGLE PROTECTION ACT

The Bald and Golden Eagle Protection Act (16 USC 668-668c) is a federal statute that protects two species of eagle. The act prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald or golden eagles, including their parts (including feathers), nests, or eggs. Violators may be assessed a civil penalty by the Secretary of not more than $5,000 for each such violation. The act also provides for fines and imprisonment for violators.

### 3.2.2.2 STATE

#### CALIFORNIA ENDANGERED SPECIES ACT

Permits may be required from CDFW if activities associated with a project have the potential to result in the "take" of a species listed as threatened or endangered under the California Endangered Species Act (CESA). The term "take" means "to hunt, pursue, catch, capture, kill, or attempt to hunt, pursue, catch, capture, or kill." (California Fish and Game Code, Section 86). The CESA states that "all native species of fishes, amphibians, reptiles, birds, mammals, invertebrates, and plants, and their habitats, threatened with extinction and those experiencing a significant decline which, if not halted, would lead to a threatened or endangered designation, will be protected or preserved." CDFW is a responsible agency under CEQA. CDFW reviews CEQA documents in order to determine the adequacy of how a project will affect a species and to make project-specific recommendations for their conservation.

#### BIRDS OF PREY

Birds of prey are protected in California under provisions of California Fish and Game Code (Section 3503.5), which states that it is unlawful to take, possess, or destroy any birds in the order Falconiformes (hawks and eagles) or Strigiformes (owls), or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto.

#### NESTING BIRDS

In California, protection is afforded to the nests and eggs of all birds. California Fish and Game Code (Section 3503) states that it is "unlawful to take, possess, or needlessly destroy the nest or eggs of any bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Breeding-season disturbance that causes nest abandonment and/or loss of reproductive effort is considered a form of "take" by the CDFW.

### 3.2.2.3 LOCAL

#### BUTTE COUNTY GENERAL PLAN 2040

The Butte County General Plan 2040 contains the following goals and policies related to the Project:

##### Water Resources Element

Goal W-1: Maintain and enhance water quality.

Policy W-P1.1: County planning and programs shall be integrated with other watershed planning efforts, including best management practices, guidelines, and policies of the Central Valley Regional Water Quality Control Board (CVRWQCB) and local Groundwater Sustainability Plans.

Policy W-P1.3: Regulations that protect water quality from the impacts of agricultural and industrial activities shall be maintained.

Goal W-2: Ensure an abundant and sustainable water supply to support all uses in Butte County.

Policy W-P2.1: The County supports solutions to ensure the sustainability of community water supplies.

Policy W-P2.2: The County may continue the Six-County Memorandum of Understanding (MOU) with Colusa, Glenn, Tehama, Shasta, and Sutter Counties, continue participation in the local GSAs and Groundwater Advisory Boards, and continue to support the Northern Sacramento Valley and Upper Feather River Integrated Regional Water Management and local Groundwater Sustainability Plans.

Policy W-P2.3: Water resources shall be planned and managed in a way that relies on sound science, data, and public participation.

Policy W-P2.4: The County's State Water Project allocation (27,500 acre-feet) should be fully utilized within Butte County when technically and economically feasible to maximize the benefit and value to Butte County by prioritizing use within the county.

Policy W-P2.8: The County supports Area of Origin and County of Origin water rights, the existing water right priority system, and the authority to make water management decisions locally to meet the county's current and future needs, thereby protecting Butte County's communities, economy, and environment.

Goal W-3: Protect and manage groundwater resources in Butte County.

Policy W-P3.1: Groundwater transfers and substitution programs shall be locally regulated to protect the sustainability of the County's economy, communities, and ecosystems.

Goal W-4: Support coordination between Groundwater Sustainability Agencies in Butte County.

Policy W-P4.1: The County shall work cooperatively with the Groundwater Sustainability Agencies in the three subbasins in Butte County to support implementation of the Sustainable Groundwater Management Act to ensure the County has sustainable water supplies.

Policy W-P4.2: The County supports working towards Sustainable Groundwater Management Act implementation to ensure the sustainability of groundwater resources, including groundwater levels, groundwater quality, and avoidance of land subsidence, and supports programs that rely on management at the local level, use sound scientific data, and ensure compliance, where consistent with the County's goals and policies.

Policy W-P4.3: Public information and involvement should be encouraged in the groundwater sustainability planning, collaboration, and coordination process.

Policy W-P4.4: The County shall consult applicable Groundwater Sustainability Plans and local groundwater management agencies when making decisions that could impact groundwater resources.

### Conservation and Open Space Element

Goal COS-6: Engage in cooperative planning efforts to protect biological resources.

Policy COS-P6.1: The County shall coordinate with applicable federal, State, regional and local agencies on natural resources and habitat planning.

Goal COS-7: Conserve and enhance habitat for protected species and sensitive biological communities.

Policy COS-P7.1: Conservation easements that protect habitat areas, habitat corridors and sensitive biological resources shall be promoted.

Policy COS-P7.3: Creeks shall be maintained in their natural state whenever possible, and creeks and floodways shall be allowed to function as natural flood protection features during storms.

Policy COS- P7.6: New development projects shall include setbacks and buffers along riparian corridors and adjacent to habitat for protected species, except where permitted in the Butte Regional Habitat Conservation Plan (HCP) and Natural Community Conservation Plan (NCCP) Planning Area and where such development is consistent with the conditions of the HCP/NCCP, upon the future adoption of the HCP/NCCP.

Policy COS-P7.7: Construction barrier fencing shall be installed around sensitive resources on or adjacent to construction sites. Fencing shall be installed prior to construction activities and maintained throughout the construction period.

Policy COS-P7.8: Where sensitive on-site biological resources have been identified, construction employees operating equipment or engaged in any development-associated activities involving vegetation removal or ground disturbing activities in sensitive resource areas shall be trained by a qualified biologist and/or botanist who will provide information on the on-site biological resources (sensitive natural communities, special-status plant and wildlife habitats, nests of special-status birds, etc.), avoidance of invasive plant introduction and spread, and the penalties for not complying with biological mitigation requirements and other State and federal regulations.

Policy COS-P7.9: A biologist shall be retained to conduct construction monitoring in and adjacent to all habitats for protected species when construction is taking place near such habitat areas.

Goal COS-9: Protect identified special-status plant and animal species.

Policy COS-P9.1: A biological resources assessment shall be required for any proposed development project where special-status species or critical habitat may be present. Assessments shall be carried out under the direction of Butte County. Additional focused surveys shall be conducted during the appropriate season if necessary. Upon adoption of the Butte Regional Habitat Conservation Plan (HCP) and Natural Community Conservation Plan (NCCP), assessment requirements of the HCP/NCCP shall be implemented for development projects within the HCP/NCCP area.

Policy COS-P9.2: If special-status plant or animal species are found to be located within a development site, proponents of the project shall engage in consultation with the appropriate federal, State, and regional agencies and mitigate project impacts in accordance with State and federal law. Upon adoption of the Butte Regional Habitat Conservation Plan (HCP) and Natural Community Conservation Plan (NCCP), mitigation requirements of the HCP/NCCP shall be implemented for development projects within the HCP/NCCP area. Examples of mitigation may include:

a. Design the proposed project to avoid and minimize impacts.
b. Restrict construction to specific seasons based on project specific special-status species issues (e.g., minimizing impacts to special-status nesting birds by constructing outside of the nesting season).
c. Confine construction disturbance to the minimum area necessary to complete the work.
d. Mitigate for the loss of special-status species by purchasing credits at an approved conservation bank (if a bank exists for the species in question), funding restoration or habitat improvement projects at existing preserves in Butte County or purchasing or donating mitigation lands of substantially similar habitat.
e. Maintain a minimum 100-foot buffer on each side of all riparian corridors, creeks and streams for special-status and common wildlife.
f. Establish setbacks from the outer edge of special-status species habitat areas.
g. Construct barriers to prevent compaction damage by foot or vehicular traffic.

### SUTTER COUNTY 2030 GENERAL PLAN

The Sutter County 2030 General Plan contains the following goals and policies related to the Project:

#### Biological Resources and Open Space

**Goal ER 1: Support a comprehensive approach for the conservation, enhancement, and regulation of Sutter County's significant habitat and natural open space resources.**

**Policy ER 1.4: Resources Assessment.** Require discretionary development proposals that could potentially impact biological resources to conduct a biological resources assessment to determine if any resources will be adversely affected by the proposal and, if so, to identify appropriate measures to avoid or mitigate such impacts.

**Policy ER 1.5: Avoidance.** Ensure that new development projects avoid, to the extent feasible, significant biological resources (e.g., areas of rare, threatened or endangered species of plants, riparian areas, vernal pools), except where such projects are identified as "Authorized Development" within an adopted Habitat Conservation Plan.

**Policy ER 1.6: Mitigation.** Mitigate biological and open space effects that cannot be avoided in accordance with an applicable Habitat Conservation Plan or federal, state, and local regulations.

**Policy ER 1.7: Permits.** Require that new development secure all necessary state and federal resource permits/approvals prior to any development activity.

**Policy ER 1.8: Buffers.** Ensure that new development incorporates buffers and other measures adequate to protect biological habitats that have been preserved, enhanced, and created.

**Goal ER 2: Conserve, protect, and enhance Sutter County's significant natural wetland and riparian habitats.**

**Policy ER 2.1: No Net Loss.** Require new development to ensure no net loss of state and federally regulated wetlands, other waters of the United States (including creeks, rivers, ponds, marshes, vernal pools, and other seasonal wetlands), and associated functions and values through a combination of avoidance, restoration, and compensation.

**Policy ER 2.2: Resource Conservation District.** Encourage and support the Sutter County Resource Conservation District's programs that facilitate preservation and restoration of natural wetland environments as long as these programs do not significantly affect Sutter County agricultural lands and flood control operations.

Goal ER 3: Conserve, protect, and enhance Sutter County's varied wildlife and vegetation resources.

Policy ER 3.1: Special-Status Species. Preserve special-status fish, wildlife, and plant species (e.g., rare, threatened, or endangered species) and habitats consistent with an applicable Habitat Conservation Plan or federal, state, and local regulations.

Policy ER 3.2: Agency Coordination. Coordinate with federal, state, and local resource agencies (e.g., California Department of Fish and Game, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers) to protect special-status species.

Policy ER 3.3: Fisheries. Support the preservation and re-establishment of fisheries in the rivers and streams within Sutter County.

Policy ER 3.4: Waterfowl Resources. Preserve and protect waterfowl resources along the Pacific Flyway Migration Corridor.

Policy ER 3.5: Wildlife Corridors. Preserve and enhance wildlife movement corridors between natural habitat areas to maintain biodiversity and prevent the creation of biological islands. Preserve contiguous habitat areas when possible.

Policy ER 3.6: Natural Vegetation. Preserve important areas of natural vegetation and the ecological integrity of these habitats, where feasible, including but not limited to riparian, vernal pool, marshes, oak woodlands and annual grasslands.

Policy ER 3.7: Oak Trees. Preserve native oak trees when possible through the review of discretionary development projects and activities. Reduce the loss of oak trees through consideration of tree mitigation/replanting programs.

Goal ER 4: Conserve, protect, and enhance Sutter County's unique natural open space lands, drainages, floodplains, and resources.

Policy ER 4.1: Preserve Natural Resources. Preserve natural landforms, natural vegetation, and natural resources as open space to the extent feasible.

Policy ER 4.2: Sutter Buttes. Preserve the Sutter Buttes as an important agricultural, cultural, historic, habitat, and open space resource. Promote and support efforts by willing landowners to increase opportunities for public access to the Sutter Buttes and other open space areas.

Policy ER 4.3: River Corridors. Preserve the Sacramento, Feather, and Bear River corridors as important habitat, recreation and open space resources. Support efforts to increase public access and recreational uses along the County's river corridors.

### Water

Goal ER 6: Preserve and protect the County's surface water and groundwater resources.

Policy ER 6.1: Integrated Water Management Programs. Integrate water management programs that emphasize multiple benefits and balance the needs of agricultural, rural, and urban users.

Policy ER 6.2: Surface Water Resources. Protect the surface water resources in the County including the Sacramento, Feather and Bear Rivers and their significant tributaries.

Policy ER 6.3: Groundwater Sustainability. Protect the sustainability of groundwater resources.

Policy ER 6.7: Water Rights. Support the protection of the existing water rights of water agencies and providers within Sutter County. Do not support out-of-area, water transfers where they would adversely

impact water supply within Sutter County. Support either out-of-area, or in-basin water transfers that would not negatively impact water supply within Sutter County.

### 3.2.3 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

A reconnaissance-level field survey of the site was conducted over two days on October 16th and October 17th, 2025, by Provost & Pritchard biologist, Olivia Arrendondo. The survey consisted of walking and driving throughout BWD's boundaries and surveying representative areas while identifying and noting land uses, biological habitats and communities, and plant and animal species encountered. Habitats were also assessed to help with determining if they could be suitable for various rare or protected plant and animal species.

Provost & Pritchard biologist Shaylea Stark then utilized the results of the field survey to analyze potential project-related impacts to biological resources based on the resources known to occur or with the potential to occur within the site. Sources of information used in preparation of this analysis included: CDFW's CNDDB and California Wildlife Habitat Relationships database; CNPS's Online Inventory of Rare and Endangered Vascular Plants of California; CalFlora's online database of California native plants; Jepson Herbarium's online database (i.e., Jepson eFlora); USFWS Environmental Conservation Online System, IPaC system, and National Wetlands Inventory; iNaturalist; NatureServe Explorer's online database; United States Department of Agriculture Natural Resources Conservation Service's (NRCS) Web Soil Survey; California Herps website; and various manuals, reports, and references related to plants and animals of the Sacramento Valley region. See Appendix C for the results of the aforementioned searches and surveys.

The field survey did not include focused surveys for special status species. The field survey conducted included the appropriate level of detail to assess the significance of potential impacts to sensitive biological resources resulting from implementing the Project. Furthermore, the field survey was sufficient to generally describe aquatic features of the project site that could be claimed as jurisdictional by federal and/or state agencies, such as the United States Army Corps of Engineers (USACE), CDFW, Regional Water Quality Control Board (RWQCB), and the State Water Resources Control Board (SWRCB). If Project activities resulted in impacts to aquatic resources and aquatic habitats, this report would be sufficient to support required permit applications, if needed, for the Project.

Public Resource Code Section 21001(c) states that it is the policy of the State to "prevent the elimination of fish and wildlife species due to man's activities, ensure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities." Impacts on biological resources were assessed using the following impact significance criteria, based on the State CEQA Guidelines Appendix G checklist. The Project would have a significant impact if it would:

- 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.

In accordance with Appendix G, the biological resources section typically contains six impact analysis questions. However, the IS (Chapter Chapter 6) analyzed potential impacts and found that there would be no or less than significant impacts related to the following questions and were not found to require additional analysis:

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or USFWS;

- 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;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with establish native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

### 3.2.4 IMPACT ANALYSIS

a) Would the project 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?

Less than Significant Impact with Mitigation Incorporated. Of the 32 regionally occurring special-status plant species, all are considered absent from, or unlikely to occur within, the site. They are not expected to be impacted by Project activities due to past or ongoing disturbances, the lack of suitable habitat, or because Project work will not occur in areas where these species may be present. While 29 species may occur within the District (Adobe-lily, Ahart's dwarf rush, Ahart's paronychia, Baker's navarretia, bent-flowered fiddleneck, big-scale balsamroot, Brazilian watermeal, broadleaf pondweed, Butte County fritillary, Butte County golden clover, Butte County meadowfoam, California alkali grass, Colusa layia, Ferris' milk-vetch, greene's tuctoria, Hartweg's golden sunburst, heartscale, lesser saltscale, pappose tarplant, pink creamsacs, recurved larkspur, Sanford's arrowhead, spicate calycadenia, subtle orache, veiny monardella, Watershield, water star-grass, woolly rose-mallow, and Wright's trichocoronis), these species would not be impacted by Project activities. Additionally, Project design and components related to Section 1018, crop idling constraints, and the SDF agreement would minimize potential impacts to surface water and cropland habitats.

Since it is unlikely that these species would occur onsite or be impacted by the Project if they do occur, implementation of the Project would have no impact on these 32 special status species through construction mortality, disturbance, or loss of habitat. Mitigation measures are not warranted for plant species as impacts would be less than significant.

Of the 36 regionally occurring special status animal species, 12 are considered absent from or unlikely to occur within the site or be impacted by Project activities due to past or ongoing disturbance, the absence of suitable habitat, or work not occurring in areas where these species may occur. These species include: California condor, California tiger salamander – central California DPS, coast horned lizard, foothill yellow-legged frog - Feather River Distinct Population Segment, foothill yellow-legged frog - north Sierra Distinct Population Segment, Least Bell's vireo, Marysville California kangaroo rat, song sparrow ("Modesto" population), valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, and western spadefoot.

While 20 species may occur within the District (American badger, bald eagle, bank swallow, burrowing owl, California black rail, Crotch's bumble bee, green sturgeon - southern Distinct Population Segment, loggerhead shrike, monarch butterfly, northern harrier, pallid bat, steelhead – Central Valley DPS,

Swainson's hawk, Townsend's big-eared bat, tricolored blackbird, western mastiff bat, western red bat, western yellow-billed cuckoo, white-tailed kite, and yellow warbler), these species would not be impacted by Project activities. Additionally, two species observed within the District during the field survey (Chinook salmon - Central Valley spring-run ESU and greater sandhill crane) would also not be impacted by Project activities. Project design and components related to Section 1018, crop idling constraints, and the SDF agreement would minimize potential impacts to surface water and cropland habitats.

Since it is unlikely that these species would occur onsite or be impacted by the Project, if construction activities occur, implementation of the Project would have no impact on these 34 special status species through construction mortality, disturbance, or loss of habitat, and mitigation measures are not warranted. However, mitigation measures described below would bring impacts to migratory birds, raptors, special status birds, giant garter snake, and northwestern pond turtle to less than significant.

### Well Site-Related Impacts

Since the Project site includes the entire District but construction will only occur at the new well site, mitigation is separated for work at the well site where construction will occur and mitigation for the water transfers and crop idling throughout the District which requires no construction or impacts to the waterways.

#### General Project-Related Impacts

The Project has the potential to impact a number of sensitive resources, as described in more detail in the following sections. Impacts to these resources could be a violation of State and federal laws or considered a potentially significant impact under CEQA. In addition to specific mitigation discussed in the following paragraphs, implementation of mitigation measures BIO-1 and BIO-2 will help reduce potential impacts to these resources to a less than significant level under CEQA and will help with complying with State and federal laws protecting these resources. These mitigation measures are identified in the subsequent Mitigation section.

#### Project-Related Mortality and/or Nest Abandonment of Migratory Birds, Raptors, and Special Status Birds

The new well site and adjacent areas contain suitable nesting and foraging habitat for a variety of protected bird species, such as migratory birds and raptors. While special status birds including bank swallow, burrowing owl, California black rail, loggerhead shrike, northern harrier, Swainson's hawk, tricolored blackbird, western yellow-billed cuckoo, white-tailed kite, and yellow warbler may forage or nest within trees throughout the District, these species would not be impacted by the water transfers or construction of the new well site and mitigation is not required. It is anticipated that during the nesting bird season, protected birds could nest on the ground or in shrubs and trees within, and adjacent to, the new well site and forage within the new well site. Protected birds located within or adjacent to the site during construction have the potential to be injured or killed by Project-related activities. In addition to the direct "take" of protected birds within the site and adjacent areas, these birds nesting in these areas could be disturbed by Project-related activities resulting in nest abandonment. Projects that result in the mortality of individuals would be considered a potentially significant impact under CEQA. Implementation of mitigation measures BIO-3, BIO-4, and BIO-5 will reduce potential impacts to migratory birds, raptors, and special status birds to a less than significant level under CEQA. These mitigation measures are identified in the subsequent Mitigation section.

#### Project-Related Mortality and/or Disturbance of Giant Garter Snake

The new well site contained upland areas with small mammal burrows for overwintering within the agricultural habitat and contained a canal adjacent to the work area which is moderately suitable giant garter snake aquatic habitat which could be used for foraging and traveling through the District to better quality habitat. This species is known to occur in the area along canals, streams, and in rice fields. Giant garter snakes occurring within the new well site during construction have the potential to be injured or killed by Project-related activities. Projects that result in the mortality of individuals would be considered a potentially significant impact under CEQA. Implementation of mitigation measures BIO-6, BIO-7, BIO-8, and BIO-9 will reduce potential impacts to giant garter snakes as a result of well site construction to a less than significant level under CEQA. These mitigation measures are identified in the subsequent Mitigation section.

#### Project-Related Mortality and/or Disturbance to Northwestern Pond Turtle

The new well site contained upland areas where this species could bask within the agricultural habitat and contained a canal adjacent to the work area which is moderately suitable aquatic habitat which could be used for foraging and traveling through the District to better quality habitat. Northwestern pond turtle occurring within the new well site have the potential to be injured or killed by Project-related activities. Projects that result in the mortality of individuals would be considered a potentially significant impact under CEQA. Implementation of mitigation measures BIO-10, BIO-11, and BIO-12 will reduce potential impacts to northwestern pond turtle to a less than significant level under CEQA. These mitigation measures are identified in the subsequent Mitigation section.

### Water Transfers and Crop Idling-Related Impacts

#### Project-Related Mortality and/or Disturbance of Giant Grater Snake

As previously mentioned, giant garter snake is known to occur in the District along canals, streams, and in rice fields. Giant garter snakes occurring within the area have the potential to be impacted by the water transfers and crop idling through temporary loss of habitat. However, Project design and components related to Section 1018, crop idling constraints, and the SDF agreement would minimize these potential impacts to giant garter snake habitat.

Projects that result in the mortality of individuals would be considered a potentially significant impact under CEQA. Implementation of mitigation measures BIO-13 and BIO-14 will further reduce potential impacts to giant garter snake as a result of water transfers to a less than significant level under CEQA. These mitigation measures are identified in the subsequent Mitigation section.

## 3.2.5 MITIGATION

### 3.2.5.1 WELL SITE MITIGATION

#### GENERAL PROJECT-RELATED IMPACTS

BIO-1 **(WEAP Training):** Prior to initiating construction activities (including staging and mobilization), all personnel associated with construction relating to the new well site will attend a mandatory Worker Environmental Awareness Program (WEAP) training, conducted by a qualified biologist (someone familiar with the identification and habitats of these species), to aid workers in identifying special status resources that may occur in the site. The specifics of this program will include identification of the sensitive species and suitable habitats, a description of the regulatory status and general ecological

characteristics of sensitive resources, and review of the limits of construction and mitigation measures required to reduce impacts to biological resources within the work area. This training will discuss special status species, describe the laws and regulations in place to provide protection of these species, identify the penalties for violation of applicable environmental laws and regulations, and include a list of required protective measures to avoid "take." A fact sheet summarizing this information, along with photographs or illustrations of sensitive species with potential to occur on the site, will also be prepared for distribution to all contractors, their employees, and all other personnel involved with construction of the Project. All trainees will sign a form documenting that they have attended WEAP training and understand the information presented to them.

BIO-2 (BMPs): The Project proponent will require that all workers employ the following Best Management Practices (BMPs) in order to avoid and minimize potential impacts to special status species:

- Vehicles will observe a 15-mph speed limit while on unpaved access routes.
- Workers will inspect areas beneath parked vehicles, equipment, and materials prior to mobilization. If federal special status species are detected, the individual will either be allowed to leave of its own volition or will be captured by a qualified biologist (must possess appropriate collecting/handling permits or relevant experience) and relocated out of harm's way to the nearest suitable habitat beyond the influence of the Action Area. "Take" of a state or federal special status (threatened, endangered, candidate, or proposed) species will be avoided and minimized to the greatest extent possible.
- Workers will initiate a trash abatement program before starting project activities and will continue the program for the duration of the project. All trash and food items will be contained in animal-proof containers and removed, ideally at daily intervals but at least once a week, to avoid attracting opportunistic predators such as ravens, coyotes, and feral dogs.
- All open trenches, holes, sumps, and other excavations more than six inches deep will be provided with one or more escape ramps constructed of earth fill or wooden planks at the end of each workday. If escape ramps cannot be provided, then holes or trenches will be covered with plywood or similar materials. If at any time a trapped giant garter snake or other species are discovered, the Designated Biologist(s) will be notified to move the individual outside of the Action Area.
- The presence of any federal special status species will be reported to a qualified biologist, who will submit the occurrence to the CNDDB. If necessary, the biologist will report the occurrence to CDFW and/or the Service.

### PROJECT-RELATED MORTALITY AND/OR NEST ABANDONMENT OF MIGRATORY BIRDS, RAPTORS, AND SPECIAL STATUS BIRDS

BIO-3 (Avoidance): The Project's construction activities will occur, if feasible, between September 1 and January 31 (outside of the nesting bird season) to avoid impacts to nesting birds.

BIO-4 (Pre-Construction Surveys): If activities must occur within the nesting bird season (February 1 to August 30), a qualified biologist (someone able to identify these species) will conduct a pre-construction take-avoidance survey for active nests within ten (10) calendar days prior to the start of construction. The survey will be completed within the new well site, and up to 100 feet outside of the new well site for nesting migratory birds and up to 500 feet outside of the new well site for nesting raptors. Raptor nests are considered "active" upon the nest-building stage. If construction is delayed or halted for more than ten (10) days, another pre-construction survey for nesting birds will be conducted.

BIO-5 (Avoidance Buffers): On discovery of any active nests or breeding colonies near work areas, a qualified biologist will determine appropriate avoidance buffer distances based on applicable CDFW and/or USFWS guidelines, the biology of the species, conditions of the nest(s), and the level of project disturbance. If necessary, avoidance buffers will be identified with flagging, fencing, or other easily visible means, and will be maintained until the biologist has determined that the nestlings have fledged.

#### PROJECT-RELATED MORTALITY AND/OR DISTURBANCE OF GIANT GARTER SNAKE

BIO-6 (Pre-Construction Surveys): If work will occur during the active season for giant garter snake (between May 1 and September 30), a qualified biologist (someone familiar with garter snake species) will conduct two giant garter snake pre-construction surveys with the first occurring within 15 days and the second occurring within 24 hours prior to the onset of construction. The information collected from the first pre-construction survey will serve primarily to alert the biologist and construction crews of the general level of giant garter snake activity at the site and borrow area, and the second survey will serve to minimize potential for take of giant garter snake. If work will occur during the inactive season, a qualified biologist will conduct a giant garter snake pre-construction survey within seven (7) days prior to the start of construction within the new well site and all accessible areas up to 200 feet. If construction is delayed or halted for more than seven (7) days, another pre-construction survey for giant garter snake will be conducted. If the surveys result in the identification of a giant garter snake, or an individual is found within the new well site during construction activities, it will be allowed to leave the site on its own and the qualified biologist will determine appropriate buffers to be implemented to avoid impacts to the individual(s).

BIO-7 (Exclusion): A giant garter snake and other wildlife exclusion fence will be installed prior to project activities. If work will occur during the inactive season for giant garter snake (between October 1 and April 30), an exclusion fence will be installed around the work areas prior to the start of the inactive season. The design of the fence will be approved by the CDFW and USFWS prior to installation. Fence installation will be supervised by a qualified biologist.

BIO-8 (Monitor): A qualified biologist will conduct a pre-activity clearance survey each day of, and remain onsite during, initial vegetation clearing and ground disturbing activities and until the wildlife exclusion fence is in place. An inspection of the exclusion fence each day by the contractor will be completed to ensure it is functional for the intended purpose. The contractor will be instructed during the WEAP training on how to inspect the exclusion fence. If a garter snake is observed within the project site, the contractor

will stop work and allow the species to leave the site of its own volition or will be captured by a qualified biologist (must possess appropriate collecting/handling permits or relevant experience) and relocated out of harm's way to the nearest suitable habitat beyond the influence of the Project work area. "Take" of a State or federal special status (rare, California Species of Special Concern, threatened, or endangered) species is prohibited without appropriate take permits from the USFWS and CDFW.

BIO-9 (Formal Consultation): If giant garter snakes are observed onsite, consultation with USFWS and CDFW is warranted to discuss how to implement the Project and avoid take of giant garter snake. If take cannot be avoided, take authorization through the acquisition of a Biological Opinion (BO) and an incidental take permit (ITP) pursuant to Fish and Game Code section 2081, subdivision (b) is recommended to comply with CESA and USFWS Section 7(a)(1) is recommended to comply with the ESA.

#### PROJECT-RELATED MORTALITY AND/OR DISTURBANCE TO NORTHWESTERN POND TURTLE

BIO-10 (Pre-Construction Survey and Avoidance Buffers): Within seven (7) days prior to the start of construction within the new well site, a qualified biologist (someone who is able to identify this species) will conduct a pre-construction survey for Northwestern Pond Turtle (NPT) within the new well site, and all accessible areas up to 330 feet. Pre-construction surveys will be conducted in accordance with the draft *Western Pond Turtle (Emys marmorata) Visual Survey Protocol for the Southcoast Ecoregion* (United States Geological Survey 2006). If no NPTs are observed during the pre-construction survey, then construction activities may begin. If construction is delayed or halted for more than seven (7) days, another pre-construction survey for NPTs will be conducted. If the surveys result in the identification of a NPT, or an individual is found within the new well site during construction activities, it will be allowed to leave the site on its own and the qualified biologist will determine appropriate buffers to be implemented to avoid impacts to the individual(s).

BIO-11 (Monitor): If NPTs are observed within the site a qualified biologist will conduct a pre-activity clearance survey each day and remain onsite to oversee all vegetation clearing and ground disturbing activities until the exclusion fence is completely installed or the individual(s) has vacated the work area. If NPTs are detected, the biologist will stop work and allow the species to leave the site or borrow area of its own volition or will be captured by the qualified biologist (must possess appropriate collecting/handling permits or relevant experience) and relocated out of harm's way to the nearest suitable habitat beyond the influence of the project work area. "Take" of a State or federal special status (rare, California Species of Special Concern, threatened, or endangered) species is prohibited.

BIO-12 (Formal Consultation): Should northwestern pond turtles get listed in this area and the Project/qualified biologist needs to move an individual, consultation for protection plans and/or relocation plans with the appropriate agencies will be completed to avoid take.

### 3.2.5.2 WATER TRANSFER AND CROP IDLING MITIGATION

#### PROJECT-RELATED MORTALITY AND/OR DISTURBANCE OF GIANT GRATER SNAKE

BIO-13 (Maintain Water): The District will keep adequate water in major irrigation and District owned and operated drainage canals. Water depths will be maintained at levels similar

to years when transfers do not occur or, where information on existing water depths is limited, at least two feet of water will be considered adequate.[9]

BIO-14 **(GGS BMPs):** The District will perform giant garter snake BMPs during irrigation canal maintenance activities, including educating maintenance personnel to recognize and avoid contact with giant garter snake, cleaning only one side of a conveyance channel per year to retain foraging areas and cover habitat for giant garter snake within maintained canals and ditches, and avoid the stockpiling of vegetation and sediment debris adjacent to canals and ditches. The District will create and distribute a giant garter snake BMPs information pamphlet to maintenance personnel that includes photos of giant garter snake and their habitat, and descriptions of BMPs.

### 3.2.6 CUMULATIVE IMPACTS

Potential impacts to biological resources, as described above, are related to direct and indirect impacts to special-status species or their habitat. The Project's crop idling and groundwater substitution transfers in combination with other cumulative projects could further reduce groundwater levels and surface water flows in affected surface waters. As mentioned in Section 3.1.5, there are several future water transfers and other type projects scheduled to be occurring in the vicinity of the Project. With respect to the aforementioned projects, when considered cumulatively on a regional scale, impacts to biological resources could be potentially significant to species which rely on surface water features and their associated habitats. However, with the implementation of the above proposed mitigation measures as well as those included in the Hydrology and Water Quality section below (Section 3.3.5), impacts to biological resources would be reduced to a level that is not cumulatively considerable. Other water transfers facilitated by USBR and DWR using federal and State facilities would be required to have similar conservation measures in place to protect special-status species, as shown in the *DRAFT Technical Information for Preparing Water Transfer Proposals in 2019.* Additionally, Project design and components related to Section 1018 and the SDF agreement would minimize potential impacts to surface water habitats. As a result, any impacts would be less than significant under the cumulative condition.

[9] (Sutter Extension Water District, 2025)

# 3.3 HYDROLOGY AND WATER QUALITY

## 3.3.1 BASELINE CONDITIONS

### 3.3.1.1 SURFACE WATER RESOURCES

#### FEATHER RIVER SYSTEM

Oroville Reservoir holds winter and spring runoff for release into the Feather River. During wet years, Oroville Reservoir aids in reducing downstream flooding. The current reservoir was formed in 1969 after the construction of Oroville Dam and is primarily filled from inflows from the North Fork, Middle Fork, and South Forks of the Feather River. DWR owns and operates the dam as part of the SWP. Oroville Reservoir has a capacity of 3.5 million AF at an elevation of 900 feet and a surface area of 15,810 acres.[10] Water from Oroville Reservoir is released to meet downstream demands, export demands, generate power at the Hyatt Powerplant beneath Oroville Dam and at the Thermalito Powerplant, and to support downstream fisheries and water quality objectives.

Oroville Reservoir is a key unit in the SWP and also provides flood control for upper portions of the Feather River watershed including Marysville, Yuba City, Oroville, and smaller communities through coordinated flood operations with New Bullards Bar Reservoir or the North Yuba River. Controlled releases from Oroville Reservoir and New Bullards Bar Reservoir combine downstream with flows from the Yuba and Bear Rivers to create the largest tributary to the Sacramento River downstream of Shasta Reservoir. Dam operations follow a Water Control Plan that include a maximum flood control space of 750,000 AF and a minimum of 375,000 AF by mid-October each year, as set by USACE. The USACE also sets downstream flow limits of 150,000 cubic feet per second (cfs) north of Honcut Creek, 180,000 cfs above the mouth of the Yuba River, and 320,000 cfs south of the Bear River.[11]

The Thermalito Afterbay is downstream of Oroville Reservoir and the Thermalito Forebay. It has a maximum operating storage of 57,040 AF. Thermalito Afterbay provides storage for the water required by the pumpback operation to Oroville Reservoir, serves as a warming basin and point of delivery for agricultural water delivered to farms primarily south and west of the afterbay, and produces controlled flow in the Feather River.[12]

The main stem of the Feather River begins downstream of Oroville Dam and generally flows in a south and southwest direction. Long portions of the Feather River have levees on both sides of its banks. On the east bank a levee extends from the confluence with the Sacramento River to Hamilton Bend near the City of Oroville. The west bank extends from the Sacramento River confluence with Honcut Creek. The Feather River design channel capacity from Thermalito Afterbay to the Yuba River is 210,000 cfs and is 300,000 cfs from the Yuba River to the Bear River.[13]

#### Butte Water District

The District is a California Water District formed and responsible for providing irrigation water to agricultural water users within its service area and boundary. BWD is a water right holder to the Feather River, and through a settlement agreement with the State following the construction of the Lake Oroville Complex, is authorized to divert water from the Thermalito Afterbay.

The District, along with Biggs-West Gridley Water District, Richvale Irrigation District, and Sutter Extension Water District, organized to form the Joint Water Districts Board. In 1969 the Joint Water Districts entered into a settlement agreement with the State regarding their right to divert water from the Feather River.

[10] (California Department of Water Resources, n.d.)
[11] (California Department of Water Resources, n.d.)
[12] (Federal Energy Regulatory Commission, 2007)
[13] (California Department of Water Resources, 2022)

The 1970 Joint Operating Agreement allocates the diversion of water to the Joint Water Districts. Accordingly, BWD may divert up to 133,200 AF of water during the defined irrigation season.

#### SACRAMENTO RIVER SYSTEM

Shasta Reservoir is the primary reservoir providing flood protection on the upper Sacramento River. The reservoir was formed in 1948 after the construction of the Shasta Dam, and is primarily filled from inflows from the Sacramento, Pit, and McCloud Rivers. The USBR owns and operates the dam and reservoir as part of the CVP. Shasta Reservoir has a capacity of 4.55 million AF.[14]

Shasta Dam provides flood control for downstream communities along the Sacramento River and water storage for irrigation in the Sacramento and San Joaquin Valleys. The normal operating water level at the dam is 522.5 feet. The dam's outlets have a combined capacity of 81,800 cfs at a water level of 1,065 feet.[15] Dam operations include a maximum flood control space of 1.3 million AF. This capacity must be available starting October 1 in anticipation of winter storms. Large winter rainstorms historically result in maximum flows between December and March.[16] Water releases are required to provide suitable conditions for the conservation of salmon in the Sacramento River.

About nine miles downstream of Shasta Dam is Keswick Dam, which helps reregulate flow releases for the benefit of hydroelectric generation. Keswick Dam's normal operating hydraulic level is 587 feet with a maximum of 601.6 feet. At normal operating level, the total water storage is 23,800 AF with a release capacity of 250,000 cfs at the dam's outlets.[17]

Downstream of Shasta Reservoir and Keswick Dam, the Sacramento River flows southwards to the Delta. The Sacramento River system is leveed from Ord Ferry to the southern tip of Sherman Island in the Delta. Flood control on the Sacramento River system is also managed by a system of weirs and bypasses constructed by the USACE. The system includes five bypasses: the Butte Basin, Sutter Bypass, Yolo Bypass, Tisdale Bypass, and Sacramento Bypass. Moulton and Colusa Weirs feed floodwaters into the Butte Basin Bypass, Tisdale Weir flows into Sutter Bypass, and Fremont Weir and Sacramento Bypass flow into the Yolo Bypass. The Yolo Bypass carries five-sixths of the volume of the Sacramento River at peak flood flows. The bypasses are large tracts of undeveloped or minimally-developed land. Development within the bypasses typically is limited to agricultural activities that require minimal infrastructure. Water released to the bypass system flows south into the Delta, in effect creating a short-term storage system for the floodwaters. Water released to the bypass system also infiltrates into the ground, recharging groundwater supplies, although this volume is small compared to the total volume of a flood. When flooding occurs, the weir and bypass system diverts water to protect the levee system and free flood storage capacity in the reservoirs. The Sacramento River levee and bypass system has a maximum conveyance capacity of 600,000 cfs, which is much greater than the capacity of the actual Sacramento River channel. Approximately 110,000 cfs is conveyed in the river and almost 500,000 cfs is channeled into the Yolo Bypass.[18]

### 3.3.1.2 SURFACE WATER QUALITY

Section 303(d) of the Clean Water Act (CWA) requires states, territories and authorized tribes to develop a list of water quality-impaired segments of waterways. The 303(d) list includes water bodies that do not meet water quality standards for their beneficial uses. The CWA requires that these jurisdictions establish priority rankings for water on the lists and develop action plans, called Total Maximum Daily Loads (TMDLs),

[14] (United States Bureau of Reclamation, n.d.)
[15] Ibid.
[16] (United States Army Corps of Engineers, 1999)
[17] (United States Bureau of Reclamation, n.d.)
[18] (California Department of Water Resources, n.d.)

to improve water quality.[19] A TMDL is the sum of the allowable loads within an individual waterbody of a single pollutant from all contributing point and nonpoint sources.[20] TMDLs are tools for implementing water quality standards and establish the allowable daily pollutant loadings or other quantifiable parameters (e.g., pH or temperature) for a waterbody.

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. Table 3-5 presents the 2024 303(d) listed water bodies within the area of analysis.

Table 3-5: List of 303(d) Listed Water Bodies in Area of Analysis

| Waterbody Name | Estimated Size Affected | Pollutant | Expected TMDL Completion Date |
|---|---|---|---|
| Butte Creek | 92.77 miles | Mercury | 2027 |
| | | Benzo(a)anthracene | 2037 |
| | | Benzo(a)pyrene | 2037 |
| | | Benzo[k]fluoranthene | 2037 |
| | | Chrysene (C1-C4) | 2037 |
| | | Dibenz[a,h]anthracene | 2037 |
| | | Indeno[1,2,3-cd]pyrene | 2037 |
| Feather River, Lower (Lake Oroville Dam to Confluence with Sacramento River) | 72.18 miles | Mercury | 2027 |
| | | PCBs | 2037 |
| | | Toxicity | 2027 |
| | | Group A Pesticides[1] | 2011 |
| Hamilton Slough | 7.36 miles | Toxicity | 2027 |
| Live Oak Slough | 8.42 miles | Dissolved Oxygen | 2021 |
| Morrison Slough | 13.13 miles | Diazinon | 2026[2] |
| Oroville Reservoir | 8468.43 acres | Mercury | 2027 |
| | | PCBs | 2021 |
| Sacramento River (Red Bluff to Knights Landing) | 148.88 miles | DDT | 2027 |
| | | Dieldrin | 2027 |
| | | Mercury | 2027 |
| | | Dissolved Oxygen | 2035 |
| | | PCBs | 2027 |
| | | Toxicity | 2027 |
| | | Temperature | 2037 |
| Sacramento Slough | 1.64 miles | Mercury | 2020 |
| | | Dissolved Oxygen | 2021 |
| | | Toxicity | 2023 |
| Thermalito Afterbay | 4036.93 acres | Mercury | 2021 |
| | | PCBs | 2021 |

Source: State Water Resources Control Board (2024)

[19] (United States Environmental Protection Agency, 2025)
[20] Ibid.

#### BUTTE CREEK

The 303(d) list indicates that certain segments of Butte Creek contain constituents of concern including Mercury, Benzo(a)anthracene, Benzo(a)pyrene, Benzo[k]fluoranthene, Chrysene (C1-C4), Dibenz[a,h]anthracene, Indeno[1,2,3-cd]pyrene (see Table 3-5); however, the water quality in Butte Creek is generally considered to be good. Seasonal variability can occur related to weather patterns and reduced flow.[21]

#### LOWER FEATHER RIVER

The 303(d) list indicates that certain segments of the Lower Feather River contain constituents of concern including Mercury, PCBs, Toxicity, and Group A Pesticides (See Table 3-5). Water quality in the Lower Feather River watershed is heavily influenced by agricultural and municipal land and water use. In October 2003, the Central Valley RWQCB established TMDL regulations for diazinon in the Lower Feather River with three recommended strategies: (1) reduce diazinon use, (2) reduce surface water runoff from sprayed orchards, (3) delay and/or filter orchard runoff containing diazinon. [22]

#### OROVILLE RESERVOIR

Oroville Reservoir receives water from the Feather River Basin which drains a large portion of the eastern Sierra-Cascade area of California. Annual runoff patterns in the watershed above Oroville Reservoir are characteristic of snowmelt dominated hydrology of Sierra Nevada mountain streams that experience peak runoff during the late winter and spring, and low flows during the summer. The quality of water in the reservoir is highly influenced by upstream tributaries.[23] Oroville Reservoir is listed on the 2024 303(d) list as impaired due to mercury and PCBs (see Table 3-5).

#### SACRAMENTO RIVER

Water quality in the lower Sacramento River is affected by agricultural runoff, acid mine drainage, stormwater discharges, water releases from dams, diversions, and urban runoff. However, low flow volumes generally provide sufficient dilution to prevent excessive concentrations of contaminants.[24] The 303(d) list indicates that certain segments of the Sacramento River contain several constituents of concern, including DDT, Dieldrin, Mercury, Dissolved Oxygen, PCBs, Toxicity, and Temperature (see Table 3-5); however, the water quality in the Sacramento River is generally of high quality and concentrations of undesirable constituents are generally low. The following sections report general water quality data for three locations along the Sacramento River.

#### THERMALITO AFTERBAY

The 303(d) list indicates that the Thermalito Afterbay contains constituents of concern including Mercury and PCBs (see Table 3-5). As a component of the Lower Feather River watershed, water quality in the Thermalito Afterbay is heavily influenced by agricultural and municipal land and water use.

### 3.3.1.3 GROUNDWATER RESOURCES

#### BUTTE SUBBASIN

##### Groundwater Levels

Within and throughout the Butte Subbasin, conjunctive use practices are implemented to manage surface water and groundwater supplies. During normal or wet hydrologic conditions, the Butte Subbasin has surface water available to support irrigation demands and provide recharge over a large portion of the Subbasin. However, during dry periods and drought, if surface water supplies are curtailed, groundwater pumping is increased to support irrigation demands. This increased pumping typically results in a decrease

[21] (Sacramento River Watershed Program)
[22] (Sacramento River Watershed Program)
[23] (Department of Energy, Federal Energy Regulatory Commission (FERC), 2006)
[24] (Bureau of Reclamation, 2014)

in groundwater levels; however, groundwater levels tend to recover following dry periods once surface water availability again increases, showing no long-term or chronic decrease in groundwater levels.[25]

To further characterize the groundwater levels in the Subbasin, Appendix F includes groundwater elevation contours for the primary and very deep aquifer for the period of 2021 through 2024 and groundwater level monitoring data as hydrographs through 2024. The contour maps of the Primary Aquifer show that groundwater elevations are generally higher in the northern and eastern areas of the Subbasin versus the southern and western areas, indicating a general gradient – and thus groundwater flow, from the northeast to the southwest. Because of the influence of the Thermalito Afterbay, groundwater elevations observed near this surface water feature are relatively stable between the spring and fall observation periods. The contour maps of the Very Deep Aquifer show a relatively consistent groundwater gradient across the Subbasin with a similar groundwater flow direction as indicated by contours in the Primary Aquifer (generally from northeast to southwest).

The hydrographs display groundwater elevation data in comparison to measurable objectives, interim milestones, and minimum thresholds, as established in the Butte Subbasin GSP. Historically, groundwater levels have typically remained at or near their respective measurable objectives in the Subbasin. If there is a decline in groundwater levels caused by increased groundwater extractions due to decreased surface water supplies, there is often a quick recovery of groundwater levels after the period of increased groundwater extractions has ended. The GSP established interim milestones equal to the measurable objectives to provide numerical metrics for GSAs to track the Subbasin's conditions relative to the overall sustainability goal, ensuring that groundwater management in the Subbasin remains sustainable. All 51 representative monitoring site wells in Butte Subbasin were above the measurable objective as of spring 2024 and, on average, approximately six feet above the measurable objective. On average, groundwater levels in representative monitoring site wells were roughly 33 feet higher than minimum threshold elevations in the fall of 2024. All WY 2024 measured groundwater levels remained within the Subbasin's margin of operational flexibility and above the minimum thresholds.

### Groundwater Quality

Irrigated agriculture is the predominant land use within the Butte Subbasin, and monitoring of groundwater quality data is largely accomplished through the Groundwater Quality Trend Monitoring Work Plan which is implemented by the Sacramento Valley Water Quality Coalition as part of the Irrigated Lands Regulatory Program. Monitoring through these programs indicates that groundwater quality in the Butte Subbasin is generally good. A broad indicator of good groundwater quality is the lack of any high-ranking High Vulnerability Areas (HVAs) in the subbasin and the presence of medium ranking HVAs only in the extreme north where the Subbasin approaches Chico.[26] The majority of agricultural lands are also observed to show very low levels of nitrates in the groundwater. The Butte Subbasin GSP identifies salinity as the key concern for groundwater quality in the Butte Subbasin that is considered to stem from a causal nexus with groundwater quantity activities (i.e. pumping).

### Land Subsidence

Available data indicate that inelastic land subsidence due to groundwater withdrawal has not been observed in the Butte Subbasin. This is likely due to subsurface materials that are not conducive to compaction and stable groundwater levels. Land subsidence in the Butte Subbasin would most likely occur as a result of aquitard consolidation. A subsidence monitoring network has been established through the

[25] (Butte Subbasin, 2022)
[26] (Butte Subbasin, 2022)

Sacramento Valley, the Sacramento Valley GPS Subsidence Monitoring Network. Changes in ground surface elevation are slight and remained at or above baseline levels in 2019.[27]

### SUTTER SUBBASIN

#### Groundwater Levels

Groundwater in the Sutter Subbasin generally follows the topography of the land surface, flowing from the Sierra Nevada on the east toward the center of the Sacramento Valley (east to west) and north to south within the valley, eventually flowing toward the Sacramento-San Joaquin Delta. Seasonal and short-term fluctuations in groundwater elevations have been observed in the Sutter Subbasin due to irrigation requirements and hydrologic conditions but have generally remained relatively stable for more than 70 years.

To further characterize the groundwater levels in the Subbasin, Appendix F includes groundwater elevation contours for the primary and very deep aquifer for the period of 2021 through 2024, and groundwater level monitoring data as hydrographs through 2024. These figures include hydrographs depicting long-term groundwater elevations, historic highs and lows, and hydraulic gradients. Groundwater levels, largely within the shallow aquifer zone (ground surface to 50 feet below ground surface), are relatively stable over time and indicate that most groundwater production is occurring below this zone. Hydrographs for representative wells in the Sutter Subbasin generally show annual groundwater level declines during the irrigation season and seasonal recovery to pre-irrigation levels once irrigation has ceased, with little to no variation by water year type. There is little to no variation in groundwater elevations by water year type. Groundwater flow is in the general north to south direction in aquifer zones AZ-1, AZ-2, and AZ-3.

#### Groundwater Quality

As cited in the Sutter Subbasin GSP, the Sutter County Groundwater Management Plan identifies several constituents within the Sutter Subbasin that are at levels that exceed the Maximum Contaminant Level (MCL) for drinking water. These constituents include arsenic, boron, total dissolved solids (TDS), and nitrate as N. These constituents, other than nitrate, were found to be naturally occurring.[28] Median concentrations of arsenic have decreased since 1952 and most recently are below the Primary MCL. The maximum concentration detected at the time of GSP preparation (0.190 milligrams per liter or mg/L) does exceed the MCL of 0.01 mg/L. Median concentrations of boron peaked between 2009 and 2012 but remained below the agricultural water quality objective of 0.7 mg/L. Maximum concentrations of boron have decreased over time with the most recently observed concentrations at 1.0 mg/L. Maximum TDS concentrations have substantially decreased since 1952, peaking at 8,200 mg/L (in 2006), with the most recently observed maximum concentration (occurring at 1,220 mg/L) below the upper secondary MCL of 1,500 mg/L. Median nitrate concentrations have increased since 1952 and have been detected above the Primary MCL as of 2012. The most recently observed maximum concentration of 137 mg/L exceeds the Primary MCL of 10 mg/L by over 10 times.[29] Minimum Thresholds were established for TDS and nitrate as N as the upper secondary MCL for TDS (1,000 mg/L) and the primary MCL for nitrate as N (10 mg/L) or the current concentration at the monitoring site based on data available from 2000 to the time of GSP preparation.

#### Land Subsidence

Land subsidence and its associated impacts have not been detected in the Sutter Subbasin, aside from elastic subsidence that is attributable to seasonal fluctuations in groundwater levels and the associated aquifer pressure. Inelastic, or permanent, land subsidence has not been detected in the Sutter Subbasin.[30]

[27] Ibid.
[28] (Sutter Subbasin Groundwater Management Coordination Committee, 2022)
[29] Ibid.
[30] Ibid.

## 3.3.2 APPLICABLE REGULATIONS

### 3.3.2.1 FEDERAL

#### CLEAN WATER ACT

The CWA is intended to restore and maintain the chemical, physical, and biological integrity of the nation's waters (33 USC 1251). The regulations implementing the CWA protect Waters of the United States, including streams and wetlands (33 CFR 328.3). The CWA requires states to set standards to protect, maintain, and restore water quality by regulating point source and some non-point source discharges. Under Section 402 of the CWA, the National Pollutant Discharge Elimination System (NPDES) permit process was established to regulate these discharges. The CWA also provides an exemption from the NPDES permitting process for agricultural return flows, which are to be regulated by the State. Such flows are regulated under the California Porter-Cologne Water Quality Act. Both types of permits--NPDES and those for exempt flows under the CWA--are issued by the State.

#### SAFE DRINKING WATER ACT

The Federal Safe Drinking Water Act (SDWA) was enacted in 1974 and authorized the United States Environmental Protection Agency (USEPA) to establish safe standards of purity for naturally-occurring and man-made contaminants. It requires all owners or operators of public water systems to comply with primary (health-related) standards and encourages attainment of secondary standards (nuisance-related). Contaminants of concern in a domestic water supply are those that either pose a health threat or in some way alter the aesthetic acceptability of the water. These types of contaminants are currently regulated by the USEPA through primary and secondary MCLs. As directed by the SDWA amendments of 1986, the USEPA has been expanding its list of primary MCLs. MCLs have been proposed or established for approximately 100 contaminants. In California, the USEPA has delegated SDWA powers to the state government.

#### NATIONAL FLOOD INSURANCE ACT

The National Flood Insurance Act (1968) makes available federally subsidized flood insurance to owners of flood-prone properties. To facilitate identifying areas with flood potential, Federal Emergency Management Agency (FEMA) has developed Flood Insurance Rate Maps that can be used for planning purposes.

### 3.3.2.2 STATE

#### PORTER-COLOGNE WATER QUALITY CONTROL ACT

The SWRCB, located in Sacramento, is the agency with jurisdiction over water quality issues in the State of California. The SWRCB is governed by the Porter-Cologne Water Quality Act (Division 7 of the California Water Code), which establishes the legal framework for water quality control activities by the SWRCB. The intent of the Porter-Cologne Act is to regulate factors which may affect the quality of waters of the State to attain the highest quality which is reasonable, considering a full range of demands and values. The State implements water quality by establishing Basin Plans, which determine the protected beneficial uses and required water quality objectives in different designated basins. The implementation of Basin Planning and the issuing of permits is delegated by the SWRCB to its nine Regional Water Quality Control Boards (RWQCB). The Project site is regulated by the Central Valley RWQCB Region 5.

#### REGIONAL WATER QUALITY CONTROL PLANS

California Water Code (Section 13240) requires the preparation and adoption of water quality control plans (Basin Plans), and the Federal CWA (Section 303) supports this requirement. According to Section 13050 of the California Water Code, Basin Plans consist of a designation or establishment of beneficial uses to be protected, water quality objectives to protect those uses, and an implementation program for achieving the objectives. Because beneficial uses, together with their corresponding water quality objectives, can be defined per Federal regulations as water quality standards, the Basin Plans are regulatory references for

meeting the State and Federal requirements for water quality control (40 Code of Federal Regulations 131.20).

Basin Plans present water quality objectives in numerical or narrative format for specified water bodies or for protection of specified beneficial uses throughout a specific basin or region. State law defines beneficial uses to include (but not be limited to) "...domestic; municipal; agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves" (Water Code Section 13050(f)). The beneficial uses designated for water bodies within the area of analysis are presented in Table 3-6.

The relevant Basin Plan for the assessment area is the Basin Plan for the Sacramento River and San Joaquin River Basins (Central Valley Regional Water Quality Control Board [CVRWQCB], 2019). The Basin Plan defines water quality objectives and outlines the policies and guidelines adopted by the CVRWQCB to implement the provisions of the Basin Plan.

Table 3-6: Basin Plan Beneficial Use Designations

| Beneficial Use Designation | Sacramento River | Lower Feather River | Oroville Reservoir | Shasta Reservoir |
|---|---|---|---|---|
| Municipal and Domestic Supply | ✓ | ✓ | ✓ | ✓ |
| Agricultural Irrigation | ✓ | ✓ | ✓ | ✓ |
| Stock Watering | ✓ | | | |
| Industrial Process Supply | | | | |
| Industrial Service Supply | ✓ | | | |
| Power Generation | ✓ | | ✓ | ✓ |
| Water Contact Recreation | ✓ | ✓ | ✓ | ✓ |
| Canoeing and Rafting | ✓ | ✓ | | |
| Non-Contact Water Recreation | ✓ | ✓ | ✓ | ✓ |
| Warm Freshwater Habitat | ✓ | ✓ | ✓ | ✓ |
| Cold Freshwater Habitat | ✓ | ✓ | ✓ | ✓ |
| Warm and Cold Water Migration Area | ✓ | ✓ | | |
| Warm Water Spawning Habitat | ✓ | ✓ | ✓ | ✓ |
| Cold Water Spawning Habitat | ✓ | ✓ | ✓ | ✓ |
| Navigation | ✓ | | | |
| Wildlife Habitat | ✓ | ✓ | ✓ | ✓ |

#### SWRCB DECISION 1641

SWRCB Decision-1641 and Water Right Order 2001-05 describe the current water right requirements to implement the flow-dependent objectives outlined in the Bay-Delta Plan. In SWRCB Decision-1641, the SWRCB assigned responsibilities to Reclamation and DWR for meeting these requirements. These responsibilities require that the CVP and SWP be operated to protect water quality, and that DWR and/or Reclamation ensure that the flow dependent water quality objectives are met in the Delta (SWRCB 2000).

#### SUSTAINABLE GROUNDWATER MANAGEMENT ACT

In 2014, DWR enacted SGMA as directed by a three-bill legislative package composed of AB 1739, Senate Bill (SB) 1168, and SB 1319 and signed into law by Governor Jerry Brown. SGMA requires the formation of Groundwater Sustainability Agencies (GSAs) and the development and adoption of GSPs. SGMA also requires that basins be prioritized as high-, medium-, low-, or very low-priority based on groundwater conditions, adverse impacts on local habitat, and adverse impacts on local stream flow. DWR identified and finalized the identification of 21 basins/subbasins with critically overdrafted conditions in January 2016. SGMA requires that the GSAs of high and medium priority basins halt overdraft conditions and bring groundwater basins into balanced levels of pumping and recharge. High- and medium-priority basins with critically overdrafted conditions were required to develop their GSPs by January 31, 2020. The GSPs for the remaining high- and medium-priority basins were required to be developed by January 31, 2022.

Under SGMA, high- and medium-priority basins must reach sustainability within 20 years of implementing their sustainability plans. For critically over-drafted basins, that would be 2040. For the remaining high and medium priority basins, 2042 is the deadline. Under SGMA, the SWRCB may designate a high- or medium-priority basin as probationary after January 31, 2025, following a determination that the GSP for the basin is inadequate and the GSA has failed to remedy the identified deficiencies within the timeframes afforded under the law. Once a basin is determined to be in probation, the SWRCB may conduct inspections, develop an interim plan that overrides the local GSP, and enforce pumping restrictions.

The Butte and Sutter Subbasins are identified by DWR as medium priority basins.[31]

### 3.3.2.3 LOCAL

#### BUTTE COUNTY GENERAL PLAN 2040

The Butte County General Plan 2040 contains the following goals and policies related to the Project:

##### Water Resources Element

Goal W-1: Maintain and enhance water quality.

Policy W-P1.1: County planning and programs shall be integrated with other watershed planning efforts, including best management practices, guidelines, and policies of the Central Valley Regional Water Quality Control Board (CVRWQCB) and local Groundwater Sustainability Plans.

Policy W-P1.3: Regulations that protect water quality from the impacts of agricultural and industrial activities shall be maintained.

Goal W-2: Ensure an abundant and sustainable water supply to support all uses in Butte County.

Policy W-P2.1: The County supports solutions to ensure the sustainability of community water supplies.

Policy W-P2.2: The County may continue the Six-County Memorandum of Understanding (MOU) with Colusa, Glenn, Tehama, Shasta, and Sutter Counties, continue participation in the local GSAs and Groundwater Advisory Boards, and continue to support the Northern Sacramento Valley and Upper Feather River Integrated Regional Water Management and local Groundwater Sustainability Plans.

[31] (California Department of Water Resources, 2020)

Policy W-P2.3: Water resources shall be planned and managed in a way that relies on sound science, data, and public participation.

Policy W-P2.4: The County's State Water Project allocation (27,500 acre-feet) should be fully utilized within Butte County when technically and economically feasible to maximize the benefit and value to Butte County by prioritizing use within the county.

Policy W-P2.8: The County supports Area of Origin and County of Origin water rights, the existing water right priority system, and the authority to make water management decisions locally to meet the county's current and future needs, thereby protecting Butte County's communities, economy, and environment.

Goal W-3: Protect and manage groundwater resources in Butte County.

Policy W-P3.1: Groundwater transfers and substitution programs shall be locally regulated to protect the sustainability of the County's economy, communities, and ecosystems.

Goal W-4: Support coordination between Groundwater Sustainability Agencies in Butte County.

Policy W-P4.1: The County shall work cooperatively with the Groundwater Sustainability Agencies in the three subbasins in Butte County to support implementation of the Sustainable Groundwater Management Act to ensure the County has sustainable water supplies.

Policy W-P4.2: The County supports working towards Sustainable Groundwater Management Act implementation to ensure the sustainability of groundwater resources, including groundwater levels, groundwater quality, and avoidance of land subsidence, and supports programs that rely on management at the local level, use sound scientific data, and ensure compliance, where consistent with the County's goals and policies.

Policy W-P4.3: Public information and involvement should be encouraged in the groundwater sustainability planning, collaboration, and coordination process.

Policy W-P4.4: The County shall consult applicable Groundwater Sustainability Plans and local groundwater management agencies when making decisions that could impact groundwater resources.

#### SUTTER COUNTY 2030 GENERAL PLAN

The Sutter County 2030 General Plan contains the following goals and policies related to the Project:

#### Water

Goal ER 6: Preserve and protect the County's surface water and groundwater resources.

Policy ER 6.1: Integrated Water Management Programs. Integrate water management programs that emphasize multiple benefits and balance the needs of agricultural, rural, and urban users.

Policy ER 6.2: Surface Water Resources. Protect the surface water resources in the County including the Sacramento, Feather and Bear Rivers and their significant tributaries.

Policy ER 6.3: Groundwater Sustainability. Protect the sustainability of groundwater resources.

Policy ER 6.7: Water Rights. Support the protection of the existing water rights of water agencies and providers within Sutter County. Do not support out-of-area water transfers where they would adversely impact water supply within Sutter County. Support either out-of-area, or in-basin water transfers that would not negatively impact water supply within Sutter County.

### 3.3.3 METHODOLOGY AND THRESHOLDS OF SIGNIFICANCE

This section evaluates the anticipated changes in hydrology and water quality as a result of the Project. State CEQA Guidelines Appendix G provides the following screening criteria to evaluate potential impacts related to hydrology and water quality. The Project would result in a significant impact if it would:

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality;
- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin; or
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

In accordance with Appendix G, the hydrology and water quality resources section typically contains five impact analysis questions. However, the initial study (Chapter 6) analyzed potential impacts and found that there would be no or less than significant impacts related to the following questions and were not found to require additional analysis:

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
    - result in substantial erosion or siltation on- or off-site,
    - substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site,
    - create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff, or
    - impede or redirect flood flows;
- Risk release of pollutants due to project inundations in flood hazard, tsunami, or seiche zones.

### 3.3.4 IMPACT ANALYSIS

#### a) Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Less than Significant Impact with Mitigation Incorporated. The Project would have less than significant impacts and would not violate water quality standards, waste discharge requirements, or otherwise substantially degrade surface or ground water quality. The potential impacts are further reduced and/or eliminated with implementation of mitigation measures/practices as described in detail in HYD-1. This finding is based on and supported by the following analysis. The Project and resultant water transfers have the potential to alter flow patterns in the Feather River and storage in both the Oroville Reservoir and the Thermalito Afterbay. In general, increased flow in the river and storage in the reservoirs will improve water quality with additional dilution of constituents of concern. Conversely, decreased flow and storage could lead to decreased water quality in both temperature and dilution of constituents of concern. Functionally, the DWR releases water from the Oroville Reservoir into the Thermalito Afterbay for diversion by BWD. Changes in diversion from Thermalito Afterbay would result in changes in DWR's releases to the Afterbay but would not change Feather River flows as releases would be made regardless of whether water would be delivered to the BWD service area or to a potential buyer. An increase in flows in the Feather River would result when the water made available for transfer is released by DWR to the Feather River. The timing of transfer releases could differ from the timing of diversions by BWD

from Thermalito Afterbay, absent the transfer action. As Feather River flows would either remain consistent with baseline conditions or increase when water made available for transfer is released downstream, surface water quality is not anticipated to degrade as a result of the Project.

In general, groundwater substitution pumping programs do have the potential to impact groundwater quality. 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.

BWD's historic groundwater substitution pumping has had little to no effect on the shallow aquifer and therefore has not caused the transport of any contaminants within the aquifer impacting water quality (see Appendix G). While the Project is not anticipated to result in impacts to the quality of groundwater, BWD has prepared and submitted as part of the transfer proposal, Groundwater Substitution Monitoring and Groundwater Substitution Transfer Mitigation Plans, as outlined in HYD-1. The plans include sampling for various constituents when pumping starts, monthly during transfer pumping, and on the day transfer pumping stops.

### b) Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Less than Significant Impact with Mitigation Incorporated. The Project was evaluated to determine any impacts that would substantially decrease groundwater supplies, interfere with groundwater recharge, or impede sustainable groundwater management. Based on historical operations, monitoring data, and implementation of mitigation measures, the Project's potential impacts would be reduced to less than significant with mitigation incorporated. Groundwater substitution pumping may lead to temporary declines in groundwater levels during the April–October pumping period. Potential effects include increased pumping costs, reduced well yields, lowered groundwater levels affecting vegetation, and potential impacts on neighboring wells. However, historical pumping by the District at similar rates has not resulted in substantial adverse groundwater impacts. Despite this, uncertainty during very dry years warrants mitigation.

Mitigation Measure HYD-1 requires participating agencies to implement groundwater level monitoring and, if impacts occur, to compensate affected parties or reduce pumping until water levels recover. With these measures, potential groundwater-level impacts would be reduced to less than significant. In addition, subsidence risk is considered low to moderate within the Butte and Sutter Groundwater Subbasin. Historical monitoring associated with previous transfers has not detected inelastic subsidence. Nonetheless, HYD-1 requires land surface elevation monitoring to ensure any subsidence is identified early, and mitigation applied if necessary. With this monitoring framework, subsidence impacts would also be less than significant.

The Project also evaluates potential groundwater–surface water interactions. Lowering groundwater levels can induce leakage from surface water bodies or intercept groundwater that would otherwise discharge to streams. To address this, the Mitigation Measure HYD-2 institutes an SDF to ensure that transferred volumes do not include water attributable to induced stream depletion.

Historically, DWR and Reclamation have assessed an assumed and agreed upon SDF on BWD transfers of between 12% and 20%. Future transfers would continue to be subject to an assumed and agreed upon SDF between BWD, DWR, and Reclamation. For purposes of this preliminary analysis, it is assumed that the SDF for BWD transfers would be consistent with the historic range (between 12% and 20%) and consistent with the DWR and Reclamation *White Paper*, as it may be amended during the five-year period of analysis.

BWD, in coordination with DWR and Reclamation, is evaluating whether additional technical analyses would help inform SDF for future transfers. SDF also implicates unresolved legal issues, such as what constitutes "legal injury" under California law to which BWD is responsible for addressing and resolving and mitigating any significant environmental impacts under CEQA and whether DWR or other downstream parties have rights to moving groundwater that is intercepted due to the transfer program and, thus, does not accrete to the surface water source. As such, impacts would be less than significant with mitigation incorporated.

### e) Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

**Less than Significant Impact with Mitigation Incorporated.** The Project is not expected to conflict with or obstruct implementation of any water quality control plan or SGMA requirements. BWD is a GSA within both the Butte and Sutter Subbasins of the Sacramento Valley Groundwater Basin. Each subbasin has an approved GSP and is currently preparing updates and five-year evaluations as required by SGMA.

Groundwater substitution transfers—where groundwater is pumped in lieu of using surface water—could theoretically conflict with provisions of the applicable GSPs. To assess potential impacts of one year surface water transfers proposed for 2026–2030, BWD contracted with Woodard & Curran to prepare a Groundwater Modeling Report. The report evaluated the range of impacts of the proposed water transfer program based on the following six scenarios:

1. No Project Alternative
2. Full Project (Full Groundwater Substitution Transfers [GWST] of 10 thousand AFY [TAFY} and Full Crop Idling of 14 TAFY)
3. Only Groundwater Substitution Transfers (10 TAFY GWST)
4. Only Crop Idling (14 TAFY Crop Idling)
5. 50% Crop Idling with Full GWST (7 TAFY Crop Idling and 10 TAFY GWST)
6. 50% GWST with Full Crop Idling (5 TAFY GWST and 14 TAFY Crop Idling)

The report, provided in Appendix E, summarizes the modeling approach and results used to evaluate these scenarios.

Because the Project actions occur within both the Butte and Sutter Subbasins, impacts were evaluated relative to each subbasin's GSP. The analysis examined effects of groundwater substitution pumping on key groundwater budget components using an integrated surface water-groundwater flow model. Results relevant to these components are summarized below, with supporting technical documentation provided in Appendix E.

### Groundwater Levels

Evaluation of groundwater conditions in the Butte and Sutter Subbasins showed that the proposed groundwater substitution transfers and associated actions would not result in significant or sustained impacts on groundwater levels.

Increased groundwater substitution pumping could affect groundwater levels and may result in temporary declines of groundwater levels. In order to quantify the impacts of the proposed water transfers and associated response actions, simulated groundwater levels for the Representative Monitoring Network (RMN) wells that fall within BWD service area were compared to well-specific minimum thresholds (MTs) as defined in the Sutter and Butte Subbasins GSPs. Both Sutter and Butte Subbasins GSPs establish groundwater level minimum thresholds for the chronic lowering of groundwater levels, the reduction of groundwater storage, and the depletion of interconnected surface waters sustainability indicators, and use those MTs as a means of assessing whether 'undesirable results' (or significant impacts) are occurring in the subbasins.

The Butte Subbasin GSP contains six RMN wells inside BWD service area, four of which are used to evaluate groundwater levels and two of which are used to evaluate interconnected surface water. The Sutter Subbasin GSP contains three groundwater level RMN wells in one nested well location. MT exceedances do not necessarily indicate an undesirable result (as defined in the GSPs) has occurred. The Butte Subbasin GSP states that groundwater conditions are expected to cause undesirable results from chronic lowering of groundwater levels when 25% of representative monitoring wells fall below their minimum thresholds for 24 consecutive months. The Sutter Subbasin GSP states that groundwater conditions are expected to cause undesirable results from chronic lowering of groundwater levels when groundwater elevations drop below the minimum threshold criteria at 25% of representative monitoring locations concurrently over two consecutive high water level measurements.

Simulated groundwater levels for nine Groundwater Sustainability Plan RMN wells in the Butte and Sutter Subbasins were compared against MTs established in each subbasin's GSP. Modeling results provided in Appendix E indicate that only one well—located within the Sutter Subbasin, where transfer pumping occurs—experienced temporary MT exceedances and only during dry-year periods when full transfer pumping was active. These exceedances were short-lived, occurring during and immediately after transfer pumping periods, and groundwater levels fully recovered once pumping ceased. All other wells remained well above their MTs under all modeled scenarios, indicating sustainable conditions as defined in each subbasin's GSP.

The groundwater level impacts indicated in the modeling results demonstrate water levels that temporarily exceed defined MTs with seasonal rebound similar to typical growing season fluctuations. Based on the seasonal fluctuation and timing of exceedances and rebound, measurement of the RMN are not anticipated to remain below the MT for 24 consecutive months, nor are they anticipated to occur concurrently over two consecutive high-water level measurements. The analysis confirms that groundwater levels do not remain below MTs for the durations necessary to trigger "undesirable results" as defined by either subbasin's GSP.

### Groundwater Storage

The groundwater budget analysis provided in Appendix E demonstrated that the short-term reductions in groundwater storage associated with transfer-related pumping are temporary, recover naturally once pumping ceases, and do not result in long-term or permanent adverse impacts. Storage conditions return to levels consistent with the existing conditions within approximately two decades, and one alternative

(crop idling) produces an initial slight net benefit. Because the system shows resilience, recovery, and no sustained departure from baseline conditions, the Project would result in less than significant impacts on groundwater storage as shown in Figure 3-1.

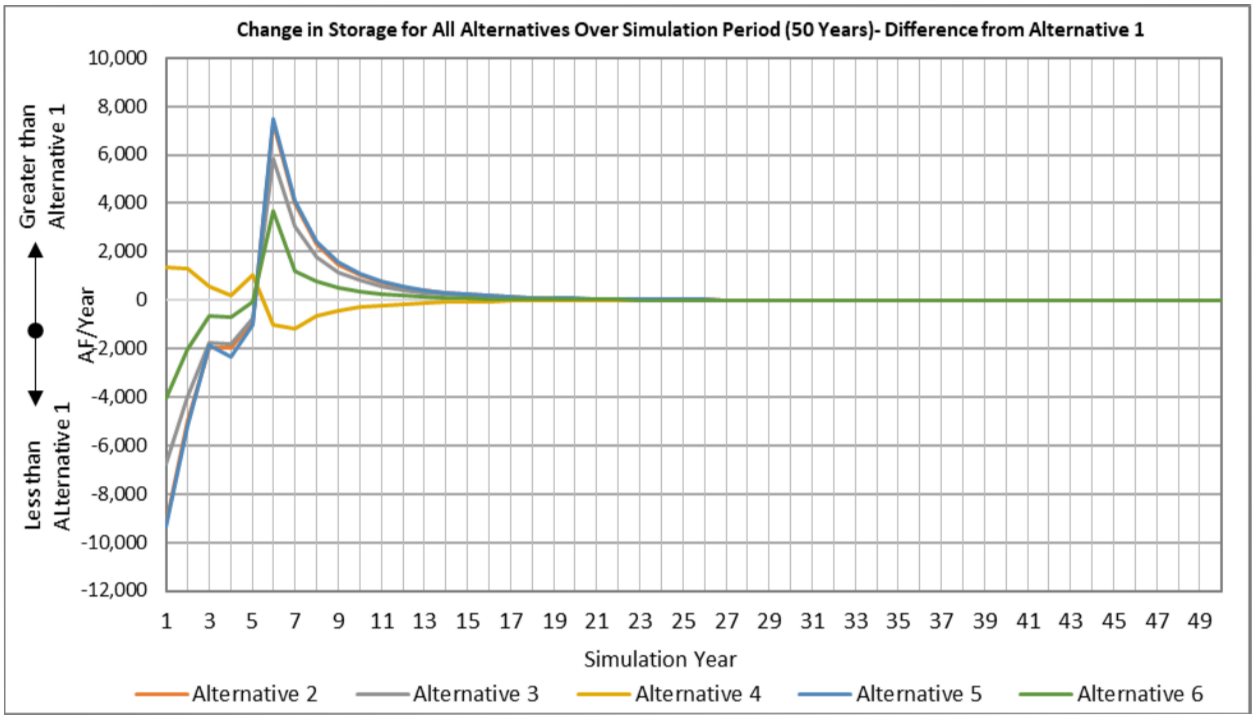



Figure 3-1: Difference from Alternative 1- Annual Change in Storage

### 3.3.5 MITIGATION

**HYD-1**

The objective of Mitigation Measure HYD-1 is to avoid potentially significant adverse environmental effects from groundwater level declines such as (1) impacts to other legal users of water; (2) land subsidence; or (3) migration of reduced quality groundwater. The measure accomplishes this by monitoring groundwater levels, within defined monitoring wells, when groundwater is being pumped, in-lieu of diverting surface water, and groundwater pumping ceases when the groundwater level reaches the established groundwater level trigger, as defined in the Mitigation Plan and Monitoring Plan. In previous transfers, BWD has used historic lows as groundwater level triggers, but this may be revised in future proposed transfers. As described in the Mitigation Plan section below, the mitigation measure also requires prompt intervention, including the cessation of groundwater pumping, if groundwater level triggers are reached during transfer-related pumping or if, in the unlikely event, that a potential impact is detected to ensure it will be reduced to less than significant. Additionally, the mitigation measure requires preventative actions if monitoring shows that identified groundwater level triggers are reached during transfer-related pumping. As part of a water transfer, Sellers are required to prepare a Monitoring Program and Mitigation Plan to address the required elements of the mitigation measure for review and approval by DWR prior to initiation of groundwater substitution pumping. BWD will confirm that the proposed groundwater pumping will be compatible with state and local regulations and GSPs under SGMA.

BWD would be required to submit monitoring reports to DWR during the period of the transfer program, and DWR will verify that BWD implements the Monitoring Program and Mitigation Plan to avoid potentially significant adverse effects of transfer-related groundwater extraction. In addition, BWD must confirm that the proposed groundwater pumping will be compatible with applicable state and local regulations as well as the subbasins' GSPs. The Butte Subbasin and Sutter Subbasin GSPs have been approved by DWR; all of the GSAs are required to meet the sustainability objectives identified under SGMA. Any BWD transfer would be operated within the parameters of the GSPs, thus providing a regulatory backstop to prevent substantial adverse effects.

BWD will prepare and submit a water transfer proposal prior to the initiation of groundwater substitution pumping transfers. DWR will review the transfer proposal, and the groundwater substitution pumping transfers cannot start prior to DWR's approval. Water transfer proposals must include well data collected by potential sellers consistent with the data requirements identified in the Water Transfers Information Checklist that is included in Reclamation and DWR's Water Transfer White Paper. BWD must demonstrate that substantial inelastic land subsidence is not occurring within the area of a transfer pumping well in accordance with minimum thresholds identified in their local DWR approved GSP(s), subject to DWR's verification; and if it is occurring, the participating transfer pumping well would not be allowed to participate in groundwater substitution transfers, ensuring adverse effects of the Project would not occur in areas vulnerable to land subsidence.

BWD has used two production wells that lie within the Sutter County portion of their district boundary for previous groundwater substitution transfers. BWD will continue to use the same two wells for groundwater substitution transfers. A third production well is anticipated to be constructed, also in the Sutter Subbasin, and potential impacts are evaluated herein. BWD will prepare a report on its groundwater substitution transfers as detailed in the most current version of the DRAFT Technical Information for Preparing Water Transfer Proposals and will submit the report to DWR for review before the transfer period.

### Monitoring Program

BWD will be required to complete and implement a monitoring program that must, at a minimum, include the following components:

Monitoring Well Network. The monitoring program shall incorporate a sufficient number of monitoring wells, as determined by the sellers in relation to local conditions, to accurately characterize groundwater levels and response in the area before, during, and after transfer pumping takes place. Depending on local conditions, additional groundwater level monitoring may be required near ecological resource areas.

Groundwater Pumping Measurements. All wells pumping to replace surface water designated for transfer shall be configured with a permanent instantaneous and totalizing flow meter capable of accurately measuring well discharge rates and volumes. Flow meter readings will be recorded just prior to initiation of pumping and at designated times, but no less than monthly and as close as practical to the last day of the month, throughout the duration of the transfer.

Groundwater Levels. BWD will collect measurements of groundwater levels in both participating transfer wells and monitoring wells. Groundwater level monitoring will include measurements before, during, and after transfer-related pumping. BWD will measure groundwater levels as follows:

- Prior to transfer: Groundwater levels will be measured monthly from March in the year of the proposed transfer-related pumping until the start of the transfer (where possible).
- Start of transfer: Groundwater levels will be measured on the same day that the transfer-related pumping begins, prior to the pump being turned on.
- During transfer-related pumping: Groundwater levels will be measured weekly throughout the transfer-related pumping period unless site-specific information indicates a different interval should be used.
- Post-transfer pumping: Groundwater levels will be measured weekly for one month after the end of transfer-related pumping, after which groundwater levels will be measured monthly through March of the year following the transfer.

BWD will monitor effects to groundwater levels that may result from the proposed transfer and avoid significant impacts. BWD will initiate the mitigation plan if groundwater levels fall below historic low groundwater levels, or another groundwater level trigger deemed appropriate by Reclamation and DWR as part of a future proposed transfer. As part of a seller's transfer proposal, BWD will need to identify appropriate monitoring wells and the specific groundwater trigger for each well (established through the historic low groundwater level for that well).

Additionally, BWD will coordinate closely with potentially impacted third parties to collect and monitor groundwater data. If a third party expects that it may be impacted by a proposed transfer, that party should contact BWD with its concern. The burden of collecting groundwater data will not be the responsibility of the third party. If warranted, groundwater level monitoring to address the third-party's concern may be incorporated in the monitoring and mitigation plans required by Mitigation Measure HYD-1.

- Groundwater Quality. BWD shall measure specific conductance in samples from each participating production well. Samples shall be collected when the seller first initiates pumping, monthly during the transfer period, and at the termination of transfer pumping.
- Land Subsidence. Subsidence monitoring will be required if groundwater levels could decline below historic low levels during the proposed water transfer. Before a transfer, BWD will examine local groundwater conditions and groundwater level changes based on past pumping events or groundwater substitution transfers. This existing information will be the basis to estimate if groundwater levels are likely to decline below historic low levels, which would trigger land surface elevation measurements (as described below).

If the measured groundwater level falls below the historic low level, the seller must confirm the measurement within seven days. If the water level has risen above the historic low level, the seller may continue transfer pumping. If the measured groundwater level remains below the historic low level, the seller will stop transfer-

related pumping immediately or begin land surface elevation measurements in strategic locations within and/or near the transfer-related pumping area. Measurements may include (1) extensometer monitoring, (2) continuous GPS monitoring, or (3) extensive land-elevation benchmark surveys conducted by a licensed surveyor. These data could be collected by the seller or from other sources (such as public extensometer data). Measurements must be completed on a monthly basis during the transfer.

If the land surface elevation survey indicates an elevation decrease between 0.1 foot and 0.2 foot from the initial measurement, the seller could have significant impacts and would need to start the process identified below in the Mitigation Plan. The seller will also work with DWR to assess the accuracy of the survey measurements based on current limitations of technology, professional engineering/surveying judgment, and any other data available in or near the transferring area.

Measurement. The threshold of 0.1 foot was chosen as this value is typical of the elastic (i.e., recoverable) portion of subsidence; the threshold of 0.2 foot was selected considering limitations of current land survey technology.

Coordination Plan. The monitoring program will include a plan to coordinate the collection and organization of monitoring data. This plan will describe how input from third parties will be incorporated into the monitoring program and will include a plan for communication with DWR as well as other decision makers and third parties.

Evaluation and Reporting. The proposed monitoring program will describe the method of reporting monitoring data. At a minimum, sellers will provide data summary tables to DWR, both during and after transfer-related groundwater pumping. Post-program reporting will continue through March of the year following the transfer. Sellers will provide a final summary report to DWR evaluating the effects of the water transfer. The final report will identify transfer-related effects on groundwater and surface water (both during and after pumping), and the extent and significance, if any, of effects on local groundwater users. It shall include groundwater elevation contour maps for the area in which transfer operations are located, showing pre-transfer groundwater elevations, groundwater elevations at the end of the transfer, and recovered groundwater elevations in March of the year following the transfer. The summary report shall also identify the extent and significance, if any, of transfer-related effects to ecological resources such as fish, wildlife, and vegetation resources.

### Mitigation Plan

The following mitigation plan must be completed and implemented to avoid potentially significant groundwater impacts and ensure prompt corrective action in the event unanticipated effects occur. Mitigation actions could include:

- Curtailment of pumping until natural recharge corrects the issue.
- Lowering of pumping bowls in non-transferring wells affected by transfer pumping.
- Reimbursement for significant increases in pumping costs due to the additional groundwater pumping to support the transfer.

- Curtailment of pumping until water levels rise above historic lows if non-reversible subsidence is detected (based on local data to identify elastic versus inelastic subsidence).
- Reimbursement for modifications to infrastructure that may be affected by inelastic subsidence.

As summarized above, the purpose of Mitigation Measure HYD-1 is to monitor groundwater levels during transfers to avoid potentially significant adverse effects. The mitigation plan will describe how to avoid significant effects and address any significant effects that occur despite monitoring efforts. The objectives of this process are to: (1) minimize potential effects to other legal users of water; (2) provide a process for review and response to reported effects; and (3) assure that a local mitigation strategy is in place prior to the groundwater transfer. Accordingly, to ensure that mitigation plans will be feasible, effective, and tailored to local conditions, the plan must include the following elements:

- A procedure for the seller to receive reports of purported environmental or effects to non-transferring parties;
- A procedure for investigating any reported effect;
- Development of mitigation options, in cooperation with the affected parties, for legitimate significant effects; and
- Assurances that adequate financial resources are available to cover reasonably anticipated mitigation needs.

Mitigation to avoid potentially significant subsidence impacts and ensure prompt corrective action in the event that unanticipated effects occur is described by the following stages.

### Stage 1: Groundwater Levels

Inelastic land subsidence would not occur if groundwater levels stay above historic low levels for the entire transfer season. As groundwater is pumped from an aquifer, the pore water pressure in the aquifer is reduced. This reduction in pore water pressure increases the effective stress on the structure of the aquifer itself. This increase in effective stress can cause the aquifer structure to deform, or compress, resulting in the subsidence of the ground surface elevation. Subsidence can be irreversible if the reduced effective stress is lower than the historically low effective stress. Typically, this would be the result of groundwater levels reaching levels lower than the historical low level.

Before a transfer, BWD will examine local groundwater conditions and groundwater level changes based on past pumping events or groundwater substitution transfers. This existing information will be the basis to estimate if groundwater levels are likely to decline below historic low levels as a result of the proposed transfer. If the pre-transfer assessment indicates that groundwater levels will stay above historic low levels, and this finding is confirmed by monitoring during the transfer-related pumping period, then no additional actions for subsidence monitoring or mitigation are necessary. BWD would need to proceed to Stage 2 for land surface elevation monitoring if the pre-transfer estimates indicate that groundwater levels are anticipated to decline below historic low levels. If monitoring during the transfer-related pumping period (confirmed by two

measurements within seven days) indicates that groundwater levels have fallen below historic low levels, BWD will immediately stop pumping or proceed to Stage 2.

### Stage 2: Ground Surface Elevations

Stage 2 includes monthly ground surface monitoring during transfer-related pumping if pumping could cause groundwater levels to fall below historic low levels, as described above in the Monitoring Plan. If ground surface elevations decrease between 0.1 and 0.2 foot, BWD will evaluate the accuracy of the information based on the current limitations of technology, professional engineering/surveying judgment, and other local data. If the elevations decline more than 0.2 foot, this change could indicate inelastic subsidence and BWD would cease transfer pumping. BWD would continue monitoring as discussed below even after discontinuing transfer pumping.

### Stage 3: Continued Monitoring

BWD will continue to monitor for subsidence while groundwater levels remain below historic low levels. If transfer-related pumping has ceased but groundwater levels remain below historic lows, subsidence monitoring will need to continue until the spring following the transfer. The results of subsidence monitoring will be factored into monitoring and mitigation plans for future transfers.

**HYD-2**

The objective of Mitigation Measure HYD-2 is to address potential streamflow depletion effects to CVP and SWP water supply. DWR will apply a streamflow depletion factor to mitigate potential water supply impacts from the additional groundwater pumping due to groundwater substitution transfers. The streamflow depletion factor equates to a percentage of the total groundwater substitution transfer that will not be credited to the transferor and is intended to offset the streamflow effects of the added groundwater pumping due to transfer.

The magnitude of potential water supply impact depends on hydrologic conditions surrounding the transfer period. The exact percentage will be assessed and determined by DWR and Reclamation in consultation with buyers and sellers and based on the best technical information available at that time.

The Woodard & Curran Groundwater Modeling Report, included as Appendix E, found that the portion of the Feather River closest to BWD is predominantly a gaining reach under baseline conditions as indicated by model results and corroborated by the analyses conducted for four GSPs: Butte Subbasin, Wyandotte Creek Subbasin, Sutter Subbasin, and North Yuba Subbasin (Butte Subbasin, 2022; Sutter Subbasin, 2022; Wyandotte Creek Subbasin, 2021; Yuba Subbasins, 2024). As described in Section 4.1.2 of the Groundwater Modeling Report, the Feather River remains a gaining stream under GWST pumping conditions, but it is gaining at a lesser rate than it was in the No Project alternative. Mitigation Measure HYD-2 will institute an SDF that would offset the potential streamflow effects of the added groundwater pumping due to transfer.

The SDF is assumed to be within the historic range of 12% to 20% and will follow the *White Paper*. BWD, in coordination with DWR and Reclamation, may undertake

additional site-specific technical analyses to more precisely estimate SDF for BWD, in which case the more specific SDF would apply.

### 3.3.6 CUMULATIVE IMPACTS

Potential impacts to hydrology and water quality, as described above, are related to direct and indirect impacts to surface water resources, groundwater resources, and water quality. As mentioned in Section 3.1.5, there are several future water transfers and other type projects scheduled to be occurring in the vicinity of the Project. With respect to the aforementioned projects, when considered cumulatively on a regional scale, impacts to hydrology and water quality could be potentially significant. However, with the implementation of the above proposed mitigation measures, impacts to hydrology and water quality would be reduced to less than significant levels.

# CHAPTER 4 ANALYSIS OF ALTERNATIVES

## 4.1 INTRODUCTION

This Chapter provides a comparison and discussion highlighting the differences and similarities among the alternatives and identifies the environmentally superior alternative as required by CEQA Guidelines (Section 15126.6(e)(2)). The focus of the alternatives analysis under CEQA is the avoidance or substantial lessening of a project's significant environmental effects.

The comparative analysis presented in this Chapter focuses on the differences in impacts among the various alternatives, with particular emphasis given to the differences in significant adverse effects. This Chapter is intended to provide decision-makers with information about the merits and disadvantages of the alternatives to assist them in their consideration of the preferred alternative and to assist the public in understanding the differences between the alternatives. In addition, the "range of alternatives" to be evaluated is governed by the "rule of reason" and feasibility, which requires the Draft EIR to set forth only those alternatives that are feasibly and necessary to permit an informed and reasoned choice by the lead agencies and to further foster meaningful public participation (CEQA Guidelines Section 15126.6(f)). CEQA generally defines "feasible" as an alternative that is capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, technological, and legal factors and other considerations (CEQA Guidelines Sections 15091(a)(3), 15364). Consistent with CEQA and under the direction of the CEQA Lead Agency, Butte Water District, six alternatives including the No Project alternative have been identified.

### 4.1.1 PROJECT OBJECTIVES

The alternatives to the Project ultimately selected for analysis in this Draft EIR were developed to avoid or substantially lessen one or more of the significant environmental impacts associated with the Project, while still attaining most of the basic objectives of the Project. The following are objectives for the Project:

- Meet the need of willing buyers for a water supply that is immediately implementable and flexible and can respond to hydrologic conditions, climate variability, watershed use, and regulatory requirements that affect water supply availability;
- Continue to support the existing level of water supply reliability throughout the State provided by the supplemental water for contractors of the CVP and the SWP, for instream use, water supply reliability, and to other potential transferees consistent with the 1969 Agreement on Diversion of Water from the Feather River;
- Develop supplemental water supply for willing buyers from a willing seller during periods of water shortages where there is a gap between available supplies and existing demand, including demand for instream use and water supply reliability such as enhancing carryover storage; and
- Continue to generate non-rate revenue to support BWD's operations and various projects and programs needed to be able to continue to serve its customers with reliable and affordable water.

## 4.2 FORMULATION PROCESS

In determining what alternatives should be considered in the EIR, it is important to consider the objectives of the project, the project's significant effects, and unique project considerations. These factors are crucial to the development of alternatives that meet the criteria specified in Section 15126.6(a). Although, as noted above, EIRs must contain a discussion of "potentially feasible" alternatives, the ultimate determination as to whether an alternative is feasible or infeasible is made by the lead agency, Butte Water District.

## 4.3 ALTERNATIVES CONSIDERED BUT REJECTED AS INFEASIBLE

In accordance with the State CEQA Guidelines, an EIR should identify any alternatives that were considered by the lead agency but were rejected as infeasible and briefly explain the reasons underlying the lead agency's determination. Section 15126.6(c) of the State CEQA Guidelines states the following:

"The EIR should identify any alternatives that were considered by the lead agency but were rejected as infeasible during the scoping process and briefly explain the reasons underlying the lead agency's determination…Among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts."

Viable alternatives are discussed in the section(s) below. Different locations for the third well were considered, which is tied to all of the alternatives analyzed. However, other locations for the new well construction were deemed infeasible and were therefore not analyzed further.

## 4.4 VIABLE ALTERNATIVES ANALYZED

In addition to the No Project Alternative, the following alternatives will be discussed and analyzed:

- Cropland Idling and Groundwater Substitution Alternative
- Cropland Idling Alternative
- Groundwater Substitution Alternative
- Reduced Cropland Idling Alternative
- Reduced Groundwater Substitution Alternative

Each of the alternatives selected for analysis is evaluated in sufficient detail to determine whether its overall environmental impacts would be lesser, similar, or greater in comparison to the impacts of the Project.

## 4.5 COMPARATIVE IMPACT ANALYSIS

The following section describes the results of the environmental analysis presented in this CEQA document. If an alternative would cause one or more significant effects in addition to those that would be caused by the Project as proposed, the significant effects of the alternative must be discussed, but in less detail than the significant effects of the Project as proposed (CCR Section 15126.6[d]). Table 4-1 compares the alternatives that were considered in terms of the level of impact for each environmental resource analyzed and is provided below.

### 4.5.1 NO PROJECT ALTERNATIVE

The No Project Alternative considered the results if the proposed project were not implemented. If the project were not to occur, none of the activities or potential environmental impacts associated with the project would occur. Analysis of the No Project Alternative is required under CEQA to allow BWD decision-makers to compare the impacts of the project and its alternatives with the impacts of not approving the project. Under the State CEQA Guidelines, the No Project Alternative discusses and analyzes the existing conditions at the time the NOP was published and what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.

In this case, if the Project is not approved, BWD would continue normal operations within the existing water supply framework, under the terms of the 1969 Agreement on Diversion of Water from the Feather River and the 1970 Joint Operating Agreement, and no transfer of conserved water would occur. Individual growers may still choose to fallow land and reduce the surface water demands within BWD in certain years, resulting in reduced water orders within BWD.

#### 4.5.1.1 AESTHETICS

The No Project Alternative would not include any construction activities, nor would it introduce new structures to the area. Water transfers would not occur and agricultural operations in the District would not be changed as a result of the Project. Visual resources would be the same as existing conditions. As such, there would be no direct or indirect related impacts.

#### 4.5.1.2 AGRICULTURAL AND FORESTRY SERVICES

There would be no direct or indirect related effects under the No Project Alternative. The No Project Alternative would not convert cropland compared to existing conditions. Therefore, there would be no impacts to Prime Farmland, Farmland of Statewide Importance, or Unique Farmland under No Project Alternative. Farmers in the District may still idle fields due to water shortages. Depending on the extent of shortages and the number of years a particular field is idled consecutively, there could be reductions in the amount of land classified as Important Farmland. These actions in response to water shortages are similar to those that occur under existing conditions; therefore, there would be no increase in effects to agricultural resources. The impacts to important farmland would be similar to the less than significant impacts with the Preferred Alternative.

#### 4.5.1.3 AIR QUALITY

Under the No Project Alternative, no short-term construction emissions nor long-term and operational emissions would be generated. However, District growers would be expected to continue groundwater pumping and cropland idling similarly to existing conditions. Groundwater pumping for irrigation would release air quality emissions if diesel pumps were used. These activities would be the same as existing conditions and would not change air quality emissions. As such, impacts would be anticipated to be similar to that of the Preferred Alternative.

#### 4.5.1.4 BIOLOGICAL RESOURCES

Under the No Project Alternative, there would be no ground disturbance taking place. In addition, there would be no changes in existing agricultural uses or water availability in the District boundaries compared to that of existing conditions. As such, impacts to biological resources would be similar to that of the Preferred Alternative regarding water transfers; however, without ground disturbance, overall impacts would be anticipated to be slightly lesser than that of the Preferred Alternative.

#### 4.5.1.5 CULTURAL RESOURCES

Under the No Project Alternative, there would be no ground disturbance taking place, and water transfers would not take place as a part of the project. There would be no changes to the significance of historical or archaeological resources, no direct or indirect destruction of unique paleontological resources or sites or unique geologic features, and no disturbance of human remains. As such, no potential impacts to existing cultural resources would occur.

#### 4.5.1.6 ENERGY

There would be no new impacts occurring from additional energy usage (including electricity, natural gas, and petroleum-fuel). However, District growers would be expected to continue groundwater pumping and cropland idling similarly to existing conditions. Groundwater pumping for irrigation would still require energy. As such, impacts would be anticipated to be similar to that of the Preferred Alternative.

#### 4.5.1.7 GEOLOGY AND SOILS

The No Project Alternative would not involve cropland idling or groundwater substitution water transfers. As such, the alternative would not increase the potential for geologic or soil hazards, create new hazards, or result in the destruction of paleontological resources beyond existing conditions. Impacts would be similar to that of the Preferred Alternative.

#### 4.5.1.8 GREENHOUSE GAS EMISSIONS

Considering no new construction activities would happen under the No Project Alternative, there would be no direct or indirect related impacts related to well installation. However, GHG emissions for well

installation would not be substantial. The alternative would have no change in water transfer activities originating in the District beyond existing conditions; therefore, the potential for GHG emissions from engine exhaust would be the same as existing conditions. The impacts to GHG emissions in the District would be similar to that of the Preferred Alternative.

#### 4.5.1.9 HAZARDS AND HAZARDOUS WASTES

No new development would occur under the No Project Alternative; no ground disturbance would occur. As such, there would be no direct or indirect related impacts, which is similar to that of the Preferred Alternative.

#### 4.5.1.10 HYDROLOGY AND WATER QUALITY

Under the No Project Alternative, no water transfers would be made from BWD. There would be no change from existing conditions related to drainage patterns, river courses, surface runoff, flood risks, groundwater usage and recharge, and water supply. Water users within the Valley Water boundary may experience shortages under certain hydrologic conditions which would require them to use supplemental water supplies. Some water users may face potential shortages under dry and critical water years. During these periods, water users may increase groundwater pumping, idle cropland, reduce landscape irrigation, ration water, or pursue supplemental water supplies in response to shortages. Impacts would be expected to be lesser than those of the Preferred Alternative.

#### 4.5.1.11 LAND USE AND PLANNING

Land use and planning would remain the same as existing conditions. There would be no direct or indirect related impacts; impacts would be the same or similar to that of the Preferred Alternative.

#### 4.5.1.12 MINERAL RESOURCES

No mineral resources would be impacted as a result of the No Project alternative as no construction or other project activities would occur. As such, impacts would be the same or similar to that of the Preferred Alternative.

#### 4.5.1.13 NOISE

There would be no construction or Operations & Maintenance (O&M) created noise under the No Project Alternative. However, O&M would continue to occur for normal operations. Noise levels would remain the same as existing conditions, which is similar to that of the Preferred Alternative.

#### 4.5.1.14 POPULATION AND HOUSING

The Project area includes the BWD boundaries. Neither population nor housing would be impacted by the No Project alternative as nothing would change from the existing conditions. As such, impacts would be same as the Preferred Alternative.

#### 4.5.1.15 PUBLIC SERVICES

The No Project Alternative would not result in the addition to or alteration of any public services. There would be no direct or indirect related impacts. As such, impacts would be same as for the Preferred Alternative.

#### 4.5.1.16 RECREATION

In the absence of transfers, there would be no changes to water surface elevations in local reservoirs and rivers that could cause or accelerate substantial physical deterioration at recreational facilities. Under the No Project Alternative, there would be no direct or indirect related impacts. As such, impacts would be same as for the Preferred Alternative.

#### 4.5.1.17 TRANSPORTATION

Under the No Project Alternative, there would be no direct or indirect related impacts. There would be no changes to existing conditions regarding transportation. As such, impacts would be similar to that of the Preferred Alternative.

#### 4.5.1.18 TRIBAL CULTURAL RESOURCES

Under the No Project Alternative, there would be no ground disturbance taking place, and water transfers would not take place as a part of the project. There would be no changes to the significance of historical or archaeological resources, no direct or indirect destruction of tribal cultural resources or sites, and no disturbance of human remains. As such, no potential impacts to existing cultural resources would occur.

#### 4.5.1.19 UTILITIES AND SERVICE SYSTEMS

There would be no need for additions or changes to the existing utilities and service systems in the Project area. Under the No Project Alternative, there would be no direct or indirect related impacts. As such, impacts would be same as for the Preferred Alternative.

#### 4.5.1.20 WILDFIRE

Under the No Project Alternative, there would be no direct or indirect related impacts as there would be no changes to the land. As such, impacts would be same as for the Preferred Alternative.

### 4.5.2 CROPLAND IDLING AND GROUNDWATER SUBSTITUTION ALTERNATIVE (PROJECT OR PREFERRED ALTERNATIVE)

This alternative would involve the potential transfers outlined in the Chapter 2 Project Description, between BWD and Valley Water, or other willing buyers if Valley Water does not elect to receive transfer supplies. Water would be made available for transfer through cropland shifting/idling, groundwater substitution, or a combination of both. The upper limit of transfers would be 24,000 AF in any year, including up to 14,000 AF from crop idling and up to 10,000 AF from groundwater substitution pumping.

Analysis of the Project is provided in Chapter Chapter 6 Initial Study. The Initial Study found that further analysis was required in the EIR for both Biological and Hydrology and Water Quality Resources, which can be found in Chapter Chapter 3 Environmental Impact Analysis. Finally, brief summaries of those resources which were found to not require additional analysis in the EIR beyond the Initial Study are included in Section 5.4. Please consult the aforementioned sections for the potential impacts to environmental resources as a result of the Project.

### 4.5.3 CROPLAND IDLING ALTERNATIVE

The cropland idling alternative would include making water available for transfer between BWD and Valley Water, or other willing buyers if Valley Water does not elect to receive transfer supplies, only through cropland idling or crop shifting. It would not include any groundwater substitution pumping as a method of making water available for transfer. Land idled for the purpose of the potential transfers would primarily be drawn from the rice acreage within the District. However, those crops suitable for idling as laid out in Table 2-1 of DWR's *DRAFT Technical Information for Preparing Water Transfer Proposals in 2019* within the District would also have the potential to be idled for the sake of transfers. The upper limit of water made available for transfer, through cropland idling, in any one year is 14,000 AF.

#### 4.5.3.1 AESTHETICS

This alternative would include the construction of a groundwater well, which would not significantly impact visual resources in the area. It would not introduce any other structures to the area. As such, impacts would be anticipated to be similar to that of the Preferred Alternative.

#### 4.5.3.2 AGRICULTURAL AND FORESTRY SERVICES

Under this alternative, any idled fields could be brought back into agricultural production in the following year. The alternative would not result in any other changes to the existing environment that would result in the conversion of farmland to non-agricultural use. There are no forests or timberland lands in the Project area or vicinity. The alternative does not propose any rezoning. It would not convert forest land to non-forest use. The impacts to important farmland would be similar to that of the proposed Project.

#### 4.5.3.3 AIR QUALITY

The alternative would not conflict with or obstruct the implementation of the air quality management standards. Standards set by the Butte County Air Quality Management District (BCAQMD) and Feather River Air Quality Management District (FRAQMD), and regulations relating to the Project would continue to apply. The alternative would not result in a cumulatively considerable net increase of any criteria pollutant for which the project alternative region is in non-attainment. There would be no construction activities in an area with sensitive receptors. The installation of the third well would occur near an existing canal and surrounded by land in agricultural production. Impacts would be similar or the same as those of the Preferred Alternative.

#### 4.5.3.4 BIOLOGICAL RESOURCES

This alternative would have the same or similar impacts as that of the Preferred Alternative as the Project area remains the same (the District boundary), and water transfers would still occur as well as the construction of a groundwater well. As such, impacts would be less than significant with mitigation incorporated.

#### 4.5.3.5 CULTURAL RESOURCES

This alternative would have the same or similar impacts as that of the Preferred Alternative as the Project area remains the same (the District boundary), and a well to be used for the groundwater substitution water transfers could be constructed as a part of the alternative. According to the Northeast Information Center (NEIC), no archaeological resources or built environment resources were identified within the Project boundaries nor within a one-mile radius of the Project's well site. Farming operations, such as plowing, planting, and harvesting, would continue to take place on land where surface disturbing activities have continuously occurred for many years, and no new or expanded uses would occur as a result of the water transfer. As such, impacts would be less than significant.

#### 4.5.3.6 ENERGY

The alternative would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency. Water transferred as a part of the alternative may be stored by DWR in Lake Oroville until the water could be moved to Valley Water or other buyers. This could affect the pattern of power generation at the Oroville facilities. However, this would cause a negligible change in the long term. As such, the alternative would not result in long-term significant impacts to power supplies. Additionally, no new facilities would be constructed for the alternative resulting in consumption of energy resources. Under this alternative, there would be no increased groundwater pumping causing an increased use in energy. As such, impacts would be likely be lesser than that of the Preferred Alternative.

#### 4.5.3.7 GEOLOGY AND SOILS

The District is not located within a known earthquake fault zone. This alternative would not involve activities that would potentially cause significant adverse effects involving strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides above the existing baseline conditions. Soils in the Project area consist of clays with a flat terrain and the existing conditions do not pose a risk of instability and, according to the NRCS's Web Soil Survey, the site's soils have a low potential for soil erosion.[32] The new well would be installed on land that has been actively used for agriculture and is immediately adjacent to an existing District canal. This alternative would have the same or similar impacts as that of the Preferred Alternative.

#### 4.5.3.8 GREENHOUSE GAS EMISSIONS

While some field work may occur in idled fields by participating landowners, it is expected that substantially less field work would occur as a result of the alternative than compared to existing conditions. By idling the land, less farm equipment would be utilized and less greenhouse gas would be emitted. However, a third well is anticipated to be installed as part of the alternative, which would cause a small increase in emissions

[32] (United States Department of Agriculture, n.d.)

during construction. GHG emissions would be generated during construction, but they would dissipate in quantity as time passes. The alternative would not result in the generation of GHG emissions that would exceed the AB 32 consistency threshold of 1,100 $MTCO_2e$ annually during construction activities. Therefore, impacts would be less than significant and similar to that of the Preferred Alternative.

#### 4.5.3.9 HAZARDS AND HAZARDOUS WASTES

Construction of the new well would not be within one-quarter mile of an existing or proposed school. On August 8, 2025, an EnviroStor and GeoTracker search determined that there are three active hazardous waste generators or hazardous material spill sites within the BWD District boundaries. However, two of the three sites are immediately adjacent to Highway 99, and none of the three are near lands that would have the potential to be idled for the alternative. As such, this alternative would have the same or similar impacts as that of the Preferred Alternative.

#### 4.5.3.10 HYDROLOGY AND WATER QUALITY

This alternative would have a lesser impact on groundwater budget components compared to the other alternatives that include groundwater substitution pumping. However, according to the Groundwater Modeling Report (see Appendix E), over the 50 years of simulation, there were no significant variations among the major components of the groundwater budget between the six different alternatives simulated. Overall, the groundwater budget results indicate that changes to the groundwater system are most impactful while the water transfers are actually occurring, and all impacts from the transfers are negligible by about 20 years after the transfers cease. As such, while it is not anticipated that this alternative would require mitigation due to the lack of groundwater substitution pumping, the simulation period shows that impacts would be very similar across all alternatives over a longer period. Apart from groundwater substitution-related impacts, this alternative would have the same or similar impacts as that of the Preferred Alternative. In summary, impacts would be less than significant.

#### 4.5.3.11 LAND USE AND PLANNING

The alternative would not physically divide an established community. The alternative would not cause a significant environmental conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. There would be no direct or indirect related impacts, like that of the Preferred Alternative.

#### 4.5.3.12 MINERAL RESOURCES

The alternative would not result in significant impacts associated with the loss of availability of a known mineral resource that would be of value to the region and the residents of the State. There would be no construction or earthmoving activities associated with implementation except for the drilling of a new well. There would be no impact, like that of the Preferred Alternative.

#### 4.5.3.13 NOISE

The alternative involves the movement of water through existing conveyance facilities as well as the installation of a well. Like the Preferred Alternative, construction of the alternative would involve temporary noise sources, predominantly from off-road equipment, such as excavators, backhoe/loader, drilling rigs, scrapers, and tractors. The site is located adjacent to agricultural lands, which makes the area accustomed to noises associated with farm equipment. The alternative will comply with the County's General Plan by obtaining any needed permits for working outside of the standard construction hours from the County for the well-related drilling. Operational maintenance activities would be on an as-needed basis with routine monitoring performed by existing staff and would not generate significant new noise. Any impacts would be temporary and, therefore, less than significant. As such, this alternative would have the same or similar impacts as that of the Preferred Alternative.

#### 4.5.3.14 POPULATION AND HOUSING

The alternative would not induce substantial population growth in an area, either directly or indirectly. The alternative would utilize existing water conveyance facilities and construct a single well next to a District

canal and surrounded by agriculture. No housing or people would be displaced as a result of this alternative, and no new housing would be created. Therefore, there would be no impact. Impacts would be the same as that of the Preferred Alternative.

#### 4.5.3.15 PUBLIC SERVICES

The alternative does not propose the construction of any habitable structures and would not induce population growth. As such, the alternative would not create a need for additional fire protection, police protection, schools, parks, or other public facilities. Water would be conveyed through existing conveyance facilities, and a single well would be constructed in an area surrounded by agriculture. As such, like the Preferred Alternative, there would be no impact to public services.

#### 4.5.3.16 RECREATION

The alternative does not include recreational facilities. As there is no population growth resulting directly or indirectly from alternative implementation, construction, or expansion of nearby recreational facilities would not be necessary. As such, like the Preferred Alternative, there would be no impact to public services.

#### 4.5.3.17 TRANSPORTATION

The alternative would not conflict with a plan, ordinance, or policy addressing the circulation system including transit, roadway, bicycle, and pedestrian facilities, nor would it conflict with or be inconsistent with CEQA guidelines section 15064.3 Subdivision (b). There is no population growth associated with the alternative, nor would implementation of the alternative result in an increase in staff or drivers utilizing roadways in the area. No roadway design features are associated with this alternative, and there would be no change in the existing land use that could result in incompatible use. As such, there are no roadways being modified for this alternative or impede any emergency access routes. Therefore, just like the Preferred Alternative, there would be no impact.

#### 4.5.3.18 TRIBAL CULTURAL RESOURCES

All of the alternatives have the same well construction site (expect for the No Project Alternative that would not involve constructing a new well). A Sacred Lands File (SLF) search completed for the new well site area, dated September 11, 2025, did not identify any tribal cultural resources within the project area. Additionally, a records search was conducted by the NEIC at California State University, Chico. This search also determined that tribal cultural resources were not present on-site. Impacts would be the same as for the Preferred Alternative.

#### 4.5.3.19 UTILITIES AND SERVICE SYSTEMS

The alternative would not involve the relocation or construction of any new or expanded wastewater treatment or storm water drainage, electric power, natural gas or telecommunications facilities. The alternative includes the installation of a new groundwater well to be used by the District. Construction-related water use would be temporary, and there would be no permanent employees on-site during project operation. This alternative does not include the construction or operation of new facilities or modifications of existing facilities that would require wastewater treatment. Additionally, the Project would not directly or indirectly induce population growth. Impacts would be the same as that of the Preferred Alternative.

#### 4.5.3.20 WILDFIRE

The District does not include lands in a Very High Fire Hazard Severity Zone. Impacts would be similar or the same for all alternatives.

### 4.5.4 GROUNDWATER SUBSTITUTION ALTERNATIVE

This alternative would include making water available for transfer between BWD and Valley Water, or other willing buyers if Valley Water does not elect to receive transfer supplies, only through groundwater substitution pumping. It would not include any cropland idling or crop shifting as methods of making water available for transfer. BWD would make water available for transfer by utilizing groundwater, in compliance

with County Ordinance and GSA policies, in-lieu of surface water. The upper limit of water made available for transfer, through groundwater substitution pumping, in any one year is 10,000 AF.

#### 4.5.4.1 AESTHETICS

This alternative would include the construction of a new groundwater well, which would not significantly impact visual resources in the area. It would not introduce any other structures to the area. As such, impacts would be anticipated to be similar to that of the Preferred Alternative.

#### 4.5.4.2 AGRICULTURAL AND FORESTRY SERVICES

No crops would be idled as a part of this alternative; however, growers in the District may still participate in crop idling if they so choose. The alternative would not result in any other changes to the existing environment that would result in the conversion of farmland to non-agricultural use. There are no forests or timberland lands in the Project area or vicinity. The alternative does not propose any rezoning. It would not convert forest land to non-forest use. Impacts would be slightly less or similar to that of the Preferred Alternative.

#### 4.5.4.3 AIR QUALITY

The alternative would not conflict with or obstruct the implementation of the air quality management standards. Standards set by the BCAQMD and FRAQMD, and regulatory agencies relating to the Project would continue to apply. The alternative would not result in a cumulatively considerable net increase of any criteria pollutant for which the project alternative region is in non-attainment. There would be no construction activities in an area with sensitive receptors. The construction of the third well would occur near an existing canal and surrounded by land in agricultural production. Impacts would be similar or the same as that of the Preferred Alternative.

#### 4.5.4.4 BIOLOGICAL RESOURCES

Potential impacts to giant garter snakes as a result of cropland idling would not occur with this alternative. However, potential impacts associated with the construction of a new groundwater well and groundwater substitution would still have the potential to occur, and other impacts would be the same or similar to that of the Preferred Alternative. Impacts would still require mitigation to be brought to a less than significant level.

#### 4.5.4.5 CULTURAL RESOURCES

This alternative would have the same or similar impacts as that of the Preferred Alternative as the Project area remains the same (the District boundary), and a new well to be used for the groundwater substitution water transfers could be constructed as a part of the alternative. According to the NEIC, no archaeological resources or built environment resources were identified within the Project boundaries nor within a one-mile radius of the Project's well site. Farming operations such as plowing, planting, and harvesting would continue to take place on land where surface disturbing activities have continuously occurred for many years, and no new or expanded uses would occur as a result of the water transfer. As such, impacts would be less than significant.

#### 4.5.4.6 ENERGY

The alternative would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency. Water transferred as a part of the alternative may be stored by DWR in Lake Oroville until the water could be moved to Valley Water or other buyers. This could affect the pattern of power generation at the Oroville facilities. However, this would cause a negligible change in the long term. As such, the alternative would not result in long-term significant impacts to power supplies. Additionally, no new facilities, apart from the new well, would be constructed for the alternative resulting in consumption of energy resources.

The alternative would extract up to 10,000 AF of groundwater from BWD production wells in Sutter County. The groundwater substitution water transfers may increase groundwater pumping within the BWD

boundaries in Sutter County which may result in increases in energy use. This would result in increased energy use during the transfer window. However, the energy needed to extract and deliver the water is a necessary component of the alternative and would not be a wasteful, inefficient, or unnecessary consumption of energy resources. As such, impacts would be less than significant.

#### 4.5.4.7 GEOLOGY AND SOILS

The District is not located within a known earthquake fault zone. This alternative would not involve activities that would potentially cause significant adverse effects involving strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides above the existing baseline conditions. Soils in the Project area consist of clays with a flat terrain and the existing conditions do not pose a risk of instability and, according to the NRCS's Web Soil Survey, the site's soils have a low potential for soil erosion.[33] The new well would be constructed on land that has been actively used for agriculture and is immediately adjacent to an existing District canal. This alternative would have the same or similar impacts as that of the Preferred Alternative.

#### 4.5.4.8 GREENHOUSE GAS EMISSIONS

A third well is anticipated to be constructed as part of the alternative, which would cause a small increase in emissions during construction. GHG emissions would be generated during construction, but they would dissipate in quantity as time passes. The alternative would not result in the generation of GHG emissions that would exceed the AB 32 consistency threshold of 1,100 $MTCO_2e$ annually during construction activities. Therefore, impacts would be less than significant and similar to that of the Preferred Alternative.

#### 4.5.4.9 HAZARDS AND HAZARDOUS WASTES

Construction of the new well would not be within one-quarter mile of an existing or proposed school. On August 8, 2025, an EnviroStor and GeoTracker search determined that there are three active hazardous waste generators or hazardous material spill sites within the BWD District boundaries. However, two of the three sites are immediately adjacent to Highway 99, and none of the three are near the well site. Groundwater substitution pumping would otherwise have no impacts to hazards or hazardous wastes. As such, this alternative would have the same or similar impacts as that of the Preferred Alternative.

#### 4.5.4.10 HYDROLOGY AND WATER QUALITY

According to the Groundwater Modeling Report attached as Appendix E, impacts associated with this alternative would be similar to that of the Preferred Alternative. Groundwater substitution pumping appeared to have the most impacts across the alternatives when it comes to hydrology and water quality due to the potential to change flows to interconnected surface waters and/or lower the groundwater levels, which could potentially impact groundwater dependent ecosystems. Considering this alternative does not include crop idling, and even though other alternatives also have groundwater substitution pumping occurring, the amount of water saved as a result of crop idling in other alternatives is greater than the amount of groundwater substitution pumping, and the impact on the agricultural groundwater pumping is related to changes caused predominantly by crop idling instead of groundwater substitution pumping. As such, while the alternative would not create any impacts associated with crop idling like the other alternatives (not including the No Project Alternative), it would still require mitigation to bring impacts to less than significant like that of the Preferred Alternative. As such, this alternative would have the same or similar impacts as that of the Preferred Alternative.

#### 4.5.4.11 LAND USE AND PLANNING

The alternative would not physically divide an established community. The alternative would not cause a significant environmental conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. There would be no direct or indirect related impacts, like that under the Preferred Alternative.

[33] (United States Department of Agriculture, n.d.)

#### 4.5.4.12 MINERAL RESOURCES

The alternative would not result in significant impacts associated with the loss of availability of a known mineral resource that would be of value to the region and the residents of the State. There would be no construction or earthmoving activities associated with implementation except for the drilling of a new well. There would be no impact, similar to the Preferred Alternative.

#### 4.5.4.13 NOISE

The alternative involves the movement of water through existing conveyance facilities as well as the construction of a new well. Construction of the alternative would involve temporary noise sources, predominantly from off-road equipment, such as excavators, backhoe/loader, drilling rigs, scrapers, and tractors. The site is located adjacent to agricultural lands, which makes the area accustomed to noises associated with farm equipment. The alternative will comply with the County's General Plan by obtaining any needed permits for working outside of the standard construction hours from the County for the well construction. Operational maintenance activities would be on an as-needed basis with routine monitoring performed by existing staff and would not generate significant new noise. Any impacts would be temporary and therefore, less than significant. As such, this alternative would have the same or similar impacts as that of the Preferred Alternative.

#### 4.5.4.14 POPULATION AND HOUSING

The alternative would not induce substantial population growth in an area, either directly or indirectly. The alternative would utilize existing water conveyance facilities and construct a new well next to a BWD canal in an area surrounded by agriculture. No housing or people would be displaced as a result of this alternative, and no new housing would be created. Therefore, there would be no impact. Impacts would be the same as that of the Preferred Alternative.

#### 4.5.4.15 PUBLIC SERVICES

The alternative does not propose the construction of any habitable structures and would not induce population growth. As such, the alternative would not create a need for additional fire protection, police protection, schools, parks, or other public facilities. Water would be conveyed through existing conveyance facilities, and a new well would be constructed in an area surrounded by agriculture. As such, like the Preferred Alternative, there would be no impact to public services.

#### 4.5.4.16 RECREATION

The alternative does not include recreational facilities. As there is no population growth resulting directly or indirectly from alternative implementation, construction, or expansion of nearby recreational facilities would not be necessary. As such, like the Preferred Alternative, there would be no impact to public services.

#### 4.5.4.17 TRANSPORTATION

The alternative would not conflict with a plan, ordinance, or policy addressing the circulation system including transit, roadway, bicycle, and pedestrian facilities, nor would it conflict with or be inconsistent with CEQA guidelines section 15064.3 Subdivision (b). There is no population growth associated with the alternative, nor would implementation of the alternative result in an increase in staff or drivers utilizing roadways in the area. No roadway design features are associated with this alternative, and there would be no change in the existing land use that could result in incompatible use. As such, there are no roadways being modified for this alternative or impede any emergency access routes. Therefore, just like the Preferred Alternative, there would be no impact.

#### 4.5.4.18 TRIBAL CULTURAL RESOURCES

An SLF search completed for the new well site area, dated September 11, 2025, did not identify any tribal cultural resources within the project area. Additionally, a records search was conducted by the NEIC at California State University, Chico. This search also determined that tribal cultural resources were not present on-site. Impacts would be the same as for the Preferred Alternative.

#### 4.5.4.19 UTILITIES AND SERVICE SYSTEMS

The alternative would not involve the relocation or construction of any new or expanded wastewater treatment or storm water drainage, electric power, natural gas or telecommunications facilities. The alternative includes the construction of a third groundwater well to be used by the District. Construction-related water use would be temporary, and there would be no permanent employees on-site during project operation. This alternative does not include the construction or operation of new facilities or modifications of existing facilities that would require wastewater treatment. Additionally, the Project would not directly or indirectly induce population growth. Impacts would be the same as that of the Preferred Alternative.

#### 4.5.4.20 WILDFIRE

The District does not include lands in a Very High Fire Hazard Severity Zone. Impacts would be similar or the same for all alternatives.

### 4.5.5 REDUCED CROPLAND IDLING ALTERNATIVE

This alternative would involve transfers from both cropland idling and groundwater substitution pumping; however, the available AF for transfer from idling would be reduced by 50% from the upper limit of 14,000 AF annually as discussed in the Project Description to 7,000 AF. Groundwater substitution transfers would comprise up to 10,000 AF of water available for transfer in any one year.

#### 4.5.5.1 AESTHETICS

This alternative would include the construction of a groundwater well, which would not significantly impact aesthetics in the area. It would not introduce any other structures to the area. As such, impacts would be less than significant.

#### 4.5.5.2 AGRICULTURAL AND FORESTRY SERVICES

This alternative would potentially involve cropland idling for fields on an annual basis; however maximum cropland idling would be reduced as compared to the Preferred Alternative. The alternative would not result in any other changes to the existing environment that would result in the conversion of farmland to non-agricultural use. Any idled fields could be brought back into agricultural production in the following year. The impacts involving changes to the existing environment that could result in conversion of farmland to non-agricultural uses is less than significant. There are no forests or timberland lands in the Project area or vicinity. The alternative does not propose any rezoning. It would not convert forest land to non-forest use. Impacts would the same or similar as the Preferred Alternative.

#### 4.5.5.3 AIR QUALITY

The alternative would not conflict with or obstruct the implementation of the air quality management standards. Standards set by the BCAQMD and FRAQMD, and regulatory agencies relating to the Project would continue to apply. The alternative would not result in a cumulatively considerable net increase of any criteria pollutant for which the project alternative region is in non-attainment. There would be no construction activities in an area with sensitive receptors. The construction of the third well would occur near an existing canal in an area surrounded by land in agricultural production. Impacts would be similar or the same as that of the Preferred Alternative.

#### 4.5.5.4 BIOLOGICAL RESOURCES

This alternative would have the same or similar impacts as that of the Preferred Alternative as the Project area remains the same (the District boundary), and water transfers would still occur as well as the construction of a groundwater well. As such, impacts would be less than significant with mitigation incorporated.

#### 4.5.5.5 CULTURAL RESOURCES

This alternative would have the same or similar impacts as that of the Preferred Alternative as the Project area remains the same (the District boundary), and a well to be used for the groundwater substitution water transfers could be constructed as a part of the alternative. According to the NEIC, no archaeological

resources or built environment resources were identified within the Project boundaries nor within a one-mile radius of the Project's well site. Farming operations such as plowing, planting, and harvesting would continue to take place on land where surface disturbing activities have continuously occurred for many years, and no new or expanded uses would occur as a result of the water transfer. As such, impacts would be less than significant.

#### 4.5.5.6 ENERGY

The alternative would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency. Water transferred as a part of the alternative may be stored by DWR in Lake Oroville until the water could be moved to Valley Water or other buyers. This could affect the pattern of power generation at the Oroville facilities. However, this would cause a negligible change in the long term. As such, the alternative would not result in long-term significant impacts to power supplies. Additionally, no new facilities, apart from the new well, would be constructed for the alternative resulting in consumption of energy resources.

The alternative would extract up to 10,000 AF of groundwater from BWD production wells in Sutter County. The groundwater substitution water transfers may increase groundwater pumping within the BWD boundaries in Sutter County resulting in increased energy use during the transfer window. However, this energy use needed to deliver the water is a necessary component of the alternative and would not be a wasteful, inefficient, or unnecessary consumption of energy resources. As such, impacts would be the same or similar to that for the Preferred Alternative.

#### 4.5.5.7 GEOLOGY AND SOILS

The District is not located within a known earthquake fault zone. This alternative would not involve activities that would potentially cause significant adverse effects involving strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides above the existing baseline conditions. Soils in the Project area consist of clays with a flat terrain and the existing conditions do not pose a risk of instability and, according to the NRCS's Web Soil Survey, the site's soils have a low potential for soil erosion.[34] The new well would be constructed on land that has been actively used for agriculture and is immediately adjacent to an existing District canal. Therefore, impacts would be the same or similar to that for the Preferred Alternative.

#### 4.5.5.8 GREENHOUSE GAS EMISSIONS

While some field work may occur in idled fields by participating landowners, it is expected that substantially less field work would occur as a result of the alternative than compared to existing conditions. By idling the land, less farm equipment would utilized and less greenhouse gas would be emitted. However, a third well is anticipated to be constructed as part of the alternative. The alternative would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. GHG emissions would be generated during construction, and they would dissipate in quantity as time passes. The alternative would not result in the generation of GHG emissions that would exceed the AB 32 consistency threshold of 1,100 $MTCO_2e$ annually during construction activities. Therefore, impacts would be the same or similar to that for the Preferred Alternative.

#### 4.5.5.9 HAZARDS AND HAZARDOUS WASTES

Construction of the well would not be within one-quarter mile of an existing or proposed school. On August 8, 2025, an EnviroStor and GeoTracker search was done for the alternative project area. The search determined that there are three active hazardous waste generators or hazardous material spill sites within the BWD District boundaries. However, two of the three sites are immediately adjacent to Highway 99, and none of the three are near lands that would have the potential to be idled for the alternative. As such, impacts would be the same or similar to that for the Preferred Alternative.

[34] (United States Department of Agriculture, n.d.)

#### 4.5.5.10 HYDROLOGY AND WATER QUALITY

The reduction in crop idling is not anticipated to have significant changes in impacts to that of the Preferred Alternative. According to the Groundwater Modeling Report attached as Appendix E, impacts associated with this alternative would be similar to that for the Preferred Alternative. Groundwater substitution pumping appeared to have the most impacts across the alternatives when it comes to hydrology and water quality. As such, with the same quantity of groundwater substitution as the Preferred Alternative, impacts would be very similar to that of the Preferred Alternative, and mitigation would be incorporated to bring impacts to less than significant.

#### 4.5.5.11 LAND USE AND PLANNING

The alternative would not physically divide an established community. The alternative would not cause a significant environmental conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. There would be no direct or indirect related impacts, like that of the Preferred Alternative.

#### 4.5.5.12 MINERAL RESOURCES

The alternative would not result in significant impacts associated with the loss of availability of a known mineral resource that would be of value to the region and the residents of the State. There would be no construction or earthmoving activities associated with implementation except for the drilling of a new well. Like the Preferred Alternative, there would be no impact.

#### 4.5.5.13 NOISE

The alternative involves the movement of water through existing conveyance facilities as well as the construction of a well. Construction of the alternative would involve temporary noise sources, predominantly from off-road equipment, such as excavators, backhoe/loader, drilling rigs, scrapers, and tractors. The site is located adjacent to agricultural lands, which makes the area accustomed to noises associated with farm equipment. The alternative will comply with the County's General Plan by obtaining any needed permits for working outside of the standard construction hours from the County for the well drilling. Operational maintenance activities would be on an as-needed basis with routine monitoring performed by existing staff and would not generate significant new noise. Any impacts would be the same or similar to that for the Preferred Alternative.

#### 4.5.5.14 POPULATION AND HOUSING

The alternative would not induce substantial population growth in an area, either directly or indirectly. The alternative would utilize existing water conveyance facilities and construct a new well next to a District canal and surrounded by agriculture. No housing or people would be displaced as a result of this alternative and no new housing would be created. Therefore, like the Preferred Alternative, there would be no impact.

#### 4.5.5.15 PUBLIC SERVICES

The alternative does not propose the construction of any habitable structures and would not induce population growth. As such, the alternative would not create a need for additional fire protection, police protection, schools, parks, or other public facilities. Water would be conveyed through existing conveyance facilities, and a new well would be constructed in an area surrounded by agriculture. As such, impacts would be the same as for the Preferred Alternative.

#### 4.5.5.16 RECREATION

The alternative does not include recreational facilities. As there is no population growth resulting directly or indirectly from alternative implementation, construction, or expansion of nearby recreational facilities would not be necessary. Like the Preferred Alternative, there would be no impact.

#### 4.5.5.17 TRANSPORTATION

The alternative would not conflict with a plan, ordinance, or policy addressing the circulation system including transit, roadway, bicycle, and pedestrian facilities, nor would it conflict with or be inconsistent with CEQA guidelines section 15064.3 Subdivision (b). There is no population growth associated with the

alternative, nor would implementation of the alternative result in an increase in staff or drivers utilizing roadways in the area. No roadway design features are associated with this alternative, and there would be no change in the existing land use that could result in incompatible use. As such, there are no roadways being modified for this alternative or impede any emergency access routes. Therefore, just like the Preferred Alternative, there would be no impact.

#### 4.5.5.18 TRIBAL CULTURAL RESOURCES

An SLF search completed for the new well site area, dated September 11, 2025, did not identify any tribal cultural resources within the project area. Additionally, a records search was conducted by the NEIC at California State University, Chico. This search also determined that tribal cultural resources were not present on-site. Impacts would be the same as for the Preferred Alternative.

#### 4.5.5.19 UTILITIES AND SERVICE SYSTEMS

The alternative would not involve the relocation or construction of any new or expanded wastewater treatment or storm water drainage, electric power, natural gas or telecommunications facilities. The alternative includes the construction of a third groundwater well to be used by the District. Construction-related water use would be temporary, and there would be no permanent employees on-site during project operation. This alternative does not include the construction or operation of new facilities or modifications of existing facilities that would require wastewater treatment. Additionally, the Project would not directly or indirectly induce population growth. Impacts would be the same as that of the Preferred Alternative.

#### 4.5.5.20 WILDFIRE

The District does not include lands in a Very High Fire Hazard Severity Zone. Impacts would be similar or the same for all alternatives.

### 4.5.6 REDUCED GROUNDWATER SUBSTITUTION ALTERNATIVE

This alternative would involve transfers from both cropland idling and groundwater substitution; however, the available AF for transfer from groundwater substitution would be reduced by 50% from the upper limit of 10,000 AF annually as discussed in the Project Description to 5,000 AF. Cropland idling transfers would comprise up to 14,000 AF of water available for transfer in any one year.

#### 4.5.6.1 AESTHETICS

This alternative would include the construction of a groundwater well, which would not significantly impact aesthetics in the area. It would not introduce any other structures to the area. Impacts would have the same or similar impacts as that of the Preferred Alternative.

#### 4.5.6.2 AGRICULTURAL AND FORESTRY SERVICES

This alternative would potentially involve cropland idling for fields on an annual basis. The alternative would not result in any other changes to the existing environment that would result in the conversion of farmland to non-agricultural use. Any idled fields could be brought back into agricultural production in the following year. The impacts involving changes to the existing environment that could result in conversion of farmland to non-agricultural uses is less than significant. There are no forests or timberland lands in the Project area or vicinity. The alternative does not propose any rezoning. It would not convert forest land to non-forest use. Impacts would the same or similar as the Preferred Alternative.

#### 4.5.6.3 AIR QUALITY

The alternative would not conflict with or obstruct the implementation of the air quality management standards. Standards set by the BCAQMD and FRAQMD, and regulatory agencies relating to the Project would continue to apply. The alternative would not result in a cumulatively considerable net increase of any criteria pollutant for which the project alternative region is in non-attainment. There would no construction activities in an area with sensitive receptors. The construction of the third well would occur near an existing canal and surrounded by land in agricultural production. Impacts would be similar or the same to that of the Preferred Alternative.

#### 4.5.6.4 BIOLOGICAL RESOURCES

This alternative would have the same or similar impacts as that of the Preferred Alternative as the Project area remains the same (the District boundary), and water transfers would still occur as well as the construction of a new groundwater well. As such, impacts would be less than significant with mitigation incorporated.

#### 4.5.6.5 CULTURAL RESOURCES

This alternative would have the same or similar impacts as that of the Preferred Alternative as the Project area remains the same (the District boundary), and a well to be used for the groundwater substitution water transfers could be constructed as a part of the alternative. According to the NEIC, no archaeological resources or built environment resources were identified within the Project boundaries nor within a one-mile radius of the Project's well site. Farming operations such as plowing, planting, and harvesting would continue to take place on land where surface disturbing activities have continuously occurred for many years, and no new or expanded uses would occur as a result of the water transfer. As such, impacts would be less than significant.

#### 4.5.6.6 ENERGY

The alternative would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency. Water transferred as a part of the alternative may be stored by DWR in Lake Oroville until the water could be moved to Valley Water or other buyers. This could affect the pattern of power generation at the Oroville facilities. However, this would cause a negligible change in the long term. As such, the alternative would not result in long-term significant impacts to power supplies. Additionally, no new facilities, apart from the new well, would be constructed for the alternative resulting in consumption of energy resources.

The alternative would extract a reduced amount of groundwater, approximately 50% of the proposed Project, or up to 5,000 AF, from BWD production wells in Sutter County. The groundwater substitution water transfers may increase groundwater pumping within the BWD boundaries in Sutter County resulting in increased energy use during the transfer window. However, this energy use needed to deliver the water is a necessary component of the alternative and would not be a wasteful, inefficient, or unnecessary consumption of energy resources. As such, impacts would be less than significant and anticipated to be similar or slightly lesser than that for the Preferred Alternative.

#### 4.5.6.7 GEOLOGY AND SOILS

The District is not located within a known earthquake fault zone. This alternative would not involve activities that would potentially cause significant adverse effects involving strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides above the existing baseline conditions. Soils in the Project area consist of clays with a flat terrain and the existing conditions do not pose a risk of instability and, according to the NRCS's Web Soil Survey, the site's soils have a low potential for soil erosion.[35] The new well would be constructed on land that has been actively used for agriculture and is immediately adjacent to an existing District canal. Therefore, impacts would be the same or similar to the Preferred Alternative.

#### 4.5.6.8 GREENHOUSE GAS EMISSIONS

While some field work may occur in idled fields by participating landowners, it is expected that substantially less field work would occur as a result of the alternative than compared to existing conditions. By idling the land, less farm equipment would utilized and less greenhouse gas would be emitted. However, a third well is anticipated to be constructed as part of the alternative. The alternative would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. GHG emissions would be generated during construction, and they would dissipate in quantity as time passes. The alternative would not result in the generation of GHG emissions that would exceed the AB 32

[35] (United States Department of Agriculture, n.d.)

consistency threshold of 1,100 $MTCO_2e$ annually during construction activities. Therefore, impacts would be the same or similar to that for the Preferred Alternative.

#### 4.5.6.9 HAZARDS AND HAZARDOUS WASTES

Construction of the well would not be within one-quarter mile of an existing or proposed school. On August 8, 2025, an EnviroStor and GeoTracker search was done for the alternative project area. The search determined that there are three active hazardous waste generators or hazardous material spill sites within the BWD District boundaries. However, two of the three sites are immediately adjacent to Highway 99, and none of the three are near lands that would have the potential to be idled for the alternative. As such, impacts would be the same or similar to that for the Preferred Alternative.

#### 4.5.6.10 HYDROLOGY AND WATER QUALITY

While this alternative includes half of the groundwater substitution transfer pumping as the Preferred Alternative (5,000 AFY) and full crop idling (14,000 AFY), the alternative generally displays behaviors closer to those of the groundwater substitution pumping scenarios, such as the Preferred Alternative. In addition, according to the Groundwater Modeling Report (see Appendix E), over the 50 years of simulation, there were not significant variations among the major components of the groundwater budget between the six different alternatives simulated. As previously mentioned, groundwater substitution pumping appeared to have the most impacts across the alternatives when it comes to hydrology and water quality. Furthermore, the Groundwater Modeling Report found the alternative to generally display behavior closer to those of the full groundwater substitution pumping alternatives. As such, while impacts would be similar to that of the Preferred Alternative, the decreased groundwater substitution pumping did not cause an exceedance of the MT as discussed in Section 3.3.4, impacts would be less than significant.

#### 4.5.6.11 LAND USE AND PLANNING

The alternative would not physically divide an established community. The alternative would not cause a significant environmental conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. There would be no direct or indirect related impacts, like that of the Preferred Alternative.

#### 4.5.6.12 MINERAL RESOURCES

The alternative would not result in significant impacts associated with the loss of availability of a known mineral resource that would be of value to the region and the residents of the State. There would be no construction or earthmoving activities associated with implementation except for the drilling of a new well. Like the Preferred Alternative, there would be no impact.

#### 4.5.6.13 NOISE

The alternative involves the movement of water through existing conveyance facilities as well as the construction of a new well. Construction of the alternative would involve temporary noise sources, predominantly from off-road equipment, such as excavators, backhoe/loader, drilling rigs, scrapers, and tractors. The site is located adjacent to agricultural lands, which makes the area accustomed to noises associated with farm equipment. The alternative will comply with the County's General Plan by obtaining any needed permits for working outside of the standard construction hours from the County for the well drilling. Operational maintenance activities would be on an as-needed basis with routine monitoring performed by existing staff and would not generate significant new noise. Any impacts would be the same or similar to that for the Preferred Alternative.

#### 4.5.6.14 POPULATION AND HOUSING

The alternative would not induce substantial population growth in an area, either directly or indirectly. The alternative would utilize existing water conveyance facilities and construct a single well next to a District canal in an area surrounded by agriculture. No housing or people would be displaced as a result of this alternative and no new housing would be created. Therefore, like the Preferred Alternative, there would be no impact.

#### 4.5.6.15 PUBLIC SERVICES

The alternative does not propose the construction of any habitable structures and would not induce population growth. As such, the alternative would not create a need for additional fire protection, police protection, schools, parks, or other public facilities. Water would be conveyed through existing conveyance facilities, and a single well would be constructed in an area surrounded by agriculture. As such, impacts would be the same as for the Preferred Alternative.

#### 4.5.6.16 RECREATION

The alternative does not include recreational facilities. As there is no population growth resulting directly or indirectly from alternative implementation, construction, or expansion of nearby recreational facilities would not be necessary. Like the Preferred Alternative, there would be no impact.

#### 4.5.6.17 TRANSPORTATION

The alternative would not conflict with a plan, ordinance, or policy addressing the circulation system including transit, roadway, bicycle, and pedestrian facilities, nor would it conflict with or be inconsistent with CEQA guidelines section 15064.3 Subdivision (b). There is no population growth associated with the alternative, nor would implementation of the alternative result in an increase in staff or drivers utilizing roadways in the area. No roadway design features are associated with this alternative, and there would be no change in the existing land use that could result in incompatible use. As such, there are no roadways being modified for this alternative or impede any emergency access routes. Therefore, just like the Preferred Alternative, there would be no impact.

#### 4.5.6.18 TRIBAL CULTURAL RESOURCES

An SLF search completed for the new well site area, dated September 11, 2025, did not identify any tribal cultural resources within the project area. Additionally, a records search was conducted by the NEIC at California State University, Chico. This search also determined that tribal cultural resources were not present on-site. Impacts would be the same as for the Preferred Alternative.

#### 4.5.6.19 UTILITIES AND SERVICE SYSTEMS

The alternative would not involve the relocation or construction of any new or expanded wastewater treatment or storm water drainage, electric power, natural gas or telecommunications facilities. The alternative includes the construction of a third new groundwater well to be used by the District. Construction-related water use would be temporary, and there would be no permanent employees on-site during project operation. This alternative does not include the construction or operation of new facilities or modifications of existing facilities that would require wastewater treatment. Additionally, the Project would not directly or indirectly induce population growth. Impacts would be the same as for the Preferred Alternative.

#### 4.5.6.20 WILDFIRE

The District does not include lands in a Very High Fire Hazard Severity Zone. Impacts would be the same as the Preferred Alternative.

## 4.6 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The CEQA Guidelines Section 15126.6(e)(2) requires identification of the environmentally superior alternative among the alternatives that are evaluated in the EIR, if the “No Project” Alternative is the environmentally superior alternative. In general, the environmentally superior alternative is the alternative that would be expected to generate the fewest adverse impacts. If the No Project Alternative is identified as environmentally superior, then another environmentally superior alternative shall be identified among the other alternatives. The Preferred Alternative would not have any significant, unavoidable adverse impacts. Similarly, none of the alternatives have significant, unavoidable adverse impacts, although some of the alternatives could have less of an impact on some resources in comparison to the Preferred Alternative.

While the Cropland Idling Alternative would reduce the environmental impacts associated with groundwater substitution transfers, the beneficial impacts, such as those described in the Project Objectives, from the implementation of the Preferred Alternative would also be less. Overall, relative to the No Project Alternative, the other alternatives show a modest redistribution of water among budget components rather than large net changes over the 50-year simulation period (see Appendix E). According to the Groundwater Modeling Report (Appendix E), over the 50 years of simulation, there were no significant variations among the major components of the groundwater budget between the six different alternatives simulated. Overall, the groundwater budget results indicate that changes to the groundwater system are most impactful while the water transfers are actually occurring, and all impacts from the transfers are negligible by about 20 years after the transfers cease. As such, impacts would be similar in nature across the alternatives, especially beyond the five-year water transfer window.

While the No Project Alternative would have the fewest adverse impacts, one of the other alternatives may be selected in line with the CEQA guidelines as discussed above. While the alternatives would impact some resources in different ways, none of the alternatives is considered to be the clear environmentally superior alternative. There are no unavoidable significant impacts associated with the Preferred Alternative that would otherwise be avoided or substantially reduced by an alternative, and each of the alternatives has its own unique set of environmental impacts which, on balance, would be a “trade-off” of environmental impacts in selecting any one alternative over another. As such, considering there is no clear environmentally superior alternative, the Preferred Alternative was selected as it most fully meets the project objectives of all the alternatives.

## Table 4-1: Comparison of Alternatives and Summary of Impacts

| Environmental Resource | No Project Alternative | Cropland Idling and Groundwater Substitution Alternative (Project) | Cropland Idling Alternative | Groundwater Substitution Alternative | Reduced Cropland Idling Alternative | Reduced Groundwater Substitution Alternative |
|---|---|---|---|---|---|---|
| Aesthetics | NCFEC | LS | LS | LS | LS | LS |
| Agricultural and Forestry Services | NCFEC | LS | LS | LS | LS | LS |
| Air Quality | NCFEC | LS | LS | LS | LS | LS |
| Biological Resources | NCFEC | SM | SM | SM | SM | SM |
| Cultural Resources | NCFEC | LS | LS | LS | LS | LS |
| Energy | NCFEC | LS | LS | LS | LS | LS |
| Geology and Soils | NCFEC | LS | LS | LS | LS | LS |
| Greenhouse Gas Emission | NCFEC | LS | LS | LS | LS | LS |
| Hazards and Hazardous Wastes | NCFEC | LS | LS | LS | LS | LS |
| Hydrology and Water Quality | NCFEC | SM | LS | SM | SM | LS |
| Land Use and Planning | NCFEC | NCFEC | NCFEC | NCFEC | NCFEC | NCFEC |
| Mineral Resources | NCFEC | NCFEC | NCFEC | NCFEC | NCFEC | NCFEC |
| Noise | NCFEC | LS | LS | LS | LS | LS |
| Population and Housing | NCFEC | NCFEC | NCFEC | NCFEC | NCFEC | NCFEC |
| Public Services | NCFEC | NCFEC | NCFEC | NCFEC | NCFEC | NCFEC |

| Environmental Resource | No Project Alternative | Cropland Idling and Groundwater Substitution Alternative (Project) | Cropland Idling Alternative | Groundwater Substitution Alternative | Reduced Cropland Idling Alternative | Reduced Groundwater Substitution Alternative |
|---|---|---|---|---|---|---|
| Recreation | NCFEC | NCFEC | NCFEC | NCFEC | NCFEC | NCFEC |
| Transportation | NCFEC | LS | LS | LS | LS | LS |
| Tribal Cultural Resources | NCFEC | LS | LS | LS | LS | LS |
| Utilities and Service Systems | NCFEC | LS | LS | LS | LS | LS |
| Wildfire | NCFEC | NCFEC | NCFEC | NCFEC | NCFEC | NCFEC |

NCFEC = No Change from Existing Conditions
LS = Less Than Significant Impact
SM = Significant Impact (but mitigable to a level that is Less Than Significant)

# CHAPTER 5 OTHER CEQA CONSIDERATIONS

Section 15126.2 of the CEQA Guidelines requires that an EIR include a discussion of significant environmental effects of a proposed project; significant environmental effects which cannot be avoided if a proposed project is implemented; significant irreversible changes which would be involved in implementation of a proposed project; and growth-inducing impacts of a proposed project. Sections 15126.4 and 15126.6 of the State CEQA Guidelines require that mitigation measures be proposed to minimize significant effects, when feasible, and alternatives to a proposed project be considered and discussed. Section 15130 of the State CEQA Guidelines requires that the cumulative impacts resulting from the incremental impacts of the proposed project, in conjunction with past, present, and reasonably foreseeable probable future projects, be evaluated. The significant environmental effects of the proposed project are addressed in the individual subsections of Chapter 3 Environmental Impact Analysis and Chapter Chapter 6 Initial Study. Mitigation measures that are proposed to minimize significant effects are also addressed in these subsections. Alternatives to the proposed project are identified and analyzed in Chapter Chapter 4 Analysis of Alternatives, of this EIR, and cumulative impacts are discussed under each environmental issue area in Chapter Chapter 3. The remaining topics identified above are addressed in this section.

The following discussion focuses on a summary of significant environmental effects which cannot be avoided, significant irreversible changes associated with project implementation, growth-inducing impacts, and effects found not to be significant for the Project.

## 5.1 SIGNIFICANT AND UNAVOIDABLE IMPACTS

Section 15126.2(c) of the CEQA Guidelines requires that an EIR describe any significant impacts that cannot be avoided, even with the implementation of feasible mitigation measures. All impacts identified for the Project would either have no impact, be less than significant, or be less than significant after inclusion of mitigation measures. Based on the evaluations in Chapter Chapter 3 Environmental Impact Analysis and Chapter Chapter 6 Initial Study, no significant and unavoidable adverse effects would occur from implementation of the water transfers.

## 5.2 SIGNIFICANT IRREVERSIBLE ENVIRONMENTAL EFFECTS

Section 15126.2(d) of the CEQA Guidelines requires a discussion of any significant irreversible environmental change that would be caused by the proposed project. Generally, a project would result in significant irreversible changes if:

- The primary and secondary impacts would generally commit future generations to similar uses (such as highway improvement that provides access to a previously inaccessible area);
- The project would involve a large commitment of nonrenewable resources (CEQA Guidelines Section 15126.2(d));
- The project would involve uses in which irreversible damage could result from any potential environmental accidents associated with the project; or
- The proposed consumption of resources is not justified (e.g., the project involves the wasteful use of energy).

Transfers from BWD would involve the transfer of water to potential buyers through existing canals, rivers, and waterways. The Project would include the installation of one groundwater well that would be used to assist with groundwater substitution transfers. No other construction of any new facilities would occur, the Project and would not require the commitment of nonrenewable resources. The Project would not have irreversible environmental effects.

## 5.3 GROWTH-INDUCING IMPACTS

Section 15126.2(e) of the CEQA guidelines describes the required analysis of direct and indirect impacts of growth-inducing impacts from projects. CEQA Section 15126.2(b) requires an analysis of a project's influence on economic or population growth, or increased housing construction and the future developments' associated environmental impacts.

Direct growth-inducing impacts are usually associated with the construction of new infrastructure, housing, or commercial development. A project which promotes growth, such as new employment opportunities or infrastructure expansion (i.e. water supply or wastewater treatment capabilities) could have indirect growth inducing effects. Generally, growth inducing impacts would be considered significant if the ability to provide needed public services by agencies is hindered, or the potential growth adversely affects the environment.

Water proposed for transfer would be transferred from BWD to Valley Water, or other willing buyers, to meet existing demands when there are shortages in surface water supplies. Valley Water has participated in water transfers in prior years. These prior temporary transfers were subject to separate analysis under CEQA undertaken separately by Valley Water. The proposed water transfers would not directly or indirectly affect growth beyond what is already planned. The term proposed for the one-year transfers under the Project is five years beginning in 2026. Water transfer supplies are not considered a reliable source of water that could be used to approve development projects by local agencies. As such, the Project would not induce development growth or remove a barrier for growth. Therefore, the Project would not induce growth.

## 5.4 EFFECTS FOUND NOT TO BE SIGNIFICANT

Several impacts were not found to be significant within the issue areas of Aesthetics, Agriculture and Forestry Resources, Air Quality, Cultural Resources, Energy, Geology and Soils, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Land Use and Planning, Mineral Resources, Noise, Population and Housing, Public Services, Recreation, Transportation/Traffic, Tribal Cultural Resources, Utilities and Service Systems, and Wildfire. These resources are discussed in Chapter Chapter 6 in the IS and are not discussed further in the EIR; however, concise summaries of the findings of the IS are included below.

### 5.4.1 AESTHETICS

Potential impacts to Aesthetics were determined not to be significant. The Project would include the construction of a groundwater well, which would not significantly impede views or alter aesthetics in the area. No other structures would be introduced to the Project area. As such, impacts to Aesthetics were not further analyzed in the EIR.

### 5.4.2 AGRICULTURE AND FORESTRY RESOURCES

Potential impacts to Agriculture and Forestry Resources were determined not to be significant. The Project would potentially involve cropland idling for fields on an annual basis. The Project would not result in any other changes to the existing environment that would result in the conversion of farmland to non-agricultural use. Any idled fields could be brought back into agricultural production in the following year. The impacts involving changes to the existing environment that could result in conversion of farmland to non-agricultural uses is less than significant. There are no forests or timberland lands in the Project area or vicinity. The Project does not propose any rezoning. It would not convert forest land to non-forest use. Therefore, impacts to Agriculture and Forestry Resources were not further analyzed in this EIR.

### 5.4.3 AIR QUALITY

Potential impacts to Air Quality were determined not to be significant. The Project would not conflict with or obstruct the implementation of the air quality management standards. Standards set by the BCAQMD

and FRAQMD, and regulatory agencies relating to the Project would continue to apply. The Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment. There would be no construction activities in an area with sensitive receptors. The installation of the third well would occur near an existing canal and surrounded by land in agricultural production. Therefore, impacts to Air Quality were not further analyzed in the EIR.

### 5.4.4 CULTURAL RESOURCES

Potential impacts to Cultural Resources were determined not to be significant. A well to be used for the groundwater substitution water transfers could be constructed as a part of the Project. The proposed well location is situated immediately adjacent to a District canal and surrounded by lands in agricultural production. As such, the land has been heavily disturbed. The Project would not require nor induce any other new surface disturbing activities such as construction. Farming operations such as plowing, planting, and harvesting would continue to take place on land where surface disturbing activities have continuously occurred for many years, and no new or expanded uses would occur as a result of the water transfer. Therefore, there would be no substantial adverse changes in the significance of historical or archeological resources as defined in CEQA Guidelines in Section 15064.5. As such, there would be no impacts to historical or archaeological resources. Therefore, impacts to Cultural Resources were not further analyzed in this EIR.

### 5.4.5 ENERGY

Potential impacts to Energy were determined not to be significant. The Project would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency. Water transferred as a part of the Project may be stored by DWR in Lake Oroville until the water could be moved to Valley Water or other buyers. This could affect the pattern of power generation at the Oroville facilities. However, this would cause a negligible change in the long term. As such, the Project would not result in long-term significant impacts to power supplies. Additionally, no new facilities would be constructed for the Project resulting in consumption of energy resources.

The Project would extract up to 10,000 AF of groundwater from BWD production wells in Sutter County. The groundwater substitution water transfers may increase groundwater pumping within the BWD boundaries in Sutter County. Water that would flow naturally by gravity and pressure would instead be extracted using existing pumps. This would result in an increased energy use during the transfer window. However, this energy use needed to deliver the water is a necessary component of the Project and would not be a wasteful, inefficient, or unnecessary consumption of energy resources. As such, impacts to Energy were not further analyzed in this EIR.

### 5.4.6 GEOLOGY AND SOILS

Potential impacts to Geology and Soils were determined to be less than significant. The District is not located within a known earthquake fault zone. The Project would not involve activities that would potentially cause significant adverse effects involving strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides above the existing baseline conditions. Soils in the Project area consist of clays with a flat terrain and the existing conditions do not pose a risk of instability and, according to the NRCS's Web Soil Survey, the site's soils have a low potential for soil erosion.[36] The new well would be installed on land that has been actively used for agriculture and is immediately adjacent to an existing District canal. Therefore, impacts for the Project would be less than significant. As such, impacts to Geology and Soils were not further analyzed in this EIR.

[36] (United States Department of Agriculture, n.d.)

### 5.4.7 GREENHOUSE GAS EMISSIONS

Potential impacts to Greenhouse Gas Emissions were determined not to be significant (see Appendix B for the CalEEMod outputs). While some field work may occur in idled fields by participating landowners, it is expected that less field work would occur as a result of the Project than compared to existing conditions. By idling the land, less farm equipment would be utilized and less greenhouse gas would be emitted. However, a third well is anticipated to be installed as part of the Project. The Project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. GHG emissions would be generated during construction, and they would dissipate in quantity as time passes. The Project would not result in the generation of GHG emissions that would exceed the AB 32 consistency threshold of 1,100 $MTCO_2e$ annually during construction activities. As such, impacts to Greenhouse Gas Emissions were not further analyzed in this EIR.

### 5.4.8 HAZARDS AND HAZARDOUS MATERIALS

Potential impacts to Hazards and Hazardous Materials were determined not to be significant. The Project would not involve the use of hazardous substances or create any significant hazards. The Project would have no impact on airport safety or wildland fire hazard. Therefore, impacts to Hazards and Hazardous Materials were not further analyzed in this EIR.

### 5.4.9 LAND USE AND PLANNING

Potential impacts to Land Use and Planning were determined not to be significant. The Project would not physically divide an established community. The Project would not cause a significant environmental conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. There would be no direct or indirect related impacts. As such, impacts to Land Use and Planning were not further analyzed in this EIR.

### 5.4.10 MINERAL RESOURCES

Potential impacts to Mineral Resources were determined not to be significant. The Project would utilize existing facilities and waterway and would not involve the conversion of land. There would be no loss of access or availability of mineral resources. Therefore, impacts to Mineral Resources were not further analyzed in this EIR.

### 5.4.11 NOISE

Potential impacts to Noise were determined not to be significant. The Project involves the movement of water through existing conveyance facilities as well as the installation of a well. Construction of the Project would involve temporary noise sources, predominantly from off-road equipment, such as excavators, backhoe/loader, drilling rigs, scrapers, and tractors. The site is located adjacent to agricultural lands, which makes the area accustomed to noises associated with farm equipment. The Project will comply with the County's General Plan by obtaining any needed permits for working outside of the standard construction hours from the County for the well drilling. Operational maintenance activities would be on an as-needed basis with routine monitoring performed by existing staff and would not generate significant new noise, nor would the operation of the well itself generate significant new noise. Any impacts would be temporary and therefore, less than significant. As such, impacts to Noise were not further analyzed in this EIR.

### 5.4.12 POPULATION AND HOUSING

Potential impacts to Population and Housing were determined not to be significant. The Project would be short term and not impact population growth or displace existing housing. Therefore, impacts to Population and Housing were not further analyzed in this EIR.

### 5.4.13 PUBLIC SERVICES

Potential impacts to Public Services were determined not to be significant. The Project would not change the level of public service needed to operate existing facilities. Therefore, impacts to Public Services were not further analyzed in this EIR.

### 5.4.14 RECREATION

Potential impacts to Recreation were determined not to be significant. The Project does not include recreational facilities. As there is no population growth resulting directly or indirectly from Project implementation, construction, or expansion of nearby recreational facilities would not be necessary. There would be no impact. As such, impacts to Recreation were not further analyzed in this EIR.

### 5.4.15 TRANSPORTATION

Potential impacts to Transportation were determined not to be significant. The Project would have no impact on the transportation system or level of traffic in the area of analysis. Therefore, impacts to Transportation were not further analyzed in this EIR.

### 5.4.16 TRIBAL CULTURAL RESOURCES

Potential impacts to Tribal Cultural Resources were determined not to be significant. A SLF search completed for the Project area, dated September 11, 2025, did not identify any tribal cultural resources within the new well site area. Additionally, a records search was conducted by the NEIC at California State University, Chico (see Appendix D). This search also determined that tribal cultural resources were not present on-site. Therefore, impacts to Tribal Cultural Resources were not further analyzed in the EIR.

### 5.4.17 UTILITIES AND SERVICE SYSTEMS

Potential impacts to Utilities and Service Systems were determined not to be significant. The Project would not involve the relocation or construction of any new or expanded wastewater treatment or storm water drainage, electric power, natural gas or telecommunications facilities. The Project includes the installation of a third groundwater well to be used by the District. Construction-related water use would be temporary, and there would be no permanent employees on-site during project operation. The Project does not include the construction or operation of new facilities or modifications of existing facilities that would require wastewater treatment. Additionally, the Project would not directly or indirectly induce population growth. As such, impacts to Utilities and Service Systems were not further analyzed in the EIR.

### 5.4.18 WILDFIRE

Potential impacts to Wildfire were determined not to be significant. The District does not include lands in a Very High Fire Hazard Severity Zone. The Project would not substantially impair adopted emergency response or evacuation plans, expose project occupants to pollutant concentrations from wildfire, require the installation or maintenance of associated infrastructure that may exacerbate fire risk or result in temporary or ongoing impacts to the environment, or expose people or structures to downslopes or downstream flooding or landslides as a result of post-fire slope instability. No impacts related to wildfire would occur. Therefore, impacts to Wildfire were not further analyzed in the EIR.

# CHAPTER 6 INITIAL STUDY

## 6.1 INTRODUCTION

Provost & Pritchard has prepared this Initial Study (IS) on behalf of the District to address the environmental effects of the Temporary Water Transfers from 2026 to 2030 Project (Project) and to determine if there is substantial evidence that any aspect of the Project, either individually or cumulatively, may cause a significant effect on the environment, regardless of whether the overall effect of the Project is adverse or beneficial. The information within this IS assisted the lead agency, the District, to determine whether an EIR was the appropriate document for the Project based on analysis of the evidence for each resource topic. This document has been prepared in accordance with the California Environmental Quality Act (CEQA), Public Resources Code Section 21000, et seq.

The site and the Project are described in detail in Chapter 2 Project Description.

# 6.2 DETERMINATION

## 6.2.1 POTENTIAL ENVIRONMENTAL IMPACTS

The environmental factors not checked below would have no impacts or less than significant impacts resulting from the Project. Environmental factors checked below would be potentially affected by the Project and involve at least one impact that is a "potentially significant impact" as indicated by the checklists on the following pages.

| | | |
|---|---|---|
| ☐ Aesthetics | ☐ Agriculture and Forestry Resources | ☐ Air Quality |
| ☒ Biological Resources | ☐ Cultural Resources | ☐ Energy |
| ☐ Geology/Soils | ☐ Greenhouse Gas Emissions | ☐ Hazards and Hazardous Materials |
| ☒ Hydrology / Water Quality | ☐ Land Use/Planning | ☐ Mineral Resources |
| ☐ Noise | ☐ Population/Housing | ☐ Public Services |
| ☐ Recreation | ☐ Transportation | ☐ Tribal Cultural Resources |
| ☐ Utilities and Service Systems | ☐ Wildfire | ☒ Mandatory Findings of Significance |

The analyses of environmental impacts in Chapter 4 Impact Analysis result in an impact statement, which shall have the following meanings.

**Potentially Significant Impact**. This category is applicable if there is substantial evidence that an effect may be significant, and no feasible mitigation measures can be identified to reduce impacts to a less than significant level. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

**Less than Significant with Mitigation Incorporated**. This category applies where the incorporation of mitigation measures would reduce an effect from a "Potentially Significant Impact" to a "Less than Significant Impact." The lead agency must describe the mitigation measure(s), and briefly explain how they would reduce the effect to a less than significant level (mitigation measures from earlier analyses may be cross-referenced).

**Less than Significant Impact**. This category is identified when the proposed Project would result in impacts below the threshold of significance, and no mitigation measures are required.

**No Impact**. This category applies when a project would not create an impact in the specific environmental issue area. "No Impact" answers do not require a detailed explanation if they are adequately supported by the information sources cited by the lead agency, which show that the impact does not apply to the specific project (e.g. the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g. the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

### 6.2.2 DETERMINATION

On the basis of this initial evaluation (to be completed by the Lead Agency):

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☒ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Donnie Stinnett
Signature

2/9/26
Date

Donnie Stinnett
Printed Name/Position

# 6.3 ENVIRONMENTAL IMPACT ANALYSIS
# 6.4 AESTHETICS

Table 6-1: Aesthetics Impacts

| Except as provided in Public Resources Code Section 21099, would the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Have substantial adverse effect on a scenic vista? | ☐ | ☐ | ☐ | ☒ |
| b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? | ☐ | ☐ | ☐ | ☒ |
| c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality? | ☐ | ☐ | ☐ | ☒ |
| d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? | ☐ | ☐ | ☐ | ☒ |

## 6.4.1 BASELINE CONDITIONS

The Project is located in Butte and Sutter Counties. Lands in the Project vicinity consist of relatively flat, irrigated farmland and rural residences. Agricultural practices in the vicinity consist of row crop, field crop, and orchard cultivation. Additionally, the immediate vicinity contains rural roadways, rural residences, canals, water retention basins, and other infrastructure typical of rural agricultural areas along Highway 99 in the northern Sacramento Valley.

## 6.4.2 APPLICABLE REGULATIONS

### 6.4.2.1 FEDERAL

#### WILD AND SCENIC RIVERS ACT

The Wild and Scenic Rivers Act protects more than 13,400 miles of rivers and streams in the United States. The Forest Service is involved in managing over 5,000 of those wild and scenic rivers miles. Congress has added these waterways to the National Wild and Scenic Rivers System due to their scenic, recreational, geologic, fish and wildlife, and historic values.

### 6.4.2.2 STATE

#### CALIFORNIA SCENIC HIGHWAY PROGRAM

California Department of Transportation (Caltrans) maintains the California Scenic Highway Program to protect scenic highway corridors from changes that would diminish the aesthetic value of lands adjacent to those highways. The Caltrans Scenic Highway program allows local jurisdictions to officially designate a scenic highway to ensure protection of the visual resources along its corridor. Caltrans identifies highways as eligible for the program, and the local jurisdiction submits an application to be officially designated. The status of a proposed state scenic highway changes from eligible to officially designated when the local governing body applies to Caltrans for scenic highway approval, adopts a Corridor Protection Program, and receives notification that the highway has been officially designated a Scenic Highway. Protection of visual

resources for the designated corridor include regulating land use and development, outdoor advertising, landscaping, and building design.

#### 6.4.2.3 LOCAL

##### SUTTER COUNTY GENERAL PLAN[37]

The Sutter County 2030 General Plan contains policies, and implementation measures relevant to the preservation and protection of aesthetics and visual resources. Relevant goals to the Project include:

ER 7.2: Scenic Resources. Protect views of Sutter County's unique scenic resources including the Sutter Buttes, wildlife and habitat areas, the Sacramento, Feather, and Bear Rivers, and other significant resources.

##### BUTTE COUNTY GENERAL PLAN[38]

The Butte County General Plan 2040 provides direction on how Butte County will fulfill its community vision and manage its future growth. Relevant goals to the Project include:

COS-17: Maintain and enhance the quality of Butte County's scenic and visual resources.

COS-18: Protect and enhance scenic areas adjacent to and visible from the highways for enjoyment by residents and visitors.

### 6.4.3 THRESHOLDS OF SIGNIFICANCE

This section evaluates the anticipated changes in the visual environment as a result of the Project. State CEQA Guidelines Appendix G provides the following screening criteria to evaluate potential impacts related to aesthetics. The Project would result in a significant impact if it would:

- Substantially and adversely affect a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings. (Public views are those that are experienced from publicly accessible vantage points.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality; or
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

### 6.4.4 IMPACT ANALYSIS

#### a) Have substantial adverse effect on a scenic vista?

No Impact. The Project would not have a substantial adverse effect on a scenic vista. A scenic vista is generally defined as a public vantage point with an expansive view of a significant landscape feature. This Project consists of moving water through existing water conveyance systems. There would be no substantial temporary or permanent physical changes associated with the Project. Therefore, there would be no impact. No further discussion or evaluation of this topic is provided in the EIR.

#### b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

[37] (Sutter County, 2011)
[38] (Butte County, 2023)

No Impact. The Project primarily involves the movement of water through existing conveyance facilities. The construction phase of the Project would consist of drilling a new well. The Project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. Therefore, there would be no impact. No further discussion or evaluation of this topic is provided in the EIR.

c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

No Impact. The Project would not substantially degrade the existing visual character or quality of public views of the site and its surroundings. As discussed above, water would be moved through existing conveyances. The Project would result in idled croplands, primarily lands devoted to rice, in the BWD service area. Idled croplands are not out of character with surrounding agricultural lands. Therefore, there would be no impact. No further discussion or evaluation of this topic is provided in the EIR.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

No Impact. The Project would not result in any new introduction of substantial light or glare to the area which would adversely affect day or nighttime views. Therefore, there would be no impact. No further discussion or evaluation of this topic is provided in the EIR.

## 6.5 AGRICULTURE AND FORESTRY RESOURCES

Table 6-2: Agriculture and Forest Impacts

| Would the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | 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? | ☐ | ☐ | ☒ | ☐ |
| b) Conflict with existing zoning for agricultural use, or a Williamson Act contract? | ☐ | ☐ | ☒ | ☐ |
| 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))? | ☐ | ☐ | ☐ | ☒ |
| d) Result in the loss of forest land or conversion of forest land to non-forest use? | ☐ | ☐ | ☐ | ☒ |
| 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? | ☐ | ☐ | ☒ | ☐ |

### 6.5.1 BASELINE CONDITIONS

The Project is located in Butte and Sutter Counties. Lands in the Project vicinity consist of relatively flat, irrigated farmland and rural residences. Agricultural practices in the vicinity consist of row crop, field crop, and orchard cultivation. Water would be transferred using existing water conveyance infrastructure and no new water conveyance infrastructure would be needed by the Project.

### 6.5.2 APPLICABLE REGULATIONS

#### 6.5.2.1 FEDERAL

**CONSERVATION RESERVE PROGRAM**

The United States Department of Agriculture (USDA) Farm Service Agency's (FSA) Conservation Reserve Program (CRP) is a voluntary program that contracts with agricultural producers so environmentally sensitive agricultural land is not farmed or ranched but instead devoted to conservation benefits. CRP participants establish long-term, resource- conserving plant species, such as approved grasses or trees (known as "covers") to control soil erosion, improve water quality and develop wildlife habitat. In return, FSA provides participants with rental payments and cost-share assistance. Contract duration is between 10 and 15 years. To be eligible for general CRP, land must be cropland (including field margins), planted, or considered planted, to an agricultural commodity four of the six crop years and be physically and legally capable of being planted (no planting restrictions due to an easement or other legally binding instrument) in a normal manner to an agricultural commodity. Alfalfa or other multiyear grasses and legumes grown in a rotation not to exceed 12 years may also be eligible.[39] As of January 2024, there were a cumulative 2,642

[39] (USDA Farm Service Agency, 2025)

acres of conservation practices under CRP within Sutter County; however, no District acreage is enrolled in a continuous CRP contract.[40]

#### 6.5.2.2 STATE

##### WILLIAMSON ACT

The California Land Conservation Act of 1965, also known as the Williamson Act, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. In return, landowners receive property tax assessments which are much lower than normal because they are based upon farming and open space uses as opposed to full market value.[41] This program is administered by local governments with assistance from the California Department of Conservation (DOC). Within the District boundaries, there are approximately 5,237 acres, or 72 parcels, under Williamson Act.[42]

##### FARMLAND MAPPING AND MONITORING PROGRAM (FMMP)

The FMMP produces maps and statistical data used for analyzing impacts to California's agricultural resources. Agricultural land is rated according to soil quality and irrigation status; the best quality land is called Prime Farmland. The maps are updated every two years with the use of a computer mapping system, aerial imagery, public review, and field reconnaissance.

The California DOC 2020 FMMP is a non-regulatory program that produces "Important Farmland" maps and statistical data used for analyzing impacts on California's agricultural resources. The Important Farmland maps identify eight land use categories, five of which are agriculture related: prime farmland, farmland of statewide importance, unique farmland, farmland of local importance, and grazing land – rated according to soil quality and irrigation status. Each is summarized below:

- PRIME FARMLAND (P): Farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.
- FARMLAND OF STATEWIDE IMPORTANCE (S): Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.
- UNIQUE FARMLAND (U): Farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated but may include non- irrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.
- FARMLAND OF LOCAL IMPORTANCE (L): Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.
- GRAZING LAND (G): Land on which the existing vegetation is suited to the grazing of livestock. The minimum mapping unit for Grazing Land is 40 acres.
- URBAN AND BUILT-UP LAND (D): Land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. This land is used for residential, industrial, commercial, institutional, public administrative purposes, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.
- OTHER LAND (X): Land not included in any other mapping category. Common examples include low density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock

[40] (USDA Farm Service Agency, No date)
[41] (USDA Farm Service Agency, No date)
[42] (California Department of Conservation, 2024)

grazing; confined livestock, poultry or aquaculture facilities; strip mines, borrow pits; and water bodies smaller than 40 acres. Vacant and non-agricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.

- WATER (W): Perennial water bodies with an extent of at least 40 acres.

The District is comprised primarily of lands designated as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland, as well as some lands designated as Urban and Built-Up Land, Grazing Land, and Other Land.[43]

#### 6.5.2.3 LOCAL

##### SUTTER COUNTY GENERAL PLAN

The Sutter County 2030 General Plan contains policies, and implementation measures relevant to the preservation and protection of agricultural resources:

AG 1.1 Agricultural Land Preservation. Preserve and maintain agriculturally designated lands for agricultural use and direct urban/suburban and other nonagricultural related development to the cities, unincorporated rural communities, and other clearly defined and comprehensively planned development areas.

AG 1.5 Agricultural Land Conversion. Discourage the conversion of agricultural land to other uses unless all of the following findings can be made:

a. The net community benefit derived from conversion of the land outweighs the need to protect the land for long-term agricultural use.
b. There are no feasible alternative locations for the proposed use that would appreciably reduce impacts upon agricultural lands.
c. The use will not have significant adverse effects, or can mitigate such effects, upon existing and future adjacent agricultural lands and operations (AG 1-A).

AG 1.9 Williamson Act. Promote the use of the California Land Conservation Act (Williamson Act) on agricultural lands throughout the County provided the State continues to fund the subvention program to offset the loss of property taxes.

##### BUTTE COUNTY GENERAL PLAN

The Butte County 2040 General Plan contains policies, and implementation measures relevant to the preservation and protection of agricultural resources:

AG-(Policy) P1.1 The County supports State and federal legislation designed to conserve soil and protect agricultural land.

AG-P1.2 The County supports agricultural education and research at Butte County educational institutions.

AG-P1.3 Continue to work with landowners in establishing new and maintaining existing Williamson Act contracts.

AG-(Action) A1.1 Maintain County policies to address consistency with the Williamson Act and future amendments.

### 6.5.3 THRESHOLDS OF SIGNIFICANCE

This section evaluates the anticipated changes to agriculture and forestry as a result of the Project. State CEQA Guidelines Appendix G provides the following screening criteria to evaluate potential impacts related to agriculture and forestry. The Project would result in a significant impact if it would:

[43] (California Department of Conservation, 2022)

- 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;
- Conflict with existing zoning for agricultural use, or a Williamson Act contract;
- Conflict with existing zoning for or cause rezoning of forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g));
- Result in the loss of forest land or conversion of forest land to non-forest use; or
- 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.

### 6.5.4 IMPACT ANALYSIS

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?

Less than Significant Impact. Land idled for the purpose of the potential transfers would primarily be drawn from the rice acreage within the District. However, those crops suitable for idling as laid out in Table 2-1 of DWR's *DRAFT Technical Information for Preparing Water Transfer Proposals in 2019* within the District would also have the potential to be idled for the sake of transfers.[44] Cropland idling would be temporary and would not result in a permanent conversion of agricultural lands. Landowners would choose whether to idle their fields to transfer water and could place fields back into production the following season. Therefore, there would be no permanent effect to land categorized as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland as a result of the transfers. For agricultural land to be categorized as Important Farmland on the FMMP maps, it must have been in irrigated agricultural production at some point during the four years prior to the Important Farmland Map date, and the soils must meet the physical and chemical criteria as determined by the USDA's NRCS. For lands to be reclassified out of Important Farmland categories, the same parcel would need to be idled for four consecutive years. Transfers would not change the soil characteristics of land. No further discussion or evaluation of this topic is provided in the EIR.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

Less than Significant Impact. As discussed above, cropland idling would be temporary and would not result in permanent changes to the land, and land would not be converted to an incompatible use under the Williamson Act. Idling actions would not interfere with objectives of the Williamson Act, FSZ lands, or other agricultural easements to preserve open space lands. The Project's potential impacts to agricultural land use would be less than significant. No further discussion or evaluation of this topic is provided in the EIR.

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))?

d) Result in the loss of forest land or conversion of forest land to non-forest use?

[44] (Department of Water Resources, 2019)

**c) and d) No Impact.** There are no forests or timberland lands in the Project area or vicinity. The Project does not propose any rezoning. It would not convert forest land to non-forest use. There would be no impact. No further discussion or evaluation of this topic is provided in the EIR.

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?

**Less than Significant Impact.** The Project would potentially involve cropland idling for fields on an annual basis. The Project would not result in any other changes to the existing environment that would result in the conversion of farmland to non-agricultural use. Any idled fields could be brought back into agricultural production in the following year. The impacts involving changes to the existing environment that could result in conversion of farmland to non-agricultural uses is less than significant. No further discussion or evaluation of this topic is provided in the EIR.

## 6.6 AIR QUALITY

Table 6-3: Air Quality Impacts

| Would the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Conflict with or obstruct implementation of the applicable air quality plan? | ☐ | ☐ | ☐ | ☒ |
| b) 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? | ☐ | ☐ | ☒ | ☐ |
| c) Expose sensitive receptors to substantial pollutant concentrations? | ☐ | ☐ | ☐ | ☒ |
| d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people? | ☐ | ☐ | ☒ | ☐ |

### 6.6.1 BASELINE CONDITIONS

The Project site is located in Butte and Sutter Counties, which are within the BCAQMD and the FRAQMD, respectively. The Project site is also situated in the Sacramento Valley Air Basin (SVAB). The SVAB is bounded to the north and west by the Coastal Mountain Range and to the east by the southern portion of the Cascade Mountain Range and the northern portion of the Sierra Nevada Mountains. Within the SVAB the elevations reach heights of approximately 3,500 feet in the southwest, 8,500 feet in the northwest, 1,700 feet in the southeast, and 10,500 feet in the northeast.[45] The mountain ranges provide a significant physical barrier to trap locally created pollution as well as pollution transported into the Valley from elsewhere. Another prominent landmark within the Sacramento Valley is the Sutter Buttes which have a top elevation of 2,117 feet and are situated in the central part of the Valley floor. However, in contrast, the elevation in Sacramento County near the San Francisco Bay delta is barely above sea level. Due to the large geographic area of the Basin the weather varies from north to south and east to west. The meteorological parameters of wind direction and speed, high and low temperatures, and precipitation are measured at several locations around the Basin. These factors have a major effect on air quality and the daily management of biomass burning.[46]

[45] (Sacramento Valley Basinwide Air Pollution Control Council, 2015)
[46] (Sacramento Valley Basinwide Air Pollution Control Council, 2015)

Table 6-4: Summary of Ambient Air Quality Standards and Attainment Designation

| Pollutant | Averaging Time | California Standards* | | National Standards* | |
|---|---|---|---|---|---|
| | | Concentration* | Attainment Status | Primary | Attainment Status |
| Ozone ($O_3$) | 1-hour | 0.09 ppm | Nonattainment / Severe | – | No Federal Standard |
| | 8-hour | 0.070 ppm | Nonattainment | 0.075 ppm | Nonattainment (Extreme)** |
| Particulate Matter ($PM_{10}$) | AAM | 20 µg/m$^3$ | Nonattainment | – | Attainment |
| | 24-hour | 50 µg/m$^3$ | | 150 µg/m$^3$ | |
| Fine Particulate Matter ($PM_{2.5}$) | AAM | 12 µg/m$^3$ | Nonattainment | 12 µg/m$^3$ | Nonattainment |
| | 24-hour | No Standard | | 35 µg/m$^3$ | |
| Carbon Monoxide (CO) | 1-hour | 20 ppm | Attainment/ Unclassified | 35 ppm | Attainment/ Unclassified |
| | 8-hour | 9 ppm | | 9 ppm | |
| | 8-hour (Lake Tahoe) | 6 ppm | | – | |
| Nitrogen Dioxide ($NO_2$) | AAM | 0.030 ppm | Attainment | 53 ppb | Attainment/ Unclassified |
| | 1-hour | 0.18 ppm | | 100 ppb | |
| Sulfur Dioxide ($SO_2$) | AAM | – | Attainment | -- | Attainment/ Unclassified |
| | 24-hour | 0.04 ppm | | -- | |
| | 3-hour | – | | 0.5 ppm | |
| | 1-hour | 0.25 ppm | | 75 ppb | |
| Lead (Pb) | 30-day Average | 1.5 µg/m$^3$ | Attainment | – | No Designation/ Classification |
| | Calendar Quarter | – | | -- | |
| | Rolling 3-Month Average | – | | 0.15 µg/m$^3$ | |
| Sulfates ($SO_4$) | 24-hour | 25 µg/m$^3$ | Attainment | No Federal Standards | |
| Hydrogen Sulfide ($H_2S$) | 1-hour | 0.03 ppm (42 µg/m$^3$) | Unclassified | | |
| Vinyl Chloride ($C_2H_3Cl$) | 24-hour | 0.01 ppm (26 µg/m$^3$) | Attainment | | |
| Visibility-Reducing Particle Matter | 8-hour | Extinction coefficient: 0.23/kilometer-visibility of 10 miles or more due to particles when the relative humidity is less than 70%. | Unclassified | | |

** For more information on standards visit: https://ww3.arb.ca.gov/research/aaqs/aaqs2.pdf*

*** No Federal 1-hour standard. Reclassified extreme nonattainment for the Federal 8-hour standard [8/28/25].*

****Secondary Standard*

California's ambient air monitoring network is one of the most extensive in the world, with more than 250 sites and 700 individual monitors measuring air pollutant levels across a diverse range of topography, meteorology, emissions, and air quality. Existing levels of ambient air quality and historical trends and projections in the area are best documented by measurements made by these monitoring sites. The nearest monitoring site to the Project is 2.5 miles southeast of the City of Gridley at 608 Cowee Avenue (Gridley Station).[47] The site measures $PM_{2.5}$, outdoor temperature, relative humidity, wind direction, and wind speed.

## 6.6.2 APPLICABLE REGULATIONS

### 6.6.2.1 FEDERAL

At the federal level, the USEPA has been charged with implementing national air quality programs. The USEPA's air quality mandates are drawn primarily from the federal Clean Air Act (CAA). The federal CAA was first signed into law in 1963. Congress substantially amended the federal CAA in 1970, 1977, and 1990.

The EPA deals with global, international, national, and interstate air pollution issues. Their primary role at the state level is one of oversight of state air quality programs. The EPA sets federal standards for vehicle and stationary sources and provides research and guidance in air pollution programs.

The federal CAA required the USEPA to set National Ambient Air Quality Standards (NAAQS) for several problem air pollutants on the basis of human health and welfare criteria. Two types of NAAQS have been established: primary standards, which protect public health, and secondary standards, which protect public welfare (e.g., crops, forests, materials, visibility, etc.). Primary NAAQS have been established for the following criteria air pollutants:

- Carbon monoxide (CO)
- Ozone ($O_3$)
- Respirable particulate matter ($PM_{10}$)
- Fine particulate matter ($PM_{2.5}$)
- Nitrogen dioxide ($NO_2$)
- Sulfur dioxide ($SO_2$)
- Lead (Pb)

All of the above, except CO, also have some form of secondary standard. The primary NAAQS standards are intended to protect, within an adequate margin of safety, those persons most susceptible to respiratory distress, such as people suffering from asthma or other illness, the elderly, very young children, or others engaged in strenuous work or exercise.

The USEPA designates areas with air quality not meeting federal standards as "nonattainment." The federal CAA further classifies nonattainment areas based on the severity of the nonattainment problem, with marginal, moderate, serious, severe, and extreme nonattainment classifications for ozone. Nonattainment classifications for PM range from marginal to serious.

The federal CAA requires areas with air quality violating the NAAQS to prepare an air quality control plan referred to as the State Implementation Plan (SIP). The SIP contains the strategies and control measures that states such as California will use to attain the NAAQS. The federal CAA amendments of 1990 require states containing areas that violate the NAAQS to revise their SIP to incorporate additional control measures to reduce air pollution. The SIP is a living document that is periodically modified to reflect the latest emissions inventories, planning documents, rules, and regulations of Air Basins as reported by the agencies with jurisdiction over them. The EPA reviews SIPs to determine if they conform to the mandates of the federal CAA amendments and will achieve air quality goals when implemented. If the EPA determines

[47] (California Air Resources Bouard, 2025)

a SIP to be inadequate, it may prepare a Federal Implementation Plan for the nonattainment area and impose additional control measures.

#### FEDERAL CLEAN AIR ACT

- Requires air quality plans to include measures necessary to achieve NAAQS.
- Requires all plans, programs, and projects that require federal approval, including transportation plans, to conform to air quality plans.
- Requires sanctions if all feasible measures are not expeditiously adopted.

#### 6.6.2.2 STATE

States are required to develop and implement air pollution control plans designed to achieve and maintain the NAAQS established by the USEPA. States may also establish their own standards, provided the state standards are at least as stringent as the NAAQS. California has established California Ambient Air Quality Standards (CAAQS) pursuant to Health and Safety Code Section 39606(b) and its predecessor statutes.

The California Legislature established the Air Resources Board (CARB) in 1967. The CARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA) of 1988. The CCAA provides a planning framework for attainment of the CAAQS for $O_3$, CO, $SO_2$, and $NO_2$. The CCAA classifies ozone nonattainment areas as moderate, serious, severe, and extreme based on severity of violation of state ambient air quality standards. For each class, the CCAA specifies air quality management strategies that must be adopted. For all nonattainment categories, attainment plans are required to demonstrate a five percent-per-year reduction in nonattainment air pollutants or their precursors, averaged every consecutive three-year period, unless an approved alternative measure of progress is developed. Air districts responsible for air basins with air quality that is in violation of CAAQS for $O_3$, CO, $SO_2$, and $NO_2$ are required to prepare an air quality attainment plan that lays out a program to attain the CCAA mandates.

Other CARB duties include monitoring air quality in conjunction with air monitoring networks maintained by air pollution control districts (APCDs) and air quality management districts (AQMDs), establishing CAAQS (which are more stringent than the NAAQS in many cases), setting emissions standards for new motor vehicles, and reviewing district input for the SIP required by the federal CAA amendments. The SIP consists of the emissions standards for vehicular sources set by the CARB as well as attainment plans adopted by the APCD or AQMD and approved by the CARB.

The State, through the CARB and Bureau of Automotive Repair, develops programs to reduce pollution from vehicles and consumer products. The following list provides a brief explanation of important regulations set forth by the State of California:

#### CALIFORNIA CLEAN AIR ACT (CCAA)

- Requires all feasible control measures, including transportation control measures, to reduce emissions.
- Provides for indirect source programs in attainment plans.
- Contains targets for emission reductions, vehicle miles traveled, and average vehicle ridership.

### 6.6.3 THRESHOLDS OF SIGNIFICANCE

This section evaluates the anticipated changes in the air quality as a result of the Project. State CEQA Guidelines Appendix G provides the following screening criteria to evaluate potential impacts related to air quality. The Project would result in a significant impact if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; or

- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

## 6.6.4 IMPACT ANALYSIS

### 6.6.4.1 SHORT-TERM CONSTRUCTION-GENERATED EMISSIONS

Estimated construction-generated emissions are summarized in Table 6-5 and Table 6-6. Operational emissions of the Project would be considered negligible due to the lack of emissions resulting from the water transfers and the minimal emissions occurring as a result of using the wells. The FRAQMD thresholds were used as the new well construction would occur within the FRAQMD boundary as well as because the FRAQMD are the more stringent when compared to BCAQMD for both ROG and $NO_X$ (the rest of the criteria air pollutant thresholds are the same).

Table 6-5: Unmitigated Short-Term Construction Generated Emissions of Criteria Air Pollutants

| Source | Annual Emissions (Tons per Year) | | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| Maximum Annual Project Construction Emissions | 0.035 | 0.312 | 0.480 | 0.001 | 0.19 | 0.012 |
| *FRAQMD Threshold* | *4.5* | *4.5* | - | - | - | - |
| Threshold Exceeded? | No | No | No | No | No | No |

Table 6-6: Maximum Daily Construction-Related Emissions of Criteria Air Pollutants

| Source | Daily Emissions Maximum (in pounds) | | | | | |
|---|---|---|---|---|---|---|
| | ROG | $NO_X$ | CO | $SO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| Construction – Summer | 0.726 | 5.360 | 8.360 | 0.013 | 0.267 | 0.125 |
| Construction – Winter | 1.055 | 9.266 | 10.06 | 0.016 | 5.727 | 2.971 |
| *FRAQMD Threshold* | *25* | *25* | - | - | *80* | - |
| Threshold Exceeded? | No | No | No | No | No | No |

a) Would the project conflict with or obstruct implementation of the applicable air quality plan?

**No Impact.** The Project would not conflict with or obstruct the implementation of the air quality management standards. Standards set by the BCAQMD and FRAQMD, and regulatory agencies relating to the Project would continue to apply. The water transferred would be transferred using existing water conveyance infrastructure. Operational emissions of the Project would be considered negligible due to the lack of emissions resulting from the water transfers and the minimal emissions occurring as a result of using the wells. Therefore, there would be no impact. No further discussion or evaluation of this topic is provided in the EIR.

b) Would the project 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?

**Less than Significant Impact.** The Project would not result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is in non-attainment. As shown in Table 6-5 and Table 6-6, the Project would not exceed an emissions threshold which has been set by the FRAQMD or BCAQMD for construction-related emissions. The Project would result in negligible quantities of operational emissions. Therefore, impacts would be less than significant. No further discussion or evaluation of this topic is provided in the EIR.

c) Would the project expose sensitive receptors to substantial pollutant concentrations?

**No Impact.** As discussed above, the Project would not result in significant long-term operational emissions. Constructed related emissions, shown in Table 6-5 and Table 6-6, would be temporary in nature, lasting approximately six months, and would cease upon completion of well construction. Sensitive Receptors are groups that would be more affected by air, noise, and light pollution, pesticides, and other toxic chemicals than others. This includes infants, children under 16, elderly over 65, athletes, and people with cardiovascular and respiratory diseases. High concentrations of these groups would include daycares, residential areas, hospitals, elder care facilities, schools and parks. There would no construction activities in an area with sensitive receptors. The installation of the third well would occur near an existing canal and surrounded by land in agricultural production. There would be no impact. No further discussion or evaluation of this topic is provided in the EIR.

### d) Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

**Less than Significant Impact.** During construction activities, construction equipment exhaust would temporarily emit odors. Considering that less agricultural land would be cultivated, fewer air pollutant emissions would be emitted from normal farm practices (e.g., internal combustion engine emissions from tilling, seeding, pesticide applications, etc.). These reductions in air emissions would be beneficial; however, such reductions would be negligible within the SVAB as a whole due in part to the Project's short duration. Odors associated with farming activities may also lessen, albeit to a minor degree, due to the decrease in farming activities during the growing season. Groundwater pumping would utilize existing electric pumps, so there would be no air emissions from pumping activities. Construction of the Project would be temporary, and odors would not remain after Project completion. Therefore, impacts would be less than significant. No further discussion or evaluation of this topic is provided in the EIR.

## 6.7 BIOLOGICAL RESOURCES

Table 6-7: Biological Resources Impacts

| Would the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | 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? | ☒ | ☐ | ☐ | ☐ |
| b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service? | ☐ | ☐ | ☒ | ☐ |
| 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? | ☐ | ☐ | ☒ | ☐ |
| 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? | ☐ | ☐ | ☐ | ☒ |
| e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? | ☐ | ☐ | ☒ | ☐ |
| 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? | ☐ | ☐ | ☒ | ☐ |

### 6.7.1 BASELINE CONDITIONS

The Project area is within the Sacramento Valley and includes the entire District, which is located in Butte County and Sutter County. The City of Biggs and the City of Live Oak are adjacent to the District's boundaries. The Project area includes agricultural fields, irrigation canals, streams, paved and unpaved roads, and non-native grasslands. Surrounding lands include agricultural fields, residential neighborhoods, various cities, and the Feather River.

## 6.7.2 APPLICABLE REGULATIONS

### 6.7.2.1 LOCAL

#### BUTTE COUNTY GENERAL PLAN 2040

The Butte County General Plan 2040 contains the following goals and policies related to the Project:

##### Water Resources Element

Goal W-1: Maintain and enhance water quality.

Policy W-P1.1: County planning and programs shall be integrated with other watershed planning efforts, including best management practices, guidelines, and policies of the Central Valley Regional Water Quality Control Board (CVRWQCB) and local Groundwater Sustainability Plans.

Policy W-P1.3: Regulations that protect water quality from the impacts of agricultural and industrial activities shall be maintained.

Goal W-2: Ensure an abundant and sustainable water supply to support all uses in Butte County.

Policy W-P2.1: The County supports solutions to ensure the sustainability of community water supplies.

Policy W-P2.2: The County may continue the Six-County Memorandum of Understanding (MOU) with Colusa, Glenn, Tehama, Shasta, and Sutter Counties, continue participation in the local GSAs and Groundwater Advisory Boards, and continue to support the Northern Sacramento Valley and Upper Feather River Integrated Regional Water Management and local Groundwater Sustainability Plans.

Policy W-P2.3: Water resources shall be planned and managed in a way that relies on sound science, data, and public participation.

Policy W-P2.4: The County's State Water Project allocation (27,500 acre-feet) should be fully utilized within Butte County when technically and economically feasible to maximize the benefit and value to Butte County by prioritizing use within the county.

Policy W-P2.8: The County supports Area of Origin and County of Origin water rights, the existing water right priority system, and the authority to make water management decisions locally to meet the county's current and future needs, thereby protecting Butte County's communities, economy, and environment.

Goal W-3: Protect and manage groundwater resources in Butte County.

Policy W-P3.1: Groundwater transfers and substitution programs shall be locally regulated to protect the sustainability of the County's economy, communities, and ecosystems.

Goal W-4: Support coordination between Groundwater Sustainability Agencies in Butte County.

Policy W-P4.1: The County shall work cooperatively with the Groundwater Sustainability Agencies in the three subbasins in Butte County to support implementation of the Sustainable Groundwater Management Act to ensure the County has sustainable water supplies.

Policy W-P4.2: The County supports working towards Sustainable Groundwater Management Ac implementation to ensure the sustainability of groundwater resources, including groundwater levels, groundwater quality, and avoidance of land subsidence, and supports programs that rely on management at the local level, use sound scientific data, and ensure compliance, where consistent with the County's goals and policies.

Policy W-P4.3: Public information and involvement should be encouraged in the groundwater sustainability planning, collaboration, and coordination process.

Policy W-P4.4: The County shall consult applicable Groundwater Sustainability Plans and local groundwater management agencies when making decisions that could impact groundwater resources.

### Conservation and Open Space Element

**Goal COS-6: Engage in cooperative planning efforts to protect biological resources.**

**Policy COS-P6.1:** The County shall coordinate with applicable federal, State, regional and local agencies on natural resources and habitat planning.

**Goal COS-7: Conserve and enhance habitat for protected species and sensitive biological communities.**

**Policy COS-P7.1:** Conservation easements that protect habitat areas, habitat corridors and sensitive biological resources shall be promoted.

**Policy COS-P7.3:** Creeks shall be maintained in their natural state whenever possible, and creeks and floodways shall be allowed to function as natural flood protection features during storms.

**Policy COS- P7.6:** New development projects shall include setbacks and buffers along riparian corridors and adjacent to habitat for protected species, except where permitted in the Butte Regional Habitat Conservation Plan (HCP) and Natural Community Conservation Plan (NCCP) Planning Area and where such development is consistent with the conditions of the HCP/NCCP, upon the future adoption of the HCP/NCCP.

**Policy COS-P7.7:** Construction barrier fencing shall be installed around sensitive resources on or adjacent to construction sites. Fencing shall be installed prior to construction activities and maintained throughout the construction period.

**Policy COS-P7.8:** Where sensitive on-site biological resources have been identified, construction employees operating equipment or engaged in any development-associated activities involving vegetation removal or ground disturbing activities in sensitive resource areas shall be trained by a qualified biologist and/or botanist who will provide information on the on-site biological resources (sensitive natural communities, special-status plant and wildlife habitats, nests of special-status birds, etc.), avoidance of invasive plant introduction and spread, and the penalties for not complying with biological mitigation requirements and other State and federal regulations.

**Policy COS-P7.9:** A biologist shall be retained to conduct construction monitoring in and adjacent to all habitats for protected species when construction is taking place near such habitat areas.

**Goal COS-9: Protect identified special-status plant and animal species.**

**Policy COS-P9.1:** A biological resources assessment shall be required for any proposed development project where special-status species or critical habitat may be present. Assessments shall be carried out under the direction of Butte County. Additional focused surveys shall be conducted during the appropriate season if necessary. Upon adoption of the Butte Regional Habitat Conservation Plan (HCP) and Natural Community Conservation Plan (NCCP), assessment requirements of the HCP/NCCP shall be implemented for development projects within the HCP/NCCP area.

**Policy COS-P9.2:** If special-status plant or animal species are found to be located within a development site, proponents of the project shall engage in consultation with the appropriate federal, State, and regional agencies and mitigate project impacts in accordance with State and federal law. Upon adoption of the Butte Regional Habitat Conservation Plan (HCP) and Natural Community Conservation Plan (NCCP), mitigation requirements of the HCP/NCCP shall be implemented for development projects within the HCP/NCCP area. Examples of mitigation may include:

h. Design the proposed project to avoid and minimize impacts.
i. Restrict construction to specific seasons based on project specific special-status species issues (e.g., minimizing impacts to special-status nesting birds by constructing outside of the nesting season).

j. Confine construction disturbance to the minimum area necessary to complete the work.
k. Mitigate for the loss of special-status species by purchasing credits at an approved conservation bank (if a bank exists for the species in question), funding restoration or habitat improvement projects at existing preserves in Butte County or purchasing or donating mitigation lands of substantially similar habitat.
l. Maintain a minimum 100-foot buffer on each side of all riparian corridors, creeks and streams for special-status and common wildlife.
m. Establish setbacks from the outer edge of special-status species habitat areas.
n. Construct barriers to prevent compaction damage by foot or vehicular traffic.

### SUTTER COUNTY 2030 GENERAL PLAN

The Sutter County 2030 General Plan contains the following goals and policies related to the Project:

#### Biological Resources and Open Space

**Goal ER 1: Support a comprehensive approach for the conservation, enhancement, and regulation of Sutter County's significant habitat and natural open space resources.**

**Policy ER 1.4: Resources Assessment.** Require discretionary development proposals that could potentially impact biological resources to conduct a biological resources assessment to determine if any resources will be adversely affected by the proposal and, if so, to identify appropriate measures to avoid or mitigate such impacts.

**Policy ER 1.5: Avoidance.** Ensure that new development projects avoid, to the extent feasible, significant biological resources (e.g. areas of rare, threatened or endangered species of plants, riparian areas, vernal pools), except where such projects are identified as "Authorized Development" within an adopted Habitat Conservation Plan.

**Policy ER 1.6: Mitigation.** Mitigate biological and open space effects that cannot be avoided in accordance with an applicable Habitat Conservation Plan or federal, state, and local regulations.

**Policy ER 1.7: Permits.** Require that new development secure all necessary state and federal resource permits/approvals prior to any development activity.

**Policy ER 1.8: Buffers.** Ensure that new development incorporates buffers and other measures adequate to protect biological habitats that have been preserved, enhanced, and created.

**Goal ER 2: Conserve, protect, and enhance Sutter County's significant natural wetland and riparian habitats.**

**Policy ER 2.1: No Net Loss.** Require new development to ensure no net loss of state and federally regulated wetlands, other waters of the United States (including creeks, rivers, ponds, marshes, vernal pools, and other seasonal wetlands), and associated functions and values through a combination of avoidance, restoration, and compensation.

**Policy ER 2.2: Resource Conservation District.** Encourage and support the Sutter County Resource Conservation District's programs that facilitate preservation and restoration of natural wetland environments as long as these programs do not significantly affect Sutter County agricultural lands and flood control operations.

**Goal ER 3: Conserve, protect, and enhance Sutter County's varied wildlife and vegetation resources.**

**Policy ER 3.1: Special-Status Species.** Preserve special-status fish, wildlife, and plant species (e.g., rare, threatened, or endangered species) and habitats consistent with an applicable Habitat Conservation Plan or federal, state, and local regulations.

**Policy ER 3.2: Agency Coordination.** Coordinate with federal, state, and local resource agencies (e.g., California Department of Fish and Game, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers) to protect special-status species.

**Policy ER 3.3: Fisheries.** Support the preservation and re-establishment of fisheries in the rivers and streams within Sutter County.

**Policy ER 3.4: Waterfowl Resources.** Preserve and protect waterfowl resources along the Pacific Flyway Migration Corridor.

**Policy ER 3.5: Wildlife Corridors.** Preserve and enhance wildlife movement corridors between natural habitat areas to maintain biodiversity and prevent the creation of biological islands. Preserve contiguous habitat areas when possible.

**Policy ER 3.6: Natural Vegetation.** Preserve important areas of natural vegetation and the ecological integrity of these habitats, where feasible, including but not limited to riparian, vernal pool, marshes, oak woodlands and annual grasslands.

**Policy ER 3.7: Oak Trees.** Preserve native oak trees when possible through the review of discretionary development projects and activities. Reduce the loss of oak trees through consideration of tree mitigation/replanting programs.

**Goal ER 4: Conserve, protect, and enhance Sutter County's unique natural open space lands, drainages, floodplains, and resources.**

**Policy ER 4.1: Preserve Natural Resources.** Preserve natural landforms, natural vegetation, and natural resources as open space to the extent feasible.

**Policy ER 4.2: Sutter Buttes.** Preserve the Sutter Buttes as an important agricultural, cultural, historic, habitat, and open space resource. Promote and support efforts by willing landowners to increase opportunities for public access to the Sutter Buttes and other open space areas.

**Policy ER 4.3: River Corridors.** Preserve the Sacramento, Feather, and Bear River corridors as important habitat, recreation and open space resources. Support efforts to increase public access and recreational uses along the County's river corridors.

#### Water

**Goal ER 6: Preserve and protect the County's surface water and groundwater resources.**

**Policy ER 6.1: Integrated Water Management Programs.** Integrate water management programs that emphasize multiple benefits and balance the needs of agricultural, rural, and urban users.

**Policy ER 6.2: Surface Water Resources.** Protect the surface water resources in the County including the Sacramento, Feather and Bear Rivers and their significant tributaries.

**Policy ER 6.3: Groundwater Sustainability.** Protect the sustainability of groundwater resources.

**Policy ER 6.7: Water Rights.** Support the protection of the existing water rights of water agencies and providers within Sutter County. Do not support out-of-area water transfers where they would adversely impact water supply within Sutter County. Support either out-of-area, or in-basin water transfers that would not negatively impact water supply within Sutter County.

### 6.7.3 THRESHOLDS OF SIGNIFICANCE

This section evaluates the anticipated changes in the biological resources as a result of the Project. State CEQA Guidelines Appendix G provides the following screening criteria to evaluate potential impacts related to biological resources. The Project would result in a significant impact if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on nay species identified as candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- 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;
- 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;
- Conflict with any local policies or ordinances protecting biological resources, such a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

### 6.7.4 IMPACT ANALYSIS

a) Would the project 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?

Potentially Significant Impact. The Project site contains suitable habitat for special status species including, but not limited to, Brazilian watermeal (*Wolffia brasiliensis*), Sanford's arrowhead (*Sagittaria sanfordii*), American badger (*Taxidea taxus*), Bald eagle (*Haliaeetus leucocephalus*), Bank swallow (*Riapria riparia*), Burrowing owl (*Athene cunicularia*), California black rail (*Laterallus jamaicensis coturniculus*), Chinook salmon (*Oncorhynchus tshawytscha*), Crotch's bumble bee (*Bombus crotchii*), Giant gartersnake (*Thamnophis gigas*), Greater sandhill crane (*Antigone canadensis tabida*), Green sturgeon (*Acipenser medirostris*), Loggerhead shrike (*Lanius ludovicianus*), Monarch butterfly (*Danaus Plexippus*), Northern harrier (*Circus hudsonius*), Northwestern pond turtle (*Actinemys marmorata*), Pallid bat (*Antrozous pallidus*), Steelhead – Central Valley DPS (*Oncorhynchus mykiss irideus*), Swainson's hawk (*Buteo swainsoni*), Townsend's big-eared bat (*Corynorhinus townsendii*), Tricolored blackbird (*Agelaius tricolor*), Western mastiff bat (*Eumops perotis californicus*), Western red bat (*Lasiurus blossevillii*), Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), White-tailed kite (*Elanus leucurus*), and Yellow warbler (*Setophaga petechia*) (see Appendix C). Implementation of appropriate mitigation measures are anticipated to reduce potential impacts to these species to a less than significant level under CEQA and ensure compliance with State and federal laws protecting these species. However, the EIR will provide further analysis and provide the appropriate mitigation to address potential adverse impacts to species.

**b)** Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Less than Significant Impact. There are no recorded observations of a natural community of special concern mapped within the Project site, and no natural communities of special concern were observed during the field survey. There are eight recorded observations of natural communities of special concern within the vicinity of the site and include:

- Coastal and Valley Freshwater Marsh (located 7 miles west of the District boundary);
- Great Valley Cottonwood Riparian Forest (located along the Feather River, adjacent to the Districts boundary);
- Great Valley Mixed Riparian Forest (located 1 mile east of the Districts boundary);
- Great Valley Valley Oak Riparian Forest (located 3 miles east of the Districts boundary);
- Great Valley Willow Scrub (located 8 miles east of the Districts boundary);
- Northern Basalt Flow Vernal Pool (located 10.5 miles east of the Districts boundary);
- Northern Hardpan Vernal Pool (located 2.5 miles east of the Districts boundary); and
- Northern Volcanic Mud Flow Vernal Pool (located 6 miles east of the Districts boundary).

Riparian habitat is composed of plant communities that occur along the banks, and sometimes over the banks, of most waterways and is an important habitat for numerous wildlife species. CDFW has jurisdiction over most riparian habitat in California. Various waterways and areas with riparian habitat are located within the District's boundaries, though the water transfers and the new well would not include any work activities within these waterways. As such, impacts to riparian habitat or other sensitive natural communities would be less than significant. No further discussion or evaluation of this topic is provided in the EIR.

c) Would the project 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?

Less than Significant Impact. The National Wetland Inventory shows potential wetlands within the District's boundaries, though they all appear to occur along surface water features such as streams and ditches/canals. These various small streams and canals that run through the District's boundaries would not be impacted during the Project as the water transfers and new well site would not include any work within these waterways. Therefore, no direct impacts would occur to wetlands or other water features as a result of the Project. There are no designated wild and scenic rivers within the Project site; therefore, the Project would not result in direct impacts to wild and scenic rivers. Since construction may involve ground disturbance of less than one (1) acre, no Stormwater Pollution Prevention Plan (SWPPP) would be required. Best management practices would be used to prevent soil from entering the canal adjacent to the new well site. As such, impacts would be less than significant. No further discussion or evaluation of this topic is provided in the EIR.

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?

No Impact. The District mainly consists of agricultural fields with irrigation canals, streams, paved and unpaved roads, and small areas with non-native grasslands. Surrounding lands include agricultural fields, residential neighborhoods, various cities, and the Feather River. The streams and canals may act as corridors for aquatic wildlife; however, the water transfers and construction of the new well would not impact these potential corridors.

The streams and canals within the Project area may be used as wildlife nursery sites for amphibian species such as Pacific tree frogs or fish species such as Chinook salmon, which were observed during the survey. However, the water transfers and construction of the new well would not impact these nursery sites. Therefore, the Project would have no impact on wildlife movement corridors or native wildlife nursery sites. No further discussion or evaluation of this topic is provided in the EIR.

### e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

### 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?

**e) and f) Less than Significant Impact.** Designated critical habitat is absent from within the District. No trees would be removed as a part of the Project. While seven species contain critical habitat within the vicinity of the District, there would be no impact to critical habitat. The Project appears to be consistent with the goals and policies of the Butte County General Plan 2040 and the Sutter County 2030 General Plan. Measures in the Butte Regional Conservation Plan will also be followed where applicable. As a result, impacts would be less than significant. No further discussion or evaluation of this topic is provided in the EIR.

# 6.8 CULTURAL RESOURCES

Table 6-8: Cultural Resources Impacts

| Would the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Cause a substantial adverse change in the significance of a historical resource pursuant to in § 15064.5? | ☐ | ☐ | ☒ | ☐ |
| b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5? | ☐ | ☐ | ☒ | ☐ |
| c) Disturb any human remains, including those interred outside of dedicated cemeteries? | ☐ | ☐ | ☒ | ☐ |

## 6.8.1 BASELINE CONDITIONS

The Project area includes existing water conveyance infrastructure and agricultural lands in the District's service area. The area where the new well would be constructed consists of agricultural land immediately adjacent to a District canal. Long-standing agricultural development in the Project area has heavily disturbed the existing grounds.

### 6.8.1.1 RECORDS SEARCH

The records search included the Project survey area (the Project well site) and a one-mile radius. To determine whether the survey area for the Project had been previously surveyed for cultural resources, and/or whether any such resources were known to exist within or near to it, an archival records search was conducted by the staff of the NEIC on October 11, 2025. The records search was completed to determine: (i) if pre-contact or historic-era cultural resources had previously been recorded within the Project survey area; (ii) if the Project survey area had been systematically surveyed by archaeologists prior to the initiation of this fieldwork; and/or (iii) whether the area surrounding the Project was known to contain archaeological sites or built environment resources and to thereby be culturally sensitive. Records examined included archaeological site files and maps, the National Register of Historic Places (NRHP), Historic Property Data File, California Inventory of Historic Resources, and the California Points of Historic Interest.

Based upon the information from the records search and local topography, the Project area is considered to have low sensitivity for cultural resources. Portions of the project along existing sites, roads, and trails are sensitive for archaeological resources. Other areas of sensitivity are flats near creeks, springs, seeps, or rock outcrops that may be located in the Project area.

The records search included the Project well site and a one-mile radius as this would be the only area with ground disturbance as a result of the Project. According to the NEIC, no archaeological resources or built environment resources were identified within the Project boundaries nor within a one-mile radius of the Project's well site. One cultural survey had been completed in the Project area in 2011.

### 6.8.1.2 NATIVE AMERICAN OUTREACH

An SLF search from the NAHC was requested on September 10, 2025. The objective of the SLF search was to identify any known places of spiritual, sacred activity or traditional use or other resources of importance. The NAHC responded on September 11, 2025. The letter stated a search of the SLF was negative. The NAHC also included contact information of local Native American representatives who may have knowledge or interest in sharing information of resources of sacred significance present in or near the Project site. Each

Native American representative listed by the NAHC was sent an outreach letter and a map notifying them of the Project and asking if they had any knowledge of the Project area or surrounding vicinity. Follow-up communication was performed via letter. Further discussion regarding outreach is included in Section 6.21.

## 6.8.2 APPLICABLE REGULATIONS

### 6.8.2.1 FEDERAL

#### NATIONAL HISTORIC PRESERVATION ACT

The National Historic Preservation Act (NHPA) established the Advisory Council on Historic Preservation, State Historic Preservation Officer (SHPO), the NRHP, and Section 106 review. The goal of the NHPA is to encourage federal agencies to act as responsible stewards of the nation's historic resources as far as their actions affect historic resources- meaning those listed on or eligible for listing on the NRHP. The NRHP recognizes buildings, structures, sites, district, and objects equal to or greater than 50 years old that are determined to be significant in respect to American history, architecture, archaeology, engineering, or culture, and at the local, State, or national level. To be determined eligible for listing on the NRHP a resource must also retain integrity in terms of location, design, setting, materials, workmanship, feeling, and association.

Resources determined eligible for, or which are listed on the NRHP, are afforded protection under Section 106 of the NHPA (as well as under CEQA). The Section 106 process serves to carry out the mission of the NHPA in that, when there is a federal or federally licensed action that has the potential to affect historic resources (i.e., those resources listed on or determined legible for listing on the NRHP), that agency is required to identify and assess the effects of its actions on historic resources.

### 6.8.2.2 STATE

#### CALIFORNIA REGISTER OF HISTORICAL RESOURCES

The importance or significance of a cultural resource depends on whether it qualifies for inclusion on the California Register of Historical Resources (CRHR). Cultural resources determined eligible for the CRHR are called "historical resources" (CEQA Guidelines Section 15064.5). In order to be considered a historical resource, a cultural resource must possess both historical significance and integrity according to the criteria defined in CEQA Guidelines Section 15064.5(a)(3).

The CRHR is an inventory of significant architectural, archaeological, and historical resources in the State of California. Important cultural resources can be listed in the CRHR through a number of methods, and listing requires approval from the State Historical Resources Commission. Properties can be nominated to the CRHR by local governments, private organizations, or citizens. State Historical Landmarks and National Register-listed properties gain automatic listing in the CRHR. The evaluative criteria used by the CRHR for determining eligibility are closely based on those developed by the National Park Service for the National Register of Historic Places. In order for a cultural resource to be significant, or in other words eligible, for listing in the CRHR, it must reflect one or more criteria seen in Public Resources Code (PRC) Section 5024.1c.

#### CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA requires that public agencies assess the effects of private and public projects on historical resources prior to approval of or determination to carry out those projects. Historical resources are defined as buildings, sites, structures, objects, areas, places, records, or manuscripts that the lead agency determines to have historical significance, including architectural, archaeological, cultural, or scientific significance. CEQA requires that if a project results in an effect that may cause a substantial adverse change in the significance of a historical resource, alternative plans or mitigation measures must be considered.

However, only significant historical resources need to be addressed. Therefore, before the assessment of effects or development of mitigation measures, the significance of cultural resources must be determined. The steps that are normally taken in a cultural resources investigation for CEQA compliance are as follows:

- Identify potential historical resources;

- Evaluate the eligibility of historical resources;
- Evaluate the effects of the project on all eligible historical resources.

In addition, properties that are listed in or eligible for listing in the NRHP are considered eligible for listing in the CRHR and thus are significant historical resources for the purposes of CEQA (PRC Section 5024.1(d)(1)).

According to CEQA, a project with an effect that may cause a substantial adverse change in the significance of a historical resource may have a significant impact on the environment (CEQA Guidelines Section 15064.5(b)). CEQA also states that a substantial adverse change in the significance of a resource means the physical demolition, destruction, relocation, or alteration of an historical resource or its immediate surroundings such that the significance of the resource would be materially impaired. Actions that would materially impair the significance of a historical resource are any actions that would demolish or materially and adversely alter the physical characteristics of a historical resource that convey its historical significance and qualify or justify its eligibility for inclusion in the CRHR or in a local register or survey that meet the requirements of PRC Sections 5020.1(k) and 5024.1(g).

### SIGNIFICANT HISTORICAL RESOURCES UNDER CEQA GUIDELINES

In completing an analysis of a project under CEQA, it must first be determined if the project site possesses a historical resource. A site may qualify as a historical resource if it falls within at least one of four categories listed in CEQA Guidelines Section 15064.5(a):

1. A resource listed in or determined to be eligible by the State Historical Resources Commission for listing in the CRHR (PRC Section 5024.1, Title 14 CCR, Section 4850 et seq.).

2. A resource included in a local register of historical resources, as defined in Section PRC Section 5020.1(k) or identified as significant in an historical resource survey meeting the requirements of PRC Section 5024.1 (g), shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

3. Any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the CRHR (PRC Section 5024.1; Title 14 CCR, Section 4852). These conditions are related to the eligibility criteria for inclusion in the CRHR (PRC Sections 5020.1[k], 5024.1, 5024.1[g]). A cultural resource may be eligible for inclusion in the CRHR if it:

    a. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

    b. Is associated with the lives of persons important in our past;

    c. Embodies the distinctive characteristics of a type, period, region, or method of construction; represents the work of an important creative individual; or possesses high artistic values; or

    d. Has yielded, or may be likely to yield, information important in prehistory or history.

4. The fact that a resource is not listed in or determined to be eligible for listing in the CRHR, not included in a local register of historical resources (pursuant to PRC Section 5020.1(k)), or identified in an historical resources survey (meeting the criteria in PRC Section 5024.1(g)) does not preclude a lead agency from determining that the resource may be an historical resource as defined in PRC Sections 5020.1(j) or 5024.1.

A lead agency must consider a resource that has been listed in or determined to be eligible for listing in the CRHR (Category 1) as an historical resource for CEQA purposes. In general, a resource that meets any of the other three criteria listed in CEQA Guidelines Section 15064.5(a) is also considered to be a historical resource unless "the preponderance of evidence demonstrates" that the resource is not historically or culturally significant."

#### HEALTH AND SAFETY CODE

The discovery of human remains is regulated according to California Health and Safety Code (HSC) Section 7050.5, which states, "If human remains are encountered, no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to PRC Section 5097.98. The County Coroner must be notified to the find immediately. If the remains are determined to be prehistoric, the Coroner will notify the NAHC, which will determine and notify Most Likely Descendant (MLD). With the permission of the landowner or his or her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection within 24 hours of notification by the NAHC. The MLD may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials."

### 6.8.3 THRESHOLDS OF SIGNIFICANCE

State CEQA Guidelines Appendix G provides the following screening criteria to evaluate potential impacts related to cultural resources. The Project would have a significant impact if it would:

- Cause a substantial adverse change in the significance of a historical resource pursuant to in § 15064.5;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5; or
- Disturb any human remains, including those interred outside of dedicated cemeteries.

### 6.8.4 IMPACT ANALYSIS

a) Would the project cause a substantial adverse change in the significance of a historical resource pursuant to in § 15064.5?

b) Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?

c) Would the project disturb any human remains, including those interred outside of dedicated cemeteries?

a-c) Less than Significant Impact. A well to be used for the groundwater substitution water transfers could be constructed as a part of the Project. The proposed well location is situated immediately adjacent to a District canal and surrounded by lands in agricultural production. As such, the land has been heavily disturbed.

As previously mentioned, a cultural resources database search was conducted in September 2025. This search identified that no cultural resources were previously recorded within the Project well site or within a one-mile radius of the well site. The Project would not require nor induce any other new surface

disturbing activities, such as construction. Farming operations such as plowing, planting, and harvesting would continue to take place on land where surface disturbing activities have continuously occurred for many years, and no new or expanded uses would occur as a result of the water transfer. Therefore, there would be no substantial adverse changes in the significance of historical or archeological resources as defined in CEQA Guidelines in Section 15064.5. As such, impacts would be less than significant to historical or archaeological resources.

The Project includes standard practices to avoid or minimize cultural resources impacts and would be required to follow all applicable federal, State, and local requirements set for archaeological resource recovery. In the unlikely event that an archaeological resource is uncovered during the construction of this Project, all construction activities would cease, and a qualified archaeologist would be contacted to assess the uncovered resource. Impacts would be less than significant. No further discussion or evaluation of this topic is provided in the EIR.

# 6.9 ENERGY

Table 6-9: Energy Impacts

| Would the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation? | ☐ | ☐ | ☒ | ☐ |
| b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency? | ☐ | ☐ | ☐ | ☒ |

## 6.9.1 BASELINE CONDITIONS

The Project area is served by Pacific Gas & Electric (PG&E) for its energy and natural gas needs.[48] Current site operations require diesel and gasoline fuel to make maintenance visits, as necessary. Operational energy consumption is composed of electricity consumption to power the existing groundwater wells. New construction would be subject to Titles 20 and 24 of the California Code of Regulations which each serve to reduce demand for electrical energy by implementing energy-efficient standards for construction, including new wells.

## 6.9.2 APPLICABLE REGULATIONS

### 6.9.2.1 FEDERAL

#### ENERGY POLICY AND CONSERVATION ACT

The Energy Policy and Conservation Act of 1975 sought to ensure that all vehicles sold in the United States would meet certain fuel economy goals. Through this Act, Congress established the first fuel economy standards for on-road motor vehicles in the U.S. Pursuant to the Act, the NHSTA, which is part of the U.S. DOT, is responsible for establishing additional vehicle standards and for revising existing standards. Since 1990, the fuel economy standard for new passenger cars has been 27.5 miles per gallon (mpg). Since 1996, the fuel economy standard for new light trucks (gross vehicle weight of 8,500 pounds or less) has been 20.7 mpg. Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not currently subject to fuel economy standards. Compliance with federal fuel economy standards is determined based on each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the U.S. The Corporate Average Fuel Economy (CAFE) program, administered by USEPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. USEPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. Based on the information generated under the CAFE program, the U.S. DOT is authorized to assess penalties for noncompliance.

#### ENERGY POLICY ACT OF 2005

The Energy Policy Act of 2005 was intended to establish a comprehensive, long-term energy policy and is implemented by the U.S. Department of Energy. This act addressed energy production in the U.S., including oil, natural gas, coal and alternative forms of energy, and energy efficiency and tax incentives. The energy efficiency and tax incentive programs include credits for the construction of new energy-efficient homes, production or purchase of energy efficient appliances, and loan guarantees for entities that develop or use innovative technologies that avoid production of GHGs. Some of these programs have expired. Solar tax

[48] (Pacific Gas & Electric Company)

credits for residential and commercial systems are 26% in 2020, 22% in 2021, and 10% for commercial systems only from 2022 onwards.

#### 6.9.2.2 STATE

##### THE WARREN-ALQUIST ACT OF 1975

The Warren-Alquist Act established the California Energy Resources Conservation and Development Commission, now known as the California Energy Commission. The Act established a State policy to reduce wasteful, uneconomical, and unnecessary uses of energy by employing a range of measures. The California Public Utilities Commission regulates privately-owned utilities in the energy, rail, telecommunications, and water fields.

### 6.9.3 THRESHOLDS OF SIGNIFICANCE

Based on Appendix F and G of the State CEQA Guidelines, the Project would result in a potentially significant impact on energy use if it would:

- Result in the wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation; or
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

### 6.9.4 IMPACT ANALYSIS

a) Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Less than Significant Impact. Water transferred as a part of the Project may be stored by DWR in Lake Oroville until the water could be moved to Valley Water or other buyers. This could affect the pattern of power generation at the Oroville facilities. However, this would cause a negligible change in the long term. As such, the Project would not result in long-term significant impacts to power supplies.

The proposed Project would extract up to 10,000 AF of groundwater from BWD production wells in Sutter County. The groundwater substitution water transfers may increase groundwater pumping within the BWD boundaries in Sutter County. Groundwater that would flow naturally by gravity and pressure would instead be extracted using existing pumps. This would result in an increased energy use during the transfer window. However, this energy use needed to deliver the water is a necessary component of the Project and would not be a wasteful, inefficient, or unnecessary consumption of energy resources. As such, impacts would be less than significant. No further discussion or evaluation of this topic is provided in the EIR.

b) Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

No Impact. State and local authorities regulate energy use and consumption. These regulations at the State level are intended to reduce energy use and GHG emissions. These include, among others, AB 1493 – Light-Duty Vehicle Standards; California Code of Regulations Title 24, Part 6 – Energy Efficiency Standards; and California Code of Regulations Title 24, Parts 6 and 11 – California Energy Code and Green Building Standards. The Project would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency. Therefore, there would be no impact. No further discussion or evaluation of this topic is provided in the EIR.

# 6.10 GEOLOGY AND SOILS

Table 6-10: Geology and Soils Impacts

| Would the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving: | ☐ | ☐ | ☐ | ☒ |
| 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. | ☐ | ☐ | ☐ | ☒ |
| ii. Strong seismic ground shaking? | ☐ | ☐ | ☐ | ☒ |
| iii. Seismic-related ground failure, including liquefaction? | ☐ | ☐ | ☐ | ☒ |
| iv. Landslides? | ☐ | ☐ | ☐ | ☒ |
| b) Result in substantial soil erosion or the loss of topsoil? | ☐ | ☐ | ☒ | ☐ |
| 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? | ☐ | ☐ | ☒ | ☐ |
| d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994) creating substantial direct or indirect risks to life or property? | ☐ | ☐ | ☐ | ☒ |
| e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater? | ☐ | ☐ | ☐ | ☒ |
| f) Directly or indirectly destroy a unique paleontological resource or site or unique geological feature? | ☐ | ☐ | ☐ | ☒ |

## 6.10.1 BASELINE CONDITIONS

The Project is located in Butte and Sutter Counties. These counties are situated within an area of relatively low seismic activity by comparison to other areas of the State. The area does experience ground shaking from earthquakes with epicenters located in other areas. In both counties, the primary earthquake hazard is ground shaking. Older buildings constructed before building codes were established and newer buildings constructed before earthquake-resistant provisions were included in the building codes are the most likely to be damaged during an earthquake.

#### 6.10.1.1 GEOLOGY AND SOILS

The Project is located in the Great Valley geomorphic province of California. The Great Valley is an alluvial plain approximately 50 miles wide and 400 miles long in the central portion of California. The Great Valley's northern portion is the Sacramento Valley, drained by the Sacramento River, and its southern portion is the San Joaquin Valley, drained by the San Joaquin River. The geology of the Great Valley is typified by thick sequences of alluvial sediments derived primarily from erosion of the mountains of the Sierra Nevada to the east, and to a lesser extent, erosion of the Klamath Mountains and Cascade Range to the north. These sediments were transported downstream and subsequently laid down as a river channel, floodplain deposits, and alluvial fans. The Sutter Buttes are composed of a volcanic plug that penetrated the alluvial basin sediments during the Pliocene. The Project area is underlain by Modesto, Riverbank, Sutter, and Turlock Lake formations.

##### EXPANSIVE SOILS

Expansive soils (also known as shrink-swell soils) are soils that contain expansive clay minerals that can absorb significant amounts of water. The presence of these clay minerals makes the soil prone to large changes in volume in response to changes in water content. When an expansive soil becomes wet, water is absorbed and it increases in volume, and as the soil dries it contracts and decreases in volume. This repeated change in volume over time can produce enough force and stress on buildings, underground utilities, and other structures to damage foundations, pipes, and walls. The quantity and type of expansive clay minerals affects the potential for the soil to expand or contract.

One measure of the shrink-swell potential of soils is linear extensibility. Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. The volume change is reported as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent, moderate if 3 to 6 percent, high if 6 to 9 percent, and very high if more than 9 percent. The NRCS has prescribed linear extensibility ratings to most soil series in California.

Soils that are subject to shrink-swell potential and expansive soil properties are present within Butte and Sutter Counties. However, expansive soil potential is generally low to moderate within the District boundaries.[49] To the west and northwest of the Project area, expansive soil potential increases.

#### 6.10.1.2 FAULTS AND SEISMICITY

The Cleveland Hills fault is the only fault located in Butte County that has been identified as an active earthquake fault pursuant to the Alquist-Priolo Earthquake Fault Zones Act.[50] Sutter County does not have any active faults and no major earthquakes or earthquake-related damage have been recorded in Sutter County.[51] The Cleveland Hills fault is generally located about 15 miles northeast of the District.

#### 6.10.1.3 LIQUEFACTION

The potential for liquefaction, which is the loss of soil strength due to seismic forces, is dependent on soil types and density, depth to groundwater, and the duration and intensity of ground shaking. No specific liquefaction hazard areas have been identified in Butte or Sutter Counties according to the California Geologic Survey.[52] No structures would be constructed as part of this Project. Liquefaction hazards would be negligible.

[49] (Butte County, 2023), (Sutter County, 2011)
[50] (Butte County, 2023)
[51] (Sutter County, 2011)
[52] (California Geologic Survey, No Date)

#### 6.10.1.4 SOIL SUBSIDENCE

Subsidence occurs when a large land area settles due to over-saturation or extensive withdrawal of ground water, oil, or natural gas. These areas are typically composed of open-textured soils, high in silt or clay content, that become saturated. Areas of subsidence exist throughout much of the District boundaries.[53] However, publicly available land subsidence data indicates that there has not been significant vertical displacement in the Project area for the period of 2015 to present [April 2025].[54]

#### 6.10.1.5 DAM AND LEVEE FAILURE

The Butte County Local Hazard Mitigation Plan (LHMP) identifies the overall vulnerability to dam failure as "extremely high." Assets at risk from dam failure include people and populations; structures; critical facilities and infrastructure and community lifelines; natural, historic, and cultural resources, economic assets, and community activities of value.[55] The Sutter County LHMP identifies the overall vulnerability to dam failure as "high." Dam failure flooding presents a threat to life and property, including buildings, their contents, and their use. Large flood events can affect crops and livestock as well as critical lifeline utilities (e.g., water, sewerage, and power), transportation, jobs, tourism, the environment, and the local and regional economies.[56]

### 6.10.2 APPLICABLE REGULATIONS

#### 6.10.2.1 FEDERAL

##### 2014 FARM BILL

The 2014 Farm Bill requires producers who participate in most programs administered by the FSA, the NRCS and the Risk Management Agency (RMA) to implement conservation compliance requirements. Highly Erodible Land Conservation provisions aim to reduce soil loss on erosion-prone lands. These provisions apply to all land that is considered highly erodible and that is owned or farmed by persons voluntarily participating in USDA programs.[57] The FSA maintains the official USDA records of highly erodible land and wetland determinations.

#### 6.10.2.2 STATE

##### ALQUIST-PRIOLO EARTHQUAKE FAULT ZONING ACT

The intent of the Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act) is to reduce losses from surface fault rupture. The Alquist-Priolo Act established the concept of "earthquake fault zones" which are regulatory zones surrounding surface traces of active faults In California. Wherever an active fault exists, if it has the potential for surface rupture, a structure for human occupancy cannot be placed over the fault and must be a minimum distance from the fault (generally 50 feet).

#### 6.10.2.3 LOCAL

##### BUTTE COUNTY GENERAL PLAN

The Health and Safety Element of the Butte County General Plan 2040 contains the following goals and policies that pertain to geology and soils.

Goal HS-7: Reduce risks from steep slopes and landslides.

Policy HS-P7.1: Site-specific geotechnical investigations shall be required to assess landslide potential for private development and public facilities projects in areas rated 'Moderate to High' and 'High' in Figure HS-7 or the most current available mapping.

[53] (Butte County, 2023), (Sutter County, 2011)
[54] (California Department of Water Resources, n.d.)
[55] (Butte County, 2024)
[56] (Sutter County, 2021)
[57] (United States Department of Agriculture, 2017)

Policy HS-P7.3: The County discourages new development in landslide or liquefaction prone areas.

Goal HS-8: Reduce risks from erosion.

Policy HS-P8.1: Site-specific geotechnical investigations shall be required to assess erosion potential for private development projects and public facilities in areas rated "Very High" in Figure HS-8 or the most current available mapping. Private development projects shall implement recommendations provided in the geotechnical investigations.

Goal HS-9: Reduce risks from expansive soils.

Policy HS-P9.1: Site-specific geotechnical investigations shall be required to assess risks from expansive soils for private development projects and public facilities in areas rated "High" in Figure HS-9 or the most current available mapping. Private development projects shall implement recommendations provided in the geotechnical investigations.

Goal HS-10: Avoid inelastic subsidence from groundwater withdrawal.

Policy HS-P10.1: Continue to work with Groundwater Sustainability Agencies to ensure that groundwater withdrawals do not lead to inelastic subsidence.

Policy HS-P10.2: Existing programs to monitor potential subsidence activity shall be supported.

#### SUTTER COUNTY GENERAL PLAN

The Public Health and Safety chapter of the Sutter County General Plan contains the following goals and policies pertaining to geology and seismic hazards.

Goal PHS 2: Minimize the risk of personal injury and property damage due to geologic and seismic hazards and adverse soil conditions.

Policy PHS 2.2: Minimize exposure to geologic hazards. Minimize development in areas where geologic hazards exist from landslides and erosion.

Policy PHS 2.3: Site-specific geotechnical analysis. Require the preparation of a County approved site-specific geotechnical analysis prior to approval and development in areas where the potential for geologic or seismic hazards exists (e.g., ground shaking, landslides, liquefaction, expansive soils, steep slopes, subsidence, and erosion) and incorporate recommended project features to avoid or minimize the identified hazards.

### 6.10.3 THRESHOLDS OF SIGNIFICANCE

This section evaluates the anticipated changes regarding geology and soils as a result of the Project. State CEQA Guidelines Appendix G provides the following screening criteria to evaluate potential impacts related to geology and soils. The Project would result in a significant impact if it would:

- Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:
    - 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;
    - Strong seismic ground shaking;
    - Seismic-related ground failure, including liquefaction; and
    - Landslides;
- Result in substantial soil erosion or the loss of topsoil;

- 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;
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property;
- 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; and
- Directly or indirectly destroy a unique paleontological resource or site or unique geological feature.

### 6.10.4 IMPACT ANALYSIS

a) Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

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.

No Impact. The District is not located within a known earthquake fault zone. Additionally, the Project does not involve activities that could potentially cause significant adverse effects above the existing baseline conditions. No further discussion or evaluation of this topic is provided in the EIR.

ii. Strong seismic ground shaking?

No Impact. The Project does not involve activities that would potentially cause significant adverse effects involving strong seismic ground shaking above the existing baseline conditions. No further discussion or evaluation of this topic is provided in the EIR.

iii. Seismic-related ground failure, including liquefaction?

No Impact. The Project does not involve activities that would potentially cause significant adverse effects involving seismic-related ground failure, including liquefaction, above the existing baseline conditions. No specific liquefaction hazard areas have been identified in Butte or Sutter Counties according to the California Geologic Survey.[58] No further discussion or evaluation of this topic is provided in the EIR.

iv. Landslides?

No Impact. The Project does not involve activities that would potentially cause significant adverse effects involving landslides above the existing baseline conditions. No further discussion or evaluation of this topic is provided in the EIR.

b) Would the project result in substantial soil erosion or the loss of topsoil?

Less than Significant Impact. The Project involves the idling of cropland which would increase the amount of idle agricultural land in the Project area as well as the construction of a groundwater well. Regarding water transfers, the agricultural lands in these counties are largely comprised of fine-textured soils such as clay and silty clay. Such soils have a wind erodibility index of approximately 85-100 (in tons per acre per year), below the USDA threshold of 134 when determining significant wind erodibility, when in a dry,

[58] (California Geologic Survey, No Date)

unvegetated condition.[59] In contrast, highly wind-erodible soils, such as fine sands and sands, have a wind erodibility index much higher, ranging from 134-310. As such, the soils in the Project area have a relatively low risk of wind erosion when left in a dry, unvegetated condition.

However, the construction of the well could cause some soil disturbance. The well site includes approximately 0.10 acres of land immediately adjacent to a District canal. The well site has relatively flat terrain, and, according to the NRCS's Web Soil Survey, the site's soils have a low potential for soil erosion.[60] Once construction activities have concluded, O&M activities would not add to any soil erosion or the loss of topsoil. Any impacts would be expected to be less than significant. No further discussion or evaluation of this topic is provided in the EIR.

### c) Would the project 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?

Less than Significant Impact. Soils in the Project area consist of clays with a flat terrain and the existing conditions do not pose a risk of instability. Publicly available land subsidence data indicates that there has not been significant vertical displacement in the Project area for the period of 2015 to present [April 2025].[61] While subsidence has not been an issue to date in the Butte and Sutter Subbasins, increases in groundwater pumping which may occur for groundwater substitution transfers under the Project, could create conditions that result in increased inelastic land subsidence. The GSPs for the Butte and Sutter Subbasins both indicate that inelastic land subsidence is not anticipated to be a concern through the implementation of SGMA. The GSPs include definitions of undesirable results, interim milestones, and minimum thresholds that specify the progress towards achieving sustainability goals around subsidence. Implementation of these GSPs will prevent significant impacts resulting from subsidence. The Project is consistent with the conditions evaluated within the GSPs and will not impede implementation of the GSPs as currently written. Should conditions change, the GSPs can be rewritten, or new policies could be adopted to address potential undesirable results. Based on the lack of historic challenges and existing regulations, the potential impacts are expected to be less than significant. No further discussion or evaluation of this topic is provided in the EIR.

### d) Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

No Impact. The Project does not involve the construction or development of facilities that could be impacted by expansive soil and would therefore not create substantial direct or indirect risks to life or property. As such, there would be no impact. No further discussion or evaluation of this topic is provided in the EIR.

### e) Would the project have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

No Impact. The Project does not involve the use of septic tanks or alternative wastewater treatment disposal systems to handle wastewater generation. Therefore, there would be no impact. No further discussion or evaluation of this topic is provided in the EIR.

[59] (United States Department of Agriculture, 1993)
[60] (United States Department of Agriculture, n.d.)
[61] (California Department of Water Resources, n.d.)

### f) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geological feature?

No Impact. There would be no construction or earthmoving activities associated with implementation except for the drilling of a new well. The new well would be installed on land that has been actively used for agriculture and is immediately adjacent to an existing District canal. As such, there would be no impact. No further discussion or evaluation of this topic is provided in the EIR.

# 6.11 GREENHOUSE GAS EMISSIONS

Table 6-11: Greenhouse Gas Emissions Impacts

| Would the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? | ☐ | ☐ | ☒ | ☐ |
| b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? | ☐ | ☐ | ☐ | ☒ |

## 6.11.1 BASELINE CONDITIONS

Commonly identified GHG emissions and sources include the following:

Carbon dioxide ($CO_2$) is an odorless, colorless natural greenhouse gas. $CO_2$ is emitted from natural and anthropogenic sources. Natural sources include the following: decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic out gassing. Anthropogenic sources include the burning of coal, oil, natural gas, and wood.

Methane ($CH_4$) is a flammable greenhouse gas. A natural source of methane is the anaerobic decay of organic matter. Geological deposits, known as natural gas fields, also contain methane, which is extracted for fuel. Other sources are from landfills, fermentation of manure, and ruminants such as cattle.

Nitrous oxide ($N_2O$), also known as laughing gas, is a colorless greenhouse gas. Nitrous oxide is produced by microbial processes in soil and water, including those reactions that occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load.

Water vapor is the most abundant, and variable greenhouse gas. It is not considered a pollutant; in the atmosphere, it maintains a climate necessary for life.

Ozone ($O_3$) is known as a photochemical pollutant and is a greenhouse gas; however, unlike other greenhouse gases, ozone in the troposphere is relatively short-lived and, therefore, is not global in nature. Ozone is not emitted directly into the atmosphere but is formed by a complex series of chemical reactions between volatile organic compounds, nitrogen oxides, and sunlight.

Aerosols are suspensions of particulate matter in a gas emitted into the air through burning biomass (plant material) and fossil fuels. Aerosols can warm the atmosphere by absorbing and emitting heat and can cool the atmosphere by reflecting light.

Chlorofluorocarbons (CFCs) are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the earth's surface). CFCs were first synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. CFCs destroy stratospheric ozone; therefore, their production was stopped as required by the Montreal Protocol in 1987.

Hydrofluorocarbons (HFCs) are synthetic chemicals that are used as a substitute for CFCs. Of all the greenhouse gases, HFCs are one of three groups (the other two are perfluorocarbons and sulfur

hexafluoride) with the highest global warming potential. HFCs are human-made for applications such as air conditioners and refrigerants.

Perfluorocarbons (PFCs) have stable molecular structures and do not break down through the chemical processes in the lower atmosphere; therefore, PFCs have long atmospheric lifetimes, between 10,000 and 50,000 years. The two main sources of PFCs are primary aluminum production and semiconductor manufacture.

Sulfur hexafluoride ($SF_6$) is an inorganic, odorless, colorless, nontoxic, nonflammable gas. It has the highest global warming potential of any gas evaluated. Sulfur hexafluoride is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

There are uncertainties as to exactly what the climate changes will be in various local areas of the earth, and what the effects of clouds will be in determining the rate at which the mean temperature will increase. There are also uncertainties associated with the magnitude and timing of other consequences of a warmer planet: sea level rise, spread of certain diseases out of their usual geographic range, the effect on agricultural production, water supply, sustainability of ecosystems, increased strength and frequency of storms, extreme heat events, air pollution episodes, and the consequence of these effects on the economy.

Emissions of GHGs contributing to global climate change are largely attributable to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. About three-quarters of human emissions of $CO_2$ to the global atmosphere during the past 20 years are due to fossil fuel burning. Atmospheric concentrations of $CO_2$, $CH_4$, and $N_2O$ have increased 31 percent, 151 percent, and 17 percent respectively since the year 1750 (CEC 2008). GHG emissions are typically expressed in carbon dioxide-equivalents ($CO_2e$), based on the GHG's Global Warming Potential (GWP). The GWP is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere. For example, one ton of $CH_4$ has the same contribution to the greenhouse effect as approximately 21 tons of $CO_2$. Therefore, $CH_4$ is a much more potent GHG than $CO_2$.

## 6.11.2 APPLICABLE REGULATIONS

### 6.11.2.1 FEDERAL

#### FEDERAL CLEAN AIR ACT

EPA is the federal agency responsible for executing the federal CAA and its amendments. In 2007, the U.S. Supreme Court ruled that $CO_2$ is an air pollutant, as defined under the CAA, and thus the EPA has the authority to regulate GHG emissions. The ruling resulted in the EPA taking steps to regulate GHG emissions and lend support to State and local agencies in their efforts to reduce GHG emissions.

### 6.11.2.2 STATE

#### EXECUTIVE ORDER S-3-05

In 2005, Governor Schwarzenegger issued EO S-3-05, proclaiming that California is vulnerable to the impacts of climate change. The EO declares that increasing temperatures could reduce the Sierra Nevada snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To address those concerns, the EO established GHG emission targets for the State and identified responsibilities for State agencies in meeting the targets. Specifically, statewide emissions are to be reduced to 2000 levels by 2010, 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

### ASSEMBLY BILL 32

In 2006, AB 32, the California Global Warming Solutions Act of 2006, was signed into law. AB 32 establishes regulations, reporting requirements, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. AB 32 also requires that:

(a) the statewide greenhouse gas emissions limit shall remain in effect unless otherwise amended or repealed.

(b) It is the intent of the Legislature that the statewide greenhouse gas emissions limit continue in existence and be used to maintain and continue reductions in emissions of greenhouse gases beyond 2020.

(c) The [CARB] shall make recommendations to the Governor and the Legislature on how to continue reductions of greenhouse gas emissions beyond 2020. [California Health and Safety Code, Division 25.5, Part 3, Section 38551]

### EXECUTIVE ORDER B-30-15

In 2015, Governor Brown issued EO B-30-15 which established a California GHG reduction target of 40 percent below 1990 levels by 2030. This emission reduction target of 40 percent below 1990 levels by 2030 set the next interim step in the State's continuing efforts to pursue the long-term target previously established under EO S-3-05 to reach the goal of reducing emissions 80 percent below 1990 levels by 2050. This is consistent with scientifically established levels needed in the U.S. to limit global warming below two degrees Celsius, the threshold at which major climate disruptions are projected, such as super droughts and rising sea levels.

### SENATE BILL 32

In 2016, SB 32 was signed into law and serves to extend California's GHG reduction programs beyond 2020. SB 32 amended existing regulations to authorize CARB to achieve a statewide GHG emission reduction of at least 40 percent below 1990 levels by no later than December 31, 2030, codifying the 2030 target established by EO B-30-15.

### SENATE BILL 100

In 2018, SB 100 increased California's Renewable Energy Portfolio targets for utility companies to 52 percent renewables by 2027 and 60 percent renewables by 2030. It also established a new zero-carbon electricity mandate by 2040.

### SENATE BILL 97

SB 97, enacted in 2007, amended the CEQA statute to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. The legislation directed the California Office of Planning and Research to develop draft CEQA Guidelines "for the mitigation of GHG emissions or the effects of GHG emissions" and directed the California Natural Resources Agency to certify and adopt the State CEQA Guidelines. CEQA Guidelines Section 15183.5, Tiering and Streamlining the Analysis of GHG Emissions, was added as part of the CEQA Guideline amendments that became effective in 2010 and describes the criteria needed in a GHG reduction plan that would allow for the tiering and streamlining of CEQA analysis for development projects.

### CLIMATE CHANGE SCOPING PLAN

In 2022, the CARB adopted the 2022 Scoping Plan, which provides a framework for achieving the State's 2030 GHG emissions reduction target of 40 percent below 1990 levels and substantially advance toward our 2045 climate goal to reduce GHG emissions by 85 percent below 1990 levels. The 2022 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program, and implementation of recently adopted policies and legislation. The 2022 Scoping Plan includes

a wide variety of goals related to energy efficiency and renewable energy that are intended to help meet the State's targets.[62]

### 6.11.3 THRESHOLDS OF SIGNIFICANCE

In accordance with Appendix G of the State CEQA Guidelines, increased GHG emissions associated with the implementation of the Project would be considered significant if it would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

### 6.11.4 IMPACT ANALYSIS

#### 6.11.4.1 PROJECT RELATED EMISSIONS

Short-term construction emissions associated with the Project were calculated using CalEEMod, Version 2022.1.1.30. The emissions modeling includes emissions generated by off-road equipment, haul trucks, and worker commute trips. Emissions were quantified based on an anticipated construction schedule of approximately six months for the installation of the new well. Remaining assumptions were based on the default parameters contained in the model. Modeling assumptions and output files are included in Appendix B. Estimated construction-generated emissions are summarized in Table 6-12. GHGs impact the environment over time as they increase and contribute to climate change. As discussed in Section 6-9, the amount of operational related emissions generated would be considered negligible.

Table 6-12: Short-term Construction Related GHG Emissions

| | Emissions (MT CO2e) in Tons per Year |
|---|---|
| Maximum Annual Construction $CO_2e$ Emissions | 67.06 |
| AB 32 Consistency Threshold for Land-Use Development Projects* | 1,100 |
| AB 32 Consistency Threshold for Stationary Source Projects* | 10,000 |
| Threshold Exceeded? | No |

* As published in the Bay Area Air Quality Management District's CEQA Air Quality Guidelines. Available online at http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed 09/10/2025.

Construction related generation of GHGs would be a maximum of 67.06 Metric Tons of Carbon Dioxide Equivalent ($MTCO_2e$) per year. While some operational emissions could result from the Project, this quantity would be negligible. The Project would not exceed the AB 32 consistency threshold for land use projects for both short term construction emissions and long-term operational emissions as a result.

a) Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

**Less than Significant Impact.** The Project would idle cropland acreage within BWD's boundaries. While some field work may occur in idled fields by participating landowners, it is expected that substantially less field work would occur as a result of the Project than compared to existing conditions. By idling the land, less farm equipment would be utilized and less greenhouse gas would be emitted. However, a third well is anticipated to be installed as part of the Project. GHG emissions would be generated during construction, but they would dissipate in quantity as time passes. Moreover, the Project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. As shown in Table 6-12, the Project construction would not result in the generation of GHG emissions that would exceed the AB 32 consistency threshold of 1,100 $MTCO_2e$ annually during

[62] (California Air Resources Board, 2022)

construction activities. Therefore, impacts would be less than significant. No further discussion or evaluation of this topic is provided in the EIR.

### b) Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

**No Impact.** The Project would not exceed the threshold for $CO_2e$ emissions. The Project does not include a change in land use. As such, the Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. The Project would be in compliance with all FRAQMD and BCAQMD policies and regulations and would not exceed an applicable threshold for GHG emissions. There would be no impact. No further discussion or evaluation of this topic is provided in the EIR.

# 6.12 HAZARDS AND HAZARDOUS MATERIALS

Table 6-13: Hazards and Hazardous Materials Impacts

| Would the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | 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? | ☐ | ☐ | ☒ | ☐ |
| 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? | ☐ | ☐ | ☒ | ☐ |
| c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? | ☐ | ☐ | ☐ | ☒ |
| 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? | ☐ | ☐ | ☐ | ☒ |
| 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 or excessive noise for people residing or working in the project area? | ☐ | ☐ | ☐ | ☒ |
| f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? | ☐ | ☐ | ☐ | ☒ |
| g) Expose people or structures, either directly or indirectly to a significant risk of loss, injury or death involving wildland fires? | ☐ | ☐ | ☐ | ☒ |

## 6.12.1 BASELINE CONDITIONS

### 6.12.1.1 HAZARDOUS MATERIALS

The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies, and developers to comply with CEQA requirements in providing information about the location of hazardous materials release sites. Government Code Section 65962.5 requires the California Environmental Protection Agency (CalEPA) to develop at least annually an updated Cortese List. The Department of Toxic Substances Control (DTSC) is responsible for a portion of the information contained in the Cortese List. Other State and local government agencies are required to provide additional hazardous material release information for the Cortese List. DTSC's EnviroStor database provides DTSCs component of Cortese List data. In addition to the EnviroStor database, the SWRCB Geotracker database provides

information on regulated hazardous waste facilities in California, including underground storage tank (UST) cases and non-UST cleanup programs, including Spills-Leaks-Investigations-Cleanups sites, Department of Defense sites, and Land Disposal program. A search of the DTSC EnviroStor database and the SWRCB Geotracker performed on August 8, 2025, determined that there are three active hazardous waste generators or hazardous material spill sites within the BWD District boundaries, two of which are immediately adjacent to Highway 99:

- WILSON FAMILY FARM RANCH LLC (T10000008612). On March 5, 2016, there was a release of 200-300 gallons of red dyed diesel due to a tree falling on an UST (storm related) at a ranch located at 661 East Evans Reimer Road, Gridley. Emergency responders applied absorbent sweep to impacted soil area at a low spot in an orchard. The case is presently still open after an assessment and interim remedial action as of March 5, 2016.
- WILBUR-ELLIS CO, FORMERLY JOHN TAYLOR FERTILIZER VNP SITE (T10000017080). Located along Highway 99 in Gridley, this case is still considered open after verification monitoring as of May 17, 2021.
- WILBUR-ELLIS CO. (537 MEYERS AVE, GRIDLEY) (T10000017079). Located immediately adjacent to Highway 99 in Gridley, a site assessment was performed on May 16, 2021, for the still-considered open case.

## 6.12.2 APPLICABLE REGULATIONS

### 6.12.2.1 FEDERAL

#### RESOURCE CONSERVATION AND RECOVERY ACT

The 1976 Federal Resource Conservation and Recovery Act (RCRA) and the 1984 RCRA Amendments regulate the treatment, storage, and disposal of hazardous and non-hazardous wastes. The legislation mandated that hazardous wastes be tracked from the point of generation to their fate in the environment. This includes detailed tracking of hazardous materials during transport and permitting of hazardous material handling facilities.

The 1984 RCRA amendments provided the framework for a regulatory program designed to prevent releases from USTs. The program establishes tank and leak detection standards, including spill and overflow protection devices for new tanks. Tanks must also meet performance standards to ensure that stored material will not corrode their tanks.

#### COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) introduced active federal involvement in emergency response, site remediation, and spill prevention, most notably the Superfund program. The Act was intended to be comprehensive in encompassing both the prevention of, and response to, uncontrolled hazardous substances releases. CERCLA deals with environmental response, providing mechanisms for reacting to emergencies and to chronic hazardous material releases. In addition to establishing procedures to prevent and remedy problems, it establishes a system for compensating appropriate individuals and assigning appropriate liability.

#### OCCUPATIONAL SAFETY AND HEALTH ACT

The Occupational Safety and Health Act is intended to ensure worker and workplace safety by requiring that employers provide their workers a place of employment free from recognized health hazards, such as exposure to toxic chemicals, excessive noise levels, mechanical dangers, heat or cold stress, and unsanitary conditions. The Occupational Safety and Health Administration (OSHA) is a division of the United States Department of Labor that oversees the administration of the act and enforces standards in all 50 states.

#### TOXIC SUBSTANCES CONTROL ACT

The Toxic Substances Control Act (TSCA) provides the USEPA with authority to require reporting, record-keeping, testing requirements, and restrictions relating to chemical substances and mixtures. The TSCA addresses the production, importation, use, and disposal of specific chemicals, including PCBs, asbestos, radon, and lead-based paint.

#### EMERGENCY PLANNING COMMUNITY RIGHT-TO-KNOW ACT

The Emergency Planning Community Right-to-Know Act (EPCRA), also known as Superfund Amendments and Reauthorization Act (SARA) Title III, was enacted in October 1986. This law requires any infrastructure at the State and local levels to plan for chemical emergencies.

Reported information is then made publicly available so that interested parties may become informed about potentially dangerous chemicals in their community. EPCRA Sections 301 through 312 are administered by the USEPA Office of Emergency Management. The USEPA Office of Information Analysis and Access implements the EPCRA Section 313 program. In California, SARA Title III is implemented through the California Accidental Release Program.

#### FEDERAL IMPLEMENTING AGENCIES

Several federal agencies regulate hazardous substances. These agencies include the USEPA, OSHA, and the USDOT. The role and authority of each agency is described below.

#### UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

The USEPA implements laws and regulations to ensure the safe production, handling, disposal, and transportation of hazardous materials. Many of these regulations are enforced by CalEPA.

#### OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

OSHA oversees the administration of the Occupational Safety and Health Act, which requires specific training for hazardous materials handlers, provision of information to employees who may be exposed to hazardous materials, and acquisition of Safety Data Sheets (SDS) (formerly Material Safety Data Sheets) from materials manufacturers. The SDSs describe risks, as well as proper handling and procedures, related to particular hazardous materials. Employee training must include response and remediation procedures for hazardous materials releases and exposures.

### 6.12.2.2 STATE

#### CALIFORNIA CODE OF REGULATIONS

Title 3 of the CCR pertains to the application of pesticides and related chemicals. Parties applying regulated substances must continuously evaluate application equipment, weather, the treated lands, and all surrounding properties. Title 3 prohibits any application that would:

- Contaminate persons not involved in the application
- Damage non-target crops or animals or any other public or private property
- Contaminate public or private property or create health hazards on said property

Title 8 of the CCR establishes Cal/OSHA requirements related to public and worker protection. Topics addressed in Title 8 include materials exposure limits, equipment requirements, protective clothing, hazardous materials, and accident prevention.

Construction safety and exposure standards for lead and asbestos are set forth in Title 8.

Title 14 of the CCR establishes minimum standards for solid waste handling and disposal.

Title 17 of the CCR establishes regulations relating to the use and disturbance of materials containing naturally occurring asbestos.

Title 22 of the CCR sets forth definitions of hazardous waste and special waste. The section also identifies hazardous waste criteria and establishes regulations pertaining to the storage, transport, and disposal of hazardous waste. Title 22 was created to regulate the hazardous wastes generated by factories or similar sources, but soil excavated during construction may also be regulated.

Title 26 of the CCR pertains to hazardous materials and waste that are presented in other regulatory sections. Title 26 mandates specific management criteria related to hazardous materials identification, packaging, and disposal. In addition, Title 26 establishes requirements for hazardous materials transport, containment, treatment, and disposal. Staff training standards are also set forth in Title 26.

Title 27 of the CCR sets forth a variety of regulations relating to the construction, operation, and maintenance of the State's landfills. The title establishes a landfill classification system and categories of waste. Each class of landfill is constructed to contain specific types of waste (household, inert, special, and hazardous).

#### CALIFORNIA HEALTH AND SAFETY CODE AND CODE OF REGULATIONS

HSC Chapter 6.95 and California Code of Regulations, Title 19, Section 2729 set out the minimum requirements for business emergency plans and chemical inventory reporting. These regulations require businesses to provide emergency response plans and procedures, training program information, and a hazardous material chemical inventory disclosing hazardous materials stored, used, or handled on-site. A business that uses hazardous materials or a mixture containing hazardous materials must establish and implement a business plan if the hazardous material is handled in certain quantities.

#### CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

One of the primary agencies that regulate hazardous materials is the CalEPA. The State, through CalEPA, is authorized by the USEPA to enforce and implement certain federal hazardous materials laws and regulations. The DTSC, a department of CalEPA, protects California and Californians from exposure to hazardous waste, primarily under the authority of the RCRA and the California Health and Safety Code. The DTSC requirements include the need for written programs and response plans, such as Hazardous Materials Business Plans. The DTSC programs include dealing with aftermath clean-ups of improper hazardous waste management, evaluation of samples taken from sites, enforcement of regulations regarding use, storage, and disposal of hazardous materials, and encouragement of pollution prevention.

#### CALIFORNIA DIVISION OF OCCUPATIONAL SAFETY AND HEALTH

Like OSHA at the federal level, Cal/OSHA is the State-level agency responsible for ensuring workplace safety. Cal/OSHA assumes primary responsibility for the adoption and enforcement of standards regarding workplace safety and safety practices. If a site is contaminated, a Site Safety Plan is prepared and implemented to protect the safety of workers. Site Safety Plans establish policies, practices, and procedures to prevent the exposure of workers and members of the public to hazardous materials originating from the contaminated site or building.

### 6.12.2.3 LOCAL

#### SUTTER COUNTY EMERGENCY OPERATIONS PLAN[63]

The County of Sutter Emergency Operations Plan addresses the County's planned response to extraordinary emergency situations associated with natural disasters, technical incidents, and national security emergencies in or affecting the Sutter Operational Area. This plan does not apply to normal day-to-day emergencies, or the established departmental procedures used to cope with such emergencies. Rather, this plan focuses on operational concepts and would be implemented relative to large-scale disasters, which can pose major threats to life, property, and the environment requiring unusual emergency responses.

[63] (Sutter County Office of Emergency Management, 2022)

#### BUTTE COUNTY EMERGENCY RESPONSE PLAN[64]

The Butte County Emergency Operations Plan addresses the County planned response to extraordinary emergency situations associated with natural disasters, technological incidents and national security emergencies in or affecting the Butte County Operational Area which includes the unincorporated areas of the County of Butte and the incorporated areas of the Cities of Chico, Oroville, Gridley, Biggs, and the Town of Paradise. This plan does not apply to normal day-to-day emergencies or the established departmental procedures used to cope with such emergencies. Rather, this plan focuses on operational concepts and would be implemented relative to large-scale disasters which can pose major threats to life, property and the environment requiring unusual emergency responses.

### 6.12.3 THRESHOLDS OF SIGNIFICANCE

The impact analysis is based on an assessment of baseline conditions for the Project area, including locations of hazardous materials use and storage, existing contaminated sites, air traffic hazards, and emergency response and evacuation plan requirements. This analysis identifies potential impacts based on the predicted interaction between the affected environment and construction, operation, and maintenance activities related to the Project. This section describes impacts in terms of location, context, duration, and intensity.

State CEQA Guidelines Appendix G provides the following screening criteria to evaluate potential impacts related to hazards and hazardous materials. The Project would have a significant impact if it would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- 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;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to GC Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment;
- 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 or excessive noise for people residing or working in the project area;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan;
- Expose people or structures, either directly or indirectly to a significant risk of loss, injury or death involving wildland fires.

### 6.12.4 IMPACT ANALYSIS

a) Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

b) Would the project 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?

a) and b) Less than Significant Impact. Project construction, which only includes the construction of a new well, would involve the storage, use, and transport of hazardous materials (e.g., asphalt, fuel, lubricants, and other substances) on roadways. Operations for the Project would not require the storage, use, or

[64] (Butte County Office of Emergency Management, 2022)

transport of hazardous materials. Regulations governing hazardous materials transport are provided in Title 22 of the CCR and the California Vehicle Code (Title 13 CCR). Any potential accidental hazardous materials spills during Project construction are the responsibility of the contractor to remediate in accordance with industry BMPs and State and Sutter County regulations. As such, any impacts would be less than significant. No further discussion or evaluation of this topic is provided in the EIR.

c) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

No Impact. Construction of the well would not be within one-quarter mile of an existing or proposed school. There would be no impact. No further discussion or evaluation of this topic is provided in the EIR.

d) Would the project 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?

No Impact. On August 8, 2025, an EnviroStor and GeoTracker search was done for the Project area. The search determined that there are three active hazardous waste generators or hazardous material spill sites within the BWD District boundaries. However, two of the three sites are immediately adjacent to Highway 99, and none of the three are near lands that would have the potential to be idled for the Project. Moreover, construction of the new well would not occur near the sites. As such, there would be no impact. No further discussion or evaluation of this topic is provided in the EIR.

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 or excessive noise for people residing or working in the project area?

No Impact. The Project would not result in a safety hazard or excessive noise for people residing or working in the Project area as it would not result in any additional people residing or working in the Project area. There would be no impact. No further discussion or evaluation of this topic is provided in the EIR.

f) Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

No Impact. The Project would use existing conveyance systems to transfer water and would not interfere with the emergency response and evacuation procedures outlined in the Sutter County Emergency Operations Plan and the Butte County Emergency Response Plan. These plans and procedures establish the Standardized Emergency Management System required by State law, and include information on mutual aid agreements, hierarchies of command, and different levels of response in emergency situations. There would be no impact. No further discussion or evaluation of this topic is provided in the EIR.

g) Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

No Impact. According to the California Department of Forestry and Fire (CalFIRE) Prevention Fire Hazard Severity Zones Map, the Project site is not located in a Very High Fire Hazard Severity Zone.[65] Therefore,

[65] (CalFIRE, 2024)

the Project would not be exposed to risks from wildland fires. There would be no impact. No further discussion or evaluation of this topic is provided in the EIR.

# 6.13 HYDROLOGY AND WATER QUALITY

Table 6-14: Hydrology and Water Quality Impacts

| Would the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality? | ☒ | ☐ | ☐ | ☐ |
| b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin? | ☒ | ☐ | ☐ | ☐ |
| c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: | | | | |
| i. result in substantial erosion or siltation on- or off-site; | ☐ | ☐ | ☒ | ☐ |
| ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site; | ☐ | ☐ | ☒ | ☐ |
| iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or | ☐ | ☐ | ☒ | ☐ |
| iv. impede or redirect flood flows? | ☐ | ☐ | ☒ | ☐ |
| d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation? | ☐ | ☐ | ☐ | ☒ |
| e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan? | ☒ | ☐ | ☐ | ☐ |

## 6.13.1 BASELINE CONDITIONS

### 6.13.1.1 FEATHER RIVER SYSTEM

Oroville Reservoir holds winter and spring runoff for release into the Feather River. During wet years, Oroville Reservoir aids in reducing downstream flooding. The current reservoir was formed in 1969 after the construction of the Oroville Dam and is primarily filled from inflows from the North Fork, Middle Fork, and South Forks of the Feather River. DWR owns and operates the dam as part of the SWP. Oroville Reservoir has a capacity of 3.5 million AF at an elevation of 900 feet and a surface area of 15,810 acres.[66] Water from Oroville Reservoir is released to meet downstream demands, export demands, generate power

[66] (California Department of Water Resources, n.d.)

at the Hyatt Powerplant beneath Oroville Dam and at the Thermalito Powerplant and to support downstream fisheries and water quality objectives.

Oroville Reservoir is a key unit in the SWP but also provides flood control for upper portions of the Feather River watershed including Marysville, Yuba City, Oroville, and smaller communities through coordinated flood operations with New Bullards Bar Reservoir or the North Yuba River. Controlled releases from Oroville Reservoir and New Bullards Bar Reservoir combine downstream with flows from the Yuba and Bear Rivers to create the largest tributary to the Sacramento River downstream of Shasta Reservoir. Dam operations follow a Water Control Plan that include a maximum flood control space of 750,000 AF and a minimum of 375,000 AF by mid-October each year, as set by USACE. The USACE also sets downstream flow limits of 150,000 cfs north of Honcut Creek, 180,000 cfs above the mouth of the Yuba River, and 320,000 cfs south of the Bear River.[67]

On February 7, 2017, during normal flood operations, the Oroville Dam Flood Control Outlet spillway was damaged. Starting in May of 2017, DWR and construction contractors started repairing and rebuilding Oroville's main and emergency spillways. The main spillway was successfully repaired by November 1, 2017 to function as a flood control outlet if needed in the winter. The main spillway was fully reconstructed to final design specifications in 2018.

The Thermalito Afterbay is downstream of Oroville Reservoir and the Thermalito Forebay. It has a maximum operating storage of 57,040 AF. Thermalito Afterbay provides storage for the water required by the pumpback operation to Oroville Reservoir, serves as a warming basin and point of delivery for agricultural water delivered to farms primarily south and west of the afterbay, and produces controlled flow in the Feather River.[68]

The main stem of the Feather River begins downstream of Oroville Dam and generally flows in a south and southwest direction. Long portions of the Feather River have levees on both sides of its banks. On the east bank a levee extends from the confluence with the Sacramento River to Hamilton Bend near the City of Oroville. The west bank extends from the Sacramento River confluence to Honcut Creek. The Feather River design channel capacity from Thermalito Afterbay to the Yuba River is 210,000 cfs and is 300,000 cfs from the Yuba River to the Bear River.[69]

### BUTTE WATER DISTRICT

Butte Water District is a California Water District formed and responsible for providing irrigation water to agricultural water users within its service area and boundary. The District, along with Biggs-West Gridley Water District, Richvale Irrigation District, and Sutter Extension Water District, organized to form the Joint Water Districts Board. In 1969 the Joint Water Districts entered into a settlement agreement with the State regarding their right to divert water from the Feather River. The 1970 Joint Operating Agreement, with the Joint Water Districts, allocates the diversion of water to the Joint Water Districts. BWD may divert up to 133,200 AF of water during the defined irrigation season from the Thermalito Afterbay, part of the Oroville Complex.

### CALIFORNIA DEPARTMENT OF WATER RESOURCES

The DWR is the manager of the SWP which is a multi-purpose water storage and delivery system that extends more than two-thirds the length of California, delivering clean water to over 27 million Californians, 750,000 acres of farmland, and businesses throughout the State.[70] Lake Oroville and the Thermalito Afterbay are component parts of the SWP system, in the Oroville Field Division. The Thermalito Afterbay is an offstream reservoir and provides storage for the water required by pumpback operations to Lake

[67] (California Department of Water Resources, n.d.)
[68] (Federal Energy Regulatory Commission, 2007)
[69] (California Department of Water Resources, 2022)
[70] (California Department of Water Resources, n.d.)

Oroville, helps regulate the power system, produces a controlled flow in the Feather River, provides recreation, and serves to warm water for rice irrigation.[71]

#### 6.13.1.2 SACRAMENTO RIVER SYSTEM

Shasta Reservoir is the primary reservoir providing flood protection on the upper Sacramento River. The reservoir was formed in 1948 after the construction of the Shasta Dam and is primarily filled from inflows from the Sacramento, Pit, and McCloud Rivers. The United States Bureau of Reclamation (USBR) owns and operates the dam and reservoir as part of the CVP. Shasta Reservoir has a capacity of 4.55 million AF.[72]

Shasta Dam provides flood control for downstream communities along the Sacramento River and water storage for irrigation in the Sacramento and San Joaquin Valleys. The normal operating water level at the dam is 522.5 feet. The dam's outlets have a combined capacity of 81,800 cfs at a water level of 1,065 feet.[73] Dam operations include a maximum flood control space of 1.3 million AF. This capacity must be available starting October 1 in anticipation of winter storms. Large winter rainstorms historically result in maximum flows between December and March.[74] Water releases are required to provide suitable conditions for the conservation of salmon in the Sacramento River. In 1997, USBR built a temperature control device that allows water releases at temperature suitable for downstream salmon.

About nine miles downstream of Shasta Dam is Keswick Dam, which helps reregulate flow releases for the power plants. Keswick Dam's normal operating hydraulic level is 587 feet with a maximum of 601.6 feet. At normal operating level, the total water storage is 23,800 AF with a release capacity of 250,000 cfs at the dam's outlets.[75]

Downstream of Shasta Reservoir, the Sacramento River flows southwards to the Delta. The Sacramento River system is leveed from Ord Ferry to the southern tip of Sherman Island in the Delta. Flood control on the Sacramento River system is also managed by a system of weirs and bypasses constructed by the USACE. The system includes five bypasses: the Butte Basin, Sutter Bypass, Yolo Bypass, Tisdale Bypass, and Sacramento Bypass. Moulton and Colusa Weirs feed floodwaters into the Butte Basin Bypass, Tisdale Weir flows into Sutter Bypass, and Fremont Weir and Sacramento Bypass flow into the Yolo Bypass. The Yolo Bypass carries five-sixths of the volume of the Sacramento River at peak flood flows. The bypasses are large tracts of undeveloped or minimally-developed land. Development within the bypasses typically is limited to agricultural activities that require minimal infrastructure. Water released to the bypass system flows south into the Delta, in effect creating a short-term storage system for the floodwaters. Water released to the bypass system also infiltrates into the ground, recharging groundwater supplies, although this volume is small compared to the total volume of a flood. When flooding occurs, the weir and bypass system diverts water to protect the levee system and free flood storage capacity in the reservoirs. The Sacramento River levee and bypass system has a maximum conveyance capacity of 600,000 cfs, which is much greater than the capacity of the actual Sacramento River channel. Approximately 110,000 cfs is conveyed in the river and almost 500,000 cfs is channeled into the Yolo Bypass.[76]

[71] Ibid.
[72] (United States Bureau of Reclamation, n.d.)
[73] Ibid.
[74] (United States Army Corps of Engineers, 1999)
[75] (United States Bureau of Reclamation, n.d.)
[76] (California Department of Water Resources, n.d.)

## 6.13.2 APPLICABLE REGULATIONS

### 6.13.2.1 FEDERAL

#### CLEAN WATER ACT

The CWA is intended to restore and maintain the chemical, physical, and biological integrity of the nation's waters (33 CFR 1251). The regulations implementing the CWA protect Waters of the United States including streams and wetlands (33 CFR 328.3). The CWA requires states to set standards to protect, maintain, and restore water quality by regulating point source and some non-point source discharges. Under Section 402 of the CWA, the NPDES permit process was established to regulate these discharges. The CWA also provides an exemption from the NPDES permitting process for agricultural return flows, which are to be regulated by the State. Such flows are regulated under the California Porter-Cologne Water Quality Act. Both types of permits--NPDES and those for exempt flows under the CWA--are issued by the State.

#### SAFE DRINKING WATER ACT

The federal SDWA was enacted in 1974 and authorized the USEPA to establish safe standards of purity for naturally-occurring and man-made contaminants. It requires all owners or operators of public water systems to comply with primary (health-related) standards and encourages attainment of secondary standards (nuisance-related). Contaminants of concern in a domestic water supply are those that either pose a health threat or in some way alter the aesthetic acceptability of the water. These types of contaminants are currently regulated by the USEPA through primary and secondary MCLs. As directed by the SDWA amendments of 1986, the USEPA has been expanding its list of primary MCLs. MCLs have been proposed or established for approximately 100 contaminants. In California, the USEPA has delegated SDWA powers to the state government.

#### NATIONAL FLOOD INSURANCE ACT

The National Flood Insurance Act (1968) makes available federally subsidized flood insurance to owners of flood-prone properties. To facilitate identifying areas with flood potential, FEMA has developed FIRM that can be used for planning purposes.

### 6.13.2.2 STATE

#### PORTER-COLOGNE WATER QUALITY CONTROL ACT

The SWRCB, located in Sacramento, is the agency with jurisdiction over water quality issues in the State of California. The SWRCB is governed by the Porter-Cologne Water Quality Act (Division 7 of the California Water Code), which establishes the legal framework for water quality control activities by the SWRCB. The intent of the Porter-Cologne Act is to regulate factors which may affect the quality of waters of the State to attain the highest quality which is reasonable, considering a full range of demands and values. The State implements water quality by establishing Basin Plans, which determine the protected beneficial uses and required water quality objectives in different designated basins. The implementation of Basin Planning and the issuing of permits is delegated by the SWRCB to its nine RWQCB. The Project site is regulated by the Central Valley RWQCB Region 5.

#### REGIONAL WATER QUALITY CONTROL PLANS

California Water Code (Section 13240) requires the preparation and adoption of water quality control plans (Basin Plans), and the Federal CWA (Section 303) supports this requirement. According to Section 13050 of the California Water Code, Basin Plans consist of a designation or establishment of beneficial uses to be protected, water quality objectives to protect those uses, and an implementation program for achieving the objectives. Because beneficial uses, together with their corresponding water quality objectives, can be defined per Federal regulations as water quality standards, the Basin Plans are regulatory references for meeting the State and Federal requirements for water quality control (40 Code of Federal Regulations 131.20).

Basin Plans present water quality objectives in numerical or narrative format for specified water bodies or for protection of specified beneficial uses throughout a specific basin or region. State law defines beneficial uses to include (but not be limited to) "...domestic; municipal; agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves" (Water Code Section 13050(f)).

#### SWRCB DECISION 1641

SWRCB Decision-1641 and Water Right Order 2001-05 describe the current water right requirements to implement the flow-dependent objectives outlined in the Bay-Delta Plan. In SWRCB Decision-1641, the SWRCB assigned responsibilities to Reclamation and DWR for meeting these requirements. These responsibilities require that the CVP and SWP be operated to protect water quality, and that DWR and/or Reclamation ensure that the flow dependent water quality objectives are met in the Delta (SWRCB 2000).

#### SUSTAINABLE GROUNDWATER MANAGEMENT ACT

In 2014, DWR enacted SGMA as directed by a three-bill legislative package composed of AB 1739, Senate Bill (SB) 1168, and SB 1319 and signed into law by Governor Jerry Brown. SGMA requires the formation of GSAs and the development and adoption of GSPs. SGMA also requires that basins be prioritized as high-, medium-, low-, or very low-priority based on groundwater conditions, adverse impacts on local habitat, and adverse impacts on local stream flow. DWR identified and finalized the identification of 21 basins/subbasins with critical overdraft conditions in January 2016. SGMA requires that the GSAs of high and medium priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge. High- and medium-priority basins with critical overdraft conditions were required to develop their GSPs by January 31, 2020. The GSPs for the remaining high- and medium-priority basins were required to be developed by January 31, 2022.

Under SGMA, high- and medium-priority basins should reach sustainability within 20 years of implementing their sustainability plans. For critically over-drafted basins, that would be 2040. For the remaining high and medium priority basins, 2042 is the deadline. Under SGMA, the SWRCB may designate a high- or medium-priority basin as probationary, after January 31, 2025, following a determination that the GSP for the basin is inadequate and the GSA has failed to remedy the identified deficiencies within the timeframes afforded under the law. Once a basin is determined to be in probation, the SWRCB may conduct inspections, develop an interim plan that overrides the local GSP, and enforce pumping restrictions.

The Butte and Sutter Subbasins are identified by DWR as medium priority basins.[77]

### 6.13.2.3 LOCAL

#### BUTTE COUNTY GENERAL PLAN 2040

The Butte County General Plan 2040 contains the following goals and policies related to the Project:

##### Water Resources Element

Goal W-1: Maintain and enhance water quality.

Policy W-P1.1: County planning and programs shall be integrated with other watershed planning efforts, including best management practices, guidelines, and policies of the Central Valley Regional Water Quality Control Board (CVRWQCB) and local Groundwater Sustainability Plans.

Policy W-P1.3: Regulations that protect water quality from the impacts of agricultural and industrial activities shall be maintained.

[77] (California Department of Water Resources, 2020)

Goal W-2: Ensure an abundant and sustainable water supply to support all uses in Butte County.

Policy W-P2.1: The County supports solutions to ensure the sustainability of community water supplies.

Policy W-P2.2: The County may continue the Six-County Memorandum of Understanding (MOU) with Colusa, Glenn, Tehama, Shasta, and Sutter Counties, continue participation in the local GSAs and Groundwater Advisory Boards, and continue to support the Northern Sacramento Valley and Upper Feather River Integrated Regional Water Management and local Groundwater Sustainability Plans.

Policy W-P2.3: Water resources shall be planned and managed in a way that relies on sound science, data, and public participation.

Policy W-P2.4: The County's State Water Project allocation (27,500 acre-feet) should be fully utilized within Butte County when technically and economically feasible to maximize the benefit and value to Butte County by prioritizing use within the county.

Policy W-P2.8: The County supports Area of Origin and County of Origin water rights, the existing water right priority system, and the authority to make water management decisions locally to meet the county's current and future needs, thereby protecting Butte County's communities, economy, and environment.

Goal W-3: Protect and manage groundwater resources in Butte County.

Policy W-P3.1: Groundwater transfers and substitution programs shall be locally regulated to protect the sustainability of the County's economy, communities, and ecosystems.

Goal W-4: Support coordination between Groundwater Sustainability Agencies in Butte County.

Policy W-P4.1: The County shall work cooperatively with the Groundwater Sustainability Agencies in the three subbasins in Butte County to support implementation of the Sustainable Groundwater Management Act to ensure the County has sustainable water supplies.

Policy W-P4.2: The County supports working towards Sustainable Groundwater Management Ac implementation to ensure the sustainability of groundwater resources, including groundwater levels, groundwater quality, and avoidance of land subsidence, and supports programs that rely on management at the local level, use sound scientific data, and ensure compliance, where consistent with the County's goals and policies.

Policy W-P4.3: Public information and involvement should be encouraged in the groundwater sustainability planning, collaboration, and coordination process.

Policy W-P4.4: The County shall consult applicable Groundwater Sustainability Plans and local groundwater management agencies when making decisions that could impact groundwater resources.

#### SUTTER COUNTY 2030 GENERAL PLAN

The Sutter County 2030 General Plan contains the following goals and policies related to the Project:

#### Water

Goal ER 6: Preserve and protect the County's surface water and groundwater resources.

Policy ER 6.1: Integrated Water Management Programs. Integrate water management programs that emphasize multiple benefits and balance the needs of agricultural, rural, and urban users.

Policy ER 6.2: Surface Water Resources. Protect the surface water resources in the County including the Sacramento, Feather and Bear Rivers and their significant tributaries.

Policy ER 6.3: Groundwater Sustainability. Protect the sustainability of groundwater resources.

**Policy ER 6.7: Water Rights.** Support the protection of the existing water rights of water agencies and providers within Sutter County. Do not support out-of-area water transfers where they would adversely impact water supply within Sutter County. Support either out-of-area, or in-basin water transfers that would not negatively impact water supply within Sutter County.

### 6.13.3 THRESHOLDS OF SIGNIFICANCE

This section evaluates the anticipated changes in the hydrology and water quality as a result of the Project. State CEQA Guidelines Appendix G provides the following screening criteria to evaluate potential impacts related to hydrology and water quality. The Project would result in a significant impact if it would:

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality;
- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
    - result in substantial erosion or siltation on- or off-site,
    - substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site,
    - create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff, or
    - impede or redirect flood flows;
- Risk release of pollutants due to project inundations in flood hazard, tsunami, or seiche zones; or
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

### 6.13.4 IMPACT ANALYSIS

#### a) Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

**Potentially Significant Impact.** The Project has the potential to affect surface or ground water quality through changes is groundwater pumping under a groundwater substitution transfer. A groundwater technical report will be prepared to analyze the impact of the project on groundwater resources. Any potential impacts and required mitigation will be analyzed further in the EIR.

#### b) Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

**Potentially Significant Impact.** The Project has the potential to decrease groundwater supplies or interfere with groundwater recharge through changes in groundwater pumping under a groundwater substitution transfer. A groundwater technical report will be prepared to analyze the impact of the project on groundwater resources. Any potential impacts and required mitigation will be analyzed further in the EIR.

#### c) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

i. result in substantial erosion or siltation on- or off-site;

ii. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;

iii. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or

iv. impede or redirect flood flows?

Less Than Significant Impact. The Project would not substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner which would result in substantial erosion, siltation on- or off-site, or increase the rate or amount of surface runoff in a manner which would result in flooding on-or off-site. The water transferred would be maintained within existing conveyance and storage systems of DWR. No drainage courses would receive transferred water as a result of the Project. Additionally, the development of the additional groundwater well would not result in any land conversions that would increase surface water runoff. No further discussion or evaluation of this topic is provided in the EIR.

d) Would the project in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundations?

No Impact. The proposed project is not located in a flood hazard, tsunami, or seiche zone. Therefore, there is no risk that the project site would be inundated in a manner that would risk the release of pollutants. No further discussion or evaluation of this topic is provided in the EIR.

e) Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Potentially Significant Impact. The Project is not anticipated to conflict with or obstruct the implementation of a water quality control plan or sustainable groundwater management plan. Under SGMA, GSAs develop, adopt, and implement a GSP for the subbasin. Under the GSP, GSAs monitor groundwater conditions and develop criteria to achieve sustainable groundwater management. Groundwater substitution transfers would involve the extraction of groundwater in lieu of surface water which theoretically has the potential to conflict with provisions under the relevant GSP. The District, as a GSA, will comply with its GSP in executing groundwater substitution transfers. A groundwater technical report will be prepared to analyze the impact of the project on groundwater resources. Any potential impacts and required mitigation will be analyzed further in the EIR.

# 6.14 LAND USE AND PLANNING

Table 6-15: Land Use and Planning Impacts

| Would the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Physically divide an established community? | ☐ | ☐ | ☐ | ☒ |
| b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect? | ☐ | ☐ | ☐ | ☒ |

## 6.14.1 BASELINE CONDITIONS

The District comprises 32,505 acres of land in Butte and Sutter Counties. The lands within the District consist primarily of rice and orchard crops in rural Butte and Sutter Counties surrounding the towns of Gridley, Biggs, Live Oak, and other small, rural communities.

## 6.14.2 APPLICABLE REGULATIONS

### 6.14.2.1 LOCAL

#### SUTTER COUNTY GENERAL PLAN

The Sutter County 2030 General Plan contains policies and implementation measures relevant to the preservation and protection of land use and planning. Relevant goals to the Project include:

LU 2.1: Long-term Conservation. Promote the long-term conservation of agricultural and open space lands in accordance with the goals and policies of the Agricultural Resources and Environmental Resources elements.

#### BUTTE COUNTY GENERAL PLAN

The Butte County General Plan 2040 provides direction on how Butte County will fulfill its community vision and manage its future growth. Relevant goals to the Project include:

LU-P1.1: The County shall protect and conserve land that is used for agricultural purposes, including cropland and grazing land.

## 6.14.3 THRESHOLDS OF SIGNIFICANCE

The analysis in this section focuses on the compatibility of land uses identified in the Project area with applicable land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating environmental impacts. This section also analyzes whether any development facilitated by the Project, or its policies would physically divide the community or conflict with an existing plan or policy aimed at reducing the environmental impact of development.

State CEQA Guidelines Appendix G provides the following screening criteria to evaluate potential impacts related to land use and planning. The Project would have a significant impact if it would:

- Physically divide an established community; or
- Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitting an environmental effect.

### 6.14.4 IMPACT ANALYSIS

a) Would the project physically divide an established community?

No Impact. The Project would not physically divide an established community. The Project would utilize existing water conveyance facilities and is not proposing the construction of any new facilities apart from a single well to be constructed immediately adjacent to a District canal and surrounded by agricultural lands. Therefore, there would be no impact. No further discussion or evaluation of this topic is provided in the EIR.

b) Would the project cause a significant environmental conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

No Impact. The Project would not cause a significant environmental conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. The Project would utilize existing water conveyance facilities and is not proposing the construction of any new facilities apart from a single well to be constructed immediately adjacent to a District canal and surrounded by agricultural lands. The Project would not conflict with any land use planning practices or General Plans. Therefore, there would be no impact. No further discussion or evaluation of this topic is provided in the EIR.

# 6.15 MINERAL RESOURCES

Table 6-16: Mineral Resources Impacts

| Would the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | 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? | ☐ | ☐ | ☐ | ☒ |
| 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? | ☐ | ☐ | ☐ | ☒ |

## 6.15.1 BASELINE CONDITIONS

In Sutter County, the extraction of mineral resources has historically been limited to the extraction of clay, sand, soils, and rock. Construction aggregate is currently the main market for mining resources produced in Sutter County and consists predominantly of sand, gravel, and soil for construction projects as well as crushed stone.[78] The four active mining operations within the Sutter County General Plan policy area are open-pit type or surface mines. Sutter County has no deep-shaft mining activity.[79]

Mining activities in Butte County focus on two industries: sand and gravel.[80] The majority of the area's sand and gravel deposits occur in two regions, along the Sacramento River and within a band running from north to south down the center of the county.[81] Gravel in the Sacramento River is no longer extensively mined, due to environmental constraints and the difficulty of working in an area with a high water table. The county's central "gravel belt" comprises the transitional region where sediments washed down from the Sierra Nevadas into the slower moving rivers of the flat valley. This is the region in Butte County where gravel mining is most active. In the past, these residual gravel deposits were mined for their gold content. However, today they are mined for gravel and sand, to be used in combination with portland cement or asphalt compounds in construction and road building. Sand and gravel deposits are also mined for silica, used in the production of cleansers, abrasives, and toothpaste.

## 6.15.2 APPLICABLE REGULATIONS

### 6.15.2.1 LOCAL

#### SUTTER COUNTY GENERAL PLAN

The Sutter County 2030 General Plan contains policies, and implementation measures relevant to the preservation and protection of mineral resources. Relevant goals to the Project include:

ER 5.1. Significant Resources. Conserve and protect mineral resources that may be identified by the State as a significant resource to allow for their continued use in the economy.

[78] (Sutter County, 2011)
[79] Ibid.
[80] (Butte County, 2023)
[81] Ibid.

### 6.15.3 THRESHOLDS OF SIGNIFICANCE

State CEQA Guidelines Appendix G provides the following screening criteria to evaluate potential impacts related to mineral resources. The Project would have a significant impact if it would:

- 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; or
- 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.

### 6.15.4 IMPACT ANALYSIS

a) Would the project 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?

No Impact. The Project would not result in significant impacts associated with the loss of availability of a known mineral resource that would be of value to the region and the residents of the State. There would be no construction or earthmoving activities associated with implementation except for the drilling of a new well. There would be no impact. No further analysis of this topic is required in the EIR.

b) Would the project 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?

No Impact. The Project would not traverse any existing mining claims or lands that are known to contain a known mineral resource. Implementation of the Project would not impact mineral resources. Therefore, the Project would not 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. There would be no impact. No further analysis of this topic is required in the EIR.

# 6.16 NOISE

Table 6-17: Noise Impacts

| Would the project result in: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? | ☐ | ☐ | ☒ | ☐ |
| b) Generation of excessive ground borne vibration or ground borne noise levels? | ☐ | ☐ | ☒ | ☐ |
| c) For a project located within the vicinity of a private airstrip or 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? | ☐ | ☐ | ☐ | ☒ |

## 6.16.1 BASELINE CONDITIONS

The boundaries of BWD include agricultural lands in Butte and Sutter Counties. Rural residential homes are sparsely located throughout the boundaries. The cities of Biggs, Gridley, and Live Oak are circumscribed by lands within BWD but are not a part of the District lands themselves.

## 6.16.2 APPLICABLE REGULATIONS

### 6.16.2.1 LOCAL

#### SUTTER COUNTY NOISE CONTROL ORDINANCE

The purpose of the Noise Control Ordinance is to assess complaints of noise alleged to exceed Sutter County standards as set forth by the Noise Element of the Sutter County General Plan and the Noise Control Ordinance and to address violations of these standards. The following noise standards, excluding certain exclusions presented in the noise control ordinance, apply to all noise sensitive exterior areas within Sutter County.

Table 6-18: Exterior Noise Standards – Sutter County

| | Daytime (7 a.m. to 10 p.m.) | Nighttime (10 p.m. to 7 a.m.) |
|---|---|---|
| *Hourly Average ($L_{eq}$)* | 55 | 45 |
| *Maximum ($L_{max}$)* | *70* | *65* |

#### BUTTE COUNTY NOISE CONTROL ORDINANCE

The purpose of the Noise Control Ordinance is to assess complaints of noise alleged to exceed Butte County standards as set forth by the Noise Element of the Butte County General Plan and the Noise Control Ordinance and to address violations of these standards. The following noise standards, excluding certain exclusions presented in the noise control ordinance, apply to all noise sensitive exterior areas within Butte County.

Table 6-19: Exterior Noise Standards – Butte County

| | Daytime (7 a.m. to 7 p.m.) | | Evening (7 p.m. to 10 p.m.) | | Nighttime (10 p.m. to 7 a.m.) | |
|---|---|---|---|---|---|---|
| | *Designation* | | | | | |
| *Noise Level Descriptor* | *Urban* | *Non-Urban* | *Urban* | *Non-Urban* | *Urban* | *Non-Urban* |
| *Hourly Average ($L_{eq}$)* | 55 | 50 | 50 | 45 | 45 | 40 |
| *Maximum ($L_{max}$)* | 70 | 60 | 60 | 55 | 55 | 50 |

## 6.16.3 THRESHOLDS OF SIGNIFICANCE

Criteria for determining the significance of noise and ground borne vibration impacts were developed based on information contained in CEQA Guidelines Appendix G. According to those guidelines, a project may have a significant effect on noise if it would result in the following conditions:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the project vicinity in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Generation of excessive ground borne vibration or ground borne noise levels; or
- Be located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or private-use airport, that exposes people residing or working in the project area to excessive noise levels.

## 6.16.4 IMPACT ANALYSIS

### a) Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less than Significant Impact. The Project involves the movement of water through existing conveyance facilities as well as the installation of a well. Construction of the Project would involve temporary noise sources, predominantly from off-road equipment, such as excavators, backhoe/loader, drilling rigs, scrapers, and tractors. The Project site is located adjacent to agricultural lands, which makes the area accustomed to noises associated with farm equipment. The Project would comply with Sutter County's General Plan by obtaining any needed permits for working outside of the standard construction hours from Sutter County for the well drilling. Operational maintenance activities would be on an as-needed basis with routine monitoring performed by existing staff and would not generate significant new noise, nor would the operation of the well generate significant new noise. Any impacts would be temporary and therefore less than significant. No further analysis of this topic is required in the EIR.

### b) Would the project result in generation of excessive ground borne vibration or ground borne noise levels?

Less than Significant Impact. The primarily Project involves the movement of water through existing conveyance facilities. The construction phase of the Project would consist of drilling a new well. As mentioned, the Project site is in an area with agricultural production. Agricultural production commonly includes the use of off-road equipment and ground-disturbing activities. During construction, Project-related construction activities would not vary substantially from the baseline conditions routinely experienced on neighboring properties. Moreover, ground borne vibration and noise would be restricted to construction apart from minimal, periodic maintenance. Impacts would be less than significant. No further analysis of this topic is required in the EIR.

c) For a project located within the vicinity of a private airstrip or 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?

No Impact. The Project would use existing water conveyance facilities and does not involve the building of habitable structures. Therefore, the Project would not expose people residing or working in the Project area to an increase in noise levels regardless of its proximity to a public airport, private airstrip, or airport land use plan. There would be no impact. No further analysis of this topic is required in the EIR.

# 6.17 POPULATION AND HOUSING

Table 6-20: Population and Housing Impacts

| Would the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Induce substantial unplanned 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)? | ☐ | ☐ | ☐ | ☒ |
| b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere? | ☐ | ☐ | ☐ | ☒ |

## 6.17.1 BASELINE CONDITIONS

The Project is located within Sutter and Butte Counties, with populations of 99,633 and 211,632, respectively.[82] [83] The District lands are primarily used for agriculture and water delivery infrastructure with sparse rural residences.

## 6.17.2 APPLICABLE REGULATIONS

The Project would not induce population growth, and it does not involve housing in any way. As such, there are no relevant applicable regulations regarding populations and housing for the Project.

## 6.17.3 THRESHOLDS OF SIGNIFICANCE

According to the CEQA Guidelines Appendix G, the Project would have a significant impact related to population and housing if it would:

- Induce substantial unplanned 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); or
- Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.

## 6.17.4 IMPACT ANALYSIS

a) Would the project induce substantial unplanned 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)?

No Impact. The Project would not induce substantial population growth in an area, either directly or indirectly. The Project would utilize existing water conveyance facilities and construct a single well next to a District canal and surrounded by agriculture. Transferred water would be utilized for existing

[82] (United States Census Bureau, 2020)
[83] (United States Census Bureau, 2020)

agricultural uses or environmental enhancement. Therefore, there would be no impact. No further analysis of this topic is required in the EIR.

### b) Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

**No Impact.** The Project would utilize existing water conveyance facilities and construct a single well next to a District canal and surrounded by agriculture. No housing or people would be displaced as a result of this Project, and no new housing would be created. Therefore, there would be no impact. No further analysis of this topic is required in the EIR.

# 6.18 PUBLIC SERVICES

Table 6-21: Public Services

| Would the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: | | | | |
| i. Fire protection? | ☐ | ☐ | ☐ | ☒ |
| ii. Police protection? | ☐ | ☐ | ☐ | ☒ |
| iii. Schools? | ☐ | ☐ | ☐ | ☒ |
| iv. Parks? | ☐ | ☐ | ☐ | ☒ |
| v. Other public facilities? | ☐ | ☐ | ☐ | ☒ |

## 6.18.1 BASELINE CONDITIONS

Fire Protection: The Sutter County Fire Department, Butte County Fire Department, and Gridley Fire Department provide fire protection and safety services for the Project area.

Police Protection: The Project area is served by the Sutter County Sheriff's Department, Butte County Sheriff's Department, and Gridley Police Department.

Schools: There are a number of schools and school districts in the Project area; however, they are focused in the cities and communities like Gridley, Live Oak, and Biggs, which are not within the Project area but surrounded by it. This includes Biggs Unified School District, Gridley Union High School District, Gridley Union Elementary School District, and Live Oak Unified School District and their associated schools.

Parks: Parks and recreation services include several facilities located within Sutter County, owned and operated either by the County, State, or private parties. Outside of river recreation and State wildlife areas, active parkland is primarily located within, and operated and maintained by, the cities of Yuba City and Live Oak in Sutter County. For Butte County, the cities of Gridley and Biggs provide recreation facilities and programs and two small County Service Areas fund swimming pools that serve these communities. The recreation and park districts for Butte County manage a number of parks in unincorporated Butte County. There are 618 acres of parkland in unincorporated Butte County, but many unincorporated communities and residential areas in Butte County do not contain parks and are not located near park facilities.

Landfills: The nearest landfill to the Project site is the Recology Butte Colusa Counties site located in the City of Oroville, approximately seven miles northeast of the District boundary.

## 6.18.2 APPLICABLE REGULATIONS

### 6.18.2.1 FEDERAL

#### FEDERAL FIRE PREVENTION AND CONTROL ACT OF 1974

The National Fire Incident Reporting System is a system established by the National Fire Data Center of the United States Fire Administration (USFA) to carry out the intentions of the Federal Fire Prevention and Control Act of 1974. The Act authorizes the USFA to gather and analyze information on the magnitude of the Nation's fire problem, as well as its detailed characteristics and trends. The Act further authorizes the USFA to develop uniform data reporting methods, and to encourage and assist State agencies in developing and reporting data.

#### NATIONAL FIRE PROTECTION ASSOCIATION STANDARD 901

The National Fire Protection Association Standard 901 provides the latest guidelines to help fire departments and other fire protection organizations effectively share data with other agencies. This standard provides common language and definitions that define and describe elements and classifications used by many fire departments in the United States and other countries to describe fire damage potential and experience during incidents.

#### DISASTER MITIGATION ACT (2000-PRESENT)

Section 104 of the Disaster Mitigation Act of 2000 (Public Law 106-390) requires a state mitigation plan as a condition of disaster assistance. There are two different levels of state disaster plans: “Standard” and “Enhanced.” States that develop an approved Enhanced State Plan can increase the amount of funding available through the Hazard Mitigation Grant Program. The Act has also established new requirements for local mitigation plans.

### 6.18.2.2 STATE

#### CALIFORNIA FIRE PLAN

The Strategic California Fire Plan is the State’s road map for reducing the risk of wildfire. In compliance with the California Fire Plan, individual CalFIRE units are required to develop Fire Management Plans for their areas of responsibility. These documents assess the fire situation within each of CalFIRE’s 21 units and six contract counties. The plans include stakeholder contributions and priorities and identify strategic areas for pre-fire planning and fuel treatment as defined by the people who live and work with the local fire problem. The plans are required to be updated annually.

#### STATE HAZARD MITIGATION PLAN

The purpose of the State Hazard Mitigation Plan (SHMP) is to significantly reduce deaths, injuries, and other losses attributed to natural and human-caused hazards in California. The SHMP provides guidance for hazard mitigation activities emphasizing partnerships among local, state, and federal agencies as well as the private sector. The California Office of Emergency Services (OES) prepares the SHMP. The SHMP identifies hazard risks and includes a vulnerability analysis and a hazard mitigation strategy. The SHMP is Federally required under the Disaster Mitigation Act of 2000 in order for the State to receive federal funding. The Disaster Mitigation Act of 2000 requires a State mitigation plan as a condition of disaster assistance. The SHMP was most recently updated in 2018.

#### WILDLAND-URBAN INTERFACE BUILDING STANDARDS

CCR Title 24, Part 9 (2022 California Fire Code) establishes standards and requirements for construction in relation to the prevention of wildfire. These codes include provisions for ignition-resistant construction standards in the wildland urban interface.

#### CALIFORNIA OFFICE OF EMERGENCY SERVICE

Through the California Emergency Services Act of 1970, the California OES provides the basis for local emergency preparedness. The OES is responsible for preparing the California State Emergency Plan and for coordinating and supporting emergency services conducted by local governments. The responsibility for

immediate response to an emergency, such as fires, landslides, earthquakes or riots, rests with local government agencies and segments of the private sector, with support services provided by other jurisdictions and/or State and federal agencies. In accordance with their normal operating procedures, the initial response to an emergency will be made by local Fire, Law Enforcement, Medical or Maintenance (Public Works) districts or departments.

### 6.18.3 THRESHOLDS OF SIGNIFICANCE

According to the CEQA Guidelines Appendix G, the Project would have a significant impact related to public services if it would:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:
    - Fire protection,
    - Police protection,
    - Schools,
    - Parks, or
    - Other public facilities.

### 6.18.4 IMPACT ANALYSIS

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

i. Fire Protection:

ii. Police Protection:

iii. Schools:

iv. Parks:

v. Other public facilities:

i.-v.) No Impact. The Project does not propose the construction of any habitable structures and would not induce population growth. As such, the Project would not create a need for additional fire protection, police protection, schools, parks, or other public facilities. Water would be conveyed through existing conveyance facilities, and a single well would be constructed in an area surrounded by agriculture. As such, there would be no impact to public services. No further analysis of this topic is required in the EIR.

# 6.19 RECREATION

Table 6-22: Recreation Impacts

| Would the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | 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? | ☐ | ☐ | ☐ | ☒ |
| 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? | ☐ | ☐ | ☐ | ☒ |

## 6.19.1 BASELINE CONDITIONS

Sutter and Butte Counties offer a variety of recreational opportunities through their Parks and Recreation Departments and nearby State and federal lands. The Project consists of existing water conveyance to provide water from BWD to Valley Water or other entities to assist with agriculture irrigation. There may be recreational areas for the public to utilize near the lands that are idled for transfer, such as parks and hiking trails, but the majority of the Project area is surrounded by agricultural lands and private property.

## 6.19.2 APPLICABLE REGULATIONS

### 6.19.2.1 LOCAL

#### BUTTE COUNTY GENERAL PLAN

The Butte County General Plan 2040 provides direction on how Butte County will fulfill its community vision and manage its future growth. Relevant goals to the Project include:

ED-P1.3: The County shall encourage a full range of recreational, and tourism uses at Oroville Dam and Lake.

## 6.19.3 THRESHOLDS OF SIGNIFICANCE

According to the CEQA Guidelines Appendix G, the Project would have a significant impact related to recreation if it would:

- 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; or
- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

## 6.19.4 IMPACT ANALYSIS

a) Would the project 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?

No Impact. The Project would not result in either an influx of population (e.g., by creation of housing or creation of jobs) or relocation of persons from elsewhere into the Project area. As such, there would be no impact. No further analysis of this topic is required in the EIR.

### 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?

**No Impact.** The Project does not include recreational facilities. As there is no population growth resulting directly or indirectly from Project implementation, construction, or expansion of nearby recreational facilities would not be necessary. There would be no impact. No further analysis of this topic is required in the EIR.

# 6.20 TRANSPORTATION

Table 6-23: Transportation Impacts

| Would the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities? | ☐ | ☐ | ☐ | ☒ |
| b) Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)? | ☐ | ☐ | ☐ | ☒ |
| c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? | ☐ | ☐ | ☐ | ☒ |
| d) Result in inadequate emergency access? | ☐ | ☐ | ☐ | ☒ |

## 6.20.1 BASELINE CONDITIONS

The Project area is characterized by vacant land, agricultural uses, and sparse residences. Highway 99 runs through the Project area, effectively bisecting the site, and Highway 70 runs north-south to the east of the Project area.

## 6.20.2 APPLICABLE REGULATIONS

### 6.20.2.1 STATE

#### CALIFORNIA DEPARTMENT OF TRANSPORTATION

Caltrans has jurisdiction over state highways and sets maximum load limits for trucks and safety requirements for oversized vehicles that operate on highways. Butte and Sutter Counties (i.e., including the Project site and surrounding area) are under the jurisdiction of Caltrans District 3.

#### SENATE BILL 743

SB 743, which was signed into law by Governor Brown in 2013, tasked Office of Planning and Research with establishing new criteria for determining the significance of transportation impacts under CEQA. SB 743 requires the new criteria to "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." It also states that alternative measures of transportation impacts may include "vehicle miles traveled, vehicle miles traveled per capita, automobile trip generation rates, or automobile trips generated." SB 743 changes the way that public agencies evaluate the transportation impacts of projects under CEQA, recognizing that roadway congestion, while an inconvenience to drivers, is not itself an environmental impact (see PRC Section 21099(b)(2)). In addition to new exemptions for projects that are consistent with specific plans, the draft SB 743 guidelines replace congestion-based metrics, such as auto delay and level of service, with VMT as the basis for determining significant impacts, unless the guidelines provide specific exceptions

## 6.20.3 THRESHOLDS OF SIGNIFICANCE

According to the CEQA Guidelines Appendix G, the Project would have a significant impact on transportation if it would:

- Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities;
- Conflict or be inconsistent with CEQA Guidelines section 15064.3 subdivision (b);
- Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or
- Result in inadequate emergency access.

### 6.20.4 IMPACT ANALYSIS

a) Would the project conflict with a plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3 subdivision (b)?

**a) and b) No Impact.** The Project would not conflict with a plan, ordinance or policy addressing the circulation system including transit, roadway, bicycle, and pedestrian facilities, nor would it conflict with or be inconsistent with CEQA guidelines section 15064.3 Subdivision (b). There is no population growth associated with the Project, nor would implementation of the Project result in an increase in staff or drivers utilizing roadways in the area. Therefore, implementation of the Project would not increase the demand for any changes to congestion management programs or interfere with existing level of service standards during the operational phase. Therefore, there would be no impact. No further analysis of this topic is required in the EIR.

c) Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

d) Would the project result in inadequate emergency access?

**c) and d) No Impact.** The Project would not substantially increase hazards due to a geometric design feature or incompatible uses, nor would it result in inadequate emergency access. Access to the well site would be through the existing maintenance roads along the canal bank. No roadway design features are associated with this Project, and there would be no change in the existing land use that could result in incompatible use. As such, there are no roadways being modified for this Project or impede any emergency access routes. Therefore, there would be no impact. No further analysis of this topic is required in the EIR.

## 6.21 TRIBAL CULTURAL RESOURCES

Table 6-24: Tribal Cultural Resources Impacts

| Would the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: | | | | |
| i. Listed or eligible for listing in the California Register of Historical Resources, or in the local register of historical resources as defined in Public Resources Code section 5020.1(k), or | ☐ | ☐ | ☒ | ☐ |
| ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe. | ☐ | ☐ | ☒ | ☐ |

### 6.21.1 BASELINE CONDITIONS

The Project is located in Butte and Sutter Counties; however, any construction would only occur in Sutter County. Lands in the Project area consist primarily of relatively flat, irrigated and non-irrigated farmland and agricultural infrastructure. The prehistoric populations of Sutter and Butte counties include territory of the Maidu Indians. The Project area is also located in a region utilized by Nisenan populations at the time of Euro-American contact. Indigenous populations used the local region for seasonal and/or permanent settlement, as well as for the gathering of plants, roots, seeds, domestic materials, and hunting seasonal game. Historically, Euro-Americans utilized the region for mining and transportation opportunities.

#### 6.21.1.1 RECORDS SEARCH

The records search included the Project survey area (the Project well site) and a one-mile radius. To determine whether the survey area for the Project had been previously surveyed for cultural resources, and/or whether any such resources were known to exist within or near to it, an archival records search was conducted by the staff of the NEIC on October 11, 2025. The records search was completed to determine: (i) if pre-contact or historic-era cultural resources had previously been recorded within the Project survey area; (ii) if the Project survey area had been systematically surveyed by archaeologists prior to the initiation of this fieldwork; and/or (iii) whether the area surrounding the proposed Project was known to contain

archaeological sites or built environment resources and to thereby be culturally sensitive. Records examined included archaeological site files and maps, the NRHP, Historic Property Data File, California Inventory of Historic Resources, and the California Points of Historic Interest.

Based upon the information from the records search and local topography, the Project area is considered to have low sensitivity for cultural resources. Portions of the project along existing sites, roads, and trails are sensitive for archaeological resources. Other areas of sensitivity are flats near creeks, springs, seeps, or rock outcrops that may be located in the project area.

The records search included the Project survey area and a one-mile radius. According to the NEIC, no archaeological resources or built environment resources were identified within the Project boundaries nor within a one-mile radius of the Project. One cultural survey had been previously completed of the Project area in 2011.

#### 6.21.1.2 NATIVE AMERICAN OUTREACH

The NAHC in Sacramento was contacted in September 2025 to perform a search of the SLF to determine if any Native American resources have been recorded in the immediate Project area. The response letter showed results were negative and confirms there are no known records associated with the Project (see Appendix D). The NAHC also provided a list of Native American tribes who may also have knowledge of cultural resources in the area, which is shown in Section 6.8. The District does not have an AB 52 letter on file from a tribe.

### 6.21.2 APPLICABLE REGULATIONS

#### 6.21.2.1 FEDERAL

##### NATIONAL HISTORIC PRESERVATION ACT

As discussed in Section 6.8.2, the NHPA established guidelines to "preserve important historic, cultural, and natural aspects of our cultural heritage, and to maintain, wherever possible, an environment that supports diversity and a variety of individual choice."

#### 6.21.2.2 STATE

##### CALIFORNIA REGISTER OF HISTORICAL RESOURCES

As discussed in Section 6.8.2, the CRHR is an inventory of significant architectural, archaeological, and historical resources in the State of California.

##### CALIFORNIA ENVIRONMENTAL QUALITY ACT

As discussed in Section 6.8.2, CEQA requires that public agencies assess the effects on historical resources of public or private projects that the agencies finance or approve. Historical resources are defined as buildings, sites, structures, objects, areas, places, records, or manuscripts that the lead agency determines to have historical significance, including architectural, archaeological, cultural, or scientific significance. CEQA requires that if a project results in an effect that may cause a substantial adverse change in the significance of a historical resource, alternative plans or mitigation measures must be considered.

##### SIGNIFICANT HISTORICAL RESOURCES UNDER CEQA GUIDELINES

In completing an analysis of a project under CEQA, it must first be determined if the project site possesses a historical resource. A site may qualify as a historical resource if it falls within at least one of four categories. See details of each category and criteria for meeting such in Section 6.8.2.

##### GOVERNMENT CODE 65352.3-5: LOCAL GOVERNMENT-TRIBAL CONSULTATION.

GC Sections 65092, 65351, 65352, 65352.3, and 65352.4, formally known as SB 18, regulate the consultation with California Native American tribes having traditional lands located within the jurisdiction of applicable cities and counties. The intent of the underlying legislation was to provide all California Native

American tribes that are on the contact list maintained by the Native American Heritage Commission, an opportunity to consult with specific local governments for the purpose of preserving and protecting their sacred places. Such consultations apply to the preparation, adoption and amendment of general plans.

#### ASSEMBLY BILL 52: NATIVE AMERICAN HISTORIC RESOURCE PROTECTION ACT

AB 52, codified at PRC Section 21080.3.1, et seq., sets forth a proactive approach intended to reduce the potential for delay and conflicts between Native American and development interests. Projects subject to AB 52 are those that file a notice of preparation for a DEIR or notice of intent to adopt a negative or mitigated negative declaration on or after July 1, 2015. AB 52 adds TCRs to the specific cultural resources protected under CEQA. Under AB 52, a TCR is defined as a site, feature, place, cultural landscape (must be geographically defined in terms of size and scope), sacred place, or object with cultural value to a California Native American tribe that is either included or eligible for inclusion in the CRHR, or included in a local register of historical resources. A Native American Tribe or the lead agency, supported by substantial evidence, may choose at its discretion to treat a resource as a TCR. AB 52 also mandates lead agencies to consult with tribes, if requested by the tribe, and sets the principles for conducting and concluding consultation. The District has not received any written correspondence from a Tribe pursuant to AB 52 requesting notification of proposed projects.

#### NATIVE AMERICAN HERITAGE ACT

Also relevant to the evaluation and mitigation of impacts to cultural resources is the Native American Heritage Act of 1976 which established the NAHC and protects Native American religious values on state property (see PRC Section 5097.9).

#### DISPOSITION OF HUMAN REMAINS

When an initial study identifies the existence, or the probable likelihood, of Native American human remains within the project, a lead agency shall work with the appropriate Native American groups or individuals as identified by the NAHC as provided in PRC Section 5097.98. The applicant may develop an agreement for treating or disposing of, with appropriate dignity, the human remains, and any items associated with Native American burials. Furthermore, HSC Section 7050.5 requires that construction or excavation be stopped in the vicinity of discovered human remains until the county coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American, the coroner must contact the NAHC.

#### CALIFORNIA NATIVE AMERICAN GRAVES PROTECTION AND REPATRIATION ACT OF 2001

HSC Sections 8010-8011 establish a State repatriation policy intent that is consistent with and facilitates implementation of the California Native American Graves Protection and Repatriation Act (NAGPRA). NAGPRA strives to ensure that all California Indian human remains, and cultural items are treated with dignity and respect. It encourages voluntary disclosure and return of remains and cultural items by publicly funded agencies and museums in California. It also states the intent for the state to provide mechanisms for aiding California Indian tribes, including non-federally recognized tribes, in filing repatriation claims and getting responses to those claims.

### 6.21.3 THRESHOLDS OF SIGNIFICANCE

According to the CEQA Guidelines Appendix G, the Project would have a significant impact related to tribal cultural resources if it would:

- Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

- Listed or eligible for listing in the California Register of Historical Resources, or in the local register of historical resources as defined in Public Resources Code section 5020.1(k), or
- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

### 6.21.4 IMPACT ANALYSIS

a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

i. Listed or eligible for listing in the California Register of Historical Resources, or in the local register of historical resources as defined in Public Resources Code section 5020.1(k), or

ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

**Less than Significant Impact.** As discussed in Section 6.8, an SLF search completed for the Project area, dated September 11, 2025, did not identify any tribal cultural resources within the Project area. Additionally, a records search was conducted by the NEIC at California State University, Chico. This search also determined that tribal cultural resources were not known to be present on-site.

Outreach letters were sent to tribal organizations using the NAHC list to further identify Native American interests and concerns in the Project area. The following Native American organizations/individuals were contacted from the list provided by NAHC below:

1. *Chairperson Benjamin Clark of the Mooretown Rancheria of Maidu Indians*
2. *Gus Taylor of the Mooretown Rancheria of Maidu Indians*
3. *Tribal Council Member Saxon Thomas of the Nevada City Rancheria Nisenan Tribe*
4. *Chairman Richard Johnson of the Nevada City Rancheria Nisenan Tribe*
5. *Tribal Secretary Shelly Covert of the Nevada City Rancheria Nisenan Tribe*
6. *President James Russ of the Round Valley Reservation/Covelo Indian Community*
7. *Tribal Historic Preservation Officer Josef Fore of the United Auburn Indian Community of the Auburn Rancheria*

Matthew Hatcher of the Mooretown Rancheria responded via letter dated October 16, 2025, and received on November 7, 2025. The response acknowledged that Mooretown Rancheria was not aware of any cultural resources that could be impacted by the water transfers or the new well. However, the tribe requested to be contacted if the construction of the well proceeds. The District will contact the tribe prior to construction of the new well. No other responses were received.

The Project includes standard practices to avoid or minimize tribal cultural resources impacts and would be required to follow all applicable federal, State, and local requirements set for archaeological resource recovery. In the unlikely event that a tribal cultural resource is uncovered during the construction of this Project, all construction activities would cease, and a qualified archaeologist would be contacted to assess the uncovered resource. As a result, impacts would be less than significant. No further analysis of this topic is required in the EIR.

# 6.22 UTILITIES AND SERVICE SYSTEMS

Table 6-25: Utilities and Service Systems Impacts

| Would the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects? | ☐ | ☐ | ☒ | ☐ |
| b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years? | ☐ | ☐ | ☒ | ☐ |
| c) 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? | ☐ | ☐ | ☐ | ☒ |
| d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals? | ☐ | ☐ | ☐ | ☒ |
| e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste? | ☐ | ☐ | ☐ | ☒ |

## 6.22.1 BASELINE CONDITIONS

The District provides irrigation water for agricultural use within the District's service area. The Project would use existing facilities to transport the water from BWD to the participating entities, assumed to be solely or primarily Valley Water, and would not extend service to locations outside of the agreed service areas. All utilities needed for the water transfer are already in place and currently being utilized as needed. There is power available on site for the proposed groundwater well.

## 6.22.2 APPLICABLE REGULATIONS

### 6.22.2.1 FEDERAL

#### RESOURCE CONSERVATION AND RECOVERY ACT

The RCRA (40 CFR, Part 258 Subtitle D) establishes minimum location standards for siting municipal solid waste landfills. In addition, because California laws and regulations governing the approval of solid waste landfills meet the requirements of Subtitle D, the USEPA has delegated the enforcement responsibility to the State.

#### 6.22.2.2 STATE

##### CALIFORNIA WATER CODE

The California Water Code is the governing law for all aspects of water management in California.

##### CALIFORNIA INTEGRATED SOLID WASTE MANAGEMENT ACT OF 1989 (ASSEMBLY BILL 939)

Pursuant to the California Integrated Solid Waste Management Act of 1989 (PRC Section 40050, et seq.) or AB 939, all cities in California are required to reduce the amount of solid waste disposed in landfills. AB 939 required a reduction of 25 percent by 1995 and 50 percent by 2000. Contracts that include work that will generate solid waste, including construction and demolition (C&D) debris, have been targeted for participation in source-reduction, reuse, and recycling programs. The contractor is urged to manage solid waste generated by the work to divert waste from disposal in landfills (particularly Class III landfills) and maximize source reduction, reuse, and recycling of C&D debris.

##### PROTECTION OF UNDERGROUND INFRASTRUCTURE

GC Sections 4216-4216.9 "Protection of Underground Infrastructure" requires an excavator to contact a regional notification center such as Underground Services Alert or Dig Alert at least two days prior to excavation of any subsurface installations. Any utility provider seeking to begin a project that could damage underground infrastructure can call Underground Service Alert, the regional notification center for southern California. Underground Service Alert will notify the utilities that may have buried lines within 1,000 feet of the project. Representatives of the utilities are then notified and are required to mark the specific location of their facilities within the work area prior to the start of project activities in the area.

#### 6.22.2.3 LOCAL

##### SUTTER COUNTY GENERAL PLAN

The Sutter County 2030 General Plan contains policies and implementation measures relevant to the preservation and protection of utilities and service systems. Relevant goals to the Project include:

I 1.12: Water Conservation. Support water conservation programs that increase water use efficiency, and provide incentives for adoption of water-efficiency measures.

##### BUTTE COUNTY GENERAL PLAN

The Butte County General Plan 2040 provides direction on how Butte County will fulfill its community vision and manage its future growth. Relevant goals to the Project include:

W-P5.1: Agricultural and urban water use efficiency shall be promoted.

### 6.22.3 THRESHOLDS OF SIGNIFICANCE

According to the CEQA Guidelines Appendix G, the Project would have a significant impact related to utilities and service systems if it would:

- Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects;
- Have insufficient water supplies available during normal, dry and multiple dry years;
- Result in a determination by the wastewater treatment provider which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals; and

- Would not comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

### 6.22.4 IMPACT ANALYSIS

a) Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Less than Significant Impact. The Project would not involve the relocation or construction of any new or expanded wastewater treatment or storm water drainage, electric power, natural gas or telecommunications facilities. The Project includes the installation of a third groundwater well to be used by the District. Construction-related water use would be temporary, and there would be no permanent employees on-site during project operation. Therefore, impacts would be less than significant. No further analysis of this topic is required in the EIR.

b) Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

Less than Significant Impact. The Project would provide one-way transfer opportunities from BWD to Valley Water or other entities if Valley Water were to refuse. If BWD's entitlement is curtailed 50 percent for an irrigation season, pursuant to the 1969 Agreement, BWD would not likely participate in a land idling transfer. The Project would not require BWD to transfer via land idling in such years. Additionally, BWD has not observed any substantial impacts on groundwater levels, groundwater supplies, or to third parties when using its groundwater production wells. As such, BWD does not anticipate any adverse impacts resulting from substantial depletion of groundwater supplies or interference with groundwater recharge resulting in a net deficit in aquifer volume or lowering of the local groundwater table level. Accordingly, the Project would not result in insufficient water supplies for BWD during normal, dry, or multiple dry years. The Groundwater Modeling Report attached as Appendix E shows that the groundwater budget results indicate that changes to the groundwater system are most impactful while the water transfers are actually occurring, and all impacts from the transfers are negligible by about 20 years after the transfers cease. As such reasonably foreseeable future development would not be significantly impacted by the Project. Any impacts would be less than significant. No further analysis of this topic is required in the EIR.

c) Would the project 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?

No Impact. The Project does not include the construction or operation of new facilities or modifications of existing facilities that would require wastewater treatment. Additionally, the Project would not directly or indirectly induce population growth. Because the Project would not induce growth, the Project would not result in increased wastewater generation beyond existing conditions. Therefore, there would be no impact. No further analysis of this topic is required in the EIR.

d) Would the project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

**No Impact.** Any waste generated during construction of the well would be the responsibility of the contractor and disposed of in compliance with current regulations. Construction would result in solid waste disposal needs but would not be in excess of landfill capacity. Therefore, there would be no impact. No further analysis of this topic is required in the EIR.

### e) Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

**No Impact.** The Project could create a temporary increase in the amount of solid waste generated during construction of the well. The Project would comply with all federal, State, and local rules, regulations, and statutes related to the reduction of solid waste. Therefore, there would be no impact. Therefore, no impacts would occur. No further analysis of this topic is required in the EIR.

# 6.23 WILDFIRE

Table 6-26: Wildfire Impacts

| If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Substantially impair an adopted emergency response plan or emergency evacuation plan? | ☐ | ☐ | ☐ | ☒ |
| b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrollable spread of wildfire? | ☐ | ☐ | ☐ | ☒ |
| c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment? | ☐ | ☐ | ☐ | ☒ |
| d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes? | ☐ | ☐ | ☐ | ☒ |

## 6.23.1 BASELINE CONDITIONS

The Project area includes agricultural lands and sparse residences. The vast majority of the Project area is not within or near a fire hazard severity zone. Lands to the southwest and northeast are within Moderate, High, and Very High fire hazard severity zones.[84]

## 6.23.2 APPLICABLE REGULATIONS

### 6.23.2.1 FEDERAL

#### FEDERAL EMERGENCY MANAGEMENT AGENCY

FEMA is an agency within the United States Department of Homeland Security, created via Executive Order 12127 on April 1, 1979, by President Carter. A second Executive Order 12148 signed on July 20, 1979, accorded the agency with the missions of emergency management and civil defense. In order to receive assistance through FEMA in the event of a disaster, a state's governor must declare a state of emergency and formally request a federal government response.

#### DISASTER MITIGATION ACT OF 2000

The Disaster Mitigation Act of 2000 requires a State mitigation plan as a condition of disaster assistance. There are two different levels of State disaster plans: "Standard;" and "Enhanced." States that develop an approved Enhanced State Plan, which includes California, can increase the amount of funding available through the Hazard Mitigation Grant Program. The act has also established new requirements for local hazard mitigation plans.

[84] (CalFIRE, 2024)

#### NATIONAL FIRE PLAN

The National Fire Plan was developed under Executive Order 11246 in August 2000, following a landmark wildland fire season. Its intent is to actively respond to severe wildland fires and their impacts to communities while ensuring sufficient firefighting capacity for the future. The plan addresses firefighting, rehabilitation, hazardous fuels reduction, community assistance, and accountability

### 6.23.2.2 STATE

#### CALIFORNIA FIRE PLAN

The Strategic California Fire Plan is the State's road map for reducing the risk of wildfire. In compliance with the California Fire Plan, individual CalFIRE units are required to develop Fire Management Plans for their areas of responsibility. These documents assess the fire situation within each of CAL FIRE's 21 units and six contract counties. The plans include stakeholder contributions and priorities and identify strategic areas for pre-fire planning and fuel treatment as defined by the people who live and work with the local fire problem. The plans are required to be updated annually.

#### WILDLAND-URBAN INTERFACE BUILDING STANDARDS

CC Title 24, Part 9 (2022 California Fire Code) establishes standards and requirements for construction in relation to the prevention of wildfire. These codes include provisions for ignition-resistant construction standards in the wildland urban interface.

#### CALIFORNIA OFFICE OF EMERGENCY SERVICE

Through the California Emergency Services Act of 1970, the California Office of Emergency Service provides the basis for local emergency preparedness. The Office of Emergency Services is responsible for preparing the California State Emergency Plan and for coordinating and supporting emergency services conducted by local governments. The responsibility for immediate response to an emergency, such as fires, landslides, earthquakes or riots, rests with local government agencies and segments of the private sector, with support services provided by other jurisdictions and/or State and federal agencies. In accordance with their normal operating procedures, the initial response to an emergency will be made by local Fire, Law Enforcement, Medical or Maintenance (Public Works) districts or departments.

#### GOVERNMENT CODE SECTION 51175

Wildfires are extremely costly, not only to property owners and residents, but also to local agencies. Wildfires pose a serious threat to the preservation of public peace, health, or safety. The wildfire front is not the only source of risk since embers, or firebrands, travel far beyond the area impacted by the front and pose a risk of ignition to a structure or fuel on a site for a longer time. Since fires ignore civil boundaries, it is necessary that cities, counties, special districts, state agencies, and federal agencies work together to bring raging fires under control. Preventive measures are therefore needed to ensure the preservation of public peace, health, or safety.

### 6.23.2.3 LOCAL

#### BUTTE COUNTY GENERAL PLAN

The Butte County General Plan 2040 provides direction on how Butte County will fulfill its community vision and manage its future growth. Relevant goals to the Project include:

Goal W-8: Improve resiliency of water supplies and related infrastructure impacted by climate change, including natural disasters such as wildfire, drought, and flooding.

## 6.23.3 THRESHOLDS OF SIGNIFICANCE

According to the CEQA Guidelines Appendix G, the Project would have a significant impact related to wildfire if it would:

- Substantially impair an adopted emergency response plan or emergency evacuation plan;

- Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrollable spread of wildfire;
- Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment; or
- Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

### 6.23.4 IMPACT ANALYSIS

a) If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

b) If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project due to slope, prevailing winds, and other factors, exacerbate wildfire risks and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

c) If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

d) If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

a-d) No Impact. According to the CalFIRE Prevention Fire Hazard Severity Zones Map, the Project site is not located in a Very High Fire Hazard Severity Zone.[85] Moreover, the Project does not involve physical changes to the environment that could create a potential fire hazard. Therefore, the Project would not substantially impair adopted emergency response or evacuation plans, expose Project occupants to pollutant concentrations from wildfire, require the installation or maintenance of associated infrastructure that may exacerbate fire risk or result in temporary or ongoing impacts to the environment, or expose people or structures to downslopes or downstream flooding or landslides as a result of post-fire slope instability. No impacts related to wildfire would occur. As such, no further analysis of this topic is required in the EIR.

[85] (CalFIRE, 2024)

## 6.24 CEQA MANDATORY FINDINGS OF SIGNIFICANCE

Table 6-27: CEQA Mandatory Findings of Significance

| Does the project: | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Have the potential to substantially 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, substantially 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? | ☒ | ☐ | ☐ | ☐ |
| b) 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)? | ☒ | ☐ | ☐ | ☐ |
| c) Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly? | ☒ | ☐ | ☐ | ☐ |

### 6.24.1 STATEMENT OF FINDINGS

a) Does the project have the potential to substantially 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, substantially 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?

Potentially Significant Impact. As discussed above, the Project has the potential to result in significant impacts to the following resource sections: Biological Resources and Hydrology and Water Quality. Therefore, this impact is potentially significant, and this topic will be further analyzed in the Project's EIR.

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)?

Potentially Significant Impact. The Project proposes potential one-year water transfers over a five-year period from 2026 through 2030. The transfers may be for environmental enhancement or for one or more buyers with temporary unmet consumptive water demands. Valley Water would have the first right of refusal for the water transfers from BWD. A well to be used for the groundwater substitution water transfers could be constructed as a part of the Project. The proposed well location is situated immediately adjacent to a District canal and surrounded by lands in agricultural production. As such, the land has been

heavily disturbed. The Project would not require nor induce any other new surface disturbing activities, such as construction. Cumulative impacts, if any, would be considered potentially significant. The potential for cumulatively considerable impacts would be analyzed further within the Project's EIR.

### c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

**Potentially Significant Impact.** The Project would include temporary, one-year water transfers over a five-year period as well as the installation of a new well. As mentioned above, the Project has the potential to result in significant impacts to Biological Resources and Hydrology and Water Quality, and it has the potential to create potentially significant cumulative impacts. While it is anticipated that the implementation of mitigation measures and basic regulatory requirements to be identified in the Project's EIR would ensure that impacts would be less than significant, this topic will be further analyzed in the Project's EIR.

# CHAPTER 7 REFERENCES

Bureau of Reclamation. (2014). *Shasta Lake Water Resources Investigation Environmental Impact Statement.* U.S. Department of the Interior.

Butte County. (2023, March 28). *Butte County General Plan 2040.* Retrieved from https://www.buttecounty.net/DocumentCenter/View/11581/Butte_County_General_Plan_2040_Compiled_Appendix_Optimized---Updated---10-12-23

Butte County. (2024, September). *2024 Local Hazard Mitigation Plan*. Retrieved from Butte County: https://www.buttecounty.net/808/Local-Hazard-Mitigation-Plan

Butte County Office of Emergency Management. (2022, April). *Butte Operational Area Emergency Operations Plan.* Retrieved from https://www.buttecounty.net/DocumentCenter/View/7071/2022-Butte-County-EOP-PDF?bidId=

Butte Subbasin. (2022, January). *Butte Subbasin Sustainable Groundwater Management Act Groundwater Substainability Plan (GSP).* Retrieved from https://sgma.water.ca.gov/portal/gsp/preview/98

CalFIRE. (2024, April 1). *Fire Hazard Severity Zones in State Responsibility Area.* Retrieved from https://calfire-forestry.maps.arcgis.com/apps/webappviewer/index.html?id=988d431a42b242b29d89597ab693d008

California Air Resources Board. (2022, November 16). *2022 Scoping Plan for Achieving Carbon Neutrality.* Retrieved from https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp_1.pdf

California Air Resources Bouard. (2025). *Air Monitoring Sites - Interactive Map.* Retrieved from https://ww2.arb.ca.gov/applications/air-monitoring-sites-interactive-map

California Department of Conservation. (2022). *California Important Farmland Finder.* Retrieved from https://maps.conservation.ca.gov/DLRP/CIFF/

California Department of Conservation. (2024). *Williamson Act Enrollment Finder.* Retrieved from https://maps.conservation.ca.gov/dlrp/williamsonact/App/index.html

California Department of Conservation. (No Date). *Williamson Act Program*. Retrieved from California Department of Conservation: https://www.conservation.ca.gov/dlrp/wa

California Department of Water Resources. (2020). *Basin Prioritization.* Retrieved from https://water.ca.gov/Programs/Groundwater-Management/Basin-Prioritization

California Department of Water Resources. (2022). *2022 State Plan of Flood Control Descriptive Document.* CA DWR.

California Department of Water Resources. (n.d.). *Reconstruction Plans*. Retrieved from California Department of Water Resources: https://water.ca.gov/Programs/State-Water-Project/SWP-Facilities/Oroville/Oroville-Spillways/Reconstruction-Plans

California Department of Water Resources. (n.d.). *State Water Project*. Retrieved from California Department of Water Resources: https://water.ca.gov/programs/state-water-project

California Department of Water Resources. (n.d.). *Sutter Basin and Sutter Bypass.* Retrieved from https://cawaterlibrary.net/wp-content/uploads/2017/09/WeirsBypassesFloodTermsRiverSystems.pdf

California Department of Water Resources. (n.d.). *SWP Facilities*. Retrieved from California Department of Water Resources: https://water.ca.gov/Programs/State-Water-Project/SWP-Facilities

California Department of Water Resources. (n.d.). *SGMA Data Viewer*. Retrieved from https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#landsub

California Geologic Survey. (No Date). *Earthquake Zones of Required Investigation*. Retrieved from California Geologic Survey: https://maps.conservation.ca.gov/cgs/informationwarehouse/eqzapp/

Department of Energy, Federal Energy Regulatory Commission (FERC). (2006). *Oroville Facilities California Draft Environmental Impact Statement FERC Project No. 2100.*

Department of Water Resources. (2019, December). *DRAFT Technical Information for Preparing Water Trasnfer Proposals.* Retrieved from https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Management/Water-Transfers/Files/Draft_2019WTWhitePaper-012324.pdf

Federal Energy Regulatory Commission. (2007, May). Final Environmental Impact Statement for the Oroville Facilities Project Docket No. P-2100-052. Washington, DC.

Pacific Gas & Electric Company. (n.d.). *Electric Service Area Maps.* Retrieved from https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_MAPS_Service%20Area%20Map.pdf

Sacramento River Watershed Program. (n.d.). *Butte Creek Watershed.* Retrieved from Sacramento River Watershed Program: https://sacriver.org/explore-watersheds/eastside-subregion/butte-creek-watershed/

Sacramento River Watershed Program. (n.d.). *Lower Feather River Watershed.* Retrieved from Sacramento River Watershed Program: https://sacriver.org/explore-watersheds/feather-river-subregion/lower-feather-river-watershed/

Sacramento Valley Basinwide Air Pollution Control Council. (2015, December 11). *Sacramento Valley Air Basin 2015 SMP Administrative Document Supplement to the Smoke Management Program.* Retrieved from https://www.airquality.org/SVBAPCC/Documents/SMPAdmin2015.pdf

Santa Clara Valley Water District. (2024, December). *Anderson Dam Seismic Retrofit Project.* Retrieved from https://s3.us-west-1.amazonaws.com/valleywater.org.us-west-1/s3fs-public/2024-12-13_AndersonDam_OnePager_LS_v05.pdf

Sutter County. (2011, April 28). *Suttery County 2030 General Plan.* Retrieved from https://www.suttercounty.org/home/showpublisheddocument/2802/637555790981470000

Sutter County. (2021, May). *Sutter County Local Hazard Mitigation Plan Update*. Retrieved from Sutter County: https://www.suttercounty.org/home/showpublisheddocument/6950

Sutter County Office of Emergency Management. (2022, September 27). *Sutter County Operational Area Emergency Operations Plan.* Retrieved from https://www.suttercounty.org/home/showdocument?id=1040

Sutter Extension Water District. (2025, January). *Draft Initial Study and Proposed Mitigated Negative Declaration for Sutter Extension Water District 2025 Water Transfer Program.* Retrieved from CEQAnet: https://files.ceqanet.lci.ca.gov/310569-1/attachment/sJ_vqwUuFyLwKx9Yg0W1McFa_RqAjurmJWe_p8vrTX9ANjszHN54DRHwmMoXXrAFU2KX1QzXLiG0CYad0

Sutter Subbasin Groundwater Management Coordination Committee. (2022, January). *Groundwater Sustainability Plan for the Sutter Subbasin Groundwater Sustainabilty Plan.* Retrieved from https://sgma.water.ca.gov/portal/gsp/preview/112

United States Army Corps of Engineers. (1999). *Sacramento and San Joaquin River Basins, California Post-Flood Assessment March 1999.* Sacramento District.

United States Bureau of Reclamation. (n.d.). *Projects & Facilities - Keswick Dam*. Retrieved from Bureau of Reclamation: https://www.usbr.gov/projects/index.php?id=185

United States Bureau of Reclamation. (n.d.). *Projects & Facilities - Shasta Dam*. Retrieved from Bureau of Reclamation: https://www.usbr.gov/projects/index.php?id=241

United States Census Bureau. (2020). *Butte County, California.* Retrieved from https://data.census.gov/profile/Butte_County,_California?g=050XX00US06007

United States Census Bureau. (2020). *Sutter County, California.* Retrieved from https://data.census.gov/profile/Sutter_County,_California?g=050XX00US06101

United States Department of Agriculture. (1993). *Soil Data Access (SDA) Wind Erodibility Index (WEI) Soils Report.* Retrieved from https://efotg.sc.egov.usda.gov/references/Public/WI/NRCS_CAET_EROSION_WEI_134_OR_GREATER.html

United States Department of Agriculture. (2017, December). *Conservation Fact Sheet*. Retrieved from Farm Service Agency: https://www.fsa.usda.gov/tools/informational/fact-sheets/conservation-compliance-highly-erodible-land-wetlands

United States Department of Agriculture. (n.d.). *Web Soil Survey.* Retrieved from Natural Resources Conservation Service: https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

United States Environmental Protection Agency. (2025, July 7). *Overview of Identifying and Restoring Impaired Waters under Section 303(d) of the CWA.* Retrieved from https://www.epa.gov/tmdl/overview-identifying-and-restoring-impaired-waters-under-section-303d-cwa

USDA Farm Service Agency. (2025, May). *Conservation Reserve Program.* Retrieved from Farm Service Agency: https://www.fsa.usda.gov/tools/informational/fact-sheets/general-signup-64-12-2025-june-6-2025

USDA Farm Service Agency. (No date). *CRP Practices by County Jan 2024.* Retrieved from https://www.fsa.usda.gov/documents/crppracticesbycountyjan24xlsx

WeatherSpark. (2025). *Climate and Average Weather Year Round in Gridley, California, United States.* Retrieved November 2025, from https://weatherspark.com/y/1179/Average-Weather-in-Gridley-California-United-States-Year-Round

# APPENDICES

# Appendix A - Notice of Preparation

Original Copy

# NOTICE OF PREPARATION OF DRAFT ENVIRONMENTAL IMPACT REPORT AND NOTICE OF PUBLIC SCOPING MEETING REGARDING THE PROPOSED BUTTE WATER DISTRICT TEMPORARY WATER TRANSFERS FROM 2026 TO 2030 PROJECT

Notice is hereby given that the Butte Water District (BWD) will be the Lead Agency and prepare an Environmental Impact Report (EIR) for the Temporary Water Transfers from 2026 to 2030 Project (Project). BWD has determined that an EIR must be prepared for the Project prior to making any final decision regarding whether to approve the Project in accordance with the California Environmental Quality Act (CEQA). The BWD Board of Directors will consider the EIR when determining how to move forward with the Project.

BWD is requesting any responsible/trustee/cooperating agency or interested person to participate, review, and provide input on how the Project may affect the environment. If you are an authorized representative of an agency with authorization of facilities that may be affected, BWD needs to know the views of your agency as to the scope and content of the environmental information that is relevant to your agency's statutory responsibilities in connection with the Project. Agencies will need to use the EIR when considering permits or other approvals. Please provide the name, address, telephone number and email address of the contact person for your agency.

BWD is seeking an examination of scope and content of the goals, objectives, policies, and actions to guide and protect the physical, environmental, economic, and social conditions on lands and in the surrounding communities within the proposed pipeline alignment.

**Project Title:** Temporary Water Transfers from 2026 to 2030 Project

**Project Applicant:** Butte Water District
735 Virginia Street
Gridley, CA. 95948

**Project Location:**
The Project area, from which the water for the Project's proposed water transfer would be made available, is defined by the BWD boundaries, which is situated approximately 50 miles north of Sacramento and 85 miles south of Redding (see Figure 1 below).

**Project Description:**
**District Background**
The Butte Water District (District or BWD) was formed in 1956 and may divert up to 133,200 acre-feet (AF) of water during the defined irrigation season under the terms of a 1969 Agreement on Diversion from the Feather River with the State of California, acting by and through the Department of Water Resources (DWR) and allocated through a 1970 Joint Operating Agreement with Butte Water District, Richvale Irrigation District, Biggs-West Gridley Water District, and Sutter Extension Water District, known collectively as the Joint Water Districts. As a result of these agreements, BWD's water is diverted from the Thermalito Afterbay, part of the Oroville Complex. The 1969 Diversion of Water agreement requires written approval from DWR before any of the districts can transfer water outside the service areas of the Joint Board. An agreement between DWR and the proposed water purchasers to store or transport the water through the State Water Project (SWP) or Central Valley Project (CVP) facilities may also be required to implement a water transfer.

**Water Transfers**

The District is preparing for potential one-year water transfers over a five-year period from 2026 through 2030. The transfers may be for environmental enhancement or for one or more buyers with temporary unmet consumptive water demands. Santa Clara Valley Water District (Valley Water) would have the first right of refusal for the water transfers from BWD.

A water transfer temporarily moves water from a willing seller (BWD) to an environmental purpose or willing buyer. To make new water available, the seller must take an action to reduce consumptive use, use a substitute water supply such as groundwater, or use water in storage. Additionally, water transfers must comply with all applicable State and federal law. Moreover, under the 1969 Diversion of Water Agreement with the State of California, BWD's water entitlement is subject to a drought reduction under certain circumstances related to dry hydrologic conditions. If BWD's entitlement is curtailed 50 percent for an irrigation season, pursuant to the 1969 Agreement, BWD has not historically participated in a land idling transfer. However, in the event of a lesser reduction, the District may still participate in a land idling transfer. BWD may participate in a groundwater substitution transfer for its lands located in Sutter County under any drought reduction scenario.

This EIR analyzes water transfers as if the full amount would be transferred every year during the five-year transfer period; however, transfers may be less frequent and smaller in volume over this period. Annual approval of transfers is required by BWD, the end user, and DWR, regardless of the EIR term or the duration of a water transfer contract. Additionally, if the Healthy Rivers and Landscapes (HRL) Program is adopted and implemented during the five-year period from 2026 to 2030, BWD's available transfer supplies may be reduced during "Above Normal", "Below Normal", and "Dry" year types.

**Water Transfer Availability**

The Project water transfers would include short-term transfers of up to 21,000 AF in any year. This includes up to 14,000 AF from crop idling transfers and up to of 6,500 AF from groundwater substitution transfers. These volumes may increase if BWD develops additional groundwater substitution capacity during the five-year period of analysis.

The Project area, from which the water for the potential transfers would be made available, is defined by the District boundaries, which encompass approximately 32,505 acres in the northern Sacramento Valley in both Butte and Sutter Counties. Land idled for the purpose of the potential transfers would be drawn from the rice acreage within the District to the exclusion of irrigable acreage dedicated to other crops and to habitat of the Giant Garter Snake. Adjoining areas, non-rice land, other irrigated lands, drains, wetlands, and waterfowl habitat would not be affected, as those areas would receive their normal entitlement, and canals and drains would operate at normal operating capacity. Water would be available on the same pattern during the growing season as it would have been consumed had a crop been planted. The irrigation season for rice generally lasts from April or May through September.

Water made available by crop idling and/or groundwater substitution within the boundaries of the District would be retained and stored by the DWR at Lake Oroville for delivery to Valley Water (or a different buyer if Valley Water refuses, as further discussed below), pending approval from DWR. If the HRL program were approved, DWR would contribute 60,000 AF in the defined call years. BWD would undertake similar transfer actions to replenish a portion of the 60,000 AF advanced by DWR for environmental enhancement under the HRL program.[1] For the Feather River, environmental enhancement would include restoration of the

[1] (California State Water Resources Control Board, 2025)

following amounts of habitat by the end of year eight: 15 acres of spawning habitat, 5.25 acres of instream rearing habitat, and 1,655 acres of floodplain rearing habitat.[2] For the HRL program, a portion of Feather River flow commitments may be provided through groundwater substitution and may only be provided in a manner that does not have redirected impacts on fish and wildlife and is consistent with SGMA. Any reduction in instream flows that result from groundwater substitution shall be accounted for and deducted from flow contributions.

**Water Transfer Type**

Cropland idling water transfers make water available by reducing the consumptive use of surface water applied for irrigation. In a groundwater substitution program, groundwater is pumped and used for agricultural purposes in lieu of surface water supplies. The equivalent surface water supplies are then not diverted and are made available for transfer. Groundwater pumping, if applicable, would only occur within that portion of the District boundaries that lie within Sutter County and in a manner consistent with the Groundwater Sustainability Plan (GSP) developed under the Sustainable Groundwater Management Act (SGMA) and would only utilize BWD wells. The District's proposed water transfers would fully comply with DWR's DRAFT Technical Information for Preparing Water Transfer Proposals in 2019 where applicable regarding land idling and groundwater substitution transfers as well as monitoring and reporting for groundwater conditions before, during, and after the transfer period.[3]

The quantity of transfer water made available through crop idling is currently calculated based on the pattern of Evapotranspiration Rate of Applied Water (ETAW).[4] In the absence of technical information supporting an alternate method, the quantity of transfer water will continue to be calculated based on ETAW for any rice acreage idling. Acreage eligible for inclusion in a rice idling program is limited to that acreage that would have been planted to rice in the absence of the proposed transfer. Consistent with the provisions contained in California Water Code Section 1018, potential participating landowners would be encouraged to cultivate or retain non-irrigated cover crops or natural vegetation into their cropland idling transfer to protect habitat value in the area to be idled.

For the groundwater substitution transfers, the Project would extract up to 6,500 AF of groundwater from two BWD production wells. These wells have approximate production capacities of 3,500 gallons per minute (GPM) and 4,000 GPM, respectively. BWD is also in the process of purchasing land for the future installation of a third production well that would also be used if completed within the five-year project duration. BWD also owns three groundwater monitoring wells and uses these wells, among others that are not owned by the District (such as those defined in transfer agreements and DWR's Water Transfer Information Management System, among others), to monitor groundwater levels in the vicinity of the production wells to ensure that no substantial depletion of groundwater supplies occurs as a result of groundwater production. The District has operated these wells in the past at similar production rates and, consistent with extensive monitoring and reporting for such past usage, BWD has not observed any substantial impacts on groundwater levels, groundwater supplies, or to third parties or other environmental resources.

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[2] Ibid.

[3] (Department of Water Resources, 2019)

[4] ETAW is defined as the portion of the total evapotranspiration that is provided by irrigation. The portion of evapotranspiration met by precipitation occurring during the growing seasons or stored as soil moisture within the root zone before the growing season does not qualify as transferable water. ETAW values used for water transfer calculations are based upon crop water demands reflecting average rainfall and evaporative demand.

**Water Transfer Operations**

No new construction or improvements by BWD, Valley Water or other potential buyers, or DWR would be necessary for the production and transfer of water resulting from the Project. However, the aforementioned third production well could be installed during the five-year Project duration and would likely be used for Project activities if completed. As mentioned above, BWD receives water from Oroville Reservoir under a Diversion Agreement with the State of California. Normal operations involve DWR releasing water from the Oroville Reservoir to the Thermalito Afterbay to be diverted by BWD. For water transfers, DWR reduces what it releases, and, as a result, BWD also reduces its water diversions. Water would be stored in the Oroville Reservoir if capacity is available and stored water follows DWR's applicable policies and regulations. Storing transfer water could not affect the ability of DWR to meet environmental commitments or water deliveries and would not be possible if flood releases were being made from the Oroville Reservoir as no capacity would be available. Water would become available for transfer on the same schedule that it would have been delivered to BWD. In most cases, this would involve water accruing in storage at the Oroville Reservoir in May and June before being conveyed downstream in July through September.

**Santa Clara Valley Water District**

It is anticipated that a key recipient of BWD's transfer supplies will be Valley Water, who has the first right of refusal of water transfers as a part of the Project. In the event that Valley Water does not elect to receive the transferred water, the District may pursue transfers to the environment or other buyers where BWD can utilize its existing water infrastructure to convey transfer water. If both Valley Water and direct conveyance route for the transfer water are not available, BWD may pursue a simultaneous water exchange to convey water to the environment or other buyers.

Valley Water has contracts for 100,000 AF per year (AFY) of SWP water and 152,500 AFY of CVP water. However, water availability and environmental conditions impact the actual amount of water delivered. As a result, Valley Water receives an average of approximately 170,000 AFY from the two sources combined. During periods of water shortage in contract allocations, Valley Water has historically participated in water transfers with other SWP and CVP contractors as well as in transfer and banking projects involving other types of contractors. In addition, Valley Water's Anderson Reservoir is currently limited to approximately 3% of its capacity due to seismic concerns, which, in turn, takes away substantial drinking water resources for Santa Clara County. The Anderson Dam is presently undergoing a seismic retrofit, but the project is not anticipated to be completed until 2033.[5] As such, Valley Water's dependence on water transfers is expected to be higher until project completion.

Since 1996, Valley Water has participated in a water banking and exchange program with the Semitropic Water Storage District located in Kern County. In wet years, Valley Water stores excess Delta-conveyed water in the Semitropic Groundwater Bank for later use, such as during dry years. Valley Water can also store imported water supplies for shorter periods of time in the San Luis Reservoir in Merced County and locally in Calero Reservoir in Santa Clara County.

To meet current and future demands, Valley Water has also implemented a long-term water conservation program. With a target of saving 100,000 AFY by 2030, the long-term program offers a variety of incentives and rebates that achieve sustainable water savings. The program saved approximately 86,000 AF in 2024.

[5] (Santa Clara Valley Water District, 2024)

**Public Review and Scoping Meeting:**
Comments on the proposed scope and content of the EIR may be submitted in writing to the attention of:

Donnie Stinnett, General Manager
Butte Water District
735 Virginia Street
Gridley, CA 95948
Phone: (530) 846-3100
Email: donnie@buttewater.net

Dawn E. Marple, Principal Planner, Environmental Project Manager
Provost & Pritchard Consulting Group
455 W. Fir Ave
Clovis, CA 93611
Phone: (559) 449-2700
Email: dmarple@ppeng.com

Comments in response to the Notice of Preparation will be accepted from August 29, 2025, through September 29, 2025. Persons with questions or requests for information may also use the above contact information.

All written scoping comments should reference Butte Water District One Year Water Transfers over Five Years Project. Please include your name, address, and phone number, and/or email so that we may contact you for clarification, if necessary.

All supporting documents can also be found at https://buttewaterdistrict.org/.
Pursuant to Section 15083 of the CEQA Guidelines, Public Scoping Meetings will be held to solicit public comments on the scope and content of the EIR. The Public Scoping Meetings will be held as follows:

**At the Butte Water District – District Office**
**Date:** Wednesday, September 17, 2025
**Time:** 6:00 P.M. to 7:00 P.M.
**Place:** District Office located at 735 Virginia Street, Gridley CA 95948

**Newspaper Notice of Preparation Published:**
Gridley Herald, August 29, 2025

**Summary**

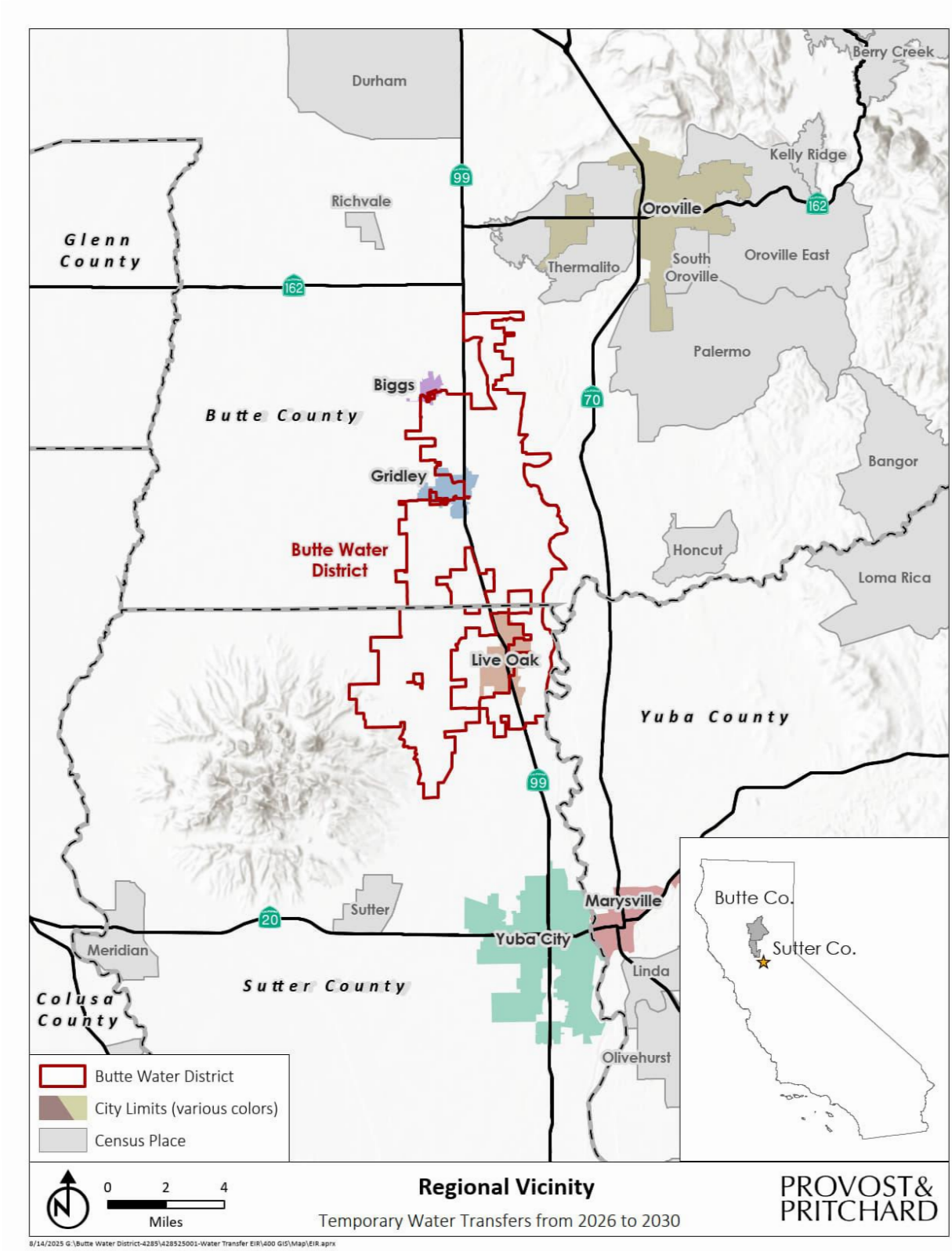
**Potential Environmental Effects:** The Draft EIR will describe the significant direct and indirect environmental impacts of the Project. The Draft EIR also will evaluate the cumulative impacts of the Project, defined as impacts that could be exacerbated when considered in conjunction with other related past, present, and reasonably foreseeable future projects. The BWD anticipates that the Project could result in potentially significant environmental impacts in the following resource areas, which will be further evaluated in the draft EIR: Agricultural and Forestry Resources, Biological Resources, Hydrology and Water Quality.

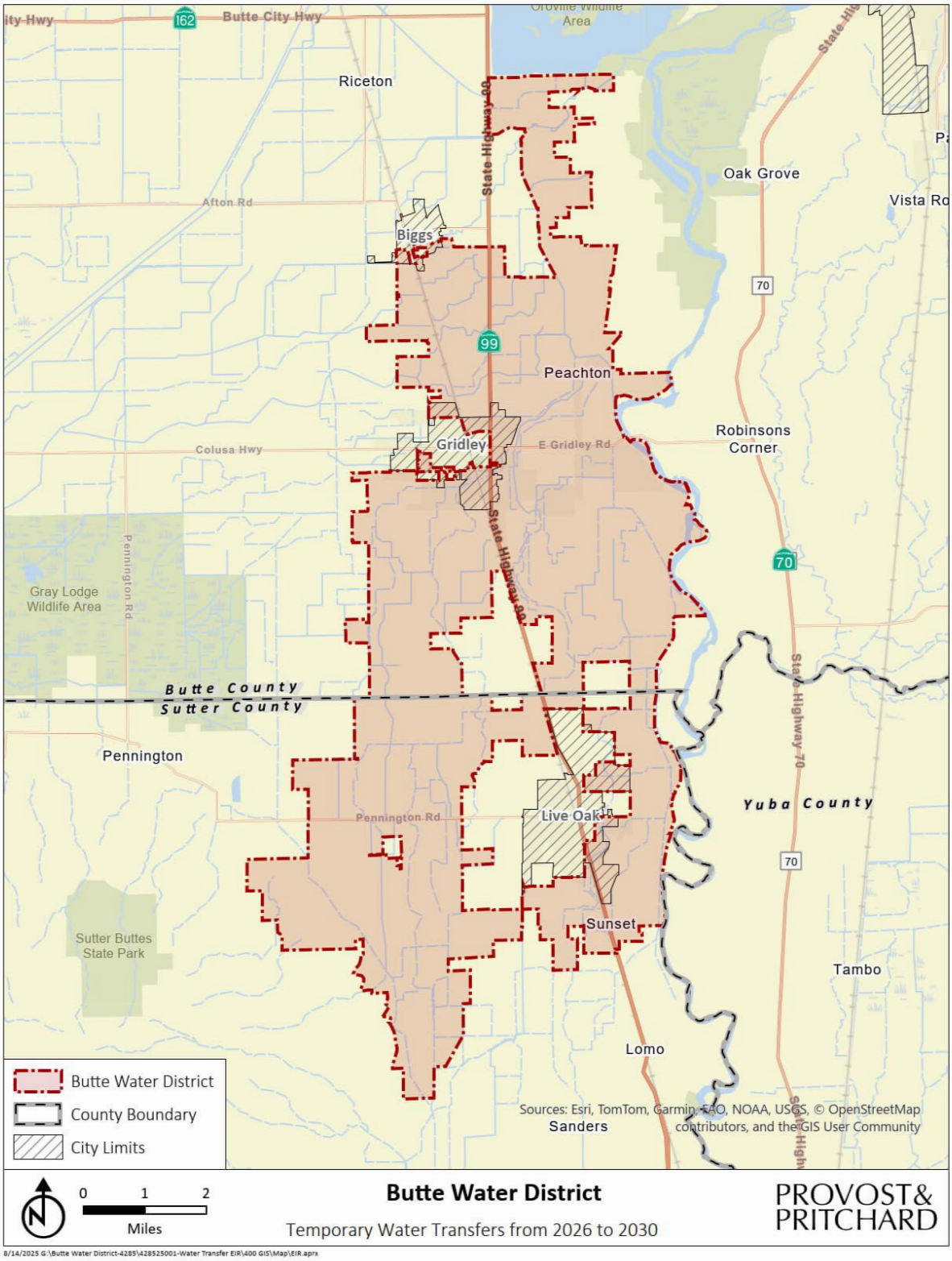
These potential impacts will be analyzed and discussed in detail in the Draft EIR, and feasible and practicable mitigation measures will be recommended to reduce any identified significant or potentially significant impacts. The discussion in the draft EIR will also include an alternatives analysis.

The BWD anticipates that the Project would not result in significant environmental impacts in the following resource areas, which will not be further evaluated in the draft EIR: Aesthetics, Air Quality, Cultural Resources, Energy, Geology and Soils, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Land Use and Planning, Mineral Resources, Noise, Population and Housing, Public Services, Recreation, Transportation, Tribal Cultural Resources, Utilities and Service Systems, and Wildfire.

**Potential Approvals and Permits Required:** Elements of the Project could be subject to permitting and/or approval authority of other agencies. As the lead agency pursuant to CEQA, the BWD is responsible for considering the adequacy of the Draft EIR. Other potential approval and/or permits required from other agencies could include:

- Department of Water Resources
- Santa Clara Valley Water District
- United States Bureau of Reclamation


Durham
Berry Creek
Kelly Ridge
Richvale
99
Oroville
162
Glenn County
Thermalito
South Oroville
Oroville East
162
Palermo
Biggs
70
Butte County
Bangor
Gridley
Butte Water District
Honcut
Loma Rica
Live Oak
Yuba County
99
Sutter
Marysville
20
Yuba City
Meridian
Linda
Sutter County
Colusa County
Olivehurst
Butte Water District
City Limits (various colors)
Census Place
Butte Co.
Sutter Co.
0 2 4
Miles
Regional Vicinity
Temporary Water Transfers from 2026 to 2030
PROVOST& PRITCHARD
8/14/2025 G:\Butte Water District-4285\428525001-Water Transfer EIR\400 GIS\Map\EIR.aprx




**Butte Water District**

Temporary Water Transfers from 2026 to 2030

PROVOST& PRITCHARD

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# Appendix B - CalEEMod Output Files

# BWD Water Transfers Custom Report

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# 1. Basic Project Information

## 1.1. Basic Project Information

| Data Field | Value |
|---|---|
| Project Name | BWD Water Transfers |
| Construction Start Date | 1/1/2026 |
| Lead Agency | — |
| Land Use Scale | Project/site |
| Analysis Level for Defaults | County |
| Windspeed (m/s) | 3.40 |
| Precipitation (days) | 12.0 |
| Location | 39.280810803809686, -121.71167880006666 |
| County | Sutter |
| City | Unincorporated |
| Air District | Feather River AQMD |
| Air Basin | Sacramento Valley |
| TAZ | 300 |
| EDFZ | 4 |
| Electric Utility | Pacific Gas & Electric Company |
| Gas Utility | Pacific Gas & Electric |
| App Version | 2022.1.1.30 |

## 1.2. Land Use Types

| Land Use Subtype | Size | Unit | Lot Acreage | Building Area (sq ft) | Landscape Area (sq ft) | Special Landscape Area (sq ft) | Population | Description |
|---|---|---|---|---|---|---|---|---|
| Other Non-Asphalt Surfaces | 0.10 | Acre | 0.10 | 0.00 | 0.00 | 0.00 | — | — |

### 1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

# 2. Emissions Summary

### 2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Un/Mit. | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 0.73 | 5.36 | 8.36 | 0.01 | 0.17 | 0.10 | 0.27 | 0.15 | 0.02 | 0.18 | — | 1,276 | 1,276 | 0.05 | 0.01 | 1,281 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 1.05 | 9.23 | 10.1 | 0.02 | 0.42 | 5.39 | 5.81 | 0.39 | 2.59 | 2.97 | — | 1,788 | 1,788 | 0.07 | 0.02 | 1,795 |
| Average Daily (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 0.19 | 1.71 | 2.63 | < 0.005 | 0.06 | 0.05 | 0.11 | 0.05 | 0.02 | 0.07 | — | 404 | 404 | 0.02 | < 0.005 | 405 |
| Annual (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Unmit. | 0.03 | 0.31 | 0.48 | < 0.005 | 0.01 | 0.01 | 0.02 | 0.01 | < 0.005 | 0.01 | — | 66.8 | 66.8 | < 0.005 | < 0.005 | 67.1 |

### 2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Year | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily - Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 0.73 | 5.36 | 8.36 | 0.01 | 0.17 | 0.10 | 0.27 | 0.15 | 0.02 | 0.18 | — | 1,276 | 1,276 | 0.05 | 0.01 | 1,281 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily - Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 1.05 | 9.23 | 10.1 | 0.02 | 0.42 | 5.39 | 5.81 | 0.39 | 2.59 | 2.97 | — | 1,788 | 1,788 | 0.07 | 0.02 | 1,795 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 0.19 | 1.71 | 2.63 | < 0.005 | 0.06 | 0.05 | 0.11 | 0.05 | 0.02 | 0.07 | — | 404 | 404 | 0.02 | < 0.005 | 405 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 2026 | 0.03 | 0.31 | 0.48 | < 0.005 | 0.01 | 0.01 | 0.02 | 0.01 | < 0.005 | 0.01 | — | 66.8 | 66.8 | < 0.005 | < 0.005 | 67.1 |

# 3. Construction Emissions Details

## 3.1. Site Preparation (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.44 | 3.74 | 5.54 | 0.01 | 0.19 | — | 0.19 | 0.17 | — | 0.17 | — | 858 | 858 | 0.03 | 0.01 | 861 |
| Dust From Material Movement | — | — | — | — | — | 0.53 | 0.53 | — | 0.06 | 0.06 | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | 0.01 | 0.12 | 0.18 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 28.2 | 28.2 | < 0.005 | < 0.005 | 28.3 |
| Dust From Material Movement | — | — | — | — | — | 0.02 | 0.02 | — | < 0.005 | < 0.005 | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | 0.02 | 0.03 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 4.67 | 4.67 | < 0.005 | < 0.005 | 4.69 |
| Dust From Material Movement | — | — | — | — | — | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.02 | 0.02 | 0.24 | 0.00 | 0.00 | 0.05 | 0.05 | 0.00 | 0.01 | 0.01 | — | 49.4 | 49.4 | < 0.005 | < 0.005 | 50.1 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.67 | 1.67 | < 0.005 | < 0.005 | 1.70 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 0.28 | 0.28 | < 0.005 | < 0.005 | 0.28 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.3. Grading (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 1.02 | 9.19 | 9.69 | 0.02 | 0.42 | — | 0.42 | 0.39 | — | 0.39 | — | 1,714 | 1,714 | 0.07 | 0.01 | 1,720 |
| Dust From Material Movement | — | — | — | — | — | 5.31 | 5.31 | — | 2.57 | 2.57 | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.01 | 0.05 | 0.05 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 9.39 | 9.39 | < 0.005 | < 0.005 | 9.43 |
| Dust From Material Movement | — | — | — | — | — | 0.03 | 0.03 | — | 0.01 | 0.01 | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 1.56 | 1.56 | < 0.005 | < 0.005 | 1.56 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dust From Material Movement | — | — | — | — | — | 0.01 | 0.01 | — | < 0.005 | < 0.005 | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.03 | 0.03 | 0.37 | 0.00 | 0.00 | 0.08 | 0.08 | 0.00 | 0.02 | 0.02 | — | 74.2 | 74.2 | < 0.005 | < 0.005 | 75.1 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 0.42 | 0.42 | < 0.005 | < 0.005 | 0.42 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 0.07 | 0.07 | < 0.005 | < 0.005 | 0.07 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.5. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.56 | 5.36 | 8.36 | 0.01 | 0.17 | — | 0.17 | 0.15 | — | 0.15 | — | 1,276 | 1,276 | 0.05 | 0.01 | 1,281 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.56 | 5.36 | 8.36 | 0.01 | 0.17 | — | 0.17 | 0.15 | — | 0.15 | — | 1,276 | 1,276 | 0.05 | 0.01 | 1,281 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.15 | 1.47 | 2.29 | < 0.005 | 0.05 | — | 0.05 | 0.04 | — | 0.04 | — | 350 | 350 | 0.01 | < 0.005 | 351 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.03 | 0.27 | 0.42 | < 0.005 | 0.01 | — | 0.01 | 0.01 | — | 0.01 | — | 57.9 | 57.9 | < 0.005 | < 0.005 | 58.1 |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Worker | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.7. Paving (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.43 | 3.84 | 5.28 | 0.01 | 0.17 | — | 0.17 | 0.15 | — | 0.15 | — | 804 | 804 | 0.03 | 0.01 | 807 |
| Paving | 0.00 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Off-Road Equipment | 0.01 | 0.05 | 0.07 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 11.0 | 11.0 | < 0.005 | < 0.005 | 11.0 |
| Paving | 0.00 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | 0.01 | 0.01 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 1.82 | 1.82 | < 0.005 | < 0.005 | 1.83 |
| Paving | 0.00 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.05 | 0.03 | 0.67 | 0.00 | 0.00 | 0.10 | 0.10 | 0.00 | 0.02 | 0.02 | — | 112 | 112 | < 0.005 | < 0.005 | 114 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | 0.01 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 1.39 | 1.39 | < 0.005 | < 0.005 | 1.41 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | < 0.005 | < 0.005 | < 0.005 | 0.00 | 0.00 | < 0.005 | < 0.005 | 0.00 | < 0.005 | < 0.005 | — | 0.23 | 0.23 | < 0.005 | < 0.005 | 0.23 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

## 3.9. Architectural Coating (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

| Location | ROG | NOx | CO | SO2 | PM10E | PM10D | PM10T | PM2.5E | PM2.5D | PM2.5T | BCO2 | NBCO2 | CO2T | CH4 | N2O | CO2e |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Onsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | 0.12 | 0.86 | 1.13 | < 0.005 | 0.02 | — | 0.02 | 0.02 | — | 0.02 | — | 134 | 134 | 0.01 | < 0.005 | 134 |
| Architectural Coatings | 0.61 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | 0.01 | 0.02 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 1.83 | 1.83 | < 0.005 | < 0.005 | 1.84 |
| Architectural Coatings | 0.01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Off-Road Equipment | < 0.005 | < 0.005 | < 0.005 | < 0.005 | < 0.005 | — | < 0.005 | < 0.005 | — | < 0.005 | — | 0.30 | 0.30 | < 0.005 | < 0.005 | 0.30 |
| Architectural Coatings | < 0.005 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Onsite truck | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Offsite | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Daily, Summer (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Daily, Winter (Max) | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Average Daily | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Annual | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| Worker | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Vendor | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Hauling | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | — | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

# 5. Activity Data

## 5.1. Construction Schedule

| Phase Name | Phase Type | Start Date | End Date | Days Per Week | Work Days per Phase | Phase Description |
|---|---|---|---|---|---|---|
| Site Preparation | Site Preparation | 1/1/2026 | 1/17/2026 | 5.00 | 12.0 | — |
| Grading | Grading | 1/18/2026 | 1/20/2026 | 5.00 | 2.00 | — |
| Building Construction | Building Construction | 1/21/2026 | 6/10/2026 | 5.00 | 100 | — |
| Paving | Paving | 6/11/2026 | 6/18/2026 | 5.00 | 5.00 | — |
| Architectural Coating | Architectural Coating | 6/19/2026 | 6/25/2026 | 5.00 | 5.00 | — |

## 5.2. Off-Road Equipment

### 5.2.1. Unmitigated

| Phase Name | Equipment Type | Fuel Type | Engine Tier | Number per Day | Hours Per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|---|---|
| Site Preparation | Graders | Diesel | Average | 1.00 | 8.00 | 148 | 0.41 |
| Site Preparation | Tractors/Loaders/Backhoes | Diesel | Average | 1.00 | 8.00 | 84.0 | 0.37 |
| Grading | Graders | Diesel | Average | 1.00 | 6.00 | 148 | 0.41 |
| Grading | Rubber Tired Dozers | Diesel | Average | 1.00 | 6.00 | 367 | 0.40 |
| Grading | Tractors/Loaders/Backhoes | Diesel | Average | 1.00 | 7.00 | 84.0 | 0.37 |
| Building Construction | Tractors/Loaders/Backhoes | Diesel | Average | 2.00 | 8.00 | 84.0 | 0.37 |
| Building Construction | Generator Sets | Diesel | Average | 1.00 | 8.00 | 14.0 | 0.74 |
| Building Construction | Welders | Diesel | Average | 1.00 | 8.00 | 46.0 | 0.45 |
| Building Construction | Bore/Drill Rigs | Diesel | Average | 1.00 | 8.00 | 83.0 | 0.50 |
| Paving | Tractors/Loaders/Backhoes | Diesel | Average | 1.00 | 8.00 | 84.0 | 0.37 |
| Paving | Cement and Mortar Mixers | Diesel | Average | 1.00 | 8.00 | 10.0 | 0.56 |
| Paving | Pavers | Diesel | Average | 1.00 | 8.00 | 81.0 | 0.42 |
| Paving | Rollers | Diesel | Average | 1.00 | 8.00 | 36.0 | 0.38 |
| Architectural Coating | Air Compressors | Diesel | Average | 1.00 | 6.00 | 37.0 | 0.48 |

## 5.3. Construction Vehicles

### 5.3.1. Unmitigated

| Phase Name | Trip Type | One-Way Trips per Day | Miles per Trip | Vehicle Mix |
|---|---|---|---|---|
| Site Preparation | — | — | — | — |
| Site Preparation | Worker | 5.00 | 14.3 | LDA,LDT1,LDT2 |

| | | | | |
|---|---|---|---|---|
| Site Preparation | Vendor | — | 8.80 | HHDT,MHDT |
| Site Preparation | Hauling | 0.00 | 20.0 | HHDT |
| Site Preparation | Onsite truck | — | — | HHDT |
| Grading | — | — | — | — |
| Grading | Worker | 7.50 | 14.3 | LDA,LDT1,LDT2 |
| Grading | Vendor | — | 8.80 | HHDT,MHDT |
| Grading | Hauling | 0.00 | 20.0 | HHDT |
| Grading | Onsite truck | — | — | HHDT |
| Building Construction | — | — | — | — |
| Building Construction | Worker | 0.00 | 14.3 | LDA,LDT1,LDT2 |
| Building Construction | Vendor | 0.00 | 8.80 | HHDT,MHDT |
| Building Construction | Hauling | 0.00 | 20.0 | HHDT |
| Building Construction | Onsite truck | — | — | HHDT |
| Paving | — | — | — | — |
| Paving | Worker | 10.0 | 14.3 | LDA,LDT1,LDT2 |
| Paving | Vendor | — | 8.80 | HHDT,MHDT |
| Paving | Hauling | 0.00 | 20.0 | HHDT |
| Paving | Onsite truck | — | — | HHDT |
| Architectural Coating | — | — | — | — |
| Architectural Coating | Worker | 0.00 | 14.3 | LDA,LDT1,LDT2 |
| Architectural Coating | Vendor | — | 8.80 | HHDT,MHDT |
| Architectural Coating | Hauling | 0.00 | 20.0 | HHDT |
| Architectural Coating | Onsite truck | — | — | HHDT |

## 5.4. Vehicles

### 5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

## 5.5. Architectural Coatings

| Phase Name | Residential Interior Area Coated (sq ft) | Residential Exterior Area Coated (sq ft) | Non-Residential Interior Area Coated (sq ft) | Non-Residential Exterior Area Coated (sq ft) | Parking Area Coated (sq ft) |
|---|---|---|---|---|---|
| Architectural Coating | 0.00 | 0.00 | 0.00 | 0.00 | 261 |

## 5.6. Dust Mitigation

### 5.6.1. Construction Earthmoving Activities

| Phase Name | Material Imported (Cubic Yards) | Material Exported (Cubic Yards) | Acres Graded (acres) | Material Demolished (sq. ft.) | Acres Paved (acres) |
|---|---|---|---|---|---|
| Site Preparation | 0.00 | 0.00 | 6.00 | 0.00 | — |
| Grading | 0.00 | 0.00 | 1.50 | 0.00 | — |
| Paving | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 |

### 5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

## 5.7. Construction Paving

| Land Use | Area Paved (acres) | % Asphalt |
|---|---|---|
| Other Non-Asphalt Surfaces | 0.10 | 0% |

## 5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

| Year | kWh per Year | CO2 | CH4 | N2O |
|---|---|---|---|---|
| 2026 | 0.00 | 204 | 0.03 | < 0.005 |

# 8. User Changes to Default Data

| Screen | Justification |
| --- | --- |
| Construction: Construction Phases | Demolition is not needed as land is cleared and construction involves drilling a well. |
| Construction: Off-Road Equipment | typical construction equipment needed |

# Appendix C - Biological Evaluation

**BUTTE WATER DISTRICT**

# TEMPORARY WATER TRANSFERS FROM 2026 TO 2030 PROJECT BIOLOGICAL EVALUATION

**BUTTE COUNTY AND SUTTER COUNTY**
**JANUARY 2026**

**PREPARED FOR:**
Butte Water District
Butte County and Sutter County

**PREPARED BY:**
Provost & Pritchard Consulting Group
455 W. Fir Ave, Clovis, California 93612

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Appendix C: IPaC Species List
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Appendix E: New Well Site Work Area NRCS Web Soil Survey Report

# ACRONYMS AND ABBREVIATIONS

BMP ..... Best Management Practices
CDFW..... California Department of Fish and Wildlife
CEQA ..... California Environmental Quality Act
CESA ..... California Endangered Species Act
CNDDB..... California Natural Diversity Database
CNPS..... California Native Plant Society
District ..... Butte Water District
ESA ..... Endangered Species Act
°F..... degrees Fahrenheit
HCP ..... Habitat Conservation Plan
IPaC ..... United States Fish and Wildlife Service's Information for Planning and Consultation system
MBTA..... Migratory Bird Treaty Act
NCCP..... Natural Community Conservation Plan
NEPA..... National Environmental Policy Act
NPDES..... National Pollutant Discharge Elimination System
NRCS..... Natural Resources Conservation Service
Project ..... Temporary Water Transfers from 2026 to 2030 Project
Provost & Pritchard..... Provost & Pritchard Consulting Group
RWQCB..... Regional Water Quality Control Board
SWPPP ..... Storm Water Pollution Prevention Plan
USACE..... United States Army Corps of Engineers
USC ..... United States Code
USEPA..... United States Environmental Protection Agency
USFWS..... United States Fish and Wildlife Service
USGS..... United States Geological Survey
WOTUS ..... Waters of the United States

# 1 INTRODUCTION

This Biological Evaluation, prepared by Provost & Pritchard Consulting Group (Provost & Pritchard) in compliance with the California Environmental Quality Act (CEQA), includes descriptions of the biological resources present or with potential to occur within the Butte Water District (District) Temporary Water Transfers from 2026 to 2030 Project (project), potential project-related impacts to those resources, and mitigation measures to reduce these impacts to a less-than-significant level under CEQA.

## 1.1 PROJECT DESCRIPTION

The Project site (or "site") is within the Sacramento Valley and includes the entire District which is located in Butte County and Sutter County. The City of Biggs and the City of Live Oak are adjacent to the District's boundaries (see Figure 2). The Project site/district spans approximately 32,505 acres (see Figure 2). The site includes agricultural fields, irrigation canals, streams, paved and unpaved roads, and non-native grasslands. Surrounding lands include agricultural fields, residential neighborhoods, various cities, and the Feather River.

The District is in the process of preparing for potential one-year water transfers to Santa Clara Valley Water District over a five-year period from 2026 through 2030 during the irrigation seasons. A Biological Evaluation (BE) and Environmental Impact Report (EIR), in compliance with CEQA Guidelines, have been developed based on the short-term transfers of a minimum of 24,000 acre-feet in any of the five years. This BE will analyze both crop idling transfers and groundwater substitution transfers, as the transfers comprise a minimum of 14,000 AF and 10,000 AF from such transfers, respectively. It is understood that the potential water transfers will originate from within the District's boundaries, which span approximately 32,505 acres across Butte and Sutter Counties.
Br
For CEQA analysis, it is important to note that land idled for the purpose of the potential transfers would primarily be drawn from the rice acreage within the District. However, those crops suitable for idling as laid out in Table 2-1 of DWR's *DRAFT Technical Information for Preparing Water Transfer Proposals in 2019* within the District would also have the potential to be idled for the sake of transfers.[1] Crop idling acreages for transfers would be to the exclusion of habitat of the Giant Garter Snake. Potential participating landowners would be encouraged to cultivate or retain non-irrigated cover crops or natural vegetation into their cropland idling transfer to protect habitat value in the area to be idled. Adjoining areas, other irrigated lands, drains, wetlands, and waterfowl habitat would not be affected, as those areas would receive their normal entitlement, and canals and drains would operate at normal operating capacity. Water would be available in the same pattern during the growing season as it would have been consumed had a crop been planted. Water made available through crop idling would be stored by the DWR at Lake Oroville, pending DWR approval. Groundwater substitution pumping—if conducted—would be limited to lands within the Sutter County portion of the District, in compliance with SGMA and the applicable GSP. Groundwater substitution transfers are not anticipated in Butte County.

For the groundwater substitution transfers, the Project would extract up to 10,000 AF of groundwater from BWD production wells. Two existing wells have approximate production capacities of 3,500 gallons per minute (GPM) and 4,000 GPM, respectively. BWD is also in the process of purchasing land for the future installation of a third production well that would also be used if completed within the five-year project duration, which would bring the total water available for transfer from groundwater substitutions to up to 10,000 AF. BWD also owns three groundwater monitoring wells and uses these wells, among others that are not owned by the District (such as those defined in transfer agreements and DWR's Water Transfer Information Management System, among others), to monitor groundwater levels in the vicinity of the

[1] (Department of Water Resources 2019)

production wells to ensure that no substantial depletion of groundwater supplies occurs as a result of groundwater production. The District has operated these wells in the past at similar production rates and, consistent with extensive monitoring and reporting for such past usage, BWD has not observed any substantial impacts on groundwater levels, groundwater supplies, or to third parties or other environmental resources.

No new construction or improvements by BWD, Valley Water or other potential buyers, or DWR would be necessary for the production and transfer of water resulting from the Project. However, the aforementioned third production well (new well/ new well site) could be installed during the five-year Project duration and would likely be used for Project activities if completed. As mentioned above, BWD receives water from Oroville Reservoir under a Diversion Agreement with the State of California. Normal operations involve DWR releasing water from the Oroville Reservoir to the Thermalito Afterbay to be diverted by BWD. For water transfers, DWR reduces what it releases, and, as a result, BWD also reduces its water diversions. Water would be stored in the Oroville Reservoir if capacity is available and stored water follows DWR's applicable policies and regulations. Storing transfer water could not affect the ability of DWR to meet environmental commitments or water deliveries and would not be possible if flood releases were being made from the Oroville Reservoir as no capacity would be available. Water would become available for transfer on the same schedule that it would have been delivered to BWD. In most cases, this would involve water accruing in storage at the Oroville Reservoir in May and June before being conveyed downstream in July through September.

## 1.2 REPORT OBJECTIVES

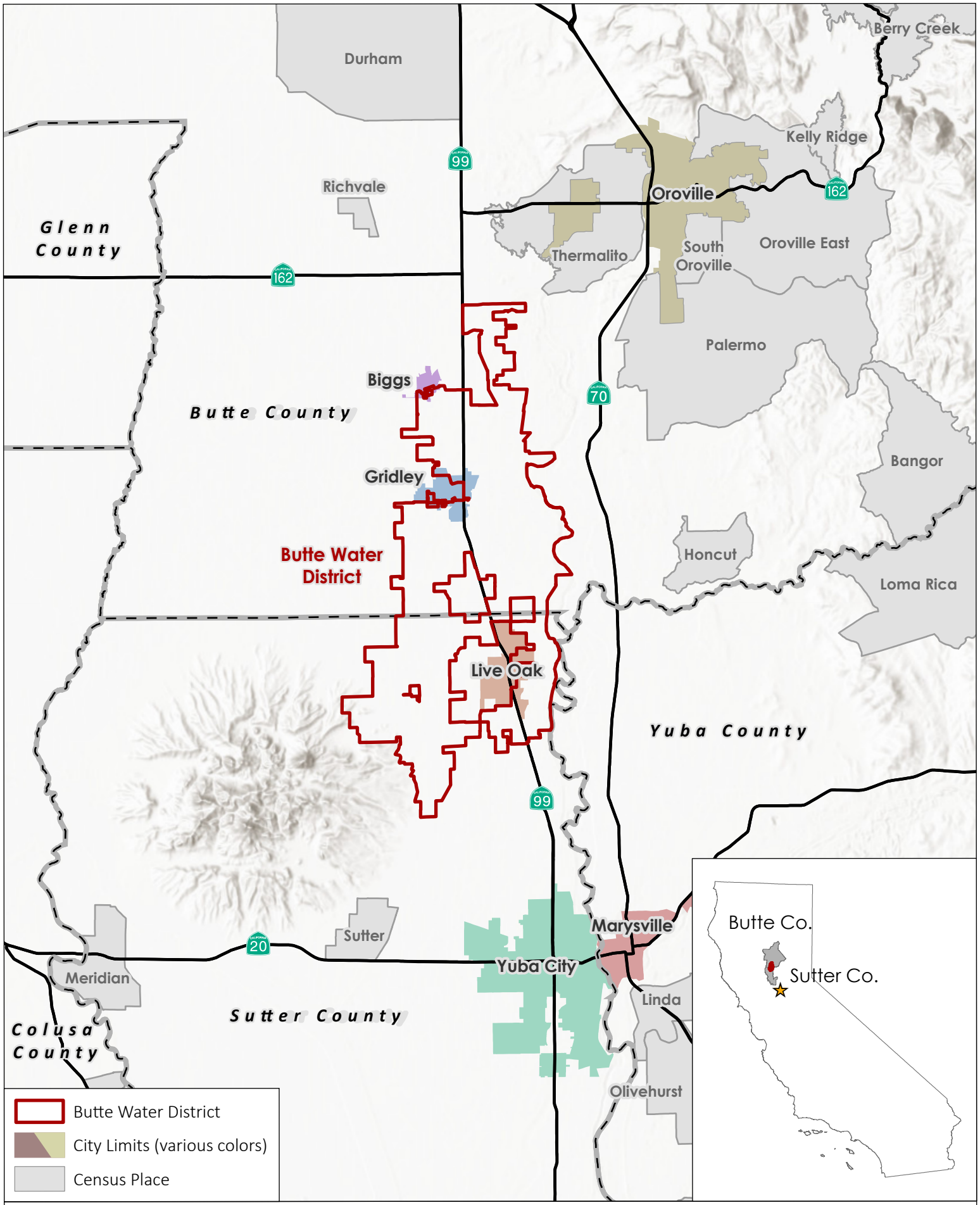
Construction activities such as those proposed by the Project could potentially change biological resources or habitats that are critical for sensitive plant and wildlife species. In cases such as these, development may be regulated by state or federal agencies, and/or addressed by local regulatory agencies.

This report addresses issues related to the following:

- The presence of sensitive biological resources within the site, or those with the potential to occur within the site.
- The federal, state, and local regulations regarding these resources.
- Mitigation measures that may be required to reduce the magnitude of anticipated impacts and/or comply with permit requirements of state and federal resource agencies.

Therefore, the objectives of this report are to:

- Summarize all site - specific information related to existing biological resources.
- Make reasonable inferences about the biological resources that could occur onsite based on habitat suitability and the proximity of the site to a species' known range.
- Summarize all state and federal natural resource protection laws that may be relevant to implementation of the Project.



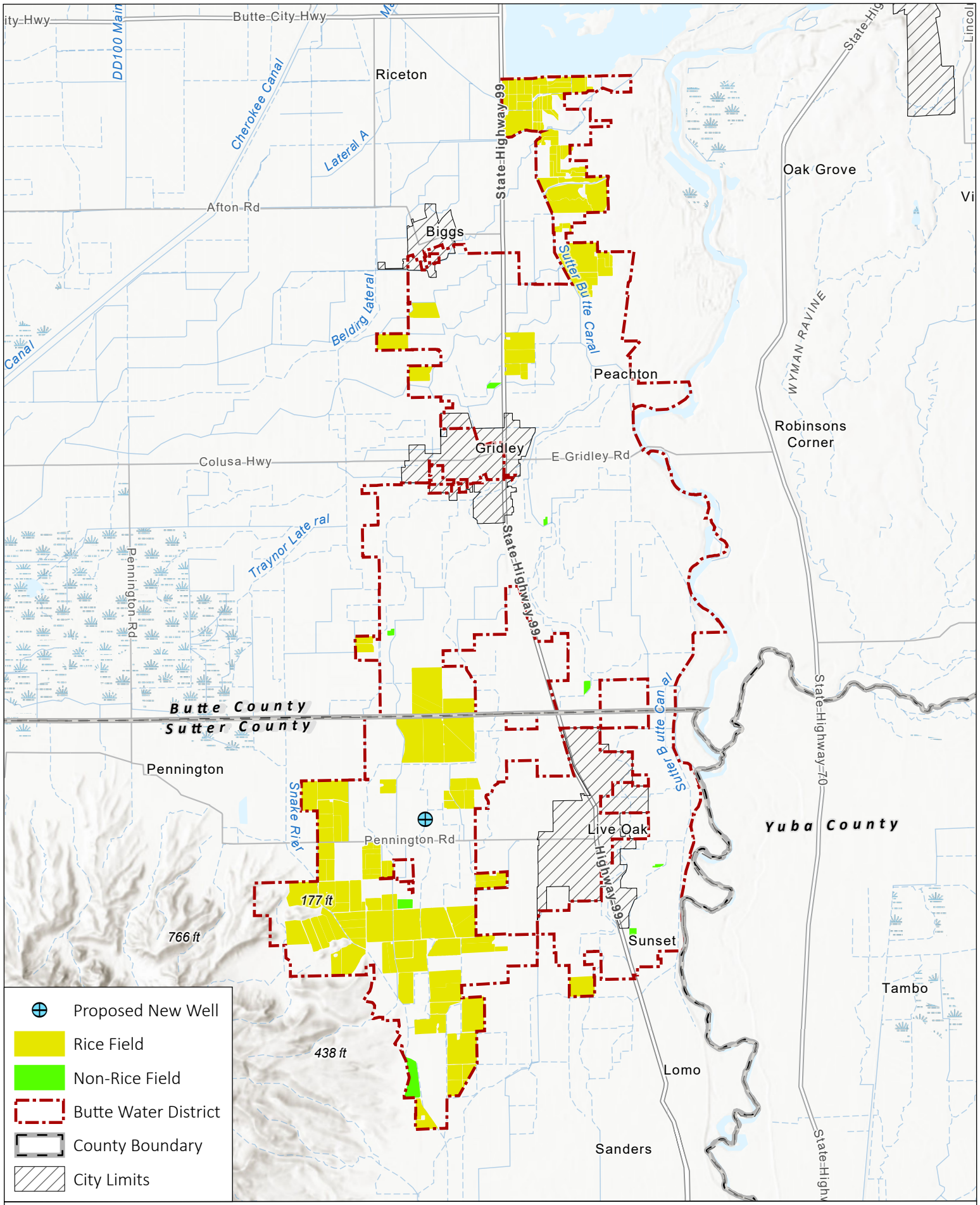

# Regional Vicinity Map

Butte Water District - Temporary Water Transfers from 2026 to 2030

PROVOST& PRITCHARD

*Fig. 1 Page 1-3*

9/9/2025 G:\Butte Water District-4285\428525001-Water Transfer EIR\400 GIS\Map\EIR.aprx




# Project Site Map

Butte Water District - Temporary Water Transfers from 2026 to 2030

PROVOST& PRITCHARD

*Fig. 2 Page 1-4*

9/15/2025 G:\Butte Water District-4285\428525001-Water Transfer EIR\400 GIS\Map\EIR.aprx




# Work Area: New Well Site Map

Butte Water District - Temporary Water Transfers from 2026 to 2030

PROVOST& PRITCHARD

*Fig. 3 Page 1-5*

9/15/2025 G:\Butte Water District-4285\428525001-Water Transfer EIR\400 GIS\Map\EIR.aprx

## 1.3 STUDY METHODOLOGY

A reconnaissance-level field survey of the site was conducted over two days on October 16th and October 17th, 2025, by Provost & Pritchard biologist, Olivia Arrendondo. The survey consisted of walking and driving throughout the District's boundaries and surveying representative areas while identifying and noting land uses, biological habitats and communities, and plant and animal species encountered. Habitats were also assessed to help with determining if they could be suitable for various rare or protected plant and animal species. Representative photographs of the site were taken and are presented in Appendix A.

Mrs. Stark then utilized the results of the field survey to analyze potential project-related impacts to biological resources based on the resources known to occur or with the potential to occur within the site. Sources of information used in preparation of this analysis included: California Department of Fish and Wildlife's California Natural Diversity Database (CNDDB; see Appendix B for the species list) and California Wildlife Habitat Relationships (CWHR) database; California Native Plant Society's (CNPS) Online Inventory of Rare and Endangered Vascular Plants of California; CalFlora's online database of California native plants; Jepson Herbarium's online database (i.e., Jepson eFlora); United States Fish and Wildlife Service's (USFWS) Environmental Conservation Online System, Information for Planning and Consultation system (IPaC; see Appendix C for the species list) system, and National Wetlands Inventory; iNaturalist; NatureServe Explorer's online database; United States Department of Agriculture Natural Resources Conservation Service's (NRCS) Web Soil Survey (see Appendix D for the Web Soil Survey Report); California Herps website; and various manuals, reports, and references related to plants and animals of the Sacramento Valley region.

The field survey did not include focused surveys for special status species. The field survey conducted included the appropriate level of detail to assess the significance of potential impacts to sensitive biological resources resulting from implementing the Project. Furthermore, the field survey was sufficient to generally describe aquatic features of the project site that could be claimed as jurisdictional by federal and/or state agencies, such as the United States Army Corps of Engineers (USACE), California Department of Fish and Wildlife (CDFW), Regional Water Quality Control Board (RWQCB), and the State Water Resources Control Board. If project activities resulted in impacts to aquatic resources and aquatic habitats, this report would be sufficient to support required permit applications, if needed, for the Project.

# 2 EXISTING CONDITIONS

## 2.1 REGIONAL SETTINGS

### 2.1.1 TOPOGRAPHY

The District is located within the *Biggs*, *Pennington*, *Gridley*, and *Sutter* United States Geological Survey (USGS) 7.5-minute quadrangles, and the new well site is within the *Gridley* USGS quadrangle within the southeast portion of Section 35, Township 17 North, Range 02 East. The topography of the District is relatively flat, though elevations decrease from the north to the south and range from approximately 40 to 785 feet above mean sea level (see Figure 4).

### 2.1.2 CLIMATE

Like most of California, the site experiences a Mediterranean climate. Warm, dry summers are followed by cool, moist winters. In the summer, average high temperatures range between 82- and 96-degrees Fahrenheit (°F), but rarely exceed 104 °F, and the humidity is generally low. Winter temperatures are often below 55 °F during the day and rarely exceed 65 °F. On average, the City of Gridley receives approximately 31 inches of precipitation in the form of rain yearly, most of which occurs between September and June (WeatherSpark 2025), and the site would be expected to receive similar amounts of precipitation.

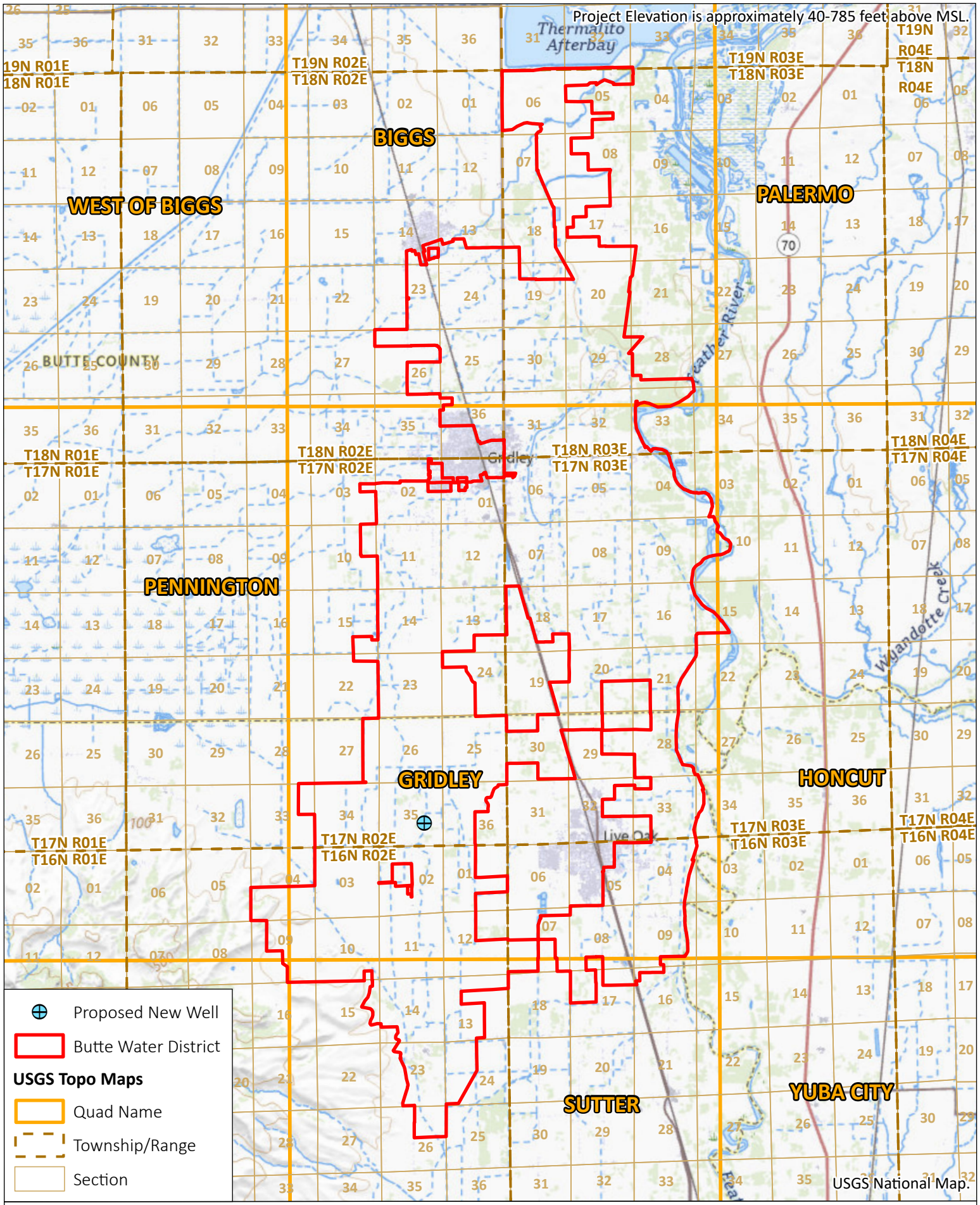
### 2.1.3 HYDROLOGY

Many small streams and canals run through the District's boundaries (see Figure 5 and Figure 6) but would not be impacted during the Project as the water transfers and new well site would not include any work within these waterways. Streams and canals that run through the District mainly receive water diverted from the Feather River and other small streams from upland areas. The Feather River is adjacent to the site and would not be impacted by the Project.

### 2.1.4 SOILS

Soils across the District include clay, silty clay, clay loam, sandy clay loam, loam, sandy loam, and fine sandy loam. Some major and minor soils across the District are considered hydric (see Appendix D for the Web Soil Survey Report). The new well site contains one soil type, Oswald Clay, 0 to 2 percent slopes. Oswald Clay soils are poorly drained, has slow permeability, has very low runoff, and are considered predominantly hydric (see Appendix EAppendix D for the Web Soil Survey Report). This soil is mainly used for irrigated rice and row crops.

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions such that under sufficiently wet conditions, hydrophytic vegetation can be supported. Hydric soil ratings are derived from specific soil properties as well as climate, parent material, vegetation, landform type, and biological activity of a certain location.



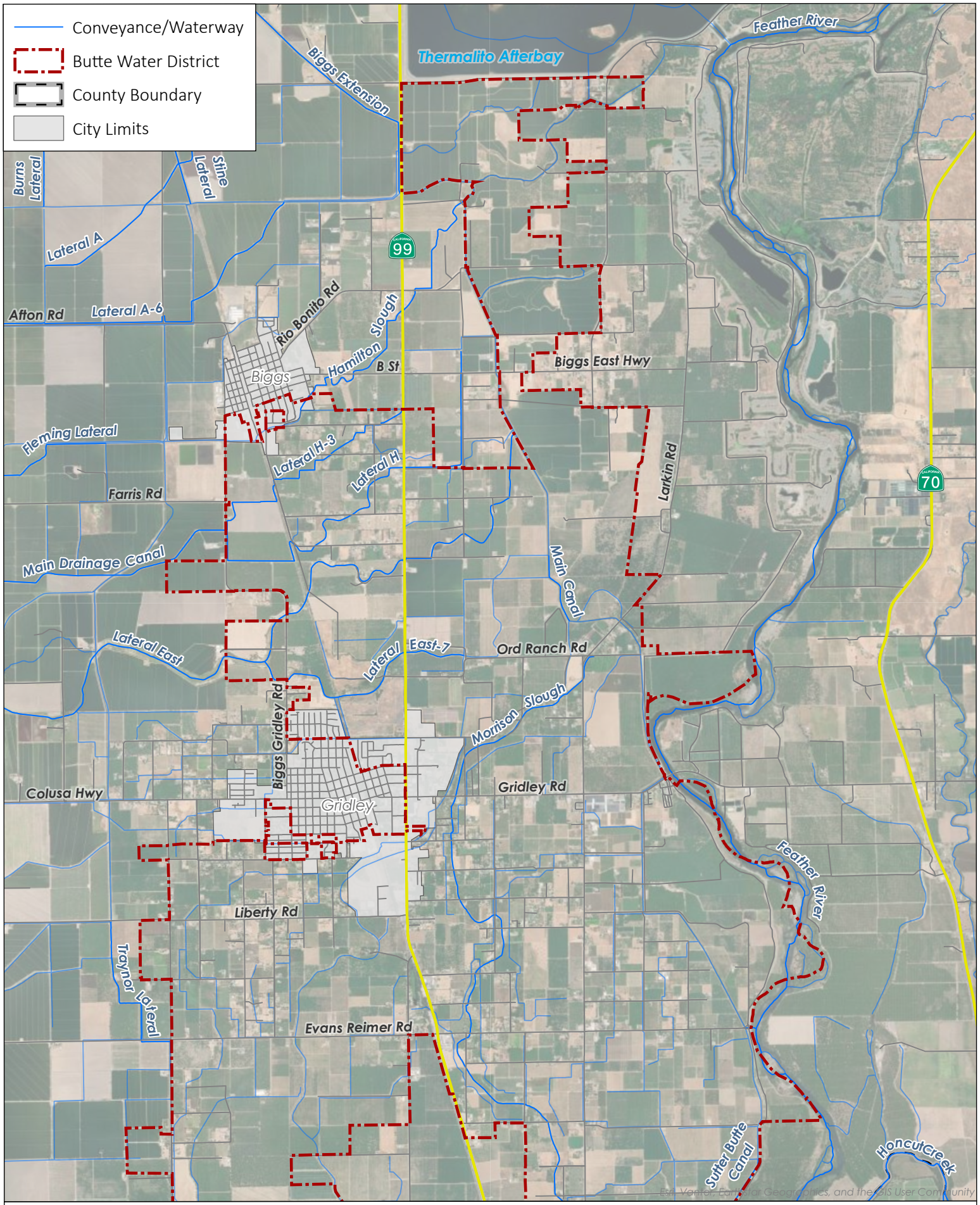

# Topographic Map

Butte Water District - Temporary Water Transfers from 2026 to 2030

PROVOST& PRITCHARD

*Fig. 4 Page 2-3*

1/7/2022 G:\Butte Water District-4285\428525001-Water Transfer EIR\400 GIS\Map\EIR.aprx

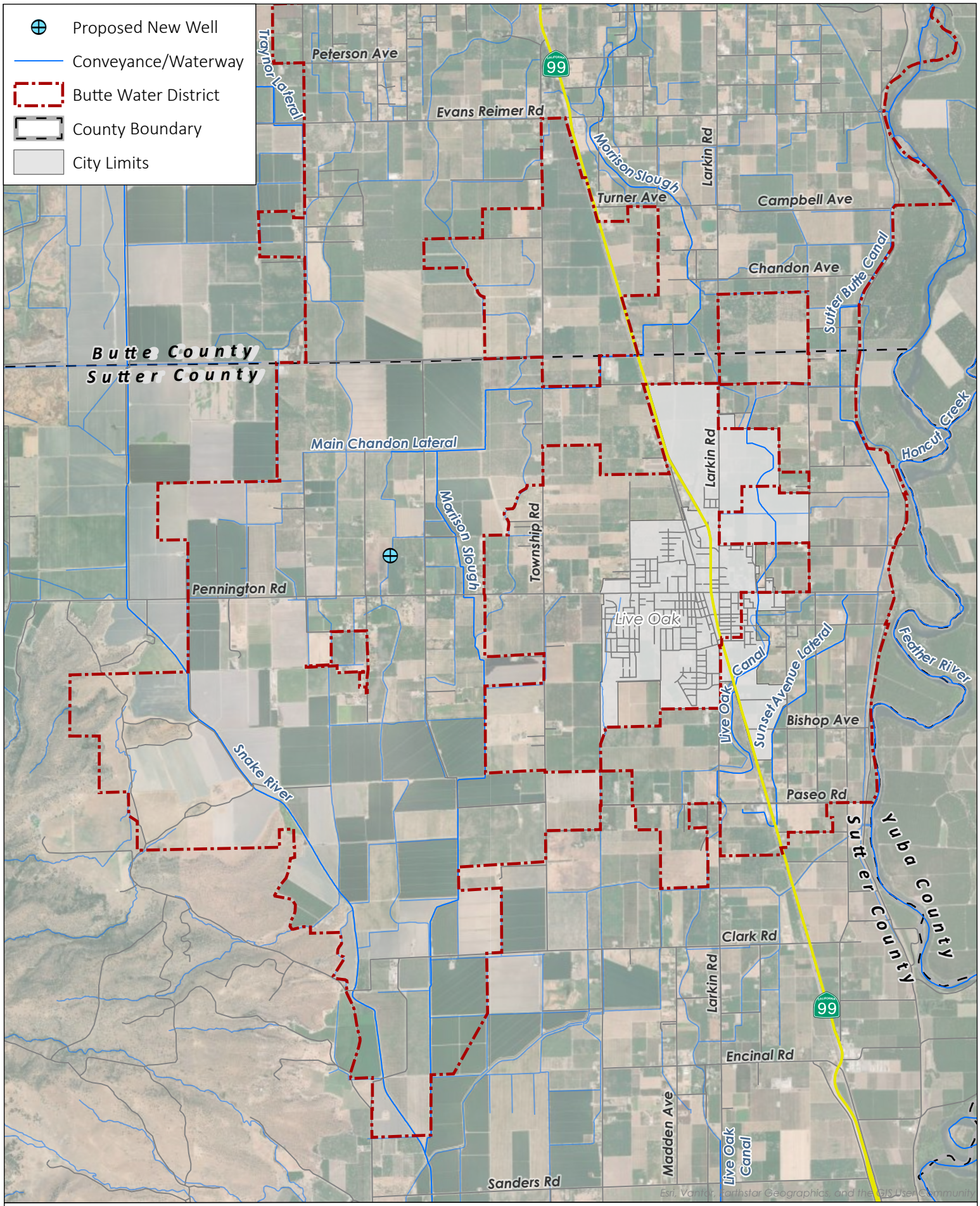



# North Waterways Map

Butte Water District - Temporary Water Transfers from 2026 to 2030

PROVOST& PRITCHARD

*Fig. 5 Page 2-4*




# South Waterways Map

Butte Water District - Temporary Water Transfers from 2026 to 2030

0 0.5 1 Miles

PROVOST& PRITCHARD

*Fig. 6 Page 2-5*

9/15/2025 G:\Butte Water District-4285\428525001-Water Transfer EIR\400 GIS\Map\EIR.aprx

## 2.2 BIOTIC HABITATS

Representative areas within the District's boundaries were chosen, including the new well site, and six biotic habitats were observed and included agricultural, non-native grassland, canal, riverine/marshland, residential, and ruderal (see Figure 5 and Figure 6). The new well site contained canal and ruderal habitats (see Figure 3). These habitats and their constituent plant and animal species are described in more detail in the following sections.

### 2.2.1 AGRICULTURAL

Agricultural fields and orchards are the main habitat type within the District's boundaries. Crop idling would mainly occur on rice fields as well as some idling of other crops. Agricultural fields surveyed included rice, watermelon, unknown crops, and an orchard. All fields were freshly tilled and contained minimal vegetation. Vegetation found across the various fields visited included sparse amounts of non-native grasses, fiddle dock (*Rumex pulcher*), curly dock (*Rumex crispus*), horseweed (*Erigeron canadensis*), rice (*Oryza* sp.), grasses (*Bromus* sp.), flatsedge (*Cyperus* spp.), watermelons (*Citrullus lanatus*), common sowthistle (*Sonchus oleraceus*), Fremont's cottonwood (*Populus fremontii*), broadleaf cattail (*Typha latifolia*), Johnson grass (*Sorghum halepense*), spurge (*Euphorbia* sp.), dallis grass (*Paspalum dilatatum*), field bindweed (*Convolvulus arvensis*), Himalayan blackberry (*Rubus armeniacus*), wild radish (*Raphanus raphanistrum*), and wild oat (*Avena fatua*).

The survey of the various agricultural fields resulted in the identification of numerus bird species including red-tailed hawk (*Buteo jamaicensis*), white-crowned sparrow (*Zonotrichia leucophrys*), house finch (*Haemorhous mexicanus*), lesser goldfinch (*Spinus psaltria*), northern harrier (*Circus hudsonius*), sandhill crane (*Antigone canadensis*), red-winged blackbird (*Agelaius phoeniceus*), western meadowlark (*Sturnella neglecta*), common raven (*Corvus corax*), great egret (*Ardea alba*), savannah sparrow (*Passerculus sandwichensis*), killdeer (*Charadrius vociferus*), yellow-rumped warbler (*Setophaga coronata*), and great blue heron (*Ardea herodias*).

The agricultural habitat within the site is highly disturbed by agricultural activities. While the rice fields provide habitat for giant garter snake during the growing season, only disturbance tolerant species and foraging birds would be expected to utilize this habitat.

### 2.2.2 NON-NATIVE GRASSLAND

Small portions of non-native grassland were located along access roads. Vegetation across the various fields visited included non-native grasses, Johnson grass, horseweed, Himalayan blackberry, rattlesnake grass (*Briza maxima*), great mullein (*Verbascum thapsus*), Peruvian pepper tree (*Schinus molle*), and tall fescue (*Festuca arundinacea*). The survey of this habitat resulted in the identification of western meadowlark and common raven.

The non-native grassland habitat within the site is moderately disturbed by agricultural and anthropogenic activities. The non-native grasslands may provide habitat to a variety of wildlife, year-round and likely serves foraging birds, including raptors, during the day, as well as bats, coyotes, and other nocturnal animals at night.

### 2.2.3 CANAL

Various canals flow through the District's boundaries (see Figure 5 and Figure 6) though the water transfers would not include any work activities within these waterways. Vegetation found within the canals included Johnson grass, Himalayan blackberry, horseweed, common duckweed (*Lemna minor*), Brazilian vervain (*Verbena brasiliensis*), shortpod mustard (*Hirschfeldia incana*), narrowleaf willows (*Salix exigua*), velvetleaf (*Abutilon theophrasti*), American pokeweed (*Phytolacca decandra*), eucalyptus (*Eucalyptus* sp.), a valley oak tree (*Quercus lobata*), scarlet pimpernel (*Anagallis arvensis*), dallis grass, Johnson grass, field bindweed,

Bulbous canary-grass (*Phalaris aquatica*), flatsedge, English plantain (*Plantago lanceolata*), curly dock, and broadleaf cattail.

The survey of the various canals resulted in the identification of sandhill cranes, black phoebe (*Sayornis nigricans*), Lincoln sparrow (*Melospiza lincolnii*), red-shouldered hawk (*Buteo lineatus*), turkey vulture (*Cathartes aura*), common raven, red-tailed hawk, white-crowned sparrow, great blue heron, and chinook salmon (*Oncorhynchus tshawytscha)*.

The canal habitat within the site is highly disturbed by irrigation activities but provides minimal habitat for wildlife when water is present. Chinook salmon are known to occur within canals in the area but mainly occur within the Feather River which is outside of the project site. The Feather River is critical habitat for various special status fish species including Chinook salmon, though no construction would occur near this waterway.

### 2.2.4 RIVERINE/ MARSHLAND

Riverine habitat within the District's boundaries includes various streams (see Figure 5 and Figure 6) though the water transfers would not include any work activities within these waterways. Vegetation within various streams in the District included broadleaf cattail, Johnson grass, Himalayan blackberry, valley oak, horseweed, curly dock, Fremont cottonwood, narrowleaf willow, and Brazilian vervain.

The survey of the riverine/marshland habitat resulted in the observation of black phoebe, red-winged blackbird, mallard (*Anas platyrhynchos*), pied-billed grebe (*Podilymbus podiceps*), Sierran treefrog (*Pseudacris sierra*), and North American river otter (*Lontra canadensis*).

Riverine habitat within the District's boundaries is marginally disturbed by agricultural and irrigation activities in the area but provides expansive high-quality habitat to a variety of wildlife, year-round. This habitat serves amphibians, fish, foraging birds, as well as bats, coyotes, and other nocturnal animals at night.

### 2.2.5 RESIDENTIAL

Rural residential houses are located within the District's boundaries but would not be impacted by the Project and vegetation included ornamental plants surrounding the houses. The survey of the residential habitat resulted in the observation of California scrub jay (*Aphelocoma californica*), California ground squirrels (*Otospermophilus beecheyi*), chickens (*Gallus domesticus*), a horse (*Equus ferus caballus)*, and dogs (*Canis lupus familiaris*). The residential habitat within the site is highly disturbed by anthropogenic activities and only disturbance tolerant species and foraging birds would be expected to utilize this habitat.

### 2.2.6 RUDERAL

The ruderal habitat of the site contained dirt access roads and paved roads throughout the District. Most ruderal areas were bare or contained minimal vegetation. Vegetation throughout this habitat included non-native grasses, field bindweed, Johnson grass, shortpod mustard, Himalayan blackberry, horseweed, dallis grass, and American pokeweed (Phytolacca decandra). The survey of the ruderal habitat resulted in the observation of American kestrel (*Falco sparverius*), coyote (*Canis latrans*) tracks, common racoon (*Procyon lotor*) tracks, small mammal burrows, unidentified crayfish carcasses, and an unidentified snake shed at the entrance of a burrow.

The ruderal habitat within the site is highly disturbed by agricultural, irrigation, and anthropogenic activities in the area. Only disturbance tolerant species, foraging birds, or transient nocturnal species would be expected to utilize this habitat.

## 2.3 NATURAL COMMUNITIES OF SPECIAL CONCERN AND RIPARIAN HABITAT

Natural communities of special concern are those that are of limited distribution, distinguished by significant biological diversity, or home to special status species. CDFW has classified and mapped all natural communities in California. Just as the special status plant and animal species (see Section 3.6), these natural communities of special concern can be found within the CNDDB. While there are no recorded observations of a natural community of special concern mapped within the site, and no natural communities of special concern were observed during the field survey, eight recorded observations are within the vicinity of the site and include:

- Coastal and Valley Freshwater Marsh (located 7 miles west of the District boundary).
- Great Valley Cottonwood Riparian Forest (located along the Feather River, adjacent to the Districts boundary).
- Great Valley Mixed Riparian Forest (located 1 mile east of the Districts boundary).
- Great Valley Valley Oak Riparian Forest (located 3 miles east of the Districts boundary).
- Great Valley Willow Scrub (located 8 miles east of the Districts boundary).
- Northern Basalt Flow Vernal Pool (located 10.5 miles east of the Districts boundary).
- Northern Hardpan Vernal Pool (located 2.5 miles east of the Districts boundary).
- Northern Volcanic Mud Flow Vernal Pool (located 6 miles east of the Districts boundary).

Riparian habitat is composed of plant communities that occur along the banks, and sometimes over the banks, of most waterways and is an important habitat for numerous wildlife species. CDFW has jurisdiction over most riparian habitat in California. Various waterways and areas with riparian habitat are located within the District's boundaries, though the water transfers and the new well would not include any work activities within these waterways.

### 2.3.1 ENVIRONMENTALLY SENSATIVE AREAS

Environmentally sensitive areas are sections of habitat that require special protection due to their ecological and biological significance. Environmentally sensitive areas for GGS in the region have previously been identified by their proximity to tule marsh habitat and wildlife refuges.

While various waterways and areas with riparian habitat are located within the District's boundaries, the water transfers and the new well would not include any work activities within these areas. The Oroville Wildlife Area, which surrounds the Thermalito Afterbay, is directly north of the District's boundaries. The Oroville Wildlife Area is primarily composed of riparian woodland habitat. Areas along the Afterbay adjacent to the site were surveyed for the presence of tule marsh and high-quality suitable habitats, neither of which were observed. The area between the Project site and the Afterbay contained large manmade berms with steep banks and a paved road which separate it from the fields that would be idled.

Within the District's boundaries GGS are primarily documented using the canals. Canals and streams will maintain water levels and conditions similar to years when water transfers do not occur.

## 2.4 DESIGNATED CRITICAL HABITAT

The USFWS often designates areas of "critical habitat" when it lists species as threatened or endangered. Critical habitat is a specific geographic area that contains features essential for the conservation of a threatened or endangered species, which may require special management and protection. According to the IPaC, designated critical habitat is absent from the site. While not within the site, seven species contain critical habitat within the vicinity of the site and include:

- Butte County meadowfoam (critical habitat located 5 miles north of the Districts boundary).

- California tiger salamander (critical habitat located 28 miles southwest of the Districts boundary).
- California red-legged frog (critical habitat located 22 miles west/ northwest of the Districts boundary).
- Chinook salmon (critical habitat located within the Feather River adjacent to the east portion of the Districts boundary).
- Foothill yellow-legged frog (proposed critical habitat located 12 miles north of the Districts boundary).
- Green sturgeon (critical habitat located within the Feather River adjacent to the east portion of the Districts boundary).
- Steelhead (critical habitat located within the Feather River adjacent to the east portion of the Districts boundary).
- Vernal pool fairy shrimp (critical habitat located 14 miles southeast of the Districts boundary).
- Vernal pool tadpole shrimp (critical habitat located 4 miles north, 14 miles southeast, and 14 miles southwest of the Districts boundary).
- Yellow-billed cuckoo (critical habitat located 14 miles west of the Districts boundary).

## 2.5 WILDLIFE MOVEMENT CORRIDORS AND NATIVE WILDLIFE NURSERY SITES

Wildlife movement corridors are routes that animals regularly and predictably follow during seasonal migration, dispersal from native ranges, daily travel within home ranges, and inter-population movements. Movement corridors in California are typically associated with valleys, ridgelines, and rivers and creeks supporting riparian vegetation.

The District mainly consists of agricultural fields with irrigation canals, streams, paved and unpaved roads, and small areas with non-native grasslands. Surrounding lands include agricultural fields, residential neighborhoods, various cities, and the Feather River. The streams and canals may act as corridors for aquatic wildlife, although the water transfers and construction of the new well site would not impact these potential corridors.

Native wildlife nursery sites are areas where a species or group of similar species raise their young in a concentrated place, such as maternity bat roosts. The streams and canals within the site may be used as wildlife nursery sites for amphibian species such as Pacific tree frogs or fish species such as Chinook salmon, which were observed during the survey. The water transfers and new well site would not impact these potential native wildlife nursery sites.

## 2.6 SPECIAL STATUS PLANTS AND ANIMALS

California contains several rare plant and animal species. In this context, “rare” is defined as a species known to have low populations or limited distributions. Conversion of habitats to accommodate human population growth in turn reduces the already-limited suitable habitat for rare species. This results in rare and sensitive species becoming increasingly more vulnerable to extirpation. State and federal regulations have provided the CDFW and USFWS with mechanisms for conserving and protecting the diversity of plant and animal species native to California. Numerous native plants and animals have been formally designated as “threatened” or “endangered” under state and federal endangered species legislation. Other formal designations include “candidate” for listing or “species of special concern” by CDFW. The CNPS has its list of native plants considered rare, threatened, or endangered. Collectively these animals and plants are referred to as “special status species.”

A query of the CNDDB for occurrences of special status plant and animal species was conducted for the *Biggs*, *Gridley*, *Pennington*, and *Sutter* USGS 7.5-minute quadrangles that contains the District, and for the 14 surrounding USGS quadrangles: *Butte City*, *Gilsizer Slough*, *Honcut*, *Meridian*, *Nelson*, *Olive Hurst*,

*Oroville*, *Palermo*, *Sanborn Slough*, *Shippee*, *Sutter Buttes*, *Tisdal Weir*, *West of Biggs*, and *Yuba City*. A query of the IPaC was also completed for the entire site. These species, and their potential to occur within the site, are listed in Table 1 and Table 2, below. Other special status species that did not show up in the CNDDB query, but have the potential to occur in the vicinity, are also included in Table 2. Species lists obtained from CNDDB and IPaC are available in Appendix B and Appendix C, respectively. All relevant sources of information, as discussed in the Study Methodology section of this report, as well as field observations, were used to determine if any special status species have the potential to occur within the site.

Table 1: List of Special Status Plants with Potential to Occur Onsite and/or in the Vicinity

| Species | Status* | Habitat | Occurrence within the Site |
|---|---|---|---|
| Adobe-lily (*Fritillaria pluriflora*) | CNPS 1B | Found in chaparral, cismontane woodland, valley, and foothill grasslands. Usually on clay soils; sometimes serpentine. Found at elevations between 145 and 3,100 feet. Blooms February –April. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 9.5 miles north of the site in 1897. |
| Ahart's dwarf rush (*Juncus leiospermus* var. *ahartii*) | CNPS 1B | Located within valley and foothill grasslands at vernal pool margins, swales, and gopher mounds. Found at elevations between 100 and 750 feet. Blooms March – May. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 2 miles east of the site in 2008. |
| Ahart's paronychia (*Paronychia ahartii*) | CNPS 1B | Found in valley and foothill grassland, vernal pools, and cismontane woodland. Occurs on stony, nearly barren clay of swales and higher ground around vernal pools at elevations below 1,640. Blooms February – June. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 4 miles north of the site in 2004. |
| Baker's navarretia (*Navarretia leucocephala* ssp. *bakeri*) | CNPS 1B | Found in meadows, seeps, vernal pools and swales within cismontane woodland, valley and foothill grassland, and lower montane coniferous forest with adobe or alkaline soils at elevations between 10 and 5,510 feet. Blooms April – July. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity of the project site was at an unknown location in 1936. |

| Species | Status* | Habitat | Occurrence within the Site |
|---|---|---|---|
| Bent-flowered fiddleneck (*Amsinckia lunaris*) | CNPS 1B | Found in cismontane woodland, valley and foothill grassland, and coastal bluff scrub at elevations between 10 and 2,600 feet. Blooms March – June. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 7 miles west of the site in 2013. |
| Big-scale balsamroot (*Balsamorhiza macrolepis*) | CNPS 1B | Found in open, grassy, or rocky slopes within chaparral, grassland, and cismontane woodland habitats at elevations less than 5,000 feet. Blooms March – July. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 9.5 miles north of the site in 1897. |
| Brazilian watermeal (*Wolffia brasiliensis*) | CNPS 2B | Found in wetlands, marshes, and swamps. Occurs mainly in shallow freshwater marshes at elevations below 330 feet. Blooms late spring to early fall. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species may be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 0.5 mile west of the site in 2012. |
| Broadleaf pondweed (*Stuckenia striata*) | CNPS 2B | Found in marshes and swamps. Occurs in lakes, ponds, rivers, and drainage canals at elevations below 4,757 feet. Blooms July – August. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 11 miles west of the site in 2019. |
| Butte County golden clover (*Trifolium jokerstii*) | CNPS 1B | Found in valley and foothill grasslands and vernal pools. Occurs in mesic sites in grassland at elevations below 1,310 feet. Blooms March – May. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 6 miles north of the site in 2020. |

| Species | Status* | Habitat | Occurrence within the Site |
|---|---|---|---|
| Butte County meadowfoam (*Limnanthes floccosa* ssp. *californica*) | CNPS 1B | Found in vernal pools, and valley and foothill grassland. Occurs in wet or flowing drainages and depressions; often not in discrete vernal pools; soils are usually Redding clay with rocks. Found at elevations below 330 feet. Blooms March – May. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 4 miles north of the site in 1999. |
| California alkali grass (*Puccinellia simplex*) | CNPS 1B | Found in the San Joaquin Valley and other parts of California in saline flats and mineral springs within valley grassland and wetland-riparian communities at elevations below 3,000 feet. Blooms March – May. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 3.5 miles west of the site in 1991. |
| Colusa layia (Layia septentrionalis) | CNPS 1B | Found in chaparral, cismontane woodland, valley, and foothill grasslands. Generally occurs on grassy slopes in sandy or serpentine soil at elevations between 50 and 3,600 feet. Blooms April – June. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 4.5 miles southwest of the site in 1930. |
| Ferris' milk-vetch (*Astragalus tener* var. *ferrisiae*) | CNPS 1B | Found in meadows, seeps, valley grasslands, and foothill grasslands. Often occurs on subalkaline flats on overflow land in the Central Valley; usually seen in dry, adobe soil at elevations below 260 feet. Blooms March – June. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 2.5 miles west of the site in 2001. |
| Greene's tuctoria (*Tuctoria greenei*) | FE, CNPS 1B | Found in the San Joaquin Valley and other parts of California in vernal pools within valley grassland, wetland, and riparian communities at elevations below 3,500 feet. Blooms May – September. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 2.5 miles north of the site in 2011. |

| Species | Status* | Habitat | Occurrence within the Site |
|---|---|---|---|
| Hartweg's golden sunburst (*Pseudobahia bahifolia*) | FE, CE, CNPS 1B | Found in valley and foothill grassland and cismontane woodland communities in clay soils that are often acidic. Occurs predominantly on northern slopes, but also along shady creeks and near vernal pools at elevations between 300 and 650 feet. Blooms March – May. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 3 miles south of the site in 1847 but was listed as extirpated in 1990. |
| Heartscale (*Atriplex cordulata* var. *cordulata*) | CNPS 1B | Found in the Central Valley in saline or alkaline soils within shadscale scrub, valley grassland, and wetland-riparian communities at elevations below 250 feet. Blooms June – July. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 3.5 miles west of the site in 2012. |
| Lesser saltscale (*Atriplex minuscula*) | CNPS 1B | Found in the San Joaquin Valley in sandy, alkaline soils in alkali scrub, valley and foothill grassland, and alkali sink communities at elevations below 750 feet. Blooms April – October. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 3.5 miles west of the site in 1998. |
| Pappose tarplant (*Centromadia parryi* ssp. *parryi*) | CNPS 1B | Found in chaparral, coastal prairie, meadows and seeps, coastal salt marsh, valley, and foothill grassland. Occurs in vernally mesic, often alkaline sites at elevations below 1,310 feet. Blooms June – October. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 3.5 miles west of the site in 1998. |
| Peruvian dodder (*Cuscuta obtusiflora* var. *glandulosa*) | CNPS 2B | An annual vine located in marshes and swamps. Found on herbs including *Alternanthera*, *Dalea*, *Lythrum*, *Polygonum*, and *Xanthium.* Found at elevations below 1,640 feet. Blooms July – October. | **Absent.** This species is extirpated from California, and the project site does not contain suitable habitat. |
| Pink creamsacs (*Castilleja rubicundula* var. *rubicundula*) | CNPS 1B | Found in chaparral, cismontane woodland, meadows and seeps, valley grasslands, and foothill grasslands. Often found on serpentine soil at elevations from | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any |

| Species | Status* | Habitat | Occurrence within the Site |
|---|---|---|---|
| | | 65 and 3,000 feet. Blooms April – June. | construction impacts. The nearest recorded observation of this species within the vicinity was approximately 3 miles west of the site in 1988. |
| Recurved larkspur (*Delphinium recurvatum*) | CNPS 1B | Occurs in chenopod scrub, cismontane woodland, and grassland habitats on poorly drained, fine, alkaline soils; often in valley saltbush or valley chenopod scrub communities at elevations between 100 and 2,600 feet. Blooms March – June. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 5.5 miles northwest of the site in 1987. |
| Red Bluff dwarf rush (*Juncus leiospermus* var. *leiospermus*) | CNPS 1B | Found in chaparral, valley and foothill grassland, cismontane woodland, vernal pools, meadows and seeps. Occurs on vernally mesic sites and on the edges of vernal pools at elevations between 920 and 1,640 feet. Blooms April – June. | **Absent.** The site is outside of the elevational range for this species. |
| Sanford's arrowhead (*Sagittaria sanfordii*) | CNPS 1B | This species is an aquatic plant and is found in the San Joaquin Valley and other parts of California in freshwater marshes, ponds, canals, and ditches at elevations below 1,000 feet. Blooms May – October. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species may be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species was within the site in 2015. |
| Slender Orcutt grass (*Orcuttia tenuis*) | FT, CE, CNPS 1B | Occurs in vernal pools and wetlands. Often found in gravelly substrate at elevations between 656 and 3,610 feet. Blooms May – October. | **Absent.** The site is mainly outside of the elevational range for this species. |
| Spicate calycadenia (*Calycadenia spicata*) | CNPS 1B | Found in valley and foothill grassland and cismontane woodland. Occurs on dry, adobe, clay, gravelly, rocky, and disturbed areas, often in openings and roadsides at elevations between 100 and 4,600 feet. Blooms May – September. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 2 miles north of the site in 2012. |
| Subtle orache (*Atriplex subtilis*) | CNPS 1B | Found in the San Joaquin Valley in saline depressions in alkaline soils within valley and foothill grassland communities at elevations below 300 feet. Blooms June – October. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was |

| Species | Status* | Habitat | Occurrence within the Site |
|---|---|---|---|
| | | | approximately 3.5 miles west of the site in 1998. |
| Veiny monardella (*Monardella venosa*) | CNPS 1B | Found in valley grassland, foothill grassland, and cismontane woodland communities. Occurs in heavy clay, mostly with grassland associates. Found at elevations between 200 and 1,400 feet. Blooms June – July. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 3 miles south of the site in 1854. |
| Watershield (*Brasenia schreberi*) | CNPS 2B | Found in marshes and swamps, as well as near artificial waterbodies at elevations below 2,200 feet. Blooms April – October. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 8 miles west of the site in 1946. |
| Water star-grass (*Heteranthera dubia*) | CNPS 2B | Found in marshes and swamps in alkaline, still, or slow-moving water. Requires a pH of 7 or higher, usually in slightly eutrophic waters. Found at elevations between 50 and 5,000 feet. Blooms July – August. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 7 miles west of the site in 1946. |
| Woolly rose-mallow (*Hibiscus lasiocarpos* var. *occidentalis*) | CNPS 1B | Occurs in marshes and swamps in moist, freshwater-soaked riverbanks and low peat islands in sloughs. Can also occur on riprap and levees. In California, known from the delta watershed at elevations below 500 feet. Blooms July – November. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 3 miles west of the site in 1983. |
| Wright's trichocoronis (*Trichocoronis wrightii* var. *wrightii*) | CNPS 2B | Found in marshes and swamps, riparian forest, meadows and seeps, and vernal pools. Occurs in mud flats of vernal lakes, drying riverbeds, and alkali meadows at elevations below 1,640 feet. Blooms May – September. | **Unlikely.** The new well site is located in agricultural habitat, which is unsuitable for this species. While this species could be found in dirt canals or streams within the District, water transfers would not result in any construction impacts. The nearest recorded observation of this species within the vicinity was approximately 16 miles southwest of the site in 1997. |

Table 2: List of Special Status Animals with Potential to Occur Onsite and/or in the Vicinity

| Species | Status* | Habitat | Occurrence within the Site |
|---|---|---|---|
| American badger (*Taxidea taxus*) | CSSC | Prefers drier open stages of shrub, forest, and herbaceous habitats with friable soils to burrow, but can be found within numerous habitats throughout California, including the margins of agricultural lands. Needs a sufficient prey base of burrowing rodents. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 9.5 miles northwest of the site at an unknown date. |
| Bald eagle (*Haliaeetus leucocephalus*) | CE, CFP | Resides in old growth forests as well as lower montane coniferous forests. Can also be found in open uplands in the winter. Nests are generally found in large trees within a mile of water. Nests and winters along ocean shores, lake margins, and rivers. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was adjacent to the east portion of the site in 2010. |
| Bank swallow (*Riparia riparia*) | CT | Nests colonially in burrows constructed along vertical banks and bluffs near waterbodies. This disturbance tolerant species is also known to nest in human-made sites, such as quarries, mounds of gravel or dirt, and road cuts. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was adjacent to the east portion of the site in 2010. |
| Burrowing owl (*Athene cunicularia*) | CCE, CSSC | Resides in open, dry grasslands, deserts, scrublands, and other areas with low growing vegetation. Nests and roosts underground in existing burrows created by mammals, most often by ground squirrels, and human-made structures. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site. No suitable burrows or signs of this species were observed during the field survey and habitat features required by this species were absent. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 2.5 miles north of the site in 2006. |
| California black rail (*Laterallus jamaicensis coturniculus*) | CT | Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering large bays. Requires water depths of about 1 inch that does not fluctuate during the year and | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways |

| Species | Status* | Habitat | Occurrence within the Site |
|---|---|---|---|
| | | dense vegetation for nesting habitat. | or this species. The nearest recorded observation of this species within the vicinity was approximately 4.5 miles west of the site in 1962. |
| California condor (*Gymnogyps californianus*) | FE, CE, CFP | Typically nests in cavities in canyon or cliff faces but has also been recorded nesting in giant sequoias in Tulare County. Requires vast expanses of open savannah, grassland, and/or foothill chaparral in mountain ranges of moderate altitude. Forages for carrion up to 100 miles from their roost/nest sites. | **Unlikely.** While this species could forage within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. There are no recorded observations of this species on the CNDDB within the regional vicinity of the project. |
| California tiger salamander – central California DPS (*Ambystoma californiense*) | FT, CT | Requires vernal pools or seasonal ponds for breeding and small mammal burrows for aestivation. Generally found in grassland and oak savannah plant communities in central California from sea level to 1,500 feet in elevation. Can migrate up to 1.3 miles to breed. | **Unlikely.** The District mainly consists of agricultural habitat which is unsuitable for this species. The new well site is located in agricultural habitat, and the water transfers would not result in any construction or impacts to waterways. Suitable habitat is present in areas outside of the District and this species would not be expected to be impacted by project activities. The nearest recorded observation of this species within the vicinity was approximately 1 mile west of the site in 1965. |
| Chinook salmon - Central Valley spring-run ESU (*Oncorhynchus tshawytscha* pop. 11) | FT, CT | Spring-run Chinook Salmon enter the Sacramento River from late March through September. Adults hold in cool water habitats through the summer, then spawn in the fall from mid-August through early October. Juveniles migrate soon after emergence as young-of-the-year or remain in freshwater and migrate as yearlings. Now only remnant runs remain in Butte, Mill, Deer, Antelope, and Beegum Creeks, tributaries to the Sacramento River. In the mainstem Sacramento River and the Feather River, early-running Chinook Salmon occur, but significant hybridization with fall run has occurred. Adult numbers depend on pool depth and volume, amount of cover, and proximity to gravel. Water temps >27 C are lethal to adults. | **Present**. This species was observed within the Snake River which runs through the southwest portion of the District. While within the boundaries of the District this species would not be impacted by the water transfers or construction of the new well site.<br><br>The nearest recorded observation of this species within the vicinity was within the Feather River, adjacent to the east portion of the site in 2015. |
| Coast horned lizard (*Phrynosoma blainvillii*) | CSSC | Found in grasslands, coniferous forests, woodlands, and chaparral, primarily in open areas with | **Unlikely.** The District mainly consists of agricultural habitat which is unsuitable for this species. The new well site is |

| Species | Status* | Habitat | Occurrence within the Site |
|---|---|---|---|
| | | patches of loose, sandy soil and low-lying vegetation in valleys, foothills, and semi-arid mountains. Frequently found near ant hills and along dirt roads in lowlands along sandy washes with scattered shrubs. | located in agricultural habitat, and the water transfers would not result in any construction or impacts to waterways. Suitable habitat is present in areas outside of the District and this species would not be expected to be impacted by project activities. The nearest recorded observation of this species within the vicinity was approximately 11.5 miles north of the site in 2002. |
| Crotch's bumble bee (*Bombus crotchii*) | CCE | Occurs throughout coastal California, as well as east to the Sierra Nevada-Cascade crest, and south into Mexico. Food plant genera include snapdragons, scorpionweeds, primroses, poppies, and buckwheats. Nests are often located underground in abandoned rodent nests, or above ground in tufts of grass, old bird nests, rock piles, or cavities in dead trees. This species overwinters under leaf litter or soft soil. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 2.5 miles southwest of the site in 2024. |
| Foothill yellow-legged frog - Feather River Distinct Population Segment (*Rana boylii* pop. 2) | FT, CT | Frequents rocky streams and rivers with rocky substrate and open, sunny banks in forests, chaparral, and woodlands. Occasionally found in isolated pools, vegetated backwaters, and deep, shaded, spring-fed pools. | **Unlikely.** While this species could occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 8.5 miles northeast of the site in 1912 but is listed as extirpated. |
| Foothill yellow-legged frog - north Sierra Distinct Population Segment (*Rana boylii* pop. 3) | CT | Frequents rocky streams and rivers with rocky substrate and open, sunny banks in forests, chaparral, and woodlands. Occasionally found in isolated pools, vegetated backwaters, and deep, shaded, spring-fed pools. | **Unlikely.** While this species could occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 1.5 miles southwest of the site in 2007 but is listed as extirpated. |
| Giant gartersnake (*Thamnophis gigas*) | FT, CT | Occurs in marshes, sloughs, canals, ditches, rice fields, and adjacent uplands. Prefers locations with emergent vegetation for cover and open areas for basking. This species uses small mammal burrows adjacent to aquatic | **Likely.** While this species occurs within the District's boundaries, work will only occur at the new well site. This species could occur in the canal adjacent to the new well site or could be found basking within the marginal habitat of the new well site. While |

| Species | Status* | Habitat | Occurrence within the Site |
|---|---|---|---|
| | | habitats for hibernation in the winter and to escape from excessive heat in the summer. | water transfers would not result in any construction related impacts to waterways or this species, crop idling rice fields may temporarily reduce available habitat for this species. Suitable habitat is available in the surrounding areas and crop idling would not be expected to significantly impact this species. The nearest recorded observation of this species was within the site in 2014. |
| Greater sandhill crane (*Antigone canadensis tabida*) | CT, CFP | Nests in wetland habitats in northeastern California and winters in the Central Valley. Grain fields within 4 miles of a shallow body of water are used as a communal roost site and irrigated pastures are used as loafing sites. | **Present.** While this species occurs within the District's boundaries, work will only occur at the new well site, and this species would only be expected to forage in croplands. While water transfers would not result in any construction related impacts to waterways or this species, crop idling rice fields may temporarily reduce available habitat for this species. Suitable habitat is available in the surrounding areas and crop idling would not be expected to significantly impact this species. The nearest recorded observation of this species was within the site in 1924. |
| Green sturgeon - southern Distinct Population Segment (*Acipenser medirostris* pop. 1) | FT, CSSC | Spawning occurs primarily in cool (51- 59 °F) sections of mainstem rivers in deep pools (26- 30 feet) with substrate containing small to medium sized sand, gravel, cobble, or boulders. | **Possible**. This species may occur within streams that flow through the District. While within the boundaries of the District this species would not be impacted by the water transfers or construction of the new well site. The nearest recorded observation of this species within the vicinity was within the Feather River, adjacent to the east portion of the site in 2020. |
| Least Bell's vireo (*Vireo bellii pusillus*) | FE, CE | This migratory species breeds in southern California. Breeding habitat consists of dense, low, shrubby, riparian vegetation in the vicinity of water or dry river bottoms. By the early 1980s, this species was extirpated from most of its historic range in California, including the Central Valley. | **Absent.** This species was extirpated from most of its historic range in California, including the Central Valley and would not be expected to occur within the project site. The nearest recorded observation of this species within the vicinity was approximately 7 miles northwest of the site in 1906. |
| Loggerhead shrike (*Lanius ludovicianus*) | CSSC | Frequents open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low herbaceous cover. In the Central Valley, this species nests in riparian areas, desert scrub, and agricultural hedgerows. | **Possible**. This species may forage or nest within trees along streams that flow through the District. While within the boundaries of the District this species would not be impacted by the water transfers or construction of the new well site. The nearest recorded observation of this species within the |

| Species | Status* | Habitat | Occurrence within the Site |
|---|---|---|---|
| | | | vicinity was approximately 9.5 miles north of the site in 2002. |
| Marysville California kangaroo rat (*Dipodomys californicus eximius*) | CSSC | Known only from the Sutter Buttes area. This species occurs in the grass-forb stages of chaparral habitat and requires friable soils. | **Unlikely.** While this species could occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 3 miles west of the site in 1983. |
| Monarch butterfly (*Danaus plexippus*) | FPT | Roosts in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby. Larval host plants consist of milkweeds. Winter roost sites extend along the Pacific Coast from northern Mendocino to Baja California, Mexico. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. While this species could travel through the site and forage, roosting habitat was absent. Water transfers would not result in any construction or impacts to waterways or this species. There are no recorded observations of this species on the CNDDB within the regional vicinity of the project. |
| Northern harrier (*Circus hudsonius*) | CSSC | Nests and forges in various grasslands, including salt grass in desert sinks, riparian scrub, and wetland edges. Nests are constructed on the ground from sticks in wet areas, usually on the edge of marshes. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 2 miles north of the site in 1986. |
| Northwestern pond turtle (*Actinemys marmorata*) | FPT, CSSC | An aquatic turtle of ponds, marshes, slow-moving rivers, streams, and irrigation ditches with riparian vegetation. Requires adequate basking sites and sandy banks or grassy open fields to deposit eggs. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site. This species could occur in the canal adjacent to the new well site or could be found basking within the marginal habitat of the new well site. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species was within the site in 2016. |
| Pallid bat (*Antrozous pallidus*) | CSSC | Found in grasslands, chaparral, and woodlands, where it feeds on ground- and vegetation-dwelling arthropods, and occasionally takes insects in flight. Prefers to roost in | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and lacks roosting habitat. Water transfers |

| Species | Status* | Habitat | Occurrence within the Site |
|---|---|---|---|
| | | rock crevices, but may also use tree cavities, caves, bridges, and other human-made structures. | would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 2.5 miles west of the site in 2003. |
| Song sparrow ("Modesto" population) (*Melospiza melodia*) | CSSC | This population is endemic to the north-central portion of the Central valley of California. This species has an affinity for emergent freshwater marshes and is associated with Scirpus *spp*. and *Typha spp*. Known to nest in riparian oak forests (Gardali, 2008). | **Unlikely.** While this species could occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 6.5 miles southeast of the site in 1915. |
| Steelhead – Central Valley DPS (*Oncorhynchus mykiss irideus* pop.11) | FT | This winter-run fish begins migration to fresh water during peak flows during December through February. The spawning season is typically from February to April. After hatching, this species will move to deeper, mid-channel habitats in late summer and fall. In general, both juveniles and adults prefer complex habitat with boulders, submerged clay, undercut banks, and large woody debris. | **Possible**. This species may occur within streams that flow through the District. While within the boundaries of the District this species would not be impacted by the water transfers or construction of the new well site. The nearest recorded observation of this species within the vicinity was within the Feather River, adjacent to the east portion of the site in 2012. |
| Swainson's hawk (*Buteo swainsoni*) | CT | Nests in large trees in open areas adjacent to grasslands, grain or alfalfa fields, or livestock pastures suitable for supporting rodent populations. | **Possible**. This species may forage or nest within trees throughout the District. While large trees occur within half a mile of the well site, construction of the new well would not result in more impacts than normal agricultural activities in the area. Therefore, this species would not be impacted by the water transfers or construction of the new well site. The nearest recorded observation of this species within the vicinity was adjacent to the east portion of the site in 2016. |
| Townsend's big-eared bat (*Corynorhinus townsendii*) | CSSC | Occurs in a variety of habitats, but prefers cool, dark roost sites, and is often found in caves and mines. They roost in the open, hanging from walls and ceilings. Western populations typically forage on moths in areas of dense foliage. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and lacks roosting habitat. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was |

| Species | Status* | Habitat | Occurrence within the Site |
|---|---|---|---|
| | | | approximately 5.5 miles northeast of the site in 1990. |
| Tricolored blackbird (*Agelaius tricolor*) | CT, CSSC | Nests colonially near fresh water in dense cattails or tules, or in thickets of riparian shrubs. Forages in grassland and cropland. Large colonies are often found foraging in dairy farm feed fields. | **Possible**. This species may forage or nest throughout the District. Construction of the new well would not result in more impacts than normal agricultural activities in the area. Therefore, this species would not be impacted by the water transfers or construction of the new well site. The nearest recorded observation of this species was within the site in 2011. |
| Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) | FT | Lives in mature elderberry shrubs in the Central Valley and adjacent foothills from Tehama County south through Merced and Mariposa Counties with two scattered populations in Madera and Fresno Counties. Adults are active from March to June. | **Unlikely.** While this species could occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and is unsuitable for this species. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species was along the east portion of the site in 2011. |
| Vernal pool fairy shrimp (*Branchinecta lynchi*) | FT | Occupies vernal and seasonal pools, with clear to tea-colored water, in grass or mud-bottomed swales, and basalt depression pools. | **Unlikely.** The District mainly consists of agricultural habitat which is unsuitable for this species. The new well site is located in agricultural habitat, and the water transfers would not result in any construction or impacts to waterways. Suitable habitat is present in areas outside of the District and this species would not be expected to be impacted by project activities. The nearest recorded observation of this species within the vicinity was approximately 1.5 miles east of the site in 2009. |
| Vernal pool tadpole shrimp (*Lepidurus packardi*) | FE | Occurs in vernal pools, clear to tea-colored water, in grass or mud-bottomed swales, and basalt depression pools. | **Unlikely.** The District mainly consists of agricultural habitat which is unsuitable for this species. The new well site is located in agricultural habitat, and the water transfers would not result in any construction or impacts to waterways. Suitable habitat is present in areas outside of the District and this species would not be expected to be impacted by project activities. The nearest recorded observation of this species within the vicinity was approximately 1.5 miles east of the site in 2009. |
| Western mastiff bat (*Eumops perotis californicus*) | CSSC | Found in open, arid to semi-arid habitats, including dry desert washes, flood plains, chaparral, oak woodland, open ponderosa pine forest, grassland, and | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and lacks roosting habitat. Water transfers |

| Species | Status* | Habitat | Occurrence within the Site |
|---|---|---|---|
| | | agricultural areas, where it feeds on insects in flight. Roosts most commonly in crevices in cliff faces but may also use high buildings and tunnels. | would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 5.5 miles northeast of the site in 1973. |
| Western red bat (*Lasiurus blossevillii*) | CSSC | Roosts primarily in trees, 2–40 feet above ground, from sea level up through mixed conifer forests. Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging. | **Possible.** While this species may occur within the District's boundaries, work will only occur at the new well site which is within agricultural habitat and lacks roosting habitat. Water transfers would not result in any construction or impacts to waterways or this species. The nearest recorded observation of this species within the vicinity was approximately 10.5 miles southwest of the site in 1999. |
| Western spadefoot (*Spea hammondii*) | FPT, CSSC | The majority of the time this species is terrestrial and occurs in small mammal burrows and soil cracks, sometimes in the bottom of dried pools. Prefers open areas with sandy or gravelly soils, in a variety of habitats including mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Vernal or seasonal pools, that hold water for a minimum of three weeks, are necessary for breeding. | **Unlikely.** The District mainly consists of agricultural habitat which is unsuitable for this species. The new well site is located in agricultural habitat, and the water transfers would not result in any construction or impacts to waterways. Suitable habitat is present in areas outside of the District and this species would not be expected to be impacted by project activities. The nearest recorded observation of this species within the vicinity was approximately 4 miles east of the site at an unknown date. |
| Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) | FT, CE | Suitable nesting habitat in California includes dense riparian willow-cottonwood and mesquite habitats along a perennial river. Once common in the California Central Valley, as well as coastal valleys and riparian habitats east of the Sierra Nevada, habitat loss now constrains the California breeding population to small numbers of birds. | **Possible**. This species may forage or nest within trees throughout the District. While within the boundaries of the District this species would not be impacted by the water transfers or construction of the new well site. The nearest recorded observation of this species within the vicinity was approximately 8 miles west of the site in 2017. |
| White-tailed kite (*Elanus leucurus*) | CFP | Occurs in rolling foothills and valley margins with scattered oaks and river bottomlands or marshes next to deciduous woodland. Often occurs in open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching. | **Possible**. This species may forage or nest within trees throughout the District. While within the boundaries of the District this species would not be impacted by the water transfers or construction of the new well site. The nearest recorded observation of this species within the vicinity was approximately 12 miles southeast of the site in 2003. |

| Species | Status* | Habitat | Occurrence within the Site |
|---|---|---|---|
| Yellow warbler (*Setophaga petechia*) | CSSC | Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders. Also nests in montane shrubbery in open conifer forests in the Cascades and Sierra Nevada ranges. | Possible. This species may forage or nest within trees throughout the District. While within the boundaries of the District this species would not be impacted by the water transfers or construction of the new well site. The nearest recorded observation of this species within the vicinity was approximately 9.5 miles north of the site in 2002. |

***EXPLANATION OF OCCURRENCE DESIGNATIONS AND STATUS CODES**

Present: Species observed on the site at time of field surveys or during recent past.
Likely: Species not observed on the site, but it may reasonably be expected to occur there on a regular basis.
Possible: Species not observed on the site, but it could occur there from time to time.
Unlikely: Species not observed on the site, and would not be expected to occur there except, perhaps, as a transient.
Absent: Species not observed on the site and precluded from occurring there due to absence of suitable habitat.

**STATUS CODES**

| | | | |
|---|---|---|---|
| FE | Federally Endangered | CE | California Endangered |
| FT | Federally Threatened | CCE | California Endangered (Candidate) |
| FPT | Federally Threatened (Proposed) | CT | California Threatened |
| | | CFP | California Fully Protected |
| | | CSSC | California Species of Special Concern |

**CNPS LISTING**

1B Plants rare, threatened, or endangered in California and elsewhere.
2B Plants rare, threatened, or endangered in California, but more common elsewhere.

# 3 IMPACTS AND MITIGATION

## 3.1 SIGNIFICANCE CRITERIA

### 3.1.1 CEQA

General plans, area plans, and specific projects are subject to the provisions of CEQA. The purpose of CEQA is to assess the impacts of proposed projects on the environment prior to project implementation. Impacts to biological resources are just one type of environmental impact assessed under CEQA and vary from project to project in terms of scope and magnitude. Projects requiring removal of vegetation may result in the mortality or displacement of animals associated with this vegetation. Animals adapted to humans, roads, buildings, and pets may replace those species formerly occurring on a site. Plants and animals that are rare may be destroyed or displaced. Sensitive habitats such as wetlands and riparian woodlands may be altered or destroyed. Such impacts may be considered either "significant" or "less than significant" under CEQA. According to *CEQA Statute and Guidelines* (AEP 2023), "significant effect on the environment" means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the Project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic interest. Specific project impacts to biological resources may be considered "significant" if they would:

- 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 CDFW or USFWS;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the CDFW or USFWS;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (CWA) (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- 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;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or state HCP.

Furthermore, CEQA Guidelines Section 15065(a) states that a project may trigger the requirement to make a "mandatory finding of significance" if the project has the potential to:

> "Substantially 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 an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory."

# 3.2 RELEVANT GOALS, POLICIES, AND LAWS

## 3.2.1 BUTTE COUNTY GENERAL PLAN 2040

The Butte County General Plan 2040 contains the following goals and policies related to the Project:

### 3.2.1.1 WATER RESOURCES ELEMENT

Goal W-1: Maintain and enhance water quality.

Policy W-P1.1: County planning and programs shall be integrated with other watershed planning efforts, including best management practices (BMPs), guidelines, and policies of the Central Valley Regional Water Quality Control Board (CVRWQCB) and local Groundwater Sustainability Plans.

Policy W-P1.3: Regulations that protect water quality from the impacts of agricultural and industrial activities shall be maintained.

Goal W-2: Ensure an abundant and sustainable water supply to support all uses in Butte County.

Policy W-P2.1: The County supports solutions to ensure the sustainability of community water supplies.

Policy W-P2.2: The County may continue the Six-County Memorandum of Understanding (MOU) with Colusa, Glenn, Tehama, Shasta, and Sutter Counties, continue participation in the local GSAs and Groundwater Advisory Boards, and continue to support the Northern Sacramento Valley and Upper Feather River Integrated Regional Water Management and local Groundwater Sustainability Plans.

Policy W-P2.3: Water resources shall be planned and managed in a way that relies on sound science, data, and public participation.

Policy W-P2.4: The County's State Water Project allocation (27,500 acre-feet) should be fully utilized within Butte County when technically and economically feasible to maximize the benefit and value to Butte County by prioritizing use within the county.

Policy W-P2.8: The County supports Area of Origin and County of Origin water rights, the existing water right priority system, and the authority to make water management decisions locally to meet the county's current and future needs, thereby protecting Butte County's communities, economy, and environment.

Goal W-3: Protect and manage groundwater resources in Butte County.

Policy W-P3.1: Groundwater transfers and substitution programs shall be locally regulated to protect the sustainability of the County's economy, communities, and ecosystems.

Goal W-4: Support coordination between Groundwater Sustainability Agencies in Butte County.

Policy W-P4.1: The County shall work cooperatively with the Groundwater Sustainability Agencies in the three subbasins in Butte County to support implementation of the Sustainable Groundwater Management Act to ensure the County has sustainable water supplies.

**Policy W-P4.2:** The County supports working towards Sustainable Groundwater Management Ac implementation to ensure the sustainability of groundwater resources, including groundwater levels, groundwater quality, and avoidance of land subsidence, and supports programs that rely on management at the local level, use sound scientific data, and ensure compliance, where consistent with the County's goals and policies.

**Policy W-P4.3:** Public information and involvement should be encouraged in the groundwater sustainability planning, collaboration, and coordination process.

**Policy W-P4.4:** The County shall consult applicable Groundwater Sustainability Plans and local groundwater management agencies when making decisions that could impact groundwater resources.

#### 3.2.1.2 CONSERVATION AND OPEN SPACE ELEMENT

**Goal COS-6: Engage in cooperative planning efforts to protect biological resources.**

**Policy COS-P6.1:** The County shall coordinate with applicable federal, State, regional and local agencies on natural resources and habitat planning.

**Goal COS-7: Conserve and enhance habitat for protected species and sensitive biological communities.**

**Policy COS-P7.1:** Conservation easements that protect habitat areas, habitat corridors and sensitive biological resources shall be promoted.

**Policy COS-P7.3:** Creeks shall be maintained in their natural state whenever possible, and creeks and floodways shall be allowed to function as natural flood protection features during storms.

**Policy COS- P7.6:** New development projects shall include setbacks and buffers along riparian corridors and adjacent to habitat for protected species, except where permitted in the Butte Regional Habitat Conservation Plan (HCP) and Natural Community Conservation Plan (NCCP) Planning Area and where such development is consistent with the conditions of the HCP/NCCP, upon the future adoption of the HCP/NCCP.

**Policy COS-P7.7:** Construction barrier fencing shall be installed around sensitive resources on or adjacent to construction sites. Fencing shall be installed prior to construction activities and maintained throughout the construction period.

**Policy COS-P7.8:** Where sensitive on-site biological resources have been identified, construction employees operating equipment or engaged in any development-associated activities involving vegetation removal or ground disturbing activities in sensitive resource areas shall be trained by a qualified biologist and/or botanist who will provide information on the on-site biological resources (sensitive natural communities, special-status plant and wildlife habitats, nests of special-status birds, etc.), avoidance of invasive plant introduction and spread, and the penalties for not complying with biological mitigation requirements and other State and federal regulations.*

**Policy COS-P7.9:** A biologist shall be retained to conduct construction monitoring in and adjacent to all habitats for protected species when construction is taking place near such habitat areas.

**Goal COS-9: Protect identified special-status plant and animal species.**

Policy COS-P9.1: A biological resources assessment shall be required for any proposed development project where special-status species or critical habitat may be present. Assessments shall be carried out under the direction of Butte County. Additional focused surveys shall be conducted during the appropriate season if necessary. Upon adoption of the Butte Regional Habitat Conservation Plan (HCP) and Natural Community Conservation Plan (NCCP), assessment requirements of the HCP/NCCP shall be implemented for development projects within the HCP/NCCP area.

Policy COS-P9.2: If special-status plant or animal species are found to be located within a development site, proponents of the project shall engage in consultation with the appropriate federal, State, and regional agencies and mitigate project impacts in accordance with State and federal law. Upon adoption of the Butte Regional Habitat Conservation Plan (HCP) and Natural Community Conservation Plan (NCCP), mitigation requirements of the HCP/NCCP shall be implemented for development projects within the HCP/NCCP area. Examples of mitigation may include:

a. Design the proposed project to avoid and minimize impacts.
b. Restrict construction to specific seasons based on project specific special-status species issues (e.g., minimizing impacts to special-status nesting birds by constructing outside of the nesting season).
c. Confine construction disturbance to the minimum area necessary to complete the work.
d. Mitigate for the loss of special-status species by purchasing credits at an approved conservation bank (if a bank exists for the species in question), funding restoration or habitat improvement projects at existing preserves in Butte County or purchasing or donating mitigation lands of substantially similar habitat.
e. Maintain a minimum 100-foot buffer on each side of all riparian corridors, creeks and streams for special-status and common wildlife.
f. Establish setbacks from the outer edge of special-status species habitat areas.
*g.* Construct barriers to prevent compaction damage by foot or vehicular traffic.

### 3.2.2 SUTTER COUNTY 2030 GENERAL PLAN

The Sutter County 2030 General Plan contains the following goals and policies related to the Project:

#### 3.2.2.1 BIOLOGICAL RESOURCES AND OPEN SPACE

Goal ER 1: Support a comprehensive approach for the conservation, enhancement, and regulation of Sutter County's significant habitat and natural open space resources.

Policy ER 1.4: Resources Assessment. Require discretionary development proposals that could potentially impact biological resources to conduct a biological resources assessment to determine if any resources will be adversely affected by the proposal and, if so, to identify appropriate measures to avoid or mitigate such impacts.

Policy ER 1.5: Avoidance. Ensure that new development projects avoid, to the extent feasible, significant biological resources (e.g. areas of rare, threatened or endangered species of plants, riparian areas, vernal pools), except where such projects are identified as "Authorized Development" within an adopted Habitat Conservation Plan.

Policy ER 1.6: Mitigation. Mitigate biological and open space effects that cannot be avoided in accordance with an applicable Habitat Conservation Plan or federal, state, and local regulations.

Policy ER 1.7: Permits. Require that new development secure all necessary state and federal resource permits/approvals prior to any development activity.

Policy ER 1.8: Buffers. Ensure that new development incorporates buffers and other measures adequate to protect biological habitats that have been preserved, enhanced, and created.

Goal ER 2: Conserve, protect, and enhance Sutter County's significant natural wetland and riparian habitats.

Policy ER 2.1: No Net Loss. Require new development to ensure no net loss of state and federally regulated wetlands, other waters of the United States (including creeks, rivers, ponds, marshes, vernal pools, and other seasonal wetlands), and associated functions and values through a combination of avoidance, restoration, and compensation.

Policy ER 2.2: Resource Conservation District. Encourage and support the Sutter County Resource Conservation District's programs that facilitate preservation and restoration of natural wetland environments as long as these programs do not significantly affect Sutter County agricultural lands and flood control operations.

Goal ER 3: Conserve, protect, and enhance Sutter County's varied wildlife and vegetation resources.

Policy ER 3.1: Special-Status Species. Preserve special-status fish, wildlife, and plant species (e.g., rare, threatened, or endangered species) and habitats consistent with an applicable Habitat Conservation Plan or federal, state, and local regulations.

Policy ER 3.2: Agency Coordination. Coordinate with federal, state, and local resource agencies (e.g., California Department of Fish and Game, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers) to protect special-status species.

Policy ER 3.3: Fisheries. Support the preservation and re-establishment of fisheries in the rivers and streams within Sutter County.

Policy ER 3.4: Waterfowl Resources. Preserve and protect waterfowl resources along the Pacific Flyway Migration Corridor.

Policy ER 3.5: Wildlife Corridors. Preserve and enhance wildlife movement corridors between natural habitat areas to maintain biodiversity and prevent the creation of biological islands. Preserve contiguous habitat areas when possible.

Policy ER 3.6: Natural Vegetation. Preserve important areas of natural vegetation and the ecological integrity of these habitats, where feasible, including but not limited to riparian, vernal pool, marshes, oak woodlands and annual grasslands.

Policy ER 3.7: Oak Trees. Preserve native oak trees when possible through the review of discretionary development projects and activities. Reduce the loss of oak trees through consideration of tree mitigation/replanting programs.

Goal ER 4: Conserve, protect, and enhance Sutter County's unique natural open space lands, drainages, floodplains, and resources.

Policy ER 4.1: Preserve Natural Resources. Preserve natural landforms, natural vegetation, and natural resources as open space to the extent feasible.

Policy ER 4.2: Sutter Buttes. Preserve the Sutter Buttes as an important agricultural, cultural, historic, habitat, and open space resource. Promote and support efforts by willing landowners to increase opportunities for public access to the Sutter Buttes and other open space areas.

Policy ER 4.3: River Corridors. Preserve the Sacramento, Feather, and Bear River corridors as important habitat, recreation and open space resources. Support efforts to increase public access and recreational uses along the County's river corridors.

#### 3.2.2.2 WATER

Goal ER 6: Preserve and protect the County's surface water and groundwater resources.

Policy ER 6.1: Integrated Water Management Programs. Integrate water management programs that emphasize multiple benefits and balance the needs of agricultural, rural, and urban users.

Policy ER 6.2: Surface Water Resources. Protect the surface water resources in the County including the Sacramento, Feather and Bear Rivers and their significant tributaries.

Policy ER 6.3: Groundwater Sustainability. Protect the sustainability of groundwater resources.

Policy ER 6.7: Water Rights. Support the protection of the existing water rights of water agencies and providers within Sutter County. Do not support out-of-area water transfers where they would adversely impact water supply within Sutter County. Support either out-of-area, or in-basin water transfers that would not negatively impact water supply within Sutter County.

### 3.2.3 HEALTHY RIVERS AND LANDSCAPES PROGRAM

The Healthy Rivers and Landscapes Program, previously referred to as Voluntary Agreements and Agreements to Support Healthy Rivers and Landscapes, aims to enhance California's river ecosystems through habitat restoration, improved water management, and collaborative efforts among various stakeholders. The program will be accountable to the State Water Board, which will maintain continuing oversight, assess progress, and ensure the Bay-Delta Plan is being properly implemented.

### 3.2.4 THREATENED AND ENDANGERED SPECIES

Permits may be required from CDFW and/or USFWS if activities associated with a project have the potential to result in the "take" of a species listed as threatened or endangered under the California Endangered Species Act (CESA) and/or Endangered Species Act (ESA), respectively. Take is defined by CESA as, "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill" (California Fish and Game Code, Section 86). Take is more broadly defined by the ESA to include "harm" (16 USC, Section 1532(19), 50 CFR, Section 17.3). CDFW and USFWS are responsible agencies under CEQA and the National Environmental Policy Act (NEPA). Both agencies review CEQA and NEPA documents in order to determine the adequacy of the treatment of endangered species issues and to make project-specific recommendations for their conservation.

### 3.2.5 DESIGNATED CRITICAL HABITAT

When species are listed as threatened or endangered, the USFWS often designates areas of "critical habitat" as defined by section 3(5)(A) of the ESA. Critical habitat is a term defined in the ESA as a specific geographic area that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat is a tool that supports

the continued conservation of imperiled species by guiding cooperation with the federal government. Designations only affect federal agency actions or federally funded or permitted activities. Critical habitat does not prevent activities that occur within the designated area. Only activities that involve a federal permit, license, or funding and are likely to destroy or adversely modify critical habitat will be affected.

### 3.2.6 MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA: 16 USC 703-712) prohibits killing, possessing, or trading in any bird species covered in one of four international conventions to which the United States is a party, except in accordance with regulations prescribed by the Secretary of the Interior. The name of the act is misleading, as it covers almost all bird's native to the United States, even those that are non-migratory. The MBTA encompasses whole birds, parts of birds, and bird nests and eggs. Additionally, California Fish and Game Code makes it unlawful to take or possess any non-game birds covered by the MBTA (Section 3513), as well as any other native non-game birds (Section 3800).

### 3.2.7 BIRDS OF PREY

Birds of prey are protected in California under provisions of California Fish and Game Code (Section 3503.5), which states that it is unlawful to take, possess, or destroy any birds in the order Falconiformes (hawks and eagles) or Strigiformes (owls), as well as their nests and eggs. The bald eagle and golden eagle are afforded additional protection under the Bald and Golden Eagle Protection Act (16 USC 668), which makes it unlawful to kill birds or their eggs, or take feathers or nests, without a permit issued by the U.S. Secretary of the Interior.

### 3.2.8 NESTING BIRDS

In California, protection is afforded to the nests and eggs of all birds. California Fish and Game Code (Section 3503) states that it is "unlawful to take, possess, or needlessly destroy the nest or eggs of any bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Breeding-season disturbance that causes nest abandonment and/or loss of reproductive effort is considered a form of "take" by the CDFW.

### 3.2.9 WETLANDS AND OTHER "JURISDICTIONAL WATERS"

Aquatic resources, including wetlands, streams, rivers, and lakes, are among the important biological resources that are protected by local, state, and federal laws and regulations. Activities that impact these "jurisdictional waters" may be regulated and require permits which aim to avoid or minimize adverse impacts to "jurisdictional waters" to the greatest extent possible. The definition of a jurisdictional water may vary depending on the regulatory agency, and the limits of jurisdiction for each agency are described below.

The USACE, pursuant to Section 404 of the Clean Water Act (CWA), upholds a set of guidelines to regulate activities that could result in the discharge of pollutants into "waters of the United States" ("WOTUS"). The legal definition of WOTUS has significantly evolved since the passage of the CWA in 1972 as a result of administrative rulings and litigation involving federal jurisdiction over water resources. Thus, the reach and extent of USACE and United States Environmental Protection Agency (USEPA) jurisdiction over aquatic features has continually been subject to revision.

The current administrative definition of WOTUS is described in the Biden Administration's 2023 "Conforming Rule." The extent of jurisdiction has been defined in the Code of Federal Regulations (CFR) but is also subject to interpretation by the federal courts. Jurisdictional waters generally include the following categories defined by section 328.3, subdivision (a) of title 33 of the CFR:

1) *Traditional Navigable Waters, the territorial seas, or interstate waters (not including interstate wetlands);*
2) *Impoundments of waters of the United States;*

3) *Tributaries of:*
    a. *Traditional Navigable Waters, territorial seas, or interstate waters (not including interstate wetlands); or*
    b. *Impoundments of water of the United States when the tributaries meet the relatively permanent standard.*
4) *Wetlands:*
    a. *Adjacent to Traditional Navigable Waters, the territorial seas, or interstate waters;*
    b. *Adjacent to and with a continuous surface connection to relatively permanent impoundments of waters of the United States*
    c. *Adjacent to and with a continuous surface connection to relatively permanent jurisdictional tributaries.*
5) *Intrastate lakes and ponds not identified in items 1 through 4 of this section that are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters identified in items 1 or 3 above.*

Exclusions under the new definition include the following:

1) *Waste treatment systems, including treatment ponds or lagoons, designed to meet the requirements of the CWA;*
2) *Prior converted cropland designated by the Secretary of Agriculture. The exclusion would cease upon a change of use, which means that the area is no longer available for the production of agricultural commodities. Notwithstanding the determination of an area's status as prior converted cropland by any other Federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with USEPA;*
3) *Ditches (including roadside ditches) excavated wholly in and draining only dry land and that do not carry a relatively permanent flow of water;*
4) *Artificially irrigated areas that would revert to dry land if the irrigation ceased;*
5) *Artificial lakes or ponds created by excavating or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing;*
6) *Artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating or diking dry land to retain water for primarily aesthetic reasons;*
7) *Waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States; and*
8) *Swales and erosional features (e.g., gullies, small washes) characterized by low volume, infrequent, or short duration flow.*

The Department of the Army, acting through the USACE, regulates the filling or excavation of jurisdictional waters and is authorized to issue permits for activities within WOTUS under the authority of Section 404 of the CWA. The extent of jurisdiction is defined by an "ordinary high-water mark" (OHWM) on opposing channel banks.

The State of California also asserts jurisdiction over drainages, wetlands, and other aquatic features. The limits of State jurisdiction differ from those of the USEPA and USACE, often being more inclusive of water resources. The California Department of Fish and Wildlife has jurisdiction over the bed and bank of rivers, natural drainages, streams, and lakes and regulates alteration to these features pursuant to the provisions of Section 1601 and 1602 of the California Fish and Game Code. Activities to alter these features would

require a Lake or Streambed Alteration Agreement from CDFW, which could include mitigation measures for aquatic and biological resources that could be affected by project activities.

The State Water Resources Control Board, under the Porter-Cologne Water Quality Control Act of 1969, holds regulatory authority over activities affecting water quality of all surface water and groundwater in California, collectively known as "waters of the state." Discharges into waters of the state that are also WOTUS require a CWA Section 401 Water Quality Certification from the appropriate regional office as a prerequisite to obtaining certain federal permits, such as a CWA Section 404 permit. Discharges into all Waters of the State, even those that are not also WOTUS, require waste discharge requirements (WDRs), or waivers of WDRs, from the RWQCB. The RWQCB also administers the Construction Storm Water Program and the federal National Pollutant Discharge Elimination System (NPDES) program. Projects that disturb one acre or more of soil must obtain a Construction General Permit under the Construction Storm Water Program. A prerequisite for this permit is the development of a Storm Water Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer. Projects that discharge wastewater, storm water, or other pollutants into a WOTUS may require an NPDES permit.

## 3.3 POTENTIALLY SIGNIFICANT PROJECT-RELATED IMPACTS AND MITIGATION

Species protected by California Fish and Game Code, CDFW, USFWS, or CEQA, that have the potential to be impacted by project activities include: giant gartersnake, northwestern pond turtle, and nesting migratory birds. Since the project site includes the entire District and work will only occur at the new well site, mitigation is separated for work at the well site where construction will occur and mitigation for the water transfers and crop idling throughout the District which requires no construction or impacts to the waterways.

Additionally, for species that were identified as possible, likely, or present, (see Table 1 and Table 2) within the District but are unlikely to occur at the new well site or would not be impacted by the water transfers and crop idling, mitigation is not warranted and therefore not included. For species with the potential to occur at the new well site or to be impacted by the water transfers and crop idling, corresponding mitigation measures can be found below.

### 3.3.1 WELL SITE MITGATION

#### 3.3.1.1 GENERAL PROJECT-RELATED IMPACTS

The Project has the potential to impact a number of sensitive resources, as described in more detail in the following sections. Impacts to these resources would be a violation of state and federal laws or considered a potentially significant impact under CEQA. Implementation of the following measures will help reduce potential impacts to these resources to a less than significant level under CEQA and will help with complying with state and federal laws protecting these resources:

> Mitigation Measure BIO-1a (*WEAP Training*): Prior to initiating construction activities (including staging and mobilization), all personnel associated with construction relating to the new well site will attend a mandatory Worker Environmental Awareness Program (WEAP) training, conducted by a qualified biologist (someone familiar with the identification and habitats of these species), to aid workers in identifying special status resources that may occur in the site. The specifics of this program will include identification of the sensitive species and suitable habitats, a description of the regulatory status and general ecological characteristics of sensitive resources, and review of the limits of construction and mitigation measures required to reduce impacts to biological resources within the work area. This training will discuss special status species, describe the laws and regulations in place to provide protection of these species, identify the penalties for violation of applicable environmental laws and regulations, and include a list of required protective measures to avoid "take." A fact sheet summarizing this information, along with photographs or

illustrations of sensitive species with potential to occur on the site, will also be prepared for distribution to all contractors, their employees, and all other personnel involved with construction of the Project. All trainees will sign a form documenting that they have attended WEAP training and understand the information presented to them.

Mitigation Measure BIO-1b (*BMPs*): The Project proponent will require that all workers employ the following BMPs in order to avoid and minimize potential impacts to special status species:

- Vehicles will observe a 15-mph speed limit while on unpaved access routes.
- Workers will inspect areas beneath parked vehicles, equipment, and materials prior to mobilization. If federal special status species are detected, the individual will either be allowed to leave of its own volition or will be captured by a qualified biologist (must possess appropriate collecting/handling permits or relevant experience) and relocated out of harm's way to the nearest suitable habitat beyond the influence of the Action Area. "Take" of a state or federal special status (threatened, endangered, candidate, or proposed) species will be avoided and minimized to the greatest extent possible.
- Workers will initiate a trash abatement program before starting project activities and will continue the program for the duration of the project. All trash and food items will be contained in animal-proof containers and removed, ideally at daily intervals but at least once a week, to avoid attracting opportunistic predators such as ravens, coyotes, and feral dogs.
- All open trenches, holes, sumps, and other excavations more than six inches deep will be provided with one or more escape ramps constructed of earth fill or wooden planks at the end of each workday. If escape ramps cannot be provided, then holes or trenches will be covered with plywood or similar materials. If at any time a trapped giant garter snake or other species are discovered, the Designated Biologist(s) will be notified to move the individual outside of the Action Area.
- The presence of any federal special status species will be reported to a qualified biologist, who will submit the occurrence to the CNDDB. If necessary, the biologist will report the occurrence to CDFW and/or the Service.

#### 3.3.1.2 PROJECT-RELATED MORTALITY AND/OR NEST ABANDONMENT OF MIGRATORY BIRDS, RAPTORS, AND SPECIAL STATUS BIRDS

The site and adjacent areas contain suitable nesting and foraging habitat for a variety of protected bird species, such as migratory birds and raptors. While special status birds including bank swallow, burrowing owl, California black rail, loggerhead shrike, northern harrier, Swainson's hawk, tricolored blackbird, western yellow-billed cuckoo, white-tailed kite, and yellow warbler may forage or nest within trees throughout the District, these species would not be impacted by the water transfers or construction of the new well site and mitigation is not required. It is anticipated that during the nesting bird season, protected birds could nest on the ground or in shrubs and trees within, and adjacent to, the new well site and forage within the new well site. Protected birds located within or adjacent to the site during construction have the potential to be injured or killed by project-related activities. In addition to the direct "take" of protected birds within the site and adjacent areas, these birds nesting in these areas could be disturbed by project-related activities resulting in nest abandonment. Projects that adversely affect the nesting success of protected birds or result in the mortality of these birds would be a violation of state and federal laws and considered a potentially significant impact under CEQA. While foraging habitat for protected birds is present on the site, suitable foraging habitat is located adjacent to the site and within the vicinity of the site. Loss of the foraging habitat from implementation of the Project is not considered a significant impact.

Implementation of the following measures will reduce potential impacts to protected nesting birds to a less than significant level under CEQA and will help the Project comply with state and federal laws protecting these bird species.

> Mitigation Measure BIO-2a (*Avoidance*): The project's construction activities will occur, if feasible, between September 1 and January 31 (outside of the nesting bird season) to avoid impacts to nesting birds.
>
> Mitigation Measure BIO-2b (*Pre-construction Surveys*): If activities must occur within the nesting bird season (February 1 to August 30), a qualified biologist (someone able to identify these species) will conduct a pre-construction take-avoidance survey for active nests within ten (10) calendar days prior to the start of construction. The survey will be completed within the new well site, and up to 100 feet outside of the new well site for nesting migratory birds and up to 500 feet outside of the new well site for nesting raptors. Raptor nests are considered "active" upon the nest-building stage. If construction is delayed or halted for more than ten (10) days, another pre-construction survey for nesting birds will be conducted.
>
> Mitigation Measure BIO-2c (*Avoidance Buffers*): On discovery of any active nests or breeding colonies near work areas, a qualified biologist will determine appropriate avoidance buffer distances based on applicable CDFW and/or USFWS guidelines, the biology of the species, conditions of the nest(s), and the level of project disturbance. If necessary, avoidance buffers will be identified with flagging, fencing, or other easily visible means, and will be maintained until the biologist has determined that the nestlings have fledged.

#### 3.3.1.3 PROJECT-RELATED MORTALITY AND/OR DISTURBANCE OF GIANT GARTER SNAKE

The new well site contained upland areas with small mammal burrows for overwintering within the agricultural habitat and contained a canal adjacent to the work area which is moderately suitable giant garter snake aquatic habitat which could be used for foraging and traveling through the District to better quality habitat. This species is known to occur in the area along canals, streams, and in rice fields. Giant garter snakes occurring within the new well site during construction have the potential to be injured or killed by project-related activities. Projects that adversely affect the success of giant garter snakes or result in the mortality of individuals would be considered a potentially significant impact under CEQA and a violation of state and federal laws.

Implementation of the following measures will reduce potential impacts to giant garter snake to a less than significant level under CEQA and will help the Project comply with state and federal laws protecting this species.

> Mitigation Measure BIO-3a (*Pre-Construction Surveys*): If work will occur during the active season for giant garter snake (between May 1 and September 30), a qualified biologist (someone familiar with garter snake species) will conduct two giant garter snake pre-construction surveys with the first occurring within 15 days and the second occurring within 24 hours prior to the onset of construction. The information collected from the first pre-construction survey will serve primarily to alert the biologist and construction crews of the general level of giant garter snake activity at the site and borrow area, and the second survey will serve to minimize potential for take of giant garter snake. If work will occur during the inactive season, a qualified biologist will conduct a giant garter snake pre-construction survey within seven (7) days prior to the start of construction within the new well site and all accessible areas up to 200 feet. If construction is delayed or halted for more than seven (7) days, another pre-construction survey for giant garter snake will be conducted. If the surveys result in the identification of a giant garter snake, or an individual is found within the

new well site during construction activities, it will be allowed to leave the site on its own and the qualified biologist will determine appropriate buffers to be implemented to avoid impacts to the individual(s).

Mitigation Measure BIO-3b (*Exclusion*): A giant garter snake and other wildlife exclusion fence will be installed prior to project activities. If work will occur during the inactive season for giant garter snake (between October 1 and April 30), an exclusion fence will be installed around the work areas prior to the start of the inactive season. The design of the fence will be approved by the CDFW and USFWS prior to installation. Fence installation will be supervised by a qualified biologist.

Mitigation Measure BIO-3c (*Monitor*): A qualified biologist will conduct a pre-activity clearance survey each day of and remain onsite during initial vegetation clearing and ground disturbing activities and until the wildlife exclusion fence is in place. An inspection of the exclusion fence each day by the contractor will be completed to ensure it is functional for the intended purpose. The contractor will be instructed during the WEAP training on how to inspect the exclusion fence. If a garter snake is observed within the project site, the contractor will stop work and allow the species to leave the site of its own volition or will be captured by a qualified biologist (must possess appropriate collecting/handling permits or relevant experience) and relocated out of harm's way to the nearest suitable habitat beyond the influence of the project work area. "Take" of a state or federal special status (rare, California Species of Special Concern, threatened, or endangered) species is prohibited without appropriate take permits from the USFWS and CDFW.

Mitigation Measure BIO-3d (*Formal Consultation*): If giant garter snakes are observed onsite, consultation with USFWS and CDFW is warranted to discuss how to implement the project and avoid take of giant garter snake. If take cannot be avoided, take authorization through the acquisition of a BO and an ITP pursuant to Fish and Game Code section 2081, subdivision (b) is recommended to comply with CESA and USFWS Section 7(a)(1) is recommended to comply with the ESA.

#### 3.3.1.4 PROJECT-RELATED MORTALITY AND/OR DISTURBANCE TO NORTHWESTERN POND TURTLE

The new well site contained upland areas where this species could bask within the agricultural habitat and contained a canal adjacent to the work area which is moderately suitable aquatic habitat which could be used for foraging and traveling through the District to better quality habitat. NPT occurring within the new well site have the potential to be injured or killed by project-related activities. Projects that adversely affect the success of northwestern pond turtle (NPT) or result in the mortality of individuals would be considered a potentially significant impact under CEQA.

Implementation of the following measures will reduce potential impacts to northwestern pond turtle to a less than significant level under CEQA.

Mitigation Measure BIO-4a (*Pre-Construction Survey and Avoidance Buffers*): Within seven (7) days prior to the start of construction within the new well site, a qualified biologist (someone who is able to identify this species) will conduct a pre-construction survey for NPT within the new well site, and all accessible areas up to 330 feet. Pre-construction surveys will be conducted in accordance with the draft *Western Pond Turtle (Emys marmorata) Visual Survey Protocol for the Southcoast Ecoregion* (United States Geological Survey 2006). If no NPTs are observed during the pre-construction survey, then construction activities may begin. If construction is delayed or halted for more than seven (7) days, another pre-construction survey for NPTs will be conducted. If the surveys result in the identification of a NPT, or an individual is found within the new well site during

construction activities, it will be allowed to leave the site on its own and the qualified biologist will determine appropriate buffers to be implemented to avoid impacts to the individual(s).

Mitigation Measure BIO-4b (*Monitor*): If NPTs are observed within the site a qualified biologist will conduct a pre-activity clearance survey each day and remain onsite to oversee all vegetation clearing and ground disturbing activities until the exclusion fence is completely installed or the individual(s) has vacated the work area. If NPTs are detected, the biologist will stop work and allow the species to leave the site or borrow area of its own volition or will be captured by the qualified biologist (must possess appropriate collecting/handling permits or relevant experience) and relocated out of harm's way to the nearest suitable habitat beyond the influence of the project work area. "Take" of a state or federal special status (rare, California Species of Special Concern, threatened, or endangered) species is prohibited.

Mitigation Measure BIO-4c (*Formal Consultation*): Should northwestern pond turtles get listed in this area and the project/qualified biologist needs to move an individual, consultation for protection plans and/or relocation plans with the appropriate agencies will be completed to avoid take.

## 3.3.2 WATER TRANSFER AND CROP IDLING MITGATION

### 3.3.2.1 PROJECT-RELATED MORTALITY AND/OR DISTURBANCE OF GIANT GARTER SNAKE

Giant garter snake is known to occur in the District along canals, streams, and in rice fields. Giant garter snakes occurring within the area have the potential to be impacted by the water transfers and crop idling. Projects that adversely affect the success of giant garter snakes or result in the mortality of individuals would be considered a potentially significant impact under CEQA and a violation of state and federal laws.

Implementation of the following measures will reduce potential impacts to giant garter snake to a less than significant level under CEQA and will help the Project comply with state and federal laws protecting this species.

Mitigation Measure BIO-5a (*Maintain Water*): The District will keep adequate water in major irrigation and district owned and operated drainage canals. Water depths will be maintained at levels similar to years when transfers do not occur or, where information on existing water depths is limited, at least two feet of water will be considered adequate.

Mitigation Measure BIO-5b (*GGS BMPs*): The District will perform giant garter snake BMPs during irrigation canal maintenance activities, including educating maintenance personnel to recognize and avoid contact with giant garter snake, cleaning only one side of a conveyance channel per year to retain foraging areas and cover habitat for giant garter snake within maintained canals and ditches, and avoid the stockpiling of vegetation and sediment debris adjacent to canals and ditches. The District will create and distribute a giant garter snake BMPs information pamphlet to maintenance personnel that includes photos of giant garter snake and their habitat, and descriptions of BMPs.

## 3.4 LESS THAN SIGNIFICANT PROJECT-RELATED IMPACTS

### 3.4.1 PROJECT-RELATED IMPACTS TO SPECIAL STATUS PLANT SPECIES ABSENT FROM, OR UNLIKELY TO OCCUR ON, THE PROJECT SITE

Of the 32 regionally occurring special status plant species, all 32 are considered absent from or unlikely to occur within the site or be impacted by project activities due to past or ongoing disturbance, the absence of suitable habitat, or work not occurring in areas where these species may occur. While 20 species may occur within the District; Adobe-lily, Ahart's dwarf rush, Ahart's paronychia, Baker's navarretia, bent-flowered fiddleneck, big-scale balsamroot, Brazilian watermeal, broadleaf pondweed, Butte County fritillary, Butte County golden clover, Butte County meadowfoam, California alkali grass, Colusa layia, Ferris' milk-vetch, Greene's tuctoria, Hartweg's golden sunburst, heartscale, lesser saltscale, pappose tarplant, pink creamsacs, recurved larkspur, Sanford's arrowhead, spicate calycadenia, subtle orache, veiny monardella, Watershield, water star-grass, woolly rose-mallow, and Wright's trichocoronis; these species would not be impacted by project activities.

Since it is unlikely that these species would occur onsite or be impacted by the Project if they do occur, implementation of the Project should have no impact on these 32 special status species through construction mortality, disturbance, or loss of habitat. Mitigation measures are not warranted.

### 3.4.2 PROJECT-RELATED IMPACTS TO SPECIAL STATUS ANIMAL SPECIES ABSENT FROM, OR UNLIKELY TO OCCUR ON, THE PROJECT SITE

Of the 36 regionally occurring special status animal species, 12 are considered absent from or unlikely to occur within the site or be impacted by project activities due to past or ongoing disturbance, the absence of suitable habitat, or work not occurring in areas where these species may occur. These species include: California condor, California tiger salamander – central California DPS, coast horned lizard, foothill yellow-legged frog - Feather River Distinct Population Segment, foothill yellow-legged frog - north Sierra Distinct Population Segment, Least Bell's vireo, Marysville California kangaroo rat, song sparrow ("Modesto" population), valley elderberry longhorn beetle, vernal pool fairy shrimp, vernal pool tadpole shrimp, and western spadefoot.

While 20 species may occur within the District; American badger, bald eagle, bank swallow, burrowing owl, California black rail, Crotch's bumble bee, green sturgeon - southern Distinct Population Segment, loggerhead shrike, monarch butterfly, northern harrier, pallid bat, steelhead – Central Valley DPS, Swainson's hawk, Townsend's big-eared bat, tricolored blackbird, western mastiff bat, western red bat, western yellow-billed cuckoo, white-tailed kite, and yellow warbler; these species would not be impacted by project activities. Additionally, two species observed within the District during the field survey; Chinook salmon - Central Valley spring-run ESU and greater sandhill crane; would also not be impacted by project activities.

Since it is unlikely that these species would occur onsite or be impacted by the Project if they do occur, implementation of the Project should have no impact on these 34 special status species through construction mortality, disturbance, or loss of habitat. Mitigation measures are not warranted.

### 3.4.3 PROJECT-RELATED IMPACTS TO RIPARIAN HABITAT AND NATURAL COMMUNITIES OF SPECIAL CONCERN

Various waterways and areas with riparian habitat are located within the District's boundaries, though the water transfers and the new well would not include any work activities within these waterways. There are no CNDDB-designated "natural communities of special concern" recorded within the District. While eight observations are within the vicinity of the District, they would not be impacted by project activities. Mitigation is not warranted.

### 3.4.4 ENVIRONMENTALLY SENSATIVE AREAS

While various waterways and areas with riparian habitat are located within the District's boundaries, the water transfers and the new well would not include any work activities within these areas.

While the Oroville Wildlife Area, which surrounds the Thermalito Afterbay, is directly north of the District's boundaries there was no tule marsh or high-quality suitable habitats adjacent to the Project site. Additionally, the Afterbay contained large manmade berms with steep banks and a paved road which separate it from the fields that would be idled.

Within the District's boundaries GGS are primarily documented using canals. Since the site is separated from the Oroville Wildlife Area and canals and streams will maintain water levels similar to years when water transfers do not occur, mitigation is not warranted.

### 3.4.5 PROJECT-RELATED IMPACTS TO REGULATED WATERS, WETLANDS, AND WATER QUALITY

Many small streams and canals run through the District's boundaries (see Figure 5 and Figure 6) but would not be impacted during the Project as the water transfers and new well site would not include any work within these waterways. There are no designated wild and scenic rivers within the project site; therefore, the Project would not result in direct impacts to wild and scenic rivers. Mitigation measures are not warranted.

Since construction may involve ground disturbance of 0.1 acres, BMPs would be used to prevent soil from entering the canal adjacent to the new well site.

### 3.4.6 PROJECT-RELATED IMPACTS TO WILDLIFE MOVEMENT CORRIDORS AND NATIVE WILDLIFE NURSERY SITES

The District mainly consists of agricultural fields with irrigation canals, streams, paved and unpaved roads, and small areas with non-native grasslands. Surrounding lands include agricultural fields, residential neighborhoods, various cities, and the Feather River. The streams and canals may act as corridors for aquatic wildlife, though the water transfers and construction of the new well site would not impact these potential corridors.

The streams and canals within the site may be used as wildlife nursery sites for amphibian species such as Pacific tree frogs or fish species such as Chinook salmon, which were observed during the survey, though the water transfers and construction of the new well site would not impact these nursery sites. Therefore, the Project would have no impact on wildlife movement corridors or native wildlife nursery sites, and mitigation measures are warranted.

### 3.4.7 PROJECT-RELATED IMPACTS TO CRITICAL HABITAT

Designated critical habitat is absent from within the District. While seven species contain critical habitat within the vicinity of the District, there would be no impact to critical habitat, and mitigation measures are not warranted.

### 3.4.8 LOCAL POLICIES OR HABITAT CONSERVATION PLANS

The Project appears to be consistent with the goals and policies of the Butte County General Plan 2040 and the Sutter County 2030 General Plan. Measures in the Butte Regional Conservation Plan will be followed (BIO-6a). The Yuba Sutter Regional Conservation Plan is currently in progress. Additional mitigation measures are not warranted.

# 4 REFERENCES

Butte County. n.d. "Butte County General Plan 2040." Accessed November 2025. https://www.buttecounty.net/367/Butte-County-General-Plan-2040.

—. 2019. "Butte Regional Conservation Plan." Accessed November 2025. https://wildlife.ca.gov/Conservation/Planning/NCCP/Plans/Butte-County.

Calflora. 2024. Accessed 2025 January. http://www.calflora.org/.

California Department of Fish and Wildlife. 2024a. *California Natural Diversity Database- RareFind.* Accessed January 2025.

—. 2018. "Considerations for Conserving the Foothill Yellow-Legged Frog." May. Accessed January 2025. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=157562&inline.

—. 2018. "Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensative Natural Communities." March. Accessed January 2025. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18959&inline.

California Department of Fish and Wildlife. 2015. "Staff Guidance Regarding Avoidance of Impacts to Tricolored Blackbird Breeding Colonies on Agricultural Fields." Accessed January 2025.

California Department of Fish and Wildlife. 2024b. "State and federally listed endangered, threatened, and rare plants of California." Accessed January 2025. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=109390&inline.

Cornell Lab of Ornithology. 2024. *eBird.* Accessed January 2025. https://ebird.org/.

County of Yuba. n.d. "Yuba Sutter Regional Conservation Plan." Accessed November 2025. https://wildlife.ca.gov/Conservation/Planning/NCCP/Plans/Yuba-Sutter.

Department of Water Resources. 2019. "DRAFT Technical Information for Preparing Water Trasnfer Proposals." December. https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/State-Water-Project/Management/Water-Transfers/Files/Draft_2019WTWhitePaper-012324.pdf.

—. 2019. *Groundwater Basin Boundary Assessment Tool.* Accessed January 2025. https://gis.water.ca.gov/app/bbat/.

iNaturalist. 2025. *Observations of Special Status Species.* Accessed January 2025. https://www.inaturalist.org/.

National NMFS. 2025. *ESA Critical Habitat Mapper.* Accessed November 2025. https://www.arcgis.com/apps/webappviewer/index.html?id=68d8df16b39c48fe9f60640692d0e318.

State of California Natural Resources Agency Department of Fish and Game. 2012. "Staff Report on Burrowing Owl Mitigation." Accessed January 2025.

State Water Resources Control Board. 2021. "State Wetland Definition and Procedures for Discharge of Dredged or Fill Material to Waters of the State." Accessed January 2025.

Sutter County. 2011. "Sutter County 2030 General Plan." Accessed November 2025. https://www.suttercounty.org/government/county-departments/development-services/planning-services/general-plan.

Swainson's Hawk Technical Advisory Committee. 2000. "Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley." May. Accessed January 2025.

The California Burrowing Owl Consortium. 1993. "Burrowing Owl Survey Protocol and Mitigation Guidelines." Accessed January 2025.

The National Oceanic and Atmospheric Administration. 2024. *Essential Fish Habitat Mapper.* Accessed January 2025. https://www.habitat.noaa.gov/apps/efhmapper/?page=page_5.

United States Army Corps of Engineers. 1987. "Corps of Engineers Wetlands Delineation Manual." Accessed January 2025.

United States Department of Agriculture Natural Resource Conservation Service. 2025. *Soil Survey Area.* Accessed January 2025. https://www.nrcs.usda.gov/publications/Lists%20of%20Hydric%20Soils%20-%20Query%20by%20Soil%20Survey%20Area%20Map%20Unit%20Rating.html.

United States Environmental Protection Agency. 2024a. *Waters GeoViewer.* Accessed January 2025. https://www.epa.gov/waterdata/waters-geoviewer.

United States Fish and Wildlife Service. 2024b. *Information on Planning and Consultation.* Accessed January 2025. https://ecos.fws.gov/ipac/.

—. 2024c. *National Wetlands Inventory.* Accessed January 2025. https://www.fws.gov/wetlands/data/mapper.html.

—. 2017. "Recovery Plan for the Giant Garter Snake (Thamnophis gigas)." Accessed January 2025.

—. 1998. "Recovery Plan for Upland Species of the San Joaquin Valley, California." Accessed January 2025.

United States Fish and Wildlife Service. 2024d. *Environmental Conservation Online System.* Accessed January 2025. https://ecos.fws.gov/ecp/.

United States Geological Survey. 2006. *United States Geological Survey Western Pond Turtle (Emys marmorata) Visual Survey Protocol for the Southcoast Ecoregion.* Accessed January 2025. https://sdmmp.com/upload/SDMMP_Repository/0/4fnpv18xm0sqtw29j7d3rz56bkychg.pdf.

University of California, Berkeley. 2024. *The Jepson Herbarium.* Accessed January 2025. http://ucjeps.berkeley.edu/eflora/.

WeatherSpark. 2025. "Climate and Average Weather Year Round in Gridley, California, United States." Accessed November 2025. https://weatherspark.com/y/1179/Average-Weather-in-Gridley-California-United-States-Year-Round.

# APPENDIX A: REPRESENTATIVE PHOTOS OF THE PROJECT SITE




**Photograph 1**

*Overview of ruderal, canal, and cropland habitat within the southern portion of Butte Water District. The waterway featured is Snake River.*



**Photograph 2**

*Overview of a water diversion structure on Snake River. A group of approximately 30 salmonids (likely Chinook salmon) were attempting to pass the barrier.*




**Photograph 3**

*The salmonid (possibly Chinook salmon) observed behind a water diversion structure on Snake River and within the District.*




**Photograph 4**

*An inundated rice field north of the marshland habitat south of East Rio Bonito Road. Multiple species of wading birds and flocks of red-shouldered blackbirds were observed utilizing the inundated rice fields.*



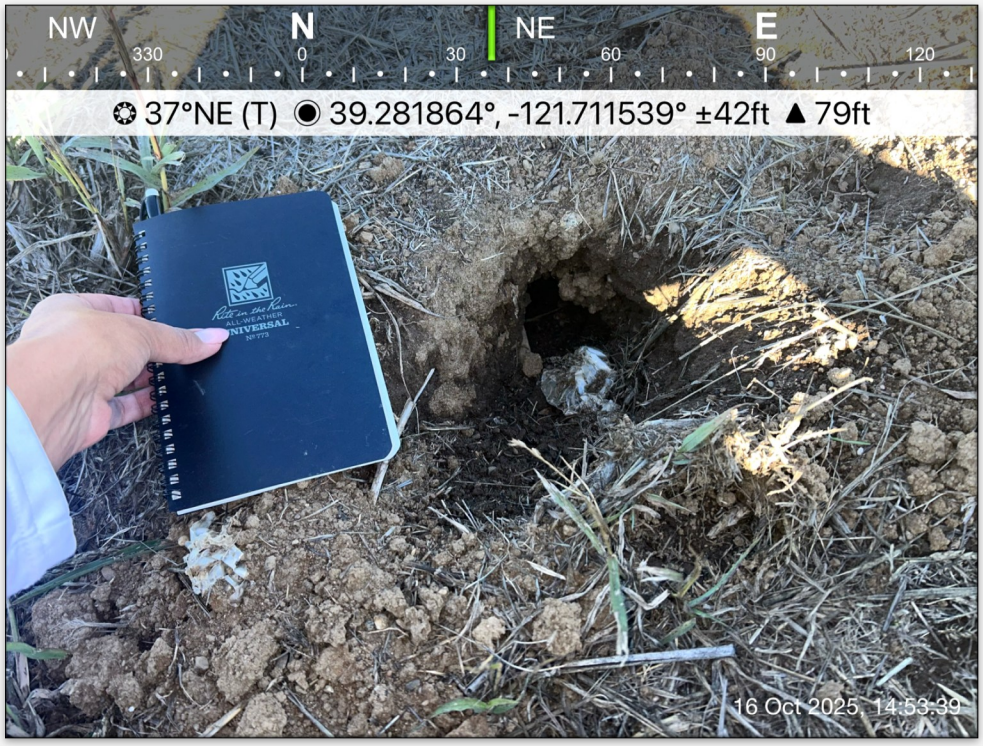

**Photograph 5**

*Overview of well site #2 within the District. The well was along a canal named "Main Chandon Lateral " surrounded by ruderal and cropland habitat.*



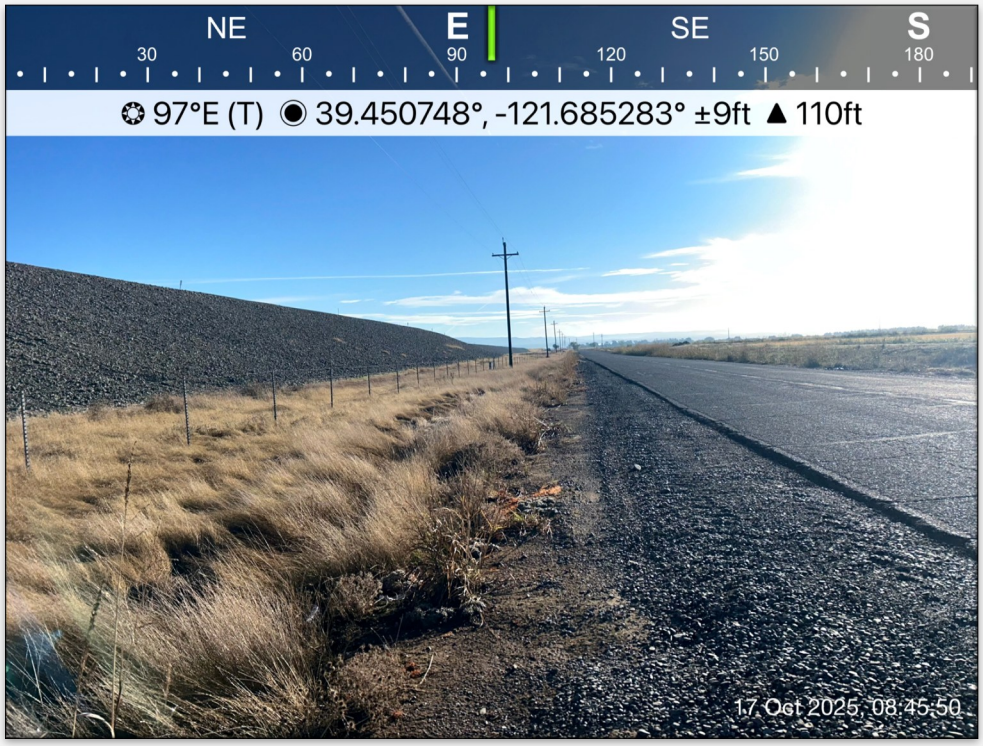

**Photograph 6**

*Overview of the proposed new well site within the District. Small mammal burrows, an unidentified snake shed, a canal, and cropland habitat were observed adjacent to the site.*



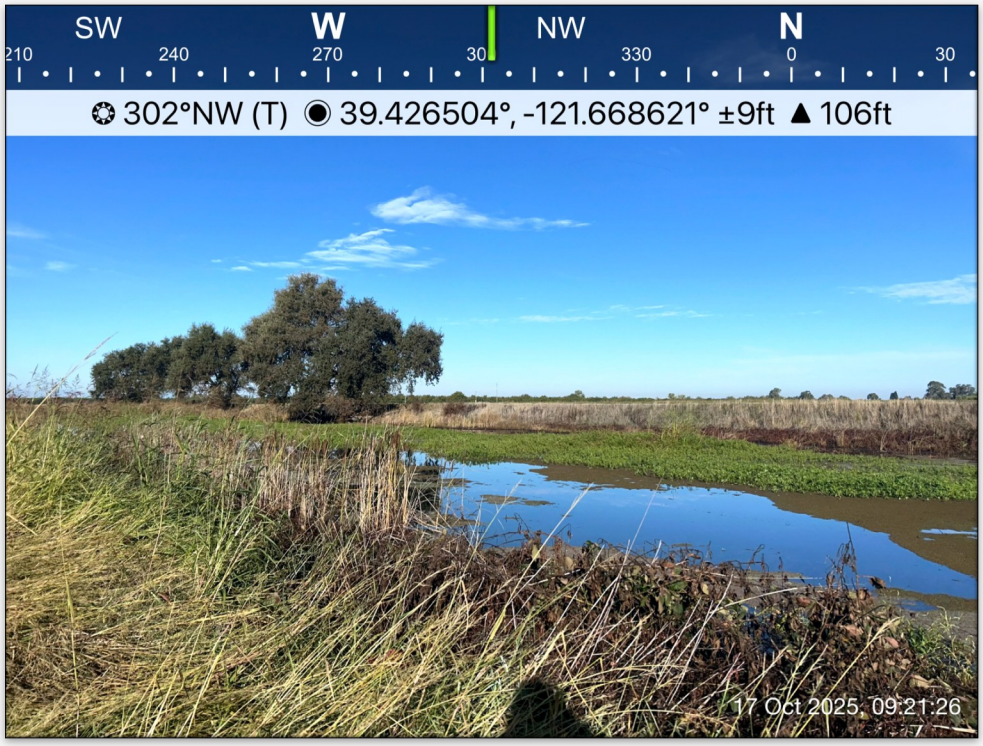

**Photograph 7**

*The unidentified snakehead observed north of the proposed new well site. The shed was deteriorated and found within the entrance of a burrow.*



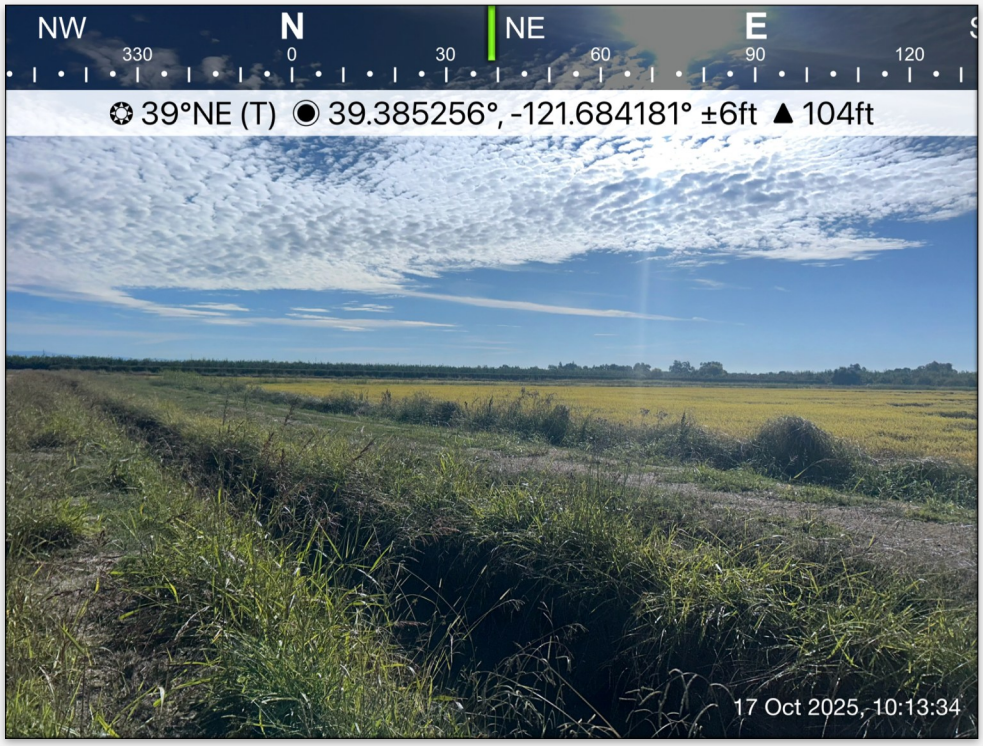

**Photograph 8**

*Overview of the non-native grassland habitat within the District along the south of Thermalito Afterbay and north of East Hamilton Road.*



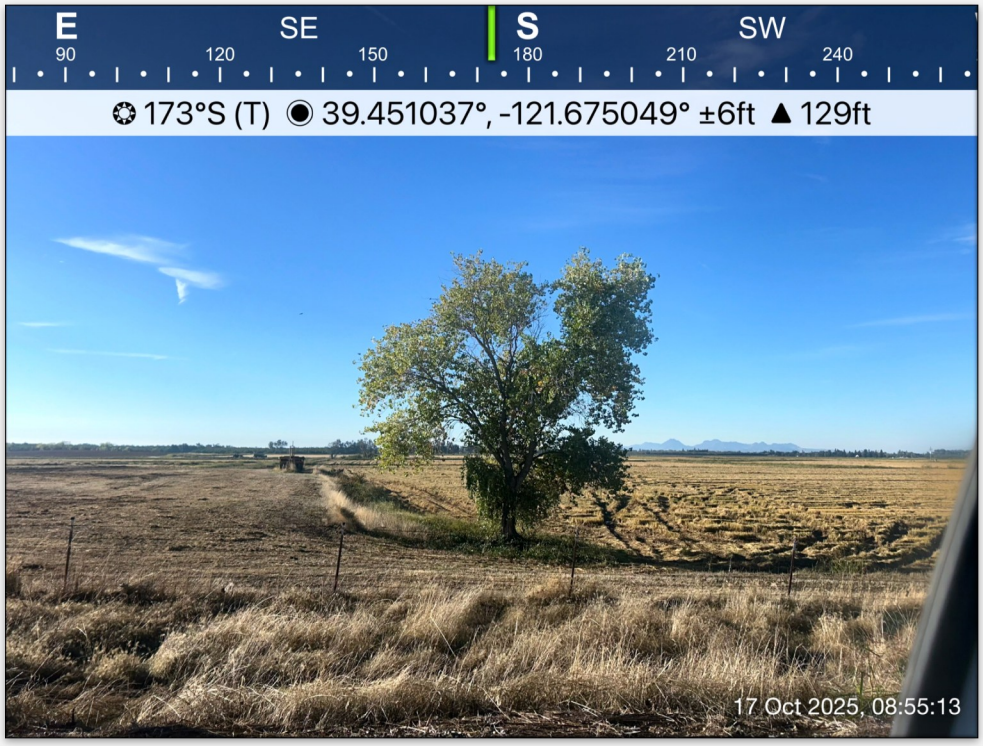

**Photograph 9**

*Overview of the marshland habitat along an unnamed waterway south of East Rio Bonito Road within the District. The surrounding area was dominated by rice fields inundated with water during the survey.*




**Photograph 10**

*A freshly tilled rice field and dry irrigation canal within the northern half of the District.*




**Photograph 11**

*Overview of the non-native grassland and cropland habitat within the northern portion of the District.*




**Photograph 12**

*Development along Sycamore Street within Gridley, CA and the District.*

# APPENDIX B: CNDDB 18-QUAD SPECIES LIST

# Selected Elements by Common Name

## California Department of Fish and Wildlife

## California Natural Diversity Database

**Query Criteria:** Quad IS (Nelson (3912157) OR Shippee (3912156) OR Oroville (3912155) OR Butte City (3912148) OR West of Biggs (3912147) OR Biggs (3912146) OR Palermo (3912145) OR Honcut (3912135) OR Gridley (3912136) OR Pennington (3912137) OR Sanborn Slough (3912138) OR Meridian (3912128) OR Sutter (3912126) OR Sutter Buttes (3912127) OR Yuba City (3912125) OR Olivehurst (3912115) OR Gilsizer Slough (3912116) OR Tisdale Weir (3912117))

| Species | Element Code | Federal Status | State Status | Global Rank | State Rank | Rare Plant Rank/CDFW SSC or FP |
|---|---|---|---|---|---|---|
| **adobe-lily** *Fritillaria pluriflora* | PMLIL0V0F0 | None | None | G2G3 | S2S3 | 1B.2 |
| **Ahart's dwarf rush** *Juncus leiospermus var. ahartii* | PMJUN011L1 | None | None | G2T1 | S1 | 1B.2 |
| **Ahart's paronychia** *Paronychia ahartii* | PDCAR0L0V0 | None | None | G3 | S3 | 1B.1 |
| **American badger** *Taxidea taxus* | AMAJF04010 | None | None | G5 | S3 | SSC |
| **American bumble bee** *Bombus pensylvanicus* | IIHYM24260 | None | None | G3G4 | S2 | |
| **Baker's navarretia** *Navarretia leucocephala ssp. bakeri* | PDPLM0C0E1 | None | None | G4T2 | S2 | 1B.1 |
| **bald eagle** *Haliaeetus leucocephalus* | ABNKC10010 | Delisted | Endangered | G5 | S3 | FP |
| **bank swallow** *Riparia riparia* | ABPAU08010 | None | Threatened | G5 | S3 | |
| **bent-flowered fiddleneck** *Amsinckia lunaris* | PDBOR01070 | None | None | G3 | S3 | 1B.2 |
| **big-scale balsamroot** *Balsamorhiza macrolepis* | PDAST11061 | None | None | G2 | S2 | 1B.2 |
| **Brandegee's clarkia** *Clarkia biloba ssp. brandegeeae* | PDONA05053 | None | None | G4G5T4 | S4 | 4.2 |
| **Brazilian watermeal** *Wolffia brasiliensis* | PMLEM03020 | None | None | G5 | S2 | 2B.3 |
| **broadleaf pondweed** *Stuckenia striata* | PMPOT030K0 | None | None | G3G4Q | S2S3 | 2B.3 |
| **burrowing owl** *Athene cunicularia* | ABNSB10010 | None | Candidate Endangered | G4 | S2 | SSC |
| **Butte County fritillary** *Fritillaria eastwoodiae* | PMLIL0V060 | None | None | G3Q | S3 | 3.2 |
| **Butte County golden clover** *Trifolium jokerstii* | PDFAB40310 | None | None | G2 | S2 | 1B.2 |
| **Butte County meadowfoam** *Limnanthes floccosa ssp. californica* | PDLIM02042 | Endangered | Endangered | G4T1 | S1 | 1B.1 |

| Species | Element Code | Federal Status | State Status | Global Rank | State Rank | Rare Plant Rank/CDFW SSC or FP |
|---|---|---|---|---|---|---|
| **cackling (=Aleutian Canada) goose**<br>*Branta hutchinsii leucopareia* | ABNJB05035 | Delisted | None | G5T3 | S3 | WL |
| **California alkali grass**<br>*Puccinellia simplex* | PMPOA53110 | None | None | G2 | S2 | 1B.2 |
| **California black rail**<br>*Laterallus jamaicensis coturniculus* | ABNME03041 | None | Threatened | G3T1 | S2 | FP |
| **California linderiella**<br>*Linderiella occidentalis* | ICBRA06010 | None | None | G2G3 | S2S3 | |
| **California tiger salamander - central California DPS**<br>*Ambystoma californiense pop. 1* | AAAAA01181 | Threatened | Threatened | G3T3 | S3 | WL |
| **chinook salmon - Central Valley spring-run ESU**<br>*Oncorhynchus tshawytscha pop. 11* | AFCHA0205L | Threatened | Threatened | G5T2Q | S2 | |
| **coast horned lizard**<br>*Phrynosoma blainvillii* | ARACF12100 | None | None | G4 | S4 | SSC |
| **Coastal and Valley Freshwater Marsh**<br>*Coastal and Valley Freshwater Marsh* | CTT52410CA | None | None | G3 | S2.1 | |
| **Colusa layia**<br>*Layia septentrionalis* | PDAST5N0F0 | None | None | G2 | S2 | 1B.2 |
| **Crotch's bumble bee**<br>*Bombus crotchii* | IIHYM24480 | None | Candidate Endangered | G2 | S2 | |
| **Ferris' milk-vetch**<br>*Astragalus tener var. ferrisiae* | PDFAB0F8R3 | None | None | G2T1 | S1 | 1B.1 |
| **foothill yellow-legged frog - Feather River DPS**<br>*Rana boylii pop. 2* | AAABH01052 | Threatened | Threatened | G3T2 | S2 | |
| **foothill yellow-legged frog - north Sierra DPS**<br>*Rana boylii pop. 3* | AAABH01053 | None | Threatened | G3T2 | S2 | |
| **giant gartersnake**<br>*Thamnophis gigas* | ARADB36150 | Threatened | Threatened | G2 | S2 | |
| **great blue heron**<br>*Ardea herodias* | ABNGA04010 | None | None | G5 | S4 | |
| **Great Valley Cottonwood Riparian Forest**<br>*Great Valley Cottonwood Riparian Forest* | CTT61410CA | None | None | G2 | S2.1 | |
| **Great Valley Mixed Riparian Forest**<br>*Great Valley Mixed Riparian Forest* | CTT61420CA | None | None | G2 | S2.2 | |
| **Great Valley Valley Oak Riparian Forest**<br>*Great Valley Valley Oak Riparian Forest* | CTT61430CA | None | None | G1 | S1.1 | |
| **Great Valley Willow Scrub**<br>*Great Valley Willow Scrub* | CTT63410CA | None | None | G3 | S3.2 | |
| **greater sandhill crane**<br>*Antigone canadensis tabida* | ABNMK01014 | None | Threatened | G5T5 | S2 | FP |
| **green sturgeon - southern DPS**<br>*Acipenser medirostris pop. 1* | AFCAA01031 | Threatened | None | G2T1 | S1 | SSC |

| Species | Element Code | Federal Status | State Status | Global Rank | State Rank | Rare Plant Rank/CDFW SSC or FP |
|---|---|---|---|---|---|---|
| **Greene's tuctoria**<br>*Tuctoria greenei* | PMPOA6N010 | Endangered | Rare | G1 | S1 | 1B.1 |
| **Hartweg's golden sunburst**<br>*Pseudobahia bahiifolia* | PDAST7P010 | Endangered | Endangered | G1 | S1 | 1B.1 |
| **heartscale**<br>*Atriplex cordulata var. cordulata* | PDCHE040B0 | None | None | GNRT2 | S2 | 1B.2 |
| **hoary bat**<br>*Lasiurus cinereus* | AMACC05032 | None | None | G3G4 | S4 | |
| **Lawrence's goldfinch**<br>*Spinus lawrencei* | ABPBY06100 | None | None | G3G4 | S4 | |
| **least Bell's vireo**<br>*Vireo bellii pusillus* | ABPBW01114 | Endangered | Endangered | G5T2 | S3 | |
| **lesser saltscale**<br>*Atriplex minuscula* | PDCHE042M0 | None | None | G2 | S2 | 1B.1 |
| **loggerhead shrike**<br>*Lanius ludovicianus* | ABPBR01030 | None | None | G4 | S4 | SSC |
| **Marysville California kangaroo rat**<br>*Dipodomys californicus eximius* | AMAFD03071 | None | None | G3T1 | S1 | SSC |
| **merlin**<br>*Falco columbarius* | ABNKD06030 | None | None | G5 | S3S4 | WL |
| **North American porcupine**<br>*Erethizon dorsatum* | AMAFJ01010 | None | None | G5 | S3 | |
| **Northern Basalt Flow Vernal Pool**<br>*Northern Basalt Flow Vernal Pool* | CTT44131CA | None | None | G3 | S2.2 | |
| **Northern Hardpan Vernal Pool**<br>*Northern Hardpan Vernal Pool* | CTT44110CA | None | None | G3 | S3.1 | |
| **northern harrier**<br>*Circus hudsonius* | ABNKC11011 | None | None | G5 | S3 | SSC |
| **Northern Volcanic Mud Flow Vernal Pool**<br>*Northern Volcanic Mud Flow Vernal Pool* | CTT44132CA | None | None | G1 | S1.1 | |
| **northwestern pond turtle**<br>*Actinemys marmorata* | ARAAD02031 | Proposed Threatened | None | G2 | SNR | SSC |
| **osprey**<br>*Pandion haliaetus* | ABNKC01010 | None | None | G5 | S4 | WL |
| **pallid bat**<br>*Antrozous pallidus* | AMACC10010 | None | None | G4 | S3 | SSC |
| **pappose tarplant**<br>*Centromadia parryi ssp. parryi* | PDAST4R0P2 | None | None | G3T2 | S2 | 1B.2 |
| **Peruvian dodder**<br>*Cuscuta obtusiflora var. glandulosa* | PDCUS01111 | None | None | G5T4? | SH | 2B.2 |
| **pink creamsacs**<br>*Castilleja rubicundula var. rubicundula* | PDSCR0D482 | None | None | G5T2 | S2 | 1B.2 |

| Species | Element Code | Federal Status | State Status | Global Rank | State Rank | Rare Plant Rank/CDFW SSC or FP |
|---|---|---|---|---|---|---|
| **recurved larkspur**<br>*Delphinium recurvatum* | PDRAN0B1J0 | None | None | G2? | S2 | 1B.2 |
| **Red Bluff dwarf rush**<br>*Juncus leiospermus var. leiospermus* | PMJUN011L2 | None | None | G2T2 | S2 | 1B.1 |
| **Sacramento Valley tiger beetle**<br>*Cicindela hirticollis abrupta* | IICOL02106 | None | None | G5TH | SH | |
| **San Joaquin pocket mouse**<br>*Perognathus inornatus* | AMAFD01060 | None | None | G3 | S2S3 | |
| **Sanford's arrowhead**<br>*Sagittaria sanfordii* | PMALI040Q0 | None | None | G3 | S3 | 1B.2 |
| **silver-haired bat**<br>*Lasionycteris noctivagans* | AMACC02010 | None | None | G4 | S3S4 | |
| **slender Orcutt grass**<br>*Orcuttia tenuis* | PMPOA4G050 | Threatened | Endangered | G2 | S2 | 1B.1 |
| **song sparrow ("Modesto" population)**<br>*Melospiza melodia pop. 1* | ABPBXA3013 | None | None | G5T3?Q | S3? | SSC |
| **spicate calycadenia**<br>*Calycadenia spicata* | PDAST1P090 | None | None | G3? | S3 | 1B.3 |
| **steelhead - Central Valley DPS**<br>*Oncorhynchus mykiss irideus pop. 11* | AFCHA0209K | Threatened | None | G5T2Q | S2 | SSC |
| **subtle orache**<br>*Atriplex subtilis* | PDCHE042T0 | None | None | G1 | S1 | 1B.2 |
| **Swainson's hawk**<br>*Buteo swainsoni* | ABNKC19070 | None | Threatened | G5 | S4 | |
| **Townsend's big-eared bat**<br>*Corynorhinus townsendii* | AMACC08010 | None | None | G4 | S2 | SSC |
| **tricolored blackbird**<br>*Agelaius tricolor* | ABPBXB0020 | None | Threatened | G1G2 | S2 | SSC |
| **valley elderberry longhorn beetle**<br>*Desmocerus californicus dimorphus* | IICOL48011 | Threatened | None | G3T3 | S3 | |
| **veiny monardella**<br>*Monardella venosa* | PDLAM18082 | None | None | G1 | S1 | 1B.1 |
| **vernal pool fairy shrimp**<br>*Branchinecta lynchi* | ICBRA03030 | Threatened | None | G3 | S3 | |
| **vernal pool tadpole shrimp**<br>*Lepidurus packardi* | ICBRA10010 | Endangered | None | G3 | S3 | |
| **water star-grass**<br>*Heteranthera dubia* | PMPON03010 | None | None | G5 | S2 | 2B.2 |
| **watershield**<br>*Brasenia schreberi* | PDCAB01010 | None | None | G5 | S3 | 2B.3 |
| **western mastiff bat**<br>*Eumops perotis californicus* | AMACD02011 | None | None | G4G5T4 | S3S4 | SSC |

| Species | Element Code | Federal Status | State Status | Global Rank | State Rank | Rare Plant Rank/CDFW SSC or FP |
|---|---|---|---|---|---|---|
| **western red bat**<br>*Lasiurus frantzii* | AMACC05080 | None | None | G4 | S3 | SSC |
| **western ridged mussel**<br>*Gonidea angulata* | IMBIV19010 | None | None | G3 | S2 | |
| **western spadefoot**<br>*Spea hammondii* | AAABF02020 | Proposed Threatened | None | G2G3 | S3S4 | SSC |
| **western yellow-billed cuckoo**<br>*Coccyzus americanus occidentalis* | ABNRB02022 | Threatened | Endangered | G5T2T3 | S1 | |
| **white-tailed kite**<br>*Elanus leucurus* | ABNKC06010 | None | None | G5 | S3S4 | FP |
| **woolly rose-mallow**<br>*Hibiscus lasiocarpos var. occidentalis* | PDMAL0H0R3 | None | None | G5T3 | S3 | 1B.2 |
| **Wright's trichocoronis**<br>*Trichocoronis wrightii var. wrightii* | PDAST9F031 | None | None | G4T3 | S1 | 2B.1 |
| **yellow warbler**<br>*Setophaga petechia* | ABPBX03010 | None | None | G5 | S3 | SSC |
| **Yuma myotis**<br>*Myotis yumanensis* | AMACC01020 | None | None | G5 | S4 | |

**Record Count: 89**

# APPENDIX C: IPAC SPECIES LIST

# United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: 11/06/2025 17:16:44 UTC
Project Code: 2026-0013079
Project Name: Butte Water District Temporary Water Transfers from 2026 to 2030 Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)

(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

**Migratory Birds**: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

# OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Sacramento Fish And Wildlife Office**
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

# PROJECT SUMMARY

Project Code: 2026-0013079

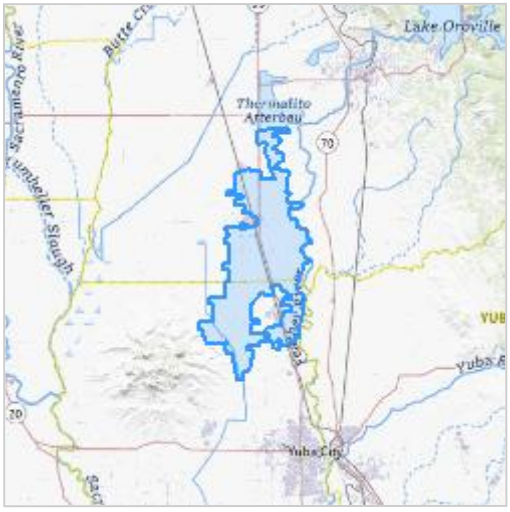
Project Name: Butte Water District Temporary Water Transfers from 2026 to 2030 Project

Project Type: Water Supply Facility - Diversions

Project Description: The District is in the process of preparing for potential one-year water transfers to Santa Clara Valley Water District over a five-year period from 2026 through 2030 during the irrigation seasons. A Biological Evaluation (BE) and Environmental Impact Report (EIR), in compliance with CEQA Guidelines, will be developed based on the short-term transfers of a minimum of 24,000 acre-feet in any of the five years. This BE will analyze both crop idling transfers and groundwater substitution transfers, as the transfers comprise a minimum of 14,000 AF and 10,000 AF from such transfers, respectively. It is understood that the potential water transfers will originate from within the District's boundaries, which span approximately 32,505 acres across Butte and Sutter Counties.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@39.330973349999994,-121.67837728971489,14z




Counties: Butte and Sutter counties, California

# ENDANGERED SPECIES ACT SPECIES

There is a total of 11 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

## BIRDS

| NAME | STATUS |
|---|---|
| California Condor *Gymnogyps californianus*<br>Population: Pacific Northwest NEP<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/8193 | Experimental Population, Non-Essential |
| Yellow-billed Cuckoo *Coccyzus americanus*<br>Population: Western U.S. DPS<br>There is **final** critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/3911 | Threatened |

## REPTILES

| NAME | STATUS |
|---|---|
| Giant Garter Snake *Thamnophis gigas*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/4482 | Threatened |
| Northwestern Pond Turtle *Actinemys marmorata*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/1111 | Proposed Threatened |

## AMPHIBIANS

| NAME | STATUS |
|---|---|
| Western Spadefoot *Spea hammondii*<br>Population: Northern DPS<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/5425 | Proposed Threatened |

## INSECTS

| NAME | STATUS |
|---|---|
| Monarch Butterfly *Danaus plexippus*<br>There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/9743 | Proposed Threatened |
| Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus*<br>There is **final** critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/7850 | Threatened |

## CRUSTACEANS

| NAME | STATUS |
|---|---|
| Vernal Pool Fairy Shrimp *Branchinecta lynchi*<br>There is **final** critical habitat for this species. Your location does not overlap the critical habitat. | Threatened |

| NAME | STATUS |
|---|---|
| Species profile: https://ecos.fws.gov/ecp/species/498 | |
| Vernal Pool Tadpole Shrimp *Lepidurus packardi*<br>There is **final** critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/2246 | Endangered |

## FLOWERING PLANTS

| NAME | STATUS |
|---|---|
| Greene's Tuctoria *Tuctoria greenei*<br>There is **final** critical habitat for this species. Your location does not overlap the critical habitat.<br>Species profile: https://ecos.fws.gov/ecp/species/1573 | Endangered |
| Hartweg's Golden Sunburst *Pseudobahia bahiifolia*<br>No critical habitat has been designated for this species.<br>Species profile: https://ecos.fws.gov/ecp/species/1704 | Endangered |

# CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

# IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Shaylea Stark
Address: 455 W Fir Ave
City: Clovis
State: CA
Zip: 93612
Email sstark@ppeng.com
Phone: 5594492700

# APPENDIX D: BUTTE WATER DISTRICT NRCS WEB SOIL SURVEY REPORT

United States Department of Agriculture

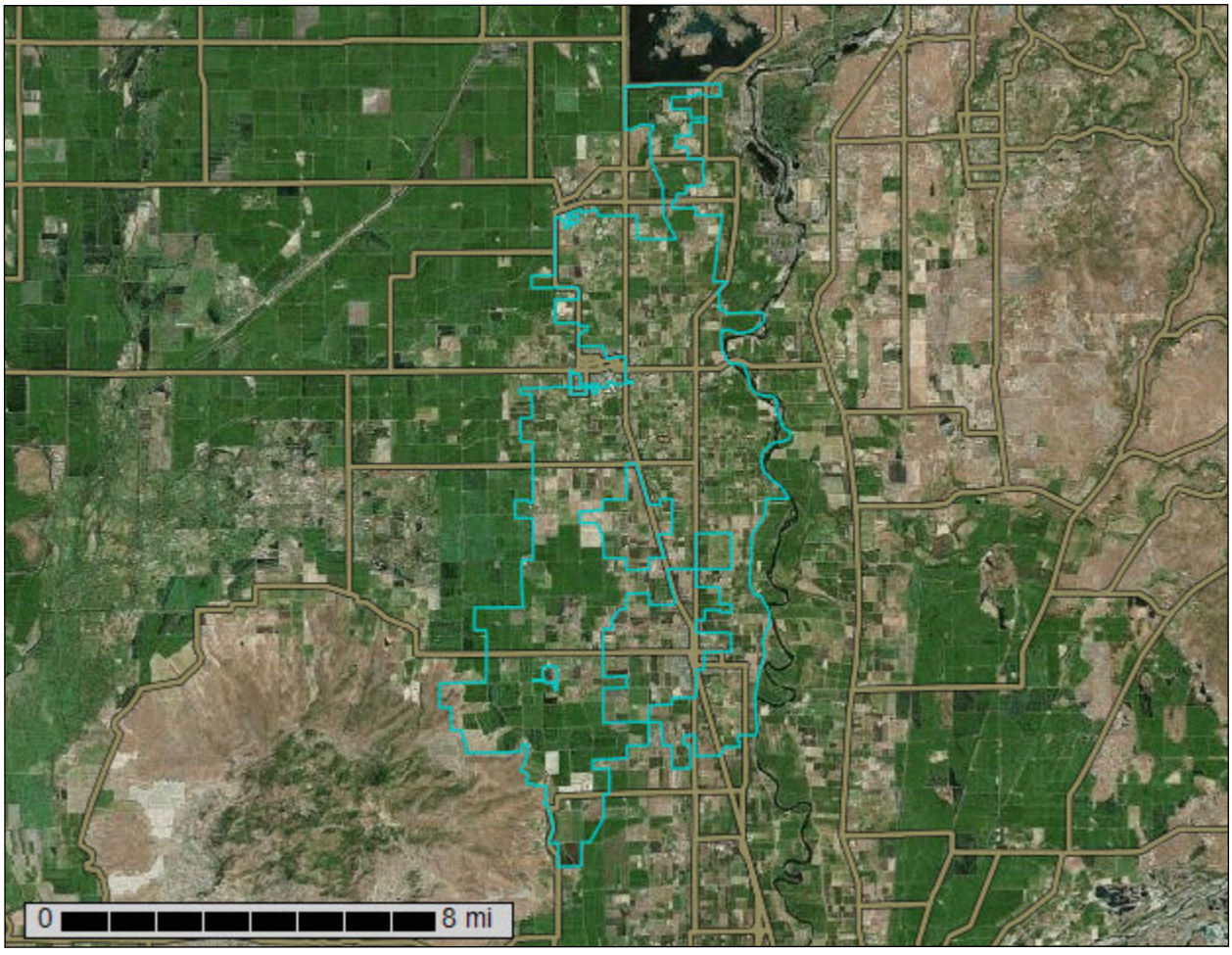
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

# Custom Soil Resource Report for Butte Area, California, Parts of Butte and Plumas Counties; and Sutter County, California

## Butte Water District Boundary




November 7, 2025

# Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

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# How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

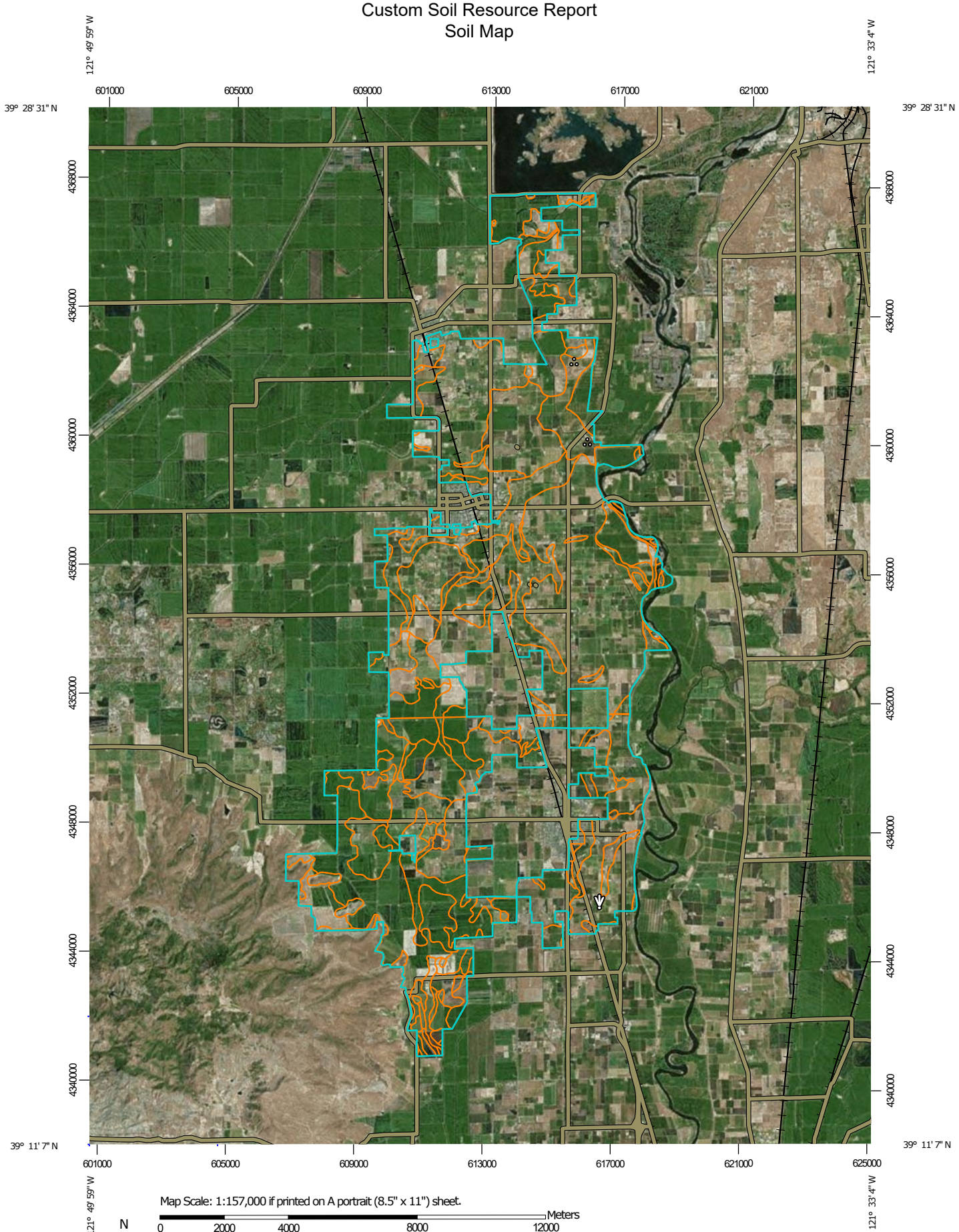
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.


121° 49' 59" W
121° 33' 4" W
39° 28' 31" N
39° 11' 7" N
601000
605000
609000
613000
617000
621000
625000
4368000
4364000
4360000
4356000
4352000
4348000
4344000
4340000
Map Scale: 1:157,000 if printed on A portrait (8.5" x 11") sheet.
N
0 2000 4000 8000 12000 Meters
0 5000 10000 20000 30000 Feet
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**Water Features**
- Streams and Canals

**Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Butte Area, California, Parts of Butte and Plumas Counties
Survey Area Data: Version 23, Sep 5, 2025

Soil Survey Area: Sutter County, California
Survey Area Data: Version 23, Sep 3, 2025

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

## MAP LEGEND

## MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| 120 | Gridley taxadjunct clay loam, 0 to 2 percent slopes | 547.2 | 1.7% |
| 121 | Boga-Loemstone , 0 to 1 percent slopes | 6,635.6 | 20.1% |
| 121su | Columbia fine sandy loam, 0 to 2 percent slopes, frequently flooded | 11.7 | 0.0% |
| 126 | Liveoak sandy loam, 0 to 2 percent slopes | 1,504.3 | 4.6% |
| 127 | Gridley taxadjunct loam, 0 to 2 percent slopes | 4,561.6 | 13.8% |
| 130 | Eastbiggs loam, 0 to 2 percent slopes | 234.2 | 0.7% |
| 136 | Duric Xerarents-Eastbiggs , 0 to 1 percent slopes, leveled | 1,352.0 | 4.1% |
| 138su | Liveoak sandy clay loam, 0 to 2 percent slopes | 2,118.3 | 6.4% |
| 139su | Liveoak-Galt taxadjuncts , 0 to 2 percent slopes, frequently flooded | 0.3 | 0.0% |
| 143su | Marcum-Gridley clay loams, 0 to 1 percent slopes | 47.1 | 0.1% |
| 150 | Columbia, 0 to 2 percent slopes, frequently flooded | 27.7 | 0.1% |
| 152 | Gianella fine sandy loam, 0 to 1 percent slopes, frequently flooded | 155.1 | 0.5% |
| 158 | Gianella fine sandy loam, 0 to 1 percent slopes, occasionally flooded | 187.4 | 0.6% |
| 161 | Gianella fine sandy loam, 0 to 1 percent slopes, rarely flooded | 664.0 | 2.0% |
| 162 | Gianella loam, 0 to 1 percent slopes, rarely flooded | 697.8 | 2.1% |
| 416 | Calcic Haploxerolls, 0 to 1 percent slopes | 11.1 | 0.0% |
| 520 | Esquon-Neerdobe , 0 to 1 percent slopes | 217.3 | 0.7% |
| 528 | Neerdobe clay loam, 0 to 1 percent slopes | 234.7 | 0.7% |
| 603 | Oroville-Thermalito-Fernandez-Thompsonflat complex, 0 to 9 percent slopes | 172.6 | 0.5% |
| 990 | Riverwash, 0 to 2 percent slopes frequently flooded | 75.7 | 0.2% |

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| 999 | Water | 76.9 | 0.2% |
| **Subtotals for Soil Survey Area** | | **19,532.7** | **59.1%** |
| **Totals for Area of Interest** | | **33,055.3** | **100.0%** |

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| 107 | Capay silty clay, siltstone substratum, 0 to 2 percent slopes | 538.6 | 1.6% |
| 118 | Columbia fine sandy loam, channeled, 0 to 2 percent slopes | 17.3 | 0.1% |
| 120bu | Gridley taxadjunct clay loam, 0 to 2 percent slopes | 359.4 | 1.1% |
| 121 | Columbia fine sandy loam, frequently flooded, 0 to 2 percent slopes | 1.4 | 0.0% |
| 121bu | Boga-Loemstone complex, 0 to 2 percent slopes | 290.2 | 0.9% |
| 124 | Conejo loam, 0 to 1 percent slopes, MLRA 17 | 78.6 | 0.2% |
| 125 | Conejo loam, 0 percent slopes, dense substratum, MLRA 17 | 3.6 | 0.0% |
| 126 | Conejo-Tisdale complex, 0 percent slopes, MLRA 17 | 2,551.4 | 7.7% |
| 127 | Conejo-Urban land complex, 0 percent slopes, MLRA 17 | 51.7 | 0.2% |
| 127bu | Gridley taxadjunct loam, 0 to 2 percent slopes | 177.4 | 0.5% |
| 132 | Gridley clay loam, 0 to 1 percent slopes | 1,048.6 | 3.2% |
| 138 | Liveoak sandy clay loam, 0 to 2 percent slopes | 1,315.7 | 4.0% |
| 139 | Liveoak-Galt taxadjuncts complex, frequently flooded, 0 to 2 percent slopes | 9.8 | 0.0% |
| 140 | Marcum clay loam, 0 to 2 percent slopes | 63.9 | 0.2% |
| 141 | Marcum clay loam, siltstone substratum, 0 to 1 percent slopes | 109.8 | 0.3% |
| 143 | Marcum-Gridley clay loams, 0 to 1 percent slopes | 627.9 | 1.9% |
| 150 | Olashes sandy loam, 0 to 2 percent slopes | 410.5 | 1.2% |
| 151 | Olashes sandy loam, 2 to 5 percent slopes | 9.3 | 0.0% |
| 153 | Oswald clay, 0 to 2 percent slopes | 1,624.6 | 4.9% |

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| 157 | Palls-Stohlman stony loams, cool, 9 to 30 percent slopes | 328.8 | 1.0% |
| 165 | Shanghai silt loam, frequently flooded, 0 to 2 percent slopes | 0.4 | 0.0% |
| 172 | Stohlman-Palls stony sandy loams, cool, 30 to 50 percent slopes | 29.4 | 0.1% |
| 173 | Subaco clay, 0 to 2 percent slopes | 2,151.4 | 6.5% |
| 174 | Tisdale clay loam, 0 to 2 percent slopes | 1,712.5 | 5.2% |
| 175 | Yuvas loam, 0 to 2 percent slopes | 10.3 | 0.0% |
| **Subtotals for Soil Survey Area** | | **13,522.5** | **40.9%** |
| **Totals for Area of Interest** | | **33,055.3** | **100.0%** |

# Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

# Butte Area, California, Parts of Butte and Plumas Counties

## 120—Gridley taxadjunct clay loam, 0 to 2 percent slopes

### Map Unit Setting

*National map unit symbol:* hgv7
*Elevation:* 60 to 90 feet
*Mean annual precipitation:* 18 to 20 inches
*Mean annual air temperature:* 61 degrees F
*Frost-free period:* 240 to 245 days
*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

*Gridley taxadjunct, clay loam, and similar soils:* 80 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Gridley Taxadjunct, Clay Loam

#### Setting

*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Clayey and loamy alluvium over cemented loamy alluvium derived from igneous, metamorphic and sedimentary rock

#### Typical profile

*A - 0 to 4 inches:* clay loam
*Bt1 - 4 to 9 inches:* clay loam
*Bt2 - 9 to 15 inches:* clay loam
*Btk - 15 to 21 inches:* clay loam
*2Bkqm - 21 to 60 inches:* cemented coarse sandy loam

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* 20 to 40 inches to duripan
*Drainage class:* Somewhat poorly drained
*Runoff class:* Very high
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to low (0.00 to 0.01 in/hr)
*Depth to water table:* About 5 to 40 inches
*Frequency of flooding:* Rare
*Frequency of ponding:* Occasional
*Calcium carbonate, maximum content:* 5 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Low (about 3.9 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 3w
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* D
*Ecological site:* R017XY902CA - Duripan Vernal Pools
*Hydric soil rating:* No

**Minor Components**

**Neerdobe, clay**
*Percent of map unit:* 5 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Gridley, clay loam, siltstone substratum**
*Percent of map unit:* 3 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, sodic**
*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Tisdale, clay loam**
*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Marcum, clay loam**
*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Subaco taxadjunct, clay**
*Percent of map unit:* 2 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Gridley taxadjunct, loam**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Gridley taxadjunct, frequently ponded**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Hydric soil rating:* No

## 121—Boga-Loemstone , 0 to 1 percent slopes

**Map Unit Setting**

*National map unit symbol:* hgv8
*Elevation:* 80 to 100 feet
*Mean annual precipitation:* 19 to 21 inches
*Mean annual air temperature:* 61 degrees F
*Frost-free period:* 240 to 250 days
*Farmland classification:* Prime farmland if irrigated

**Map Unit Composition**

*Boga, loam, and similar soils:* 45 percent
*Loemstone, loam, and similar soils:* 40 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Boga, Loam**

**Setting**

*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium over dense silty alluvium derived from igneous and metamorphic rock

**Typical profile**

*Ap1 - 0 to 3 inches:* loam
*Ap2 - 3 to 6 inches:* loam
*Bt1 - 6 to 14 inches:* clay loam
*Bt2 - 14 to 29 inches:* clay loam
*Bt3 - 29 to 53 inches:* clay loam

*Bt4 - 53 to 73 inches:* loam
*2Cd - 73 to 80 inches:* material

**Properties and qualities**

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* 60 to 80 inches to densic material
*Drainage class:* Moderately well drained
*Runoff class:* Medium
*Capacity of the most limiting layer to transmit water (Ksat):* Low to moderately low (0.00 to 0.06 in/hr)
*Depth to water table:* About 20 to 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* Occasional
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 3.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Very high (about 12.2 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 2s
*Land capability classification (nonirrigated):* 3s
*Hydrologic Soil Group:* C
*Ecological site:* R017XY904CA - Subirrigated Deep Alluvial Fans
*Hydric soil rating:* No

## Description of Loemstone, Loam

**Setting**

*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium over dense silty alluvium derived from igneous and metamorphic rock

**Typical profile**

*Ap1 - 0 to 2 inches:* loam
*Ap2 - 2 to 4 inches:* silt loam
*Ap3 - 4 to 10 inches:* silt loam
*Bt1 - 10 to 18 inches:* clay loam
*Bt2 - 18 to 23 inches:* silty clay loam
*Bt3 - 23 to 32 inches:* silt loam
*Bt4 - 32 to 40 inches:* silt loam
*Bt5 - 40 to 48 inches:* silt loam
*2Cd - 48 to 57 inches:* silt

**Properties and qualities**

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* 40 to 60 inches to densic material
*Drainage class:* Moderately well drained
*Runoff class:* Medium
*Capacity of the most limiting layer to transmit water (Ksat):* Low to moderately low (0.00 to 0.06 in/hr)
*Depth to water table:* About 18 to 60 inches
*Frequency of flooding:* None
*Frequency of ponding:* Occasional
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 3.0 mmhos/cm)
*Sodium adsorption ratio, maximum:* 1.0
*Available water supply, 0 to 60 inches:* High (about 9.5 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 3s
*Land capability classification (nonirrigated):* 3s
*Hydrologic Soil Group:* C
*Ecological site:* R017XY904CA - Subirrigated Deep Alluvial Fans
*Hydric soil rating:* No

**Minor Components**

**Unnamed, densic material 20 to 40 inches**

*Percent of map unit:* 4 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Liveoak, sandy clay loam**

*Percent of map unit:* 4 percent
*Landform:* Channels on stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, duripan 20 to 60 inches**

*Percent of map unit:* 2 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Marcum, loam**

*Percent of map unit:* 2 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Tisdale, clay loam**

*Percent of map unit:* 2 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, coarse-loamy**

*Percent of map unit:* 1 percent
*Landform:* Channels on stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 121su—Columbia fine sandy loam, 0 to 2 percent slopes, frequently flooded

### Map Unit Setting

*National map unit symbol:* 1j6q9
*Elevation:* 20 to 80 feet
*Mean annual precipitation:* 17 to 22 inches
*Mean annual air temperature:* 60 to 64 degrees F
*Frost-free period:* 260 to 280 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Columbia, fine sandy loam, frequently flooded, and similar soils:* 80 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Columbia, Fine Sandy Loam, Frequently Flooded

#### Setting

*Landform:* Flood-plain steps, flood plains, flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Mixed sandy alluvium

#### Typical profile

*Ap or A - 0 to 14 inches:* fine sandy loam
*C1 to C4 - 14 to 60 inches:* stratified fine sandy loam to very fine sandy loam

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat poorly drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)
*Depth to water table:* About 36 to 60 inches
*Frequency of flooding:* Frequent
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 6.6 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 4w
*Land capability classification (nonirrigated):* 4w
*Hydrologic Soil Group:* A
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* Yes

**Minor Components**

**Holillipah**

*Percent of map unit:* 7 percent
*Landform:* Flood-plain steps, flood plains, flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* Yes

**Tisdale**

*Percent of map unit:* 7 percent
*Landform:* Flood-plain steps, flood plains, flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* No

**Shanghai**

*Percent of map unit:* 6 percent
*Landform:* Flood-plain steps, flood plains, flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* Yes

## 126—Liveoak sandy loam, 0 to 2 percent slopes

**Map Unit Setting**

*National map unit symbol:* hgvc
*Elevation:* 90 to 110 feet
*Mean annual precipitation:* 19 to 21 inches
*Mean annual air temperature:* 61 to 63 degrees F
*Frost-free period:* 240 to 250 days
*Farmland classification:* Prime farmland if irrigated

**Map Unit Composition**

*Liveoak, sandy loam, and similar soils:* 85 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Liveoak, Sandy Loam**

**Setting**

*Landform:* Channels on stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear

*Across-slope shape:* Linear
*Parent material:* Loamy and sandy alluvium derived from igneous and metamorphic rock

**Typical profile**

*Ap1 - 0 to 4 inches:* sandy loam
*Ap2 - 4 to 17 inches:* sandy loam
*Bw1 - 17 to 37 inches:* sandy loam
*Bw2 - 37 to 48 inches:* sandy loam
*Bw3 - 48 to 61 inches:* sandy loam
*C1 - 61 to 71 inches:* sand
*C2 - 71 to 75 inches:* gravelly sand

**Properties and qualities**

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Runoff class:* Negligible
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.43 to 2.98 in/hr)
*Depth to water table:* About 11 to 40 inches
*Frequency of flooding:* Very rare
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 1 percent
*Available water supply, 0 to 60 inches:* Moderate (about 7.5 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 2s
*Land capability classification (nonirrigated):* 3s
*Hydrologic Soil Group:* B
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* No

## Minor Components

**Unnamed, light surface colors**

*Percent of map unit:* 3 percent
*Landform:* Channels on stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Liveoak, sandy clay loam**

*Percent of map unit:* 2 percent
*Landform:* Channels on stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Xerofluvents, coarse loamy**

*Percent of map unit:* 2 percent
*Landform:* Channels on stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear

*Hydric soil rating:* No

**Urban land**

*Percent of map unit:* 2 percent
*Landform:* Channels on stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear

**Loemstone, loam**

*Percent of map unit:* 2 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Gridley taxadjunct, clay loam**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Boga, loam**

*Percent of map unit:* 2 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 127—Gridley taxadjunct loam, 0 to 2 percent slopes

**Map Unit Setting**

*National map unit symbol:* hgvd
*Elevation:* 70 to 100 feet
*Mean annual precipitation:* 18 to 21 inches
*Mean annual air temperature:* 61 degrees F
*Frost-free period:* 240 to 245 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

*Gridley taxadjunct, loam, and similar soils:* 85 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Gridley Taxadjunct, Loam

#### Setting

*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy and clayey alluvium over cemented loamy alluvium derived from igneous and metamorphic rock

#### Typical profile

*A - 0 to 10 inches:* loam
*Bt - 10 to 20 inches:* clay loam
*Btk - 20 to 22 inches:* clay
*2Bkqm - 22 to 60 inches:* cemented material

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* 20 to 40 inches to duripan
*Drainage class:* Somewhat poorly drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to low (0.00 to 0.01 in/hr)
*Depth to water table:* About 5 to 40 inches
*Frequency of flooding:* Rare
*Frequency of ponding:* Occasional
*Calcium carbonate, maximum content:* 5 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Low (about 3.9 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 3w
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* D
*Ecological site:* R017XY902CA - Duripan Vernal Pools
*Hydric soil rating:* No

### Minor Components

#### Unnamed, frequently flooded

*Percent of map unit:* 5 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Channels
*Down-slope shape:* Linear
*Across-slope shape:* Linear, concave
*Hydric soil rating:* Yes

#### Unnamed, duripan greater than 40 inches

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear

*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, duripan less than 20 inches**
*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Mollic haploxeralfs, fine-loamy**
*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Typic haploxerolls, fine-loamy**
*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Typic argixerolls, fine-loamy**
*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 130—Eastbiggs loam, 0 to 2 percent slopes

**Map Unit Setting**
*National map unit symbol:* hgvh
*Elevation:* 90 to 120 feet
*Mean annual precipitation:* 21 to 23 inches
*Mean annual air temperature:* 61 degrees F
*Frost-free period:* 250 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**
*Eastbiggs, loam, and similar soils:* 80 percent

*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Eastbiggs, Loam

#### Setting

*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Mounds
*Down-slope shape:* Linear, convex
*Across-slope shape:* Linear, convex
*Parent material:* Loamy alluvium over clayey alluvium over cemented loamy alluvium derived from igneous and metamorphic rock

#### Typical profile

*A1 - 0 to 3 inches:* loam
*A2 - 3 to 10 inches:* loam
*BAt - 10 to 17 inches:* loam
*2Bt - 17 to 27 inches:* clay
*3Bqm - 27 to 34 inches:* cemented material
*3Bq - 34 to 60 inches:* cemented material

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches; 20 to 40 inches to duripan
*Drainage class:* Somewhat poorly drained
*Runoff class:* Very high
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Depth to water table:* About 14 to 40 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water supply, 0 to 60 inches:* Very low (about 2.9 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 5w
*Land capability classification (nonirrigated):* 5w
*Hydrologic Soil Group:* D
*Ecological site:* R017XY902CA - Duripan Vernal Pools
*Hydric soil rating:* No

### Minor Components

#### Galt, clay

*Percent of map unit:* 9 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit, toeslope
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Swales
*Down-slope shape:* Linear
*Across-slope shape:* Linear, concave
*Hydric soil rating:* Yes

#### Unnamed, clayey, duripan 10 to 20 inches

*Percent of map unit:* 3 percent
*Landform:* Fan remnants

*Landform position (two-dimensional):* Summit, toeslope
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Swales
*Down-slope shape:* Linear
*Across-slope shape:* Linear, concave
*Hydric soil rating:* Yes

**Unnamed, frequent long ponding**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit, toeslope
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Vernal pools
*Down-slope shape:* Linear, concave
*Across-slope shape:* Linear, concave
*Hydric soil rating:* Yes

**Unnamed, loamy, duripan 10 to 20 inches**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit, toeslope
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Swales
*Down-slope shape:* Linear
*Across-slope shape:* Linear, concave
*Hydric soil rating:* Yes

**Kimball, loam**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, rarely flooded**

*Percent of map unit:* 2 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 136—Duric Xerarents-Eastbiggs , 0 to 1 percent slopes, leveled

**Map Unit Setting**

*National map unit symbol:* hgvk
*Elevation:* 70 to 140 feet
*Mean annual precipitation:* 19 to 23 inches
*Mean annual air temperature:* 61 degrees F

*Frost-free period:* 240 to 250 days
*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Duric xerarents, cut, and similar soils:* 35 percent
*Duric xerarents, fill, and similar soils:* 30 percent
*Eastbiggs, fine sandy loam, leveled, and similar soils:* 25 percent
*Minor components:* 10 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Duric Xerarents, Cut**

**Setting**

*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Human altered clayey alluvium over cemented loamy alluvium derived from igneous and metamorphic rock

**Typical profile**

*Bt1 - 0 to 3 inches:* clay loam
*Bt2 - 3 to 8 inches:* clay loam
*Bt3 - 8 to 10 inches:* clay loam
*2Bt4 - 10 to 13 inches:* clay
*3Bqm - 13 to 23 inches:* cemented material

**Properties and qualities**

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* 6 to 21 inches to duripan
*Drainage class:* Somewhat poorly drained
*Runoff class:* High
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Depth to water table:* About 0 to 21 inches
*Frequency of flooding:* None
*Frequency of ponding:* Frequent
*Maximum salinity:* Nonsaline (0.0 to 0.5 mmhos/cm)
*Available water supply, 0 to 60 inches:* Very low (about 2.3 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 5w
*Land capability classification (nonirrigated):* 5w
*Hydrologic Soil Group:* D
*Ecological site:* R017XY902CA - Duripan Vernal Pools
*Hydric soil rating:* Yes

**Description of Duric Xerarents, Fill**

**Setting**

*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear

*Parent material:* Human transported clayey alluvium over cemented loamy alluvium derived from igneous and metamorphic rock

**Typical profile**

*Ap - 0 to 5 inches:* clay loam
*Btb1 - 5 to 12 inches:* clay loam
*Btb2 - 12 to 16 inches:* clay
*Bqb - 16 to 30 inches:* cemented sandy loam
*Btb3 - 30 to 38 inches:* sandy clay loam
*Btb4 - 38 to 48 inches:* sandy clay loam
*2Bqmb - 48 to 58 inches:* cemented material

**Properties and qualities**

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* 24 to 80 inches to duripan
*Drainage class:* Somewhat poorly drained
*Runoff class:* Negligible
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Depth to water table:* About 35 to 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* Rare
*Available water supply, 0 to 60 inches:* Moderate (about 7.1 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 4w
*Land capability classification (nonirrigated):* 4w
*Hydrologic Soil Group:* C
*Ecological site:* R017XY902CA - Duripan Vernal Pools
*Hydric soil rating:* No

**Description of Eastbiggs, Fine Sandy Loam, Leveled**

**Setting**

*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Mounds
*Down-slope shape:* Linear, convex
*Across-slope shape:* Linear, convex
*Parent material:* Human-transported loamy alluvium over clayey alluvium over cemented loamy alluvium derived from igneous and metamorphic rock

**Typical profile**

*Ap1 - 0 to 5 inches:* fine sandy loam
*Ap2 - 5 to 12 inches:* fine sandy loam
*Btb1 - 12 to 18 inches:* sandy clay loam
*Btb2 - 18 to 23 inches:* sandy clay loam
*Btb3 - 23 to 26 inches:* clay loam
*2Btb4 - 26 to 30 inches:* clay
*3Bqmb - 30 to 40 inches:* cemented material

**Properties and qualities**

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* 20 to 40 inches to duripan
*Drainage class:* Somewhat poorly drained
*Runoff class:* High

*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Depth to water table:* About 14 to 40 inches
*Frequency of flooding:* None
*Frequency of ponding:* Frequent
*Available water supply, 0 to 60 inches:* Low (about 4.9 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 5w
*Land capability classification (nonirrigated):* 5w
*Hydrologic Soil Group:* C/D
*Ecological site:* R017XY902CA - Duripan Vernal Pools
*Hydric soil rating:* No

**Minor Components**

**Duric xerarents, cut and fill with gravel**

*Percent of map unit:* 5 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Esquon, human transported fill overburden**

*Percent of map unit:* 3 percent
*Landform:* Drainageways on fan remnants
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear, concave
*Across-slope shape:* Concave, convex
*Hydric soil rating:* Yes

**Unnamed, human transported fill, > 60 in. thick**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 138su—Liveoak sandy clay loam, 0 to 2 percent slopes

**Map Unit Setting**

*National map unit symbol:* yrcw
*Elevation:* 20 to 100 feet

*Mean annual precipitation:* 17 to 21 inches
*Mean annual air temperature:* 61 to 64 degrees F
*Frost-free period:* 240 to 280 days
*Farmland classification:* Prime farmland if irrigated

**Map Unit Composition**

*Liveoak, sandy clay loam, and similar soils:* 85 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Liveoak, Sandy Clay Loam**

**Setting**

*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium derived from igneous and metamorphic rock

**Typical profile**

*Ap1-Ap2 - 0 to 13 inches:* sandy clay loam
*Bt1-Bt2-BC - 13 to 53 inches:* sandy clay loam
*C - 53 to 60 inches:* sandy loam

**Properties and qualities**

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)
*Depth to water table:* About 11 to 40 inches
*Frequency of flooding:* Very rare
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 1 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* High (about 10.0 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 2s
*Land capability classification (nonirrigated):* 3s
*Hydrologic Soil Group:* B
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* No

**Minor Components**

**Liveoak, sandy loam**

*Percent of map unit:* 2 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Tisdale, clay loam**

*Percent of map unit:* 2 percent

*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Boga, loam**

*Percent of map unit:* 2 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Loemstone, loam**

*Percent of map unit:* 2 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, duripan below 40 inches**

*Percent of map unit:* 2 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Gridley taxadjunct, clay loam**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, sandy substratum below 40 inches**

*Percent of map unit:* 1 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, light surface colors**

*Percent of map unit:* 1 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, no water table**

*Percent of map unit:* 1 percent
*Landform:* Stream terraces

*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 139su—Liveoak-Galt taxadjuncts , 0 to 2 percent slopes, frequently flooded

### Map Unit Setting

*National map unit symbol:* hgv6
*Elevation:* 20 to 70 feet
*Mean annual precipitation:* 14 to 20 inches
*Mean annual air temperature:* 60 to 64 degrees F
*Frost-free period:* 260 to 280 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Liveoak taxadjunct, loam, frequently flooded, and similar soils:* 45 percent
*Galt taxadjunct, clay loam, frequently flooded, and similar soils:* 40 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Liveoak Taxadjunct, Loam, Frequently Flooded

#### Setting

*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium derived from igneous and metamorphic rock

#### Typical profile

*Ak - 0 to 6 inches:* loam
*Bk and Bkq - 6 to 54 inches:* loam
*Bkqm - 54 to 63 inches:* cemented material
*2C - 63 to 73 inches:* very fine sandy loam

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* 40 to 60 inches to duripan
*Drainage class:* Moderately well drained
*Runoff class:* Low
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Depth to water table:* About 48 to 60 inches
*Frequency of flooding:* Frequent
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 1 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

*Available water supply, 0 to 60 inches:* Moderate (about 8.6 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 4w
*Land capability classification (nonirrigated):* 4w
*Hydrologic Soil Group:* B
*Ecological site:* R017XY902CA - Duripan Vernal Pools
*Hydric soil rating:* Yes

## Description of Galt Taxadjunct, Clay Loam, Frequently Flooded

**Setting**

*Landform:* Fan remnants
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium derived from igneous and metamorphic rock

**Typical profile**

*A1,A2,Bw,Bk - 0 to 21 inches:* clay loam
*Bkqm - 21 to 22 inches:* cemented material
*Ck - 22 to 25 inches:* loam
*B'kqm - 25 to 26 inches:* cemented material
*Cd - 26 to 60 inches:* bedrock

**Properties and qualities**

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* 20 to 35 inches to duripan; 20 to 35 inches to duripan; 26 to 60 inches to densic material
*Drainage class:* Somewhat poorly drained
*Runoff class:* Medium
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Depth to water table:* About 12 to 24 inches
*Frequency of flooding:* Frequent
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 3 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Low (about 4.0 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 5w
*Land capability classification (nonirrigated):* 5w
*Hydrologic Soil Group:* D
*Ecological site:* R017XY902CA - Duripan Vernal Pools
*Hydric soil rating:* Yes

## Minor Components

**Galt, clay**

*Percent of map unit:* 4 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear

*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* Yes

**Subaco, clay**

*Percent of map unit:* 3 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Columbia**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Channels
*Down-slope shape:* Linear
*Across-slope shape:* Linear, concave
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* Yes

**Unnamed, duripan < 20 inches**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Clear lake, clay**

*Percent of map unit:* 2 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Gridley, clay loam**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* No

## 143su—Marcum-Gridley clay loams, 0 to 1 percent slopes

### Map Unit Setting

*National map unit symbol:* hgvl
*Elevation:* 20 to 80 feet
*Mean annual precipitation:* 17 to 20 inches
*Mean annual air temperature:* 60 to 64 degrees F
*Frost-free period:* 260 to 280 days
*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

*Marcum, clay loam, and similar soils:* 45 percent
*Gridley, clay loam, and similar soils:* 40 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Marcum, Clay Loam

#### Setting

*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium derived from mixed

#### Typical profile

*Ap or A - 0 to 16 inches:* clay loam
*Bt1 - 16 to 28 inches:* clay loam
*Bt2 - 28 to 40 inches:* clay
*Bk - 40 to 43 inches:* clay loam
*2Cr - 43 to 62 inches:* bedrock

#### Properties and qualities

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* 40 to 80 inches to paralithic bedrock
*Drainage class:* Moderately well drained
*Runoff class:* Low
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 1 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 7.4 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 2s

*Land capability classification (nonirrigated):* 3s
*Hydrologic Soil Group:* C
*Ecological site:* R017XY904CA - Subirrigated Deep Alluvial Fans
*Hydric soil rating:* No

### Description of Gridley, Clay Loam

#### Setting

*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Clayey alluvium derived from mixed

#### Typical profile

*Ap or A - 0 to 19 inches:* clay loam
*Bt1 and Bt2 - 19 to 37 inches:* clay
*Cr - 37 to 60 inches:* bedrock

#### Properties and qualities

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* 20 to 40 inches to paralithic bedrock
*Drainage class:* Moderately well drained
*Runoff class:* Medium
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 6.5 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 3s
*Land capability classification (nonirrigated):* 3s
*Hydrologic Soil Group:* D
*Ecological site:* R017XY901CA - Clayey Basin Group
*Hydric soil rating:* No

### Minor Components

#### Liveoak

*Percent of map unit:* 3 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

#### Tisdale

*Percent of map unit:* 3 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Capay**

*Percent of map unit:* 2 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Oswald**

*Percent of map unit:* 2 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Conejo**

*Percent of map unit:* 2 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Gridley**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, frequently ponded**

*Percent of map unit:* 1 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

## 150—Columbia, 0 to 2 percent slopes, frequently flooded

**Map Unit Setting**

*National map unit symbol:* hgvm
*Elevation:* 70 to 170 feet

*Mean annual precipitation:* 19 to 23 inches
*Mean annual air temperature:* 61 degrees F
*Frost-free period:* 240 to 250 days
*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Columbia, stratified sand to fine sandy loam, and similar soils:* 85 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Columbia, Stratified Sand To Fine Sandy Loam**

**Setting**

*Landform:* Channels on flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Stratified sandy alluvium derived from igneous, metamorphic and sedimentary rock

**Typical profile**

*A - 0 to 5 inches:* stratified sand to fine sandy loam
*C1 - 5 to 10 inches:* stratified silt loam to sandy loam
*C2 - 10 to 29 inches:* loam
*C3 - 29 to 37 inches:* fine sandy loam
*C4 - 37 to 46 inches:* sand
*C5 - 46 to 60 inches:* stratified fine sandy loam to fine sand

**Properties and qualities**

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat poorly drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* High (1.70 to 11.34 in/hr)
*Depth to water table:* About 20 to 72 inches
*Frequency of flooding:* Frequent
*Frequency of ponding:* None
*Available water supply, 0 to 60 inches:* Moderate (about 6.8 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 4w
*Land capability classification (nonirrigated):* 4w
*Hydrologic Soil Group:* A
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* Yes

**Minor Components**

**Riverwash, unvegetated**

*Percent of map unit:* 5 percent
*Landform:* Channels on flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* Yes

**Parrott, silt loam**

*Percent of map unit:* 5 percent
*Landform:* Bars on flood-plain steps
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* Yes

**Gianella, fine sandy loam, loam and silt loam**

*Percent of map unit:* 5 percent
*Landform:* Bars on flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* Yes

## 152—Gianella fine sandy loam, 0 to 1 percent slopes, frequently flooded

**Map Unit Setting**

*National map unit symbol:* hgvp
*Elevation:* 80 to 160 feet
*Mean annual precipitation:* 20 to 22 inches
*Mean annual air temperature:* 61 to 63 degrees F
*Frost-free period:* 240 to 245 days
*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Gianella, fine sandy loam, frequently flooded, and similar soils:* 85 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Gianella, Fine Sandy Loam, Frequently Flooded**

**Setting**

*Landform:* Bars on flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Stratified coarse-loamy alluvium derived from igneous, metamorphic and sedimentary rock

**Typical profile**

*A - 0 to 6 inches:* fine sandy loam
*C1 - 6 to 15 inches:* silt loam
*C2 - 15 to 20 inches:* fine sandy loam
*C3 - 20 to 22 inches:* silt loam
*C4 - 22 to 27 inches:* silt loam
*C5 - 27 to 32 inches:* fine sandy loam

*C6 - 32 to 43 inches:* fine sandy loam
*C7 - 43 to 64 inches:* fine sandy loam
*C8 - 64 to 80 inches:* loamy sand

**Properties and qualities**

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Runoff class:* Negligible
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (1.13 to 5.38 in/hr)
*Depth to water table:* About 33 to 80 inches
*Frequency of flooding:* Frequent
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.0 to 0.5 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 8.9 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 4w
*Land capability classification (nonirrigated):* 4w
*Hydrologic Soil Group:* B
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* No

**Minor Components**

**Parrott, silt loam, frequently flooded**

*Percent of map unit:* 5 percent
*Landform:* Bars on flood-plain steps
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* No

**Unnamed, gravelly substratum**

*Percent of map unit:* 5 percent
*Landform:* Bars on flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Columbia, frequently flooded**

*Percent of map unit:* 3 percent
*Landform:* Channels on flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* Yes

**Gianella, fine sandy loam, occasionally flooded**

*Percent of map unit:* 2 percent
*Landform:* Bars on flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear

*Across-slope shape:* Linear
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* No

## 158—Gianella fine sandy loam, 0 to 1 percent slopes, occasionally flooded

### Map Unit Setting

*National map unit symbol:* hgvt
*Elevation:* 70 to 170 feet
*Mean annual precipitation:* 19 to 23 inches
*Mean annual air temperature:* 61 to 63 degrees F
*Frost-free period:* 240 to 250 days
*Farmland classification:* Prime farmland if irrigated

### Map Unit Composition

*Gianella, fine sandy loam, occasionally flooded, and similar soils:* 85 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Gianella, Fine Sandy Loam, Occasionally Flooded

#### Setting

*Landform:* Bars on flood-plain steps
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Stratified coarse-loamy alluvium derived from igneous, metamorphic and sedimentary rock

#### Typical profile

*Ap - 0 to 3 inches:* fine sandy loam
*A - 3 to 12 inches:* fine sandy loam
*C1 - 12 to 19 inches:* loam
*C2 - 19 to 28 inches:* fine sandy loam
*C3 - 28 to 48 inches:* loam
*C4 - 48 to 57 inches:* sandy loam
*C5 - 57 to 80 inches:* loamy sand

#### Properties and qualities

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Runoff class:* Negligible
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (1.13 to 5.95 in/hr)
*Depth to water table:* About 33 to 80 inches
*Frequency of flooding:* Occasional
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.0 to 0.5 mmhos/cm)

*Available water supply, 0 to 60 inches:* Moderate (about 8.1 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 2w
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* A
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* No

**Minor Components**

**Parrott, silt loam, occasionally flooded**

*Percent of map unit:* 5 percent
*Landform:* Bars on flood-plain steps
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* No

**Unnamed, gravelly substratum**

*Percent of map unit:* 4 percent
*Landform:* Bars on flood-plain steps
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Columbia, frequently flooded**

*Percent of map unit:* 3 percent
*Landform:* Channels on flood-plain steps
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Concave, linear
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* Yes

**Gianella, fine sandy loam, frequently flooded**

*Percent of map unit:* 2 percent
*Landform:* Channels on flood-plain steps
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear, concave
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* No

**Farwell, loam**

*Percent of map unit:* 1 percent
*Landform:* Flood-plain steps
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* No

## 161—Gianella fine sandy loam, 0 to 1 percent slopes, rarely flooded

### Map Unit Setting

*National map unit symbol:* yrd0
*Elevation:* 90 to 110 feet
*Mean annual precipitation:* 20 to 22 inches
*Mean annual air temperature:* 61 degrees F
*Frost-free period:* 250 days
*Farmland classification:* Prime farmland if irrigated

### Map Unit Composition

*Gianella, fine sandy loam, rarely flooded, and similar soils:* 90 percent
*Minor components:* 10 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Gianella, Fine Sandy Loam, Rarely Flooded

#### Setting

*Landform:* Bars on flood-plain steps
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Stratified coarse-loamy alluvium derived from igneous, metamorphic and sedimentary rock

#### Typical profile

*Ap - 0 to 3 inches:* fine sandy loam
*A - 3 to 12 inches:* fine sandy loam
*C1 - 12 to 19 inches:* loam
*C2 - 19 to 28 inches:* fine sandy loam
*C3 - 28 to 48 inches:* loam
*C4 - 48 to 57 inches:* sandy loam
*C5 - 57 to 80 inches:* loamy sand

#### Properties and qualities

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Runoff class:* Negligible
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (1.13 to 5.95 in/hr)
*Depth to water table:* About 33 to 80 inches
*Frequency of flooding:* Rare
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.0 to 0.5 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 8.1 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 2s
*Land capability classification (nonirrigated):* 3s

*Hydrologic Soil Group:* A
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* No

**Minor Components**

**Unnamed, gravelly substratum**
*Percent of map unit:* 5 percent
*Landform:* Bars on flood-plain steps
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Columbia taxadjunct, very fine sandy loam**
*Percent of map unit:* 3 percent
*Landform:* Channels on flood-plain steps
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Concave, linear
*Hydric soil rating:* Yes

**Gianella, fine sandy loam, occasionally flooded**
*Percent of map unit:* 2 percent
*Landform:* Bars on flood-plain steps
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 162—Gianella loam, 0 to 1 percent slopes, rarely flooded

**Map Unit Setting**
*National map unit symbol:* yrcz
*Elevation:* 100 to 110 feet
*Mean annual precipitation:* 20 inches
*Mean annual air temperature:* 61 degrees F
*Frost-free period:* 250 days
*Farmland classification:* Prime farmland if irrigated

**Map Unit Composition**
*Gianella, loam, rarely flooded, and similar soils:* 90 percent
*Minor components:* 10 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Gianella, Loam, Rarely Flooded**

**Setting**
*Landform:* Bars on flood-plain steps
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear

*Across-slope shape:* Linear
*Parent material:* Stratified coarse-loamy alluvium derived from igneous, metamorphic and sedimentary rock

**Typical profile**

*Ap - 0 to 18 inches:* loam
*C1 - 18 to 42 inches:* fine sandy loam
*C2 - 42 to 52 inches:* fine sandy loam
*C3 - 52 to 70 inches:* loamy sand

**Properties and qualities**

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Runoff class:* Negligible
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.85 to 1.98 in/hr)
*Depth to water table:* About 33 to 80 inches
*Frequency of flooding:* Rare
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.0 to 0.5 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 8.4 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 2s
*Land capability classification (nonirrigated):* 3s
*Hydrologic Soil Group:* B
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* No

**Minor Components**

**Columbia taxadjunct, very fine sandy loam**

*Percent of map unit:* 5 percent
*Landform:* Channels on flood-plain steps
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Concave, linear
*Hydric soil rating:* Yes

**Unnamed, gravelly substratum**

*Percent of map unit:* 5 percent
*Landform:* Bars on flood-plain steps
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 416—Calcic Haploxerolls, 0 to 1 percent slopes

### Map Unit Setting

*National map unit symbol:* hh1r
*Elevation:* 70 to 90 feet
*Mean annual precipitation:* 18 to 19 inches
*Mean annual air temperature:* 61 degrees F
*Frost-free period:* 240 days
*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

*Calcic haploxerolls, sandy loam, and similar soils:* 90 percent
*Minor components:* 10 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Calcic Haploxerolls, Sandy Loam

#### Setting

*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Coarse-loamy alluvium derived from igneous, metamorphic and sedimentary rock

#### Typical profile

*A - 0 to 5 inches:* sandy loam
*Ak - 5 to 17 inches:* sandy loam
*Bk1 - 17 to 20 inches:* sandy loam
*Bk2 - 20 to 33 inches:* sandy loam
*C - 33 to 44 inches:* sandy loam
*2Cd - 44 to 72 inches:* material

#### Properties and qualities

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* 40 to 60 inches to densic material
*Drainage class:* Moderately well drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* Low to moderately low (0.00 to 0.06 in/hr)
*Depth to water table:* About 11 to 60 inches
*Frequency of flooding:* Rare
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 5 percent
*Maximum salinity:* Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
*Sodium adsorption ratio, maximum:* 13.0
*Available water supply, 0 to 60 inches:* Low (about 5.6 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 3s
*Land capability classification (nonirrigated):* 3s
*Hydrologic Soil Group:* B
*Ecological site:* R017XY905CA - Dry Alluvial Fans and Terraces
*Hydric soil rating:* No

**Minor Components**

**Calcic haploxerolls, loam texture throughout**

*Percent of map unit:* 5 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Calcic haploxerolls, clay loam**

*Percent of map unit:* 3 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, 20 to 60 inches to duripan**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 520—Esquon-Neerdobe , 0 to 1 percent slopes

**Map Unit Setting**

*National map unit symbol:* hgx4
*Elevation:* 60 to 170 feet
*Mean annual precipitation:* 18 to 25 inches
*Mean annual air temperature:* 59 to 63 degrees F
*Frost-free period:* 240 to 250 days
*Farmland classification:* Prime farmland if irrigated

**Map Unit Composition**

*Esquon, clay, and similar soils:* 60 percent
*Neerdobe, clay, and similar soils:* 30 percent
*Minor components:* 10 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Esquon, Clay**

**Setting**

*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Clayey alluvium over cemented loamy alluvium derived from igneous, metamorphic and sedimentary rock

**Typical profile**

*Ap - 0 to 5 inches:* clay
*Bssg - 5 to 11 inches:* clay
*Bss1 - 11 to 22 inches:* clay
*Bss2 - 22 to 35 inches:* clay
*Bkss1 - 35 to 46 inches:* clay
*Bkss2 - 46 to 50 inches:* silty clay
*Bk - 50 to 56 inches:* silty clay
*2Bkqm - 56 to 67 inches:* cemented material

**Properties and qualities**

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* 40 to 60 inches to duripan
*Drainage class:* Poorly drained
*Runoff class:* High
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Depth to water table:* About 0 to 60 inches
*Frequency of flooding:* Rare
*Frequency of ponding:* Frequent
*Calcium carbonate, maximum content:* 14 percent
*Maximum salinity:* Nonsaline (0.0 to 0.5 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 8.9 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 5w
*Land capability classification (nonirrigated):* 5w
*Hydrologic Soil Group:* D
*Ecological site:* R017XY901CA - Clayey Basin Group
*Hydric soil rating:* Yes

**Description of Neerdobe, Clay**

**Setting**

*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Clayey alluvium over cemented loamy alluvium derived from igneous, metamorphic and sedimentary rock

**Typical profile**

*A - 0 to 5 inches:* clay

*Bssg1 - 5 to 15 inches:* clay
*Bssg2 - 15 to 23 inches:* clay
*Bssg3 - 23 to 28 inches:* clay
*Bk - 28 to 33 inches:* clay
*2Bkq - 33 to 38 inches:* loam
*2Bkqm - 38 to 56 inches:* cemented material

**Properties and qualities**

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* 20 to 40 inches to duripan
*Drainage class:* Poorly drained
*Runoff class:* High
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Depth to water table:* About 0 to 40 inches
*Frequency of flooding:* Rare
*Frequency of ponding:* Frequent
*Calcium carbonate, maximum content:* 14 percent
*Maximum salinity:* Nonsaline (0.0 to 0.5 mmhos/cm)
*Available water supply, 0 to 60 inches:* Low (about 5.8 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 5w
*Land capability classification (nonirrigated):* 5w
*Hydrologic Soil Group:* D
*Ecological site:* R017XY901CA - Clayey Basin Group
*Hydric soil rating:* Yes

**Minor Components**

**Eastbiggs**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Unnamed, filled, without duripan**

*Percent of map unit:* 2 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Channels
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Esquon, loamy sand to silty clay overwash**

*Percent of map unit:* 2 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R017XY901CA - Clayey Basin Group

*Hydric soil rating:* Yes

**Lofgren, clay**

*Percent of map unit:* 2 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R017XY901CA - Clayey Basin Group
*Hydric soil rating:* Yes

**Urban land**

*Percent of map unit:* 2 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear

## 528—Neerdobe clay loam, 0 to 1 percent slopes

**Map Unit Setting**

*National map unit symbol:* hgzg
*Elevation:* 90 feet
*Mean annual precipitation:* 20 inches
*Mean annual air temperature:* 61 degrees F
*Frost-free period:* 245 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

*Neerdobe, clay loam, and similar soils:* 90 percent
*Minor components:* 10 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Neerdobe, Clay Loam**

**Setting**

*Landform:* Basin floors
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Clayey alluvium over cemented loamy alluvium derived from mixed

**Typical profile**

*A - 0 to 10 inches:* clay loam
*Bss1 - 10 to 18 inches:* clay
*Bss2 - 18 to 25 inches:* clay

*2Bqm - 25 to 35 inches:* cemented material

**Properties and qualities**

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* 20 to 40 inches to duripan
*Drainage class:* Poorly drained
*Runoff class:* Very high
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Depth to water table:* About 0 to 40 inches
*Frequency of flooding:* Rare
*Frequency of ponding:* Frequent
*Calcium carbonate, maximum content:* 1 percent
*Maximum salinity:* Nonsaline (0.0 to 0.5 mmhos/cm)
*Available water supply, 0 to 60 inches:* Low (about 4.2 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 5w
*Land capability classification (nonirrigated):* 5w
*Hydrologic Soil Group:* D
*Ecological site:* R017XY901CA - Clayey Basin Group
*Hydric soil rating:* Yes

**Minor Components**

**Gridley, clay loam**

*Percent of map unit:* 5 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, frequently flooded**

*Percent of map unit:* 3 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Channels
*Down-slope shape:* Linear
*Across-slope shape:* Linear, concave
*Hydric soil rating:* Yes

**Unnamed, duripan 10 to 20 inches**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

## 603—Oroville-Thermalito-Fernandez-Thompsonflat complex, 0 to 9 percent slopes

### Map Unit Setting

*National map unit symbol:* hgxg
*Elevation:* 110 to 260 feet
*Mean annual precipitation:* 20 to 26 inches
*Mean annual air temperature:* 61 to 63 degrees F
*Frost-free period:* 250 to 255 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Oroville, gravelly fine sandy loam, and similar soils:* 30 percent
*Thermalito, sandy loam, and similar soils:* 25 percent
*Fernandez, sandy loam, and similar soils:* 15 percent
*Thompsonflat, fine sandy loam, and similar soils:* 15 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Oroville, Gravelly Fine Sandy Loam

#### Setting

*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit, toeslope
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Swales
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy and gravelly alluvium over clayey and gravelly alluvium over cemented loamy and gravelly alluvium derived from igneous and metamorphic rock

#### Typical profile

*A - 0 to 2 inches:* gravelly fine sandy loam
*BAt - 2 to 6 inches:* gravelly sandy loam
*Bt1 - 6 to 13 inches:* gravelly clay loam
*2Bt2 - 13 to 17 inches:* gravelly clay
*2Btg - 17 to 23 inches:* gravelly sandy clay
*3Bqm1 - 23 to 31 inches:* cemented extremely gravelly material
*3Bqm2 - 31 to 60 inches:* cemented extremely gravelly material

#### Properties and qualities

*Slope:* 0 to 9 percent
*Depth to restrictive feature:* 20 to 40 inches to duripan
*Drainage class:* Poorly drained
*Runoff class:* Very high
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Depth to water table:* About 0 to 40 inches

*Frequency of flooding:* None
*Frequency of ponding:* Frequent
*Available water supply, 0 to 60 inches:* Very low (about 2.7 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 4e
*Land capability classification (nonirrigated):* 4e
*Hydrologic Soil Group:* D
*Ecological site:* R017XY902CA - Duripan Vernal Pools
*Hydric soil rating:* Yes

**Description of Thermalito, Sandy Loam**

**Setting**

*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Mounds
*Down-slope shape:* Linear, convex
*Across-slope shape:* Linear, convex
*Parent material:* Loamy and gravelly alluvium over clayey and gravelly alluvium over cemented sandy and gravelly alluvium derived from igneous and metamorphic rock

**Typical profile**

*A - 0 to 2 inches:* sandy loam
*Bt1 - 2 to 6 inches:* gravelly sandy loam
*Bt2 - 6 to 12 inches:* sandy clay loam
*Bt3 - 12 to 18 inches:* gravelly sandy clay loam
*Bt4 - 18 to 23 inches:* gravelly sandy clay loam
*Bt5 - 23 to 25 inches:* gravelly sandy clay loam
*2Bt6 - 25 to 29 inches:* gravelly clay
*2Bt7 - 29 to 32 inches:* gravelly clay
*3Bqm - 32 to 60 inches:* cemented gravelly material

**Properties and qualities**

*Slope:* 0 to 9 percent
*Depth to restrictive feature:* 20 to 40 inches to duripan
*Drainage class:* Somewhat poorly drained
*Runoff class:* Very high
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Depth to water table:* About 14 to 40 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water supply, 0 to 60 inches:* Low (about 3.7 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 3e
*Land capability classification (nonirrigated):* 3e
*Hydrologic Soil Group:* C/D
*Ecological site:* R017XY902CA - Duripan Vernal Pools
*Hydric soil rating:* No

### Description of Fernandez, Sandy Loam

#### Setting

*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Fine-loamy alluvium over clayey and gravelly alluvium over cemented sandy and gravelly alluvium derived from igneous and metamorphic rock

#### Typical profile

*A - 0 to 2 inches:* sandy loam
*Bt1 - 2 to 6 inches:* sandy clay loam
*Bt2 - 6 to 18 inches:* sandy clay loam
*2Bt3 - 18 to 28 inches:* clay loam
*2Bt4 - 28 to 44 inches:* clay loam
*2Bt5 - 44 to 57 inches:* clay
*2Bt6 - 57 to 65 inches:* gravelly clay
*2Bt7 - 65 to 73 inches:* gravelly clay loam
*3Btq - 73 to 85 inches:* cemented gravelly material

#### Properties and qualities

*Slope:* 0 to 9 percent
*Depth to restrictive feature:* 60 to 81 inches to duripan
*Drainage class:* Moderately well drained
*Runoff class:* Low
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.06 in/hr)
*Depth to water table:* About 40 to 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Available water supply, 0 to 60 inches:* Moderate (about 8.7 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 3e
*Land capability classification (nonirrigated):* 3e
*Hydrologic Soil Group:* C
*Ecological site:* R017XY902CA - Duripan Vernal Pools
*Hydric soil rating:* No

### Description of Thompsonflat, Fine Sandy Loam

#### Setting

*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium over clayey alluvium over sandy and gravelly alluvium derived from igneous and metamorphic rock

#### Typical profile

*A - 0 to 3 inches:* fine sandy loam
*Bt1 - 3 to 7 inches:* fine sandy loam

*Bt2 - 7 to 11 inches:* sandy clay loam
*Bt3 - 11 to 15 inches:* sandy clay
*2Bt4 - 15 to 22 inches:* gravelly sandy clay
*3Btq1 - 22 to 35 inches:* extremely gravelly sandy clay loam
*3Btq2 - 35 to 45 inches:* extremely gravelly coarse sandy loam
*3Btq3 - 45 to 53 inches:* extremely gravelly coarse sandy loam
*3Btq4 - 53 to 66 inches:* extremely gravelly coarse sandy loam
*3Btq5 - 66 to 80 inches:* extremely gravelly coarse sandy loam

**Properties and qualities**

*Slope:* 0 to 9 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Runoff class:* High
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.09 to 0.23 in/hr)
*Depth to water table:* About 40 to 81 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.0 to 0.5 mmhos/cm)
*Available water supply, 0 to 60 inches:* Low (about 4.2 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 3e
*Land capability classification (nonirrigated):* 3e
*Hydrologic Soil Group:* C
*Ecological site:* R017XY905CA - Dry Alluvial Fans and Terraces
*Hydric soil rating:* No

**Minor Components**

**Unnamed, frequent long ponding**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit, toeslope
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Vernal pools
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Palexeralfs, fine, greater than 60 inches deep**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, loamy, duripan 10 to 20 inches**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit, toeslope
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Swales
*Down-slope shape:* Linear

*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Vistarobles**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit, toeslope
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Swales
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Redding**

*Percent of map unit:* 1 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Mounds
*Down-slope shape:* Linear, convex
*Across-slope shape:* Linear, convex
*Hydric soil rating:* No

**Unnamed, fine-loamy, duripan 20 to 40 inches**

*Percent of map unit:* 1 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit, toeslope
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Swales
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Aquerts, fine, duripan 20 to 40 inches**

*Percent of map unit:* 1 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit, toeslope
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Vernal pools
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Unnamed, clayey-skeletal shallow to duripan**

*Percent of map unit:* 1 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit, toeslope
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Swales
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Unnamed, loamy-skeletal mod deep to duripan**

*Percent of map unit:* 1 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit

*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Mounds
*Down-slope shape:* Linear, convex
*Across-slope shape:* Linear, convex
*Hydric soil rating:* No

**Unnamed, fine-loamy deep to duripan**

*Percent of map unit:* 1 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Mounds
*Down-slope shape:* Linear, convex
*Across-slope shape:* Linear, convex
*Hydric soil rating:* No

**Unnamed, fine deep to duripan**

*Percent of map unit:* 1 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit, toeslope
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Swales
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 990—Riverwash, 0 to 2 percent slopes frequently flooded

**Map Unit Setting**

*National map unit symbol:* hgxk
*Elevation:* 80 to 170 feet
*Mean annual precipitation:* 21 to 23 inches
*Mean annual air temperature:* 61 degrees F
*Frost-free period:* 245 days
*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Riverwash, frequently flooded:* 100 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Riverwash, Frequently Flooded**

**Setting**

*Landform:* Flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear

*Parent material:* Sandy and gravelly alluvium derived from igneous and metamorphic rock

**Properties and qualities**

*Slope:* 0 to 2 percent
*Drainage class:* Excessively drained
*Runoff class:* Negligible
*Depth to water table:* About 0 to 24 inches
*Frequency of flooding:* Frequent

**Interpretive groups**

*Land capability classification (irrigated):* 8
*Land capability classification (nonirrigated):* 8
*Hydrologic Soil Group:* D
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* Yes

## 999—Water

**Map Unit Composition**

*Water:* 100 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

# Sutter County, California

## 107—Capay silty clay, siltstone substratum, 0 to 2 percent slopes

### Map Unit Setting

*National map unit symbol:* hdyp
*Elevation:* 20 to 50 feet
*Mean annual precipitation:* 14 to 17 inches
*Mean annual air temperature:* 61 to 64 degrees F
*Frost-free period:* 260 to 280 days
*Farmland classification:* Prime farmland if irrigated

### Map Unit Composition

*Capay, silty clay, siltstone substratum, and similar soils:* 85 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Capay, Silty Clay, Siltstone Substratum

#### Setting

*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Mixed alluvium

#### Typical profile

*H1 - 0 to 32 inches:* silty clay
*H2 - 32 to 50 inches:* clay loam
*H3 - 50 to 54 inches:* weathered bedrock

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* 40 to 60 inches to paralithic bedrock
*Drainage class:* Moderately well drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 in/hr)
*Depth to water table:* About 36 to 60 inches
*Frequency of flooding:* Rare
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 8.0 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 2w
*Land capability classification (nonirrigated):* 4w
*Hydrologic Soil Group:* C
*Ecological site:* R017XY901CA - Clayey Basin Group
*Hydric soil rating:* Yes

### Minor Components

#### Clear lake

*Percent of map unit:* 5 percent
*Landform:* Basin floors

*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Oswald**

*Percent of map unit:* 5 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Gridley**

*Percent of map unit:* 5 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 118—Columbia fine sandy loam, channeled, 0 to 2 percent slopes

**Map Unit Setting**

*National map unit symbol:* hdz1
*Elevation:* 20 to 80 feet
*Mean annual precipitation:* 17 to 20 inches
*Mean annual air temperature:* 61 to 64 degrees F
*Frost-free period:* 260 to 280 days
*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Columbia, fine sandy loam, channeled, and similar soils:* 80 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Columbia, Fine Sandy Loam, Channeled**

**Setting**

*Landform:* Flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Mixed alluvium

**Typical profile**

*H1 - 0 to 14 inches:* fine sandy loam
*H2 - 14 to 60 inches:* stratified fine sandy loam to very fine sandy loam

**Properties and qualities**

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat poorly drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)
*Depth to water table:* About 36 to 60 inches
*Frequency of flooding:* Frequent
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 6.6 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 4w
*Land capability classification (nonirrigated):* 4w
*Hydrologic Soil Group:* A
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* Yes

**Minor Components**

**Holillipah**

*Percent of map unit:* 7 percent
*Landform:* Flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Shanghai**

*Percent of map unit:* 7 percent
*Landform:* Flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Tisdale**

*Percent of map unit:* 6 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 120bu—Gridley taxadjunct clay loam, 0 to 2 percent slopes

**Map Unit Setting**

*National map unit symbol:* xhlq

*Elevation:* 60 to 90 feet
*Mean annual precipitation:* 18 to 20 inches
*Mean annual air temperature:* 61 degrees F
*Frost-free period:* 240 to 245 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

*Gridley taxadjunct, clay loam, and similar soils:* 80 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Gridley Taxadjunct, Clay Loam**

**Setting**

*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Clayey and loamy alluvium over cemented loamy alluvium derived from igneous, metamorphic and sedimentary rock

**Typical profile**

*A - 0 to 4 inches:* clay loam
*Bt1 - 4 to 9 inches:* clay loam
*Bt2 - 9 to 15 inches:* clay loam
*Btk - 15 to 21 inches:* clay loam
*2Bkqm - 21 to 60 inches:* cemented coarse sandy loam

**Properties and qualities**

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* 20 to 40 inches to duripan
*Drainage class:* Somewhat poorly drained
*Runoff class:* Very high
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to low (0.00 to 0.01 in/hr)
*Depth to water table:* About 5 to 40 inches
*Frequency of flooding:* Rare
*Frequency of ponding:* Occasional
*Calcium carbonate, maximum content:* 5 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Low (about 3.9 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 3w
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* D
*Ecological site:* R017XY902CA - Duripan Vernal Pools
*Hydric soil rating:* No

**Minor Components**

**Neerdobe, clay**

*Percent of map unit:* 5 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Gridley, clay loam, siltstone substratum**

*Percent of map unit:* 3 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Gridley taxadjunct, loam**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Gridley taxadjunct, frequently ponded**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Concave
*Across-slope shape:* Concave
*Hydric soil rating:* No

**Unnamed, sodic**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Tisdale, clay loam**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Marcum, clay loam**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Subaco taxadjunct, clay**

*Percent of map unit:* 2 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

## 121—Columbia fine sandy loam, frequently flooded, 0 to 2 percent slopes

### Map Unit Setting

*National map unit symbol:* hdz4
*Elevation:* 20 to 80 feet
*Mean annual precipitation:* 17 to 22 inches
*Mean annual air temperature:* 60 to 64 degrees F
*Frost-free period:* 260 to 280 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Columbia, fine sandy loam, frequently flooded, and similar soils:* 80 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Columbia, Fine Sandy Loam, Frequently Flooded

#### Setting

*Landform:* Flood-plain steps, flood plains, flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Mixed sandy alluvium

#### Typical profile

*Ap or A - 0 to 14 inches:* fine sandy loam
*C1 to C4 - 14 to 60 inches:* stratified fine sandy loam to very fine sandy loam

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat poorly drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)
*Depth to water table:* About 36 to 60 inches
*Frequency of flooding:* Frequent
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 6.6 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 4w
*Land capability classification (nonirrigated):* 4w
*Hydrologic Soil Group:* A
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* Yes

**Minor Components**

**Holillipah**

*Percent of map unit:* 7 percent
*Landform:* Flood-plain steps, flood plains, flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* Yes

**Tisdale**

*Percent of map unit:* 7 percent
*Landform:* Flood-plain steps, flood plains, flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* No

**Shanghai**

*Percent of map unit:* 6 percent
*Landform:* Flood-plain steps, flood plains, flood plains
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* Yes

## 121bu—Boga-Loemstone complex, 0 to 2 percent slopes

**Map Unit Setting**

*National map unit symbol:* yrcv
*Elevation:* 80 to 100 feet
*Mean annual precipitation:* 19 to 21 inches
*Mean annual air temperature:* 61 degrees F
*Frost-free period:* 240 to 250 days
*Farmland classification:* Prime farmland if irrigated

**Map Unit Composition**

*Boga, loam, and similar soils:* 45 percent
*Loemstone, loam, and similar soils:* 40 percent
*Minor components:* 15 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Boga, Loam**

**Setting**

*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium over dense silty alluvium derived from igneous and metamorphic rock

**Typical profile**

*Ap1 - 0 to 3 inches:* loam
*Ap2 - 3 to 6 inches:* loam
*Bt1 - 6 to 14 inches:* clay loam
*Bt2 - 14 to 29 inches:* clay loam
*Bt3 - 29 to 53 inches:* clay loam
*Bt4 - 53 to 73 inches:* loam
*2Cd - 73 to 80 inches:* material

**Properties and qualities**

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* 60 to 80 inches to densic material
*Drainage class:* Moderately well drained
*Runoff class:* Medium
*Capacity of the most limiting layer to transmit water (Ksat):* Low to moderately low (0.00 to 0.06 in/hr)
*Depth to water table:* About 20 to 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* Occasional
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 3.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Very high (about 12.2 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 2s
*Land capability classification (nonirrigated):* 3s
*Hydrologic Soil Group:* C
*Ecological site:* R017XY904CA - Subirrigated Deep Alluvial Fans
*Hydric soil rating:* No

**Description of Loemstone, Loam**

**Setting**

*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium over dense silty alluvium derived from igneous and metamorphic rock

**Typical profile**

*Ap1 - 0 to 2 inches:* loam
*Ap2 - 2 to 4 inches:* silt loam
*Ap3 - 4 to 10 inches:* silt loam
*Bt1 - 10 to 18 inches:* clay loam
*Bt2 - 18 to 23 inches:* silty clay loam

*Bt3 - 23 to 32 inches:* silt loam
*Bt4 - 32 to 40 inches:* silt loam
*Bt5 - 40 to 48 inches:* silt loam
*2Cd - 48 to 57 inches:* silt

**Properties and qualities**

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* 40 to 60 inches to densic material
*Drainage class:* Moderately well drained
*Runoff class:* Medium
*Capacity of the most limiting layer to transmit water (Ksat):* Low to moderately low (0.00 to 0.06 in/hr)
*Depth to water table:* About 18 to 60 inches
*Frequency of flooding:* None
*Frequency of ponding:* Occasional
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 3.0 mmhos/cm)
*Sodium adsorption ratio, maximum:* 1.0
*Available water supply, 0 to 60 inches:* High (about 9.5 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 3s
*Land capability classification (nonirrigated):* 3s
*Hydrologic Soil Group:* C
*Ecological site:* R017XY904CA - Subirrigated Deep Alluvial Fans
*Hydric soil rating:* No

**Minor Components**

**Liveoak, sandy clay loam**

*Percent of map unit:* 4 percent
*Landform:* Channels on stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, densic material 20 to 40 inches**

*Percent of map unit:* 4 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Marcum, loam**

*Percent of map unit:* 2 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Tisdale, clay loam**

*Percent of map unit:* 2 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear

*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, duripan 20 to 60 inches**
*Percent of map unit:* 2 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, coarse-loamy**
*Percent of map unit:* 1 percent
*Landform:* Channels on stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 124—Conejo loam, 0 to 1 percent slopes, MLRA 17

**Map Unit Setting**
*National map unit symbol:* 2xc97
*Elevation:* 30 to 140 feet
*Mean annual precipitation:* 20 to 28 inches
*Mean annual air temperature:* 62 to 62 degrees F
*Frost-free period:* 319 to 328 days
*Farmland classification:* Prime farmland if irrigated

**Map Unit Composition**
*Conejo, loam, and similar soils:* 80 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Conejo, Loam**

**Setting**
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium derived from igneous and metamorphic rock

**Typical profile**
*Ap - 0 to 7 inches:* loam
*Bt - 7 to 30 inches:* loam
*Bw - 30 to 62 inches:* loam

**Properties and qualities**
*Slope:* 0 to 1 percent

*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 1.42 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* Rare
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.2 to 0.5 mmhos/cm)
*Available water supply, 0 to 60 inches:* High (about 10.8 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 1
*Land capability classification (nonirrigated):* 4c
*Hydrologic Soil Group:* C
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* No

**Minor Components**

**Marcum**

*Percent of map unit:* 7 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Tisdale**

*Percent of map unit:* 7 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Perkins**

*Percent of map unit:* 3 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear

**Horst**

*Percent of map unit:* 3 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear

## 125—Conejo loam, 0 percent slopes, dense substratum, MLRA 17

### Map Unit Setting

*National map unit symbol:* 2y0fm
*Elevation:* 30 to 70 feet
*Mean annual precipitation:* 20 to 23 inches
*Mean annual air temperature:* 62 to 62 degrees F
*Frost-free period:* 321 to 324 days
*Farmland classification:* Prime farmland if irrigated

### Map Unit Composition

*Conejo, loam, dense substratum, and similar soils:* 75 percent
*Minor components:* 25 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Conejo, Loam, Dense Substratum

#### Setting

*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium derived from igneous and metamorphic rock over dense alluvium derived from igneous and metamorphic rock

#### Typical profile

*Ap - 0 to 11 inches:* loam
*Bt - 11 to 42 inches:* loam
*2Cd - 42 to 80 inches:* material

#### Properties and qualities

*Slope:* 0 percent
*Depth to restrictive feature:* 40 to 60 inches to densic material
*Drainage class:* Moderately well drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* Low to moderately low (0.00 to 0.06 in/hr)
*Depth to water table:* About 20 to 40 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.2 to 0.5 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 7.6 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 1
*Land capability classification (nonirrigated):* 4c
*Hydrologic Soil Group:* C
*Ecological site:* R017XY905CA - Dry Alluvial Fans and Terraces
*Hydric soil rating:* No

**Minor Components**

**Marcum**
*Percent of map unit:* 7 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Tisdale**
*Percent of map unit:* 6 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, very deep**
*Percent of map unit:* 6 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, thin solum**
*Percent of map unit:* 6 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 126—Conejo-Tisdale complex, 0 percent slopes, MLRA 17

**Map Unit Setting**
*National map unit symbol:* 2y0fn
*Elevation:* 40 to 80 feet
*Mean annual precipitation:* 21 to 24 inches
*Mean annual air temperature:* 62 to 62 degrees F
*Frost-free period:* 319 to 322 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**
*Conejo, loam, dense substratum, and similar soils:* 45 percent
*Tisdale, clay loam, and similar soils:* 40 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Conejo, Loam, Dense Substratum

#### Setting

*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium derived from igneous and metamorphic rock over dense alluvium derived from igneous and metamorphic rock

#### Typical profile

*Ap - 0 to 11 inches:* loam
*Bt - 11 to 42 inches:* loam
*2Cd - 42 to 80 inches:* material

#### Properties and qualities

*Slope:* 0 percent
*Depth to restrictive feature:* 40 to 60 inches to densic material
*Drainage class:* Moderately well drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* Low to moderately low (0.00 to 0.06 in/hr)
*Depth to water table:* About 20 to 40 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.2 to 0.5 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 7.6 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 1
*Land capability classification (nonirrigated):* 4c
*Hydrologic Soil Group:* C
*Ecological site:* R017XY905CA - Dry Alluvial Fans and Terraces
*Hydric soil rating:* No

### Description of Tisdale, Clay Loam

#### Setting

*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium derived from igneous and metamorphic rock over dense alluvium derived from igneous and metamorphic rock

#### Typical profile

*Ap - 0 to 7 inches:* clay loam
*A - 7 to 11 inches:* clay loam
*Bt1 - 11 to 21 inches:* clay loam
*Bt2 - 21 to 31 inches:* clay loam
*2Cd - 31 to 40 inches:* material

#### Properties and qualities

*Slope:* 0 percent
*Depth to restrictive feature:* 20 to 40 inches to densic material
*Drainage class:* Moderately well drained
*Runoff class:* Very low

*Capacity of the most limiting layer to transmit water (Ksat):* Low to moderately low (0.00 to 0.06 in/hr)
*Depth to water table:* About 11 to 40 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.1 to 0.5 mmhos/cm)
*Sodium adsorption ratio, maximum:* 1.0
*Available water supply, 0 to 60 inches:* Low (about 5.5 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 3s
*Land capability classification (nonirrigated):* 4s
*Hydrologic Soil Group:* C/D
*Ecological site:* R017XY905CA - Dry Alluvial Fans and Terraces
*Hydric soil rating:* No

**Minor Components**

**Conejo**

*Percent of map unit:* 4 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Gridley**

*Percent of map unit:* 4 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Liveoak**

*Percent of map unit:* 4 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Oswald**

*Percent of map unit:* 3 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

## 127—Conejo-Urban land complex, 0 percent slopes, MLRA 17

### Map Unit Setting

*National map unit symbol:* 2xc99
*Elevation:* 50 to 80 feet
*Mean annual precipitation:* 22 to 23 inches
*Mean annual air temperature:* 62 degrees F
*Frost-free period:* 320 to 321 days
*Farmland classification:* Prime farmland if irrigated

### Map Unit Composition

*Conejo, loam, and similar soils:* 46 percent
*Urban land:* 44 percent
*Minor components:* 10 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Conejo, Loam

#### Setting

*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium derived from igneous and metamorphic rock over dense alluvium derived from igneous and metamorphic rock

#### Typical profile

*Ap - 0 to 11 inches:* loam
*Bt - 11 to 42 inches:* loam
*2Cd - 42 to 80 inches:* material

#### Properties and qualities

*Slope:* 0 percent
*Depth to restrictive feature:* 40 to 60 inches to densic material
*Drainage class:* Moderately well drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* Low to moderately low (0.00 to 0.06 in/hr)
*Depth to water table:* About 20 to 40 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline (0.2 to 0.5 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 7.6 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 3s
*Land capability classification (nonirrigated):* 3s
*Hydrologic Soil Group:* C
*Ecological site:* R017XY905CA - Dry Alluvial Fans and Terraces

*Hydric soil rating:* No

**Description of Urban Land**

**Setting**

*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 8s
*Hydrologic Soil Group:* D
*Hydric soil rating:* No

**Minor Components**

**Gridley**

*Percent of map unit:* 5 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, very deep**

*Percent of map unit:* 5 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 127bu—Gridley taxadjunct loam, 0 to 2 percent slopes

**Map Unit Setting**

*National map unit symbol:* xhlp
*Elevation:* 70 to 100 feet
*Mean annual precipitation:* 18 to 21 inches
*Mean annual air temperature:* 61 degrees F
*Frost-free period:* 240 to 245 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

*Gridley taxadjunct, loam, and similar soils:* 85 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

## Description of Gridley Taxadjunct, Loam

### Setting

*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy and clayey alluvium over cemented loamy alluvium derived from igneous and metamorphic rock

### Typical profile

*A - 0 to 10 inches:* loam
*Bt - 10 to 20 inches:* clay loam
*Btk - 20 to 22 inches:* clay
*2Bkqm - 22 to 60 inches:* cemented material

### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* 20 to 40 inches to duripan
*Drainage class:* Somewhat poorly drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to low (0.00 to 0.01 in/hr)
*Depth to water table:* About 5 to 40 inches
*Frequency of flooding:* Rare
*Frequency of ponding:* Occasional
*Calcium carbonate, maximum content:* 5 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Low (about 3.9 inches)

### Interpretive groups

*Land capability classification (irrigated):* 3w
*Land capability classification (nonirrigated):* 3w
*Hydrologic Soil Group:* D
*Ecological site:* R017XY902CA - Duripan Vernal Pools
*Hydric soil rating:* No

## Minor Components

### Unnamed, frequently flooded

*Percent of map unit:* 5 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Channels
*Down-slope shape:* Linear
*Across-slope shape:* Linear, concave
*Hydric soil rating:* Yes

### Unnamed, duripan greater than 40 inches

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear

*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, duripan less than 20 inches**
*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Mollic haploxeralfs, fine-loamy**
*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Typic haploxerolls, fine-loamy**
*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Typic argixerolls, fine-loamy**
*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 132—Gridley clay loam, 0 to 1 percent slopes

**Map Unit Setting**
*National map unit symbol:* hdzh
*Elevation:* 20 to 80 feet
*Mean annual precipitation:* 17 to 20 inches
*Mean annual air temperature:* 61 to 64 degrees F
*Frost-free period:* 260 to 280 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**
*Gridley and similar soils:* 80 percent

*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Gridley

#### Setting

*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Clayey alluvium derived from mixed

#### Typical profile

*H1 - 0 to 19 inches:* clay loam
*H2 - 19 to 37 inches:* clay
*Cr - 37 to 60 inches:* bedrock

#### Properties and qualities

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* 20 to 40 inches to paralithic bedrock
*Drainage class:* Moderately well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 6.5 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 3s
*Land capability classification (nonirrigated):* 4s
*Hydrologic Soil Group:* D
*Ecological site:* R017XY901CA - Clayey Basin Group
*Hydric soil rating:* No

### Minor Components

#### Capay

*Percent of map unit:* 4 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

#### Conejo

*Percent of map unit:* 4 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

#### Liveoak

*Percent of map unit:* 3 percent

*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Marcum**

*Percent of map unit:* 3 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Oswald**

*Percent of map unit:* 3 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Tisdale**

*Percent of map unit:* 3 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 138—Liveoak sandy clay loam, 0 to 2 percent slopes

### Map Unit Setting

*National map unit symbol:* hdzp
*Elevation:* 20 to 100 feet
*Mean annual precipitation:* 17 to 21 inches
*Mean annual air temperature:* 61 to 64 degrees F
*Frost-free period:* 240 to 280 days
*Farmland classification:* Prime farmland if irrigated

### Map Unit Composition

*Liveoak, sandy clay loam, and similar soils:* 85 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Liveoak, Sandy Clay Loam

#### Setting

*Landform:* Stream terraces

*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium derived from igneous and metamorphic rock

**Typical profile**

*Ap1-Ap2 - 0 to 13 inches:* sandy clay loam
*Bt1-Bt2-BC - 13 to 53 inches:* sandy clay loam
*C - 53 to 60 inches:* sandy loam

**Properties and qualities**

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)
*Depth to water table:* About 11 to 40 inches
*Frequency of flooding:* Very rare
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 1 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* High (about 10.0 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 2s
*Land capability classification (nonirrigated):* 3s
*Hydrologic Soil Group:* B
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* No

**Minor Components**

**Liveoak, sandy loam**

*Percent of map unit:* 2 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Tisdale, clay loam**

*Percent of map unit:* 2 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Boga, loam**

*Percent of map unit:* 2 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Loemstone, loam**

*Percent of map unit:* 2 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, duripan below 40 inches**

*Percent of map unit:* 2 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Gridley taxadjunct, clay loam**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, sandy substratum below 40 inches**

*Percent of map unit:* 1 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, light surface colors**

*Percent of map unit:* 1 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, no water table**

*Percent of map unit:* 1 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 139—Liveoak-Galt taxadjuncts complex, frequently flooded, 0 to 2 percent slopes

### Map Unit Setting

*National map unit symbol:* hdzq
*Elevation:* 20 to 70 feet
*Mean annual precipitation:* 14 to 20 inches
*Mean annual air temperature:* 60 to 64 degrees F
*Frost-free period:* 260 to 280 days
*Farmland classification:* Not prime farmland

### Map Unit Composition

*Liveoak taxadjunct, loam, frequently flooded, and similar soils:* 45 percent
*Galt taxadjunct, clay loam, frequently flooded, and similar soils:* 40 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Liveoak Taxadjunct, Loam, Frequently Flooded

#### Setting

*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium derived from igneous and metamorphic rock

#### Typical profile

*Ak - 0 to 6 inches:* loam
*Bk and Bkq - 6 to 54 inches:* loam
*Bkqm - 54 to 63 inches:* cemented material
*2C - 63 to 73 inches:* very fine sandy loam

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* 40 to 60 inches to duripan
*Drainage class:* Moderately well drained
*Runoff class:* Low
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Depth to water table:* About 48 to 60 inches
*Frequency of flooding:* Frequent
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 1 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 8.6 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 4w
*Land capability classification (nonirrigated):* 4w

*Hydrologic Soil Group:* B
*Ecological site:* R017XY902CA - Duripan Vernal Pools
*Hydric soil rating:* Yes

### Description of Galt Taxadjunct, Clay Loam, Frequently Flooded

#### Setting

*Landform:* Fan remnants
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium derived from igneous and metamorphic rock

#### Typical profile

*A1,A2,Bw,Bk - 0 to 21 inches:* clay loam
*Bkqm - 21 to 22 inches:* cemented material
*Ck - 22 to 25 inches:* loam
*B'kqm - 25 to 26 inches:* cemented material
*Cd - 26 to 60 inches:* bedrock

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* 20 to 35 inches to duripan; 20 to 35 inches to duripan; 26 to 60 inches to densic material
*Drainage class:* Somewhat poorly drained
*Runoff class:* Medium
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Depth to water table:* About 12 to 24 inches
*Frequency of flooding:* Frequent
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 3 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Low (about 4.0 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 5w
*Land capability classification (nonirrigated):* 5w
*Hydrologic Soil Group:* D
*Ecological site:* R017XY902CA - Duripan Vernal Pools
*Hydric soil rating:* Yes

### Minor Components

#### Galt, clay

*Percent of map unit:* 4 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* Yes

#### Subaco, clay

*Percent of map unit:* 3 percent

*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Columbia**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Microfeatures of landform position:* Channels
*Down-slope shape:* Linear
*Across-slope shape:* Linear, concave
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* Yes

**Unnamed, duripan < 20 inches**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Clear lake, clay**

*Percent of map unit:* 2 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Gridley, clay loam**

*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* No

## 140—Marcum clay loam, 0 to 2 percent slopes

**Map Unit Setting**

*National map unit symbol:* hdzr

*Elevation:* 20 to 80 feet
*Mean annual precipitation:* 16 to 20 inches
*Mean annual air temperature:* 61 to 64 degrees F
*Frost-free period:* 260 to 280 days
*Farmland classification:* Prime farmland if irrigated

**Map Unit Composition**

*Marcum, clay loam, and similar soils:* 80 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Marcum, Clay Loam**

**Setting**

*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium derived from mixed

**Typical profile**

*H1 - 0 to 9 inches:* clay loam
*H2 - 9 to 35 inches:* clay
*H3 - 35 to 60 inches:* clay loam

**Properties and qualities**

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Moderately well drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* Rare
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* High (about 10.0 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 2s
*Land capability classification (nonirrigated):* 4s
*Hydrologic Soil Group:* C
*Ecological site:* R017XY901CA - Clayey Basin Group
*Hydric soil rating:* No

**Minor Components**

**Capay**

*Percent of map unit:* 7 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Galt**

*Percent of map unit:* 7 percent
*Landform:* Basin floors on fan remnants
*Landform position (two-dimensional):* Footslope, toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Tisdale**

*Percent of map unit:* 6 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 141—Marcum clay loam, siltstone substratum, 0 to 1 percent slopes

**Map Unit Setting**

*National map unit symbol:* hdzs
*Elevation:* 20 to 80 feet
*Mean annual precipitation:* 17 to 20 inches
*Mean annual air temperature:* 61 to 64 degrees F
*Frost-free period:* 260 to 280 days
*Farmland classification:* Prime farmland if irrigated

**Map Unit Composition**

*Marcum, clay loam, siltstone substratum, and similar soils:* 75 percent
*Minor components:* 25 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Marcum, Clay Loam, Siltstone Substratum**

**Setting**

*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium derived from mixed

**Typical profile**

*H1 - 0 to 16 inches:* clay loam
*H2 - 16 to 28 inches:* clay loam
*H3 - 28 to 40 inches:* silty clay
*H4 - 40 to 43 inches:* clay loam
*H5 - 43 to 60 inches:* weathered bedrock

**Properties and qualities**

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* 40 to 80 inches to paralithic bedrock
*Drainage class:* Moderately well drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 1 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 7.4 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 2s
*Land capability classification (nonirrigated):* 4s
*Hydrologic Soil Group:* C
*Ecological site:* R017XY901CA - Clayey Basin Group
*Hydric soil rating:* No

**Minor Components**

**Conejo**

*Percent of map unit:* 7 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Oswald**

*Percent of map unit:* 6 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Gridley**

*Percent of map unit:* 6 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Tisdale**

*Percent of map unit:* 6 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 143—Marcum-Gridley clay loams, 0 to 1 percent slopes

### Map Unit Setting

*National map unit symbol:* hdzv
*Elevation:* 20 to 80 feet
*Mean annual precipitation:* 17 to 20 inches
*Mean annual air temperature:* 60 to 64 degrees F
*Frost-free period:* 260 to 280 days
*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

*Marcum, clay loam, and similar soils:* 45 percent
*Gridley, clay loam, and similar soils:* 40 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Marcum, Clay Loam

#### Setting

*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium derived from mixed

#### Typical profile

*Ap or A - 0 to 16 inches:* clay loam
*Bt1 - 16 to 28 inches:* clay loam
*Bt2 - 28 to 40 inches:* clay
*Bk - 40 to 43 inches:* clay loam
*2Cr - 43 to 62 inches:* bedrock

#### Properties and qualities

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* 40 to 80 inches to paralithic bedrock
*Drainage class:* Moderately well drained
*Runoff class:* Low
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Calcium carbonate, maximum content:* 1 percent
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 7.4 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 2s
*Land capability classification (nonirrigated):* 3s

*Hydrologic Soil Group:* C
*Ecological site:* R017XY904CA - Subirrigated Deep Alluvial Fans
*Hydric soil rating:* No

### Description of Gridley, Clay Loam

#### Setting

*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Clayey alluvium derived from mixed

#### Typical profile

*Ap or A - 0 to 19 inches:* clay loam
*Bt1 and Bt2 - 19 to 37 inches:* clay
*Cr - 37 to 60 inches:* bedrock

#### Properties and qualities

*Slope:* 0 to 1 percent
*Depth to restrictive feature:* 20 to 40 inches to paralithic bedrock
*Drainage class:* Moderately well drained
*Runoff class:* Medium
*Capacity of the most limiting layer to transmit water (Ksat):* Very low (0.00 to 0.00 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 6.5 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 3s
*Land capability classification (nonirrigated):* 3s
*Hydrologic Soil Group:* D
*Ecological site:* R017XY901CA - Clayey Basin Group
*Hydric soil rating:* No

### Minor Components

#### Liveoak

*Percent of map unit:* 3 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

#### Tisdale

*Percent of map unit:* 3 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Capay**
*Percent of map unit:* 2 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Oswald**
*Percent of map unit:* 2 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Conejo**
*Percent of map unit:* 2 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Gridley**
*Percent of map unit:* 2 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, frequently ponded**
*Percent of map unit:* 1 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

## 150—Olashes sandy loam, 0 to 2 percent slopes

**Map Unit Setting**
*National map unit symbol:* hf02
*Elevation:* 50 to 750 feet

*Mean annual precipitation:* 16 to 19 inches
*Mean annual air temperature:* 57 to 63 degrees F
*Frost-free period:* 250 to 270 days
*Farmland classification:* Prime farmland if irrigated

**Map Unit Composition**

*Olashes, sandy loam, and similar soils:* 85 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Olashes, Sandy Loam**

**Setting**

*Landform:* Fan remnants, alluvial fans
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium derived from mixed

**Typical profile**

*A - 0 to 4 inches:* sandy loam
*Bt1 and Bt2 - 4 to 52 inches:* sandy clay loam
*2C - 52 to 60 inches:* sand

**Properties and qualities**

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Runoff class:* Low
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.57 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 8.1 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 1
*Land capability classification (nonirrigated):* 3c
*Hydrologic Soil Group:* C
*Ecological site:* R017XY905CA - Dry Alluvial Fans and Terraces
*Hydric soil rating:* No

**Minor Components**

**Oswald**

*Percent of map unit:* 8 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Ecological site:* R017XY901CA - Clayey Basin Group
*Hydric soil rating:* Yes

**Unnamed, bedrock or duripan, 40 to 60 inches**

*Percent of map unit:* 5 percent
*Landform:* Strath terraces, fan remnants
*Landform position (two-dimensional):* Footslope, summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Convex, linear
*Across-slope shape:* Convex, linear
*Hydric soil rating:* No

**Subaco**

*Percent of map unit:* 2 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

## 151—Olashes sandy loam, 2 to 5 percent slopes

**Map Unit Setting**

*National map unit symbol:* hf03
*Elevation:* 70 to 750 feet
*Mean annual precipitation:* 16 to 19 inches
*Mean annual air temperature:* 61 to 64 degrees F
*Frost-free period:* 250 to 270 days
*Farmland classification:* Prime farmland if irrigated

**Map Unit Composition**

*Olashes, sandy loam, and similar soils:* 85 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Olashes, Sandy Loam**

**Setting**

*Landform:* Stream terraces
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Loamy alluvium derived from mixed

**Typical profile**

*H1 - 0 to 4 inches:* sandy loam
*H2 - 4 to 52 inches:* sandy clay loam
*H3 - 52 to 60 inches:* sand

**Properties and qualities**

*Slope:* 2 to 5 percent

*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Well drained
*Runoff class:* Low
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.57 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Moderate (about 8.1 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 2e
*Land capability classification (nonirrigated):* 4e
*Hydrologic Soil Group:* C
*Ecological site:* R017XY905CA - Dry Alluvial Fans and Terraces
*Hydric soil rating:* No

**Minor Components**

**Oswald**

*Percent of map unit:* 5 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Palls**

*Percent of map unit:* 5 percent
*Landform:* Pyroclastic flows, mudflows
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Linear
*Across-slope shape:* Concave
*Hydric soil rating:* No

**Unnamed, hardpan**

*Percent of map unit:* 5 percent
*Landform:* Fan remnants, strath terraces
*Landform position (two-dimensional):* Summit, footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear, convex
*Across-slope shape:* Linear, convex
*Hydric soil rating:* No

## 153—Oswald clay, 0 to 2 percent slopes

**Map Unit Setting**

*National map unit symbol:* hf05

*Elevation:* 20 to 40 feet
*Mean annual precipitation:* 14 to 17 inches
*Mean annual air temperature:* 61 to 64 degrees F
*Frost-free period:* 260 to 280 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

*Oswald, clay, and similar soils:* 90 percent
*Minor components:* 10 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Oswald, Clay**

**Setting**

*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Clayey alluvium derived from mixed

**Typical profile**

*H1 - 0 to 15 inches:* clay
*H2 - 15 to 33 inches:* clay
*H3 - 33 to 37 inches:* weathered bedrock

**Properties and qualities**

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* 20 to 40 inches to paralithic bedrock
*Drainage class:* Poorly drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
*Depth to water table:* About 18 to 42 inches
*Frequency of flooding:* Rare
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Low (about 5.3 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 3w
*Land capability classification (nonirrigated):* 4w
*Hydrologic Soil Group:* D
*Ecological site:* R017XY901CA - Clayey Basin Group
*Hydric soil rating:* Yes

**Minor Components**

**Conejo**

*Percent of map unit:* 4 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Gridley**

*Percent of map unit:* 3 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Tisdale**

*Percent of map unit:* 3 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

## 157—Palls-Stohlman stony loams, cool, 9 to 30 percent slopes

**Map Unit Setting**

*National map unit symbol:* hf09
*Elevation:* 80 to 1,500 feet
*Mean annual precipitation:* 17 to 19 inches
*Mean annual air temperature:* 57 to 61 degrees F
*Frost-free period:* 250 to 270 days
*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Palls, stony sandy loam, cool, and similar soils:* 41 percent
*Stohlman, stony sandy loam, and similar soils:* 39 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Palls, Stony Sandy Loam, Cool**

**Setting**

*Landform:* Pyroclastic flows, mudflows
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Linear
*Across-slope shape:* Concave
*Parent material:* Residuum weathered from andesite

**Typical profile**

*H1 - 0 to 8 inches:* stony sandy loam
*H2 - 8 to 31 inches:* gravelly sandy loam
*H3 - 31 to 35 inches:* unweathered bedrock

**Properties and qualities**

*Slope:* 9 to 30 percent

*Depth to restrictive feature:* 20 to 40 inches to lithic bedrock
*Drainage class:* Well drained
*Runoff class:* Medium
*Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Low (about 3.1 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 4s
*Hydrologic Soil Group:* B
*Ecological site:* R018XD077CA - STONY COARSE LOAMY (BLUE OAK/ ANNUAL GRASS)
*Hydric soil rating:* No

**Description of Stohlman, Stony Sandy Loam**

**Setting**

*Landform:* Pyroclastic flows, mudflows
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Linear
*Across-slope shape:* Convex
*Parent material:* Colluvium derived from andesite

**Typical profile**

*H1 - 0 to 7 inches:* stony sandy loam
*H2 - 7 to 16 inches:* gravelly sandy loam
*H3 - 16 to 20 inches:* unweathered bedrock

**Properties and qualities**

*Slope:* 9 to 30 percent
*Depth to restrictive feature:* 10 to 20 inches to lithic bedrock
*Drainage class:* Well drained
*Runoff class:* High
*Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Very low (about 1.6 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 6s
*Hydrologic Soil Group:* D
*Ecological site:* R018XD079CA - STONY SHALLOW LOAMY (BLUE OAK/ ANNUAL GRASS)
*Hydric soil rating:* No

**Minor Components**

**Ocraig, stvsl**
*Percent of map unit:* 8 percent
*Landform:* Pyroclastic flows, mudflows
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Hydric soil rating:* No

**Unnamed, deep**
*Percent of map unit:* 6 percent
*Landform:* Pyroclastic flows, mudflows
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Linear
*Across-slope shape:* Concave
*Hydric soil rating:* No

**Unnamed, gentler slopes**
*Percent of map unit:* 6 percent
*Landform:* Pyroclastic flows, mudflows
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Linear
*Across-slope shape:* Concave
*Hydric soil rating:* No

## 165—Shanghai silt loam, frequently flooded, 0 to 2 percent slopes

**Map Unit Setting**
*National map unit symbol:* hf0k
*Elevation:* 20 to 80 feet
*Mean annual precipitation:* 17 to 20 inches
*Mean annual air temperature:* 61 to 64 degrees F
*Frost-free period:* 260 to 280 days
*Farmland classification:* Not prime farmland

**Map Unit Composition**
*Shanghai, silt loam, frequently flooded, and similar soils:* 90 percent
*Minor components:* 10 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Shanghai, Silt Loam, Frequently Flooded**

**Setting**
*Landform:* Flood-plain steps, flood plains
*Landform position (three-dimensional):* Tread

*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Alluvium derived from mixed

**Typical profile**

*H1 - 0 to 11 inches:* silt loam
*H2 - 11 to 60 inches:* stratified fine sandy loam to silty clay loam

**Properties and qualities**

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches
*Drainage class:* Somewhat poorly drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high to high (0.57 to 1.98 in/hr)
*Depth to water table:* About 36 to 60 inches
*Frequency of flooding:* Frequent
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* High (about 10.2 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 4w
*Land capability classification (nonirrigated):* 4w
*Hydrologic Soil Group:* B
*Ecological site:* R017XY903CA - Stream Channels and Floodplains
*Hydric soil rating:* Yes

**Minor Components**

**Columbia**

*Percent of map unit:* 5 percent
*Landform:* Flood plains, flood-plain steps
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Holillipah**

*Percent of map unit:* 5 percent
*Landform:* Flood plains, flood-plain steps
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

## 172—Stohlman-Palls stony sandy loams, cool, 30 to 50 percent slopes

**Map Unit Setting**

*National map unit symbol:* hf0s
*Elevation:* 80 to 1,500 feet

*Mean annual precipitation:* 17 to 19 inches
*Mean annual air temperature:* 57 to 61 degrees F
*Frost-free period:* 250 to 270 days
*Farmland classification:* Not prime farmland

**Map Unit Composition**

*Stohlman, stony sandy loam, and similar soils:* 40 percent
*Palls, stony sandy loam, and similar soils:* 35 percent
*Minor components:* 25 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Stohlman, Stony Sandy Loam**

**Setting**

*Landform:* Lava domes, mudflows, pyroclastic flows
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Linear
*Across-slope shape:* Convex
*Parent material:* Colluvium derived from andesite

**Typical profile**

*H1 - 0 to 7 inches:* stony sandy loam
*H2 - 7 to 16 inches:* gravelly sandy loam
*H3 - 16 to 20 inches:* unweathered bedrock

**Properties and qualities**

*Slope:* 30 to 50 percent
*Depth to restrictive feature:* 10 to 20 inches to lithic bedrock
*Drainage class:* Well drained
*Runoff class:* High
*Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Very low (about 1.6 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 6e
*Hydrologic Soil Group:* D
*Ecological site:* R018XD079CA - STONY SHALLOW LOAMY (BLUE OAK/ ANNUAL GRASS)
*Hydric soil rating:* No

**Description of Palls, Stony Sandy Loam**

**Setting**

*Landform:* Pyroclastic flows, mudflows, lava domes
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Linear
*Across-slope shape:* Concave
*Parent material:* Residuum weathered from andesite

**Typical profile**

*H1 - 0 to 8 inches:* stony sandy loam
*H2 - 8 to 31 inches:* gravelly sandy loam
*H3 - 31 to 35 inches:* unweathered bedrock

**Properties and qualities**

*Slope:* 30 to 50 percent
*Depth to restrictive feature:* 20 to 40 inches to lithic bedrock
*Drainage class:* Well drained
*Runoff class:* High
*Capacity of the most limiting layer to transmit water (Ksat):* High (1.98 to 5.95 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Low (about 3.1 inches)

**Interpretive groups**

*Land capability classification (irrigated):* None specified
*Land capability classification (nonirrigated):* 6e
*Hydrologic Soil Group:* B
*Ecological site:* R018XD077CA - STONY COARSE LOAMY (BLUE OAK/ ANNUAL GRASS)
*Hydric soil rating:* No

**Minor Components**

**Ocraig, stvsl**

*Percent of map unit:* 10 percent
*Landform:* Pyroclastic flows, mudflows, lava domes
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Hydric soil rating:* No

**Rock outcrop**

*Percent of map unit:* 10 percent
*Landform:* Pyroclastic flows, mudflows, lava domes
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Convex
*Across-slope shape:* Convex
*Hydric soil rating:* No

**Unnamed, deep**

*Percent of map unit:* 5 percent
*Landform:* Pyroclastic flows, mudflows, lava domes
*Landform position (two-dimensional):* Backslope
*Landform position (three-dimensional):* Side slope
*Down-slope shape:* Linear
*Across-slope shape:* Concave
*Hydric soil rating:* No

## 173—Subaco clay, 0 to 2 percent slopes

### Map Unit Setting

*National map unit symbol:* hf0t
*Elevation:* 20 to 50 feet
*Mean annual precipitation:* 14 to 17 inches
*Mean annual air temperature:* 61 to 64 degrees F
*Frost-free period:* 260 to 280 days
*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

*Subaco, clay, and similar soils:* 80 percent
*Minor components:* 20 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Subaco, Clay

#### Setting

*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Clayey alluvium derived from mixed

#### Typical profile

*H1 - 0 to 13 inches:* clay
*H2 - 13 to 26 inches:* clay
*H3 - 26 to 30 inches:* unweathered bedrock

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* 20 to 40 inches to lithic bedrock
*Drainage class:* Poorly drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
*Depth to water table:* About 18 to 36 inches
*Frequency of flooding:* Rare
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Low (about 3.9 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 3w
*Land capability classification (nonirrigated):* 4w
*Hydrologic Soil Group:* D
*Ecological site:* R017XY901CA - Clayey Basin Group
*Hydric soil rating:* Yes

**Minor Components**

**Capay**

*Percent of map unit:* 7 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Clear lake**

*Percent of map unit:* 7 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Oswald**

*Percent of map unit:* 6 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

## 174—Tisdale clay loam, 0 to 2 percent slopes

**Map Unit Setting**

*National map unit symbol:* hf0v
*Elevation:* 10 to 100 feet
*Mean annual precipitation:* 18 inches
*Mean annual air temperature:* 63 degrees F
*Frost-free period:* 270 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

*Tisdale and similar soils:* 75 percent
*Minor components:* 25 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Tisdale**

**Setting**

*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear

*Across-slope shape:* Linear
*Parent material:* Mixed loamy alluvium

**Typical profile**

*H1 - 0 to 11 inches:* clay loam
*H2 - 11 to 31 inches:* clay loam
*H3 - 31 to 35 inches:* weathered bedrock

**Properties and qualities**

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* 20 to 40 inches to paralithic bedrock
*Drainage class:* Well drained
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately high (0.20 to 0.57 in/hr)
*Depth to water table:* More than 80 inches
*Frequency of flooding:* None
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Low (about 5.4 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 3s
*Land capability classification (nonirrigated):* 4s
*Hydrologic Soil Group:* C
*Ecological site:* R017XY905CA - Dry Alluvial Fans and Terraces
*Hydric soil rating:* No

**Minor Components**

**Oswald**

*Percent of map unit:* 5 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Conejo**

*Percent of map unit:* 5 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Gridley**

*Percent of map unit:* 5 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Liveoak**

*Percent of map unit:* 5 percent
*Landform:* Stream terraces

*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Unnamed, w/ hardpan**

*Percent of map unit:* 5 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear

## 175—Yuvas loam, 0 to 2 percent slopes

**Map Unit Setting**

*National map unit symbol:* hf0w
*Elevation:* 20 to 80 feet
*Mean annual precipitation:* 17 to 20 inches
*Mean annual air temperature:* 61 to 64 degrees F
*Frost-free period:* 260 to 280 days
*Farmland classification:* Farmland of statewide importance

**Map Unit Composition**

*Yuvas, loam, and similar soils:* 85 percent
*Minor components:* 15 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

**Description of Yuvas, Loam**

**Setting**

*Landform:* Fan remnants
*Landform position (two-dimensional):* Summit
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Clayey alluvium derived from mixed

**Typical profile**

*H1 - 0 to 16 inches:* loam
*H2 - 16 to 24 inches:* clay
*H3 - 24 to 38 inches:* indurated
*H4 - 38 to 42 inches:* weathered bedrock

**Properties and qualities**

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* More than 80 inches; 20 to 40 inches to duripan; 22 to 40 inches to paralithic bedrock
*Drainage class:* Moderately well drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* Very low to moderately low (0.00 to 0.06 in/hr)

*Depth to water table:* More than 80 inches
*Frequency of flooding:* Rare
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Very low (about 2.4 inches)

**Interpretive groups**

*Land capability classification (irrigated):* 4s
*Land capability classification (nonirrigated):* 4s
*Hydrologic Soil Group:* D
*Ecological site:* R017XY902CA - Duripan Vernal Pools
*Hydric soil rating:* Yes

**Minor Components**

**Conejo**

*Percent of map unit:* 5 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Oswald**

*Percent of map unit:* 4 percent
*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* Yes

**Gridley**

*Percent of map unit:* 3 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Tisdale**

*Percent of map unit:* 3 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

# References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

# APPENDIX E: NEW WELL SITE WORK AREA NRCS WEB SOIL SURVEY REPORT

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

# Custom Soil Resource Report for Sutter County, California

## New Well Site Work Area




November 7, 2025

# Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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# How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

# Custom Soil Resource Report
## Soil Map




Map Scale: 1:471 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 5 10 20 30

Feet
0 20 40 80 120

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

## MAP LEGEND

**Area of Interest (AOI)**
- Area of Interest (AOI)

**Soils**
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

**Special Point Features**
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

**Water Features**
- Streams and Canals

**Transportation**
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

**Background**
- Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Sutter County, California
Survey Area Data: Version 23, Sep 3, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 3, 2023—Sep 8, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# Map Unit Legend

| Map Unit Symbol | Map Unit Name | Acres in AOI | Percent of AOI |
|---|---|---|---|
| 153 | Oswald clay, 0 to 2 percent slopes | 0.7 | 100.0% |
| **Totals for Area of Interest** | | **0.7** | **100.0%** |

# Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

# Sutter County, California

## 153—Oswald clay, 0 to 2 percent slopes

### Map Unit Setting

*National map unit symbol:* hf05
*Elevation:* 20 to 40 feet
*Mean annual precipitation:* 14 to 17 inches
*Mean annual air temperature:* 61 to 64 degrees F
*Frost-free period:* 260 to 280 days
*Farmland classification:* Farmland of statewide importance

### Map Unit Composition

*Oswald, clay, and similar soils:* 90 percent
*Minor components:* 10 percent
*Estimates are based on observations, descriptions, and transects of the mapunit.*

### Description of Oswald, Clay

#### Setting

*Landform:* Basin floors
*Landform position (two-dimensional):* Toeslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Parent material:* Clayey alluvium derived from mixed

#### Typical profile

*H1 - 0 to 15 inches:* clay
*H2 - 15 to 33 inches:* clay
*H3 - 33 to 37 inches:* weathered bedrock

#### Properties and qualities

*Slope:* 0 to 2 percent
*Depth to restrictive feature:* 20 to 40 inches to paralithic bedrock
*Drainage class:* Poorly drained
*Runoff class:* Very low
*Capacity of the most limiting layer to transmit water (Ksat):* Moderately low to moderately high (0.06 to 0.20 in/hr)
*Depth to water table:* About 18 to 42 inches
*Frequency of flooding:* Rare
*Frequency of ponding:* None
*Maximum salinity:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
*Available water supply, 0 to 60 inches:* Low (about 5.3 inches)

#### Interpretive groups

*Land capability classification (irrigated):* 3w
*Land capability classification (nonirrigated):* 4w
*Hydrologic Soil Group:* D
*Ecological site:* R017XY901CA - Clayey Basin Group
*Hydric soil rating:* Yes

### Minor Components

#### Conejo

*Percent of map unit:* 4 percent

*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Gridley**

*Percent of map unit:* 3 percent
*Landform:* Fan remnants
*Landform position (two-dimensional):* Footslope
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

**Tisdale**

*Percent of map unit:* 3 percent
*Landform:* Stream terraces
*Landform position (three-dimensional):* Tread
*Down-slope shape:* Linear
*Across-slope shape:* Linear
*Hydric soil rating:* No

# References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

# Appendix D- Cultural Records Search Results

California Historical Resources Information System

BUTTE
GLENN
LASSEN
MODOC
PLUMAS
SHASTA
SIERRA
SISKIYOU
SUTTER
TEHAMA
TRINITY

Northeast Information Center
1074 East Avenue, Suite F
Chico, California 95926
Phone (530) 898-6256
*neinfocntr@csuchico.edu*

October 11, 2025

Kyler Dill
PROVOST & PRITCHARD CONSULTING GROUP
3387 Bodero Ln.
Chico, CA 95973

**IC File # NE25-444**
**Non-Confidential Record**
**Search - Standard**

RE: Butte Water District Temporary Water Transfers from 2026 to 2030
T17N, R2E, Section 35 MDBM
USGS Gridley 7.5' (1973) & Gridley 15' (1968) quadrangle maps
0.1 acres (Sutter County)

Kyler Dill:

In response to your request, a records search for the project cited above was conducted by examining the official maps and records for cultural resources and surveys in Sutter County. Cultural resources in our inventory include archaeological objects, sites, landscapes, districts, and all manner of buildings and structures associated with past human activities. Please note that access to archaeological resource records is restricted to qualified individuals.

## Results:

**Archaeological Resources:** According to our records, no resources of this type have been recorded within the project boundaries. In addition, no resources have been recorded within the one-mile vicinity.

**Built Environment Resources:** According to our records, no resources of this type have been recorded within or adjacent to the project boundaries. The Built Environment Resources Directory (BERD), which includes listings of the California Register of Historical Resources, California State Historical Landmarks, California State Points of Historical Interest, and the National Register of Historic Places, does not list any properties within or adjacent to the proposed project area. The BERD is available online at: https://ohp.parks.ca.gov/?page_id=30338

**Previous Investigations:** According to our records, the project area has been previously surveyed for cultural resources. Additional information is provided below.

Heather Blind and Barb Siskin (Garcia and Associates)
2011 *Cultural Resource Constraints Analysis for the Line 167 and Line 167-1 Gas Line Modernization Project, Butte and Sutter Counties, California.* **NEIC-012490**

**Historical Maps and Literature Search:** The official records and maps for archaeological sites and surveys in Sutter County were reviewed. Also reviewed: **National Register of Historic Places - Listed properties and Determined Eligible Properties** (2022); **California Register of Historical Resources** (2022); **California Points of Historical Interest** (2022); **California Inventory of Historic Resources** (1976); **California Historical Landmarks** (2022); **Archaeological Resource Directory** (2022); and **Handbook of North American Indians, Vol. 8, California** (1978).

The USGS Gridley 7.5' (1973) & Gridley 15' (1968) quadrangle maps depict archaeological sensitive areas within the project's region such as an orchard and a ditch. Additional orchards and ditches, as well as structures and foundations are located in the project vicinity.

The project is located in a region utilized by Nisenan populations at the time of Euro-American contact. Indigenous populations used the local region for seasonal and/or permanent settlement, as well as for the gathering of plants, roots, seeds, domestic materials, and hunting seasonal game. Historically, Euro-Americans utilized the region for mining and transportation opportunities.

## Sensitivity Assessment and Recommendations:

Based upon the above information and local topography, the project area is considered to have low sensitivity for cultural resources. Portions of the project along existing sites, roads, and trails are sensitive for archaeological resources. Other areas of sensitivity are flats near creeks, springs, seeps, or rock outcrops that may be located in the project area.

Therefore, because the project area has not been previously surveyed for archaeological resources within the last 10 years, we recommend that a professional consultant be contacted prior to ground disturbance. The project archaeologist can offer recommendations for avoidance and protection of any existing or newly identified resources. If the proposed project contains buildings or structures that meet the minimum age requirement (45 years in age or older) it is recommended that the resources be assessed by a qualified specialist familiar with architecture and history of the county. Review of the available historic building/structure data has included only those sources listed above and should not be considered comprehensive. A list of qualified consultants is available online at www.chrisinfo.org.

During any phase of parcel development, if any archaeological resources are encountered, all work should cease in the area of the find pending an examination of the site and materials by the project archaeologist. This request to cease work in the area of a potential archaeological find is intended for accidental discoveries made during construction activities and is not intended as a substitute for the recommended cultural resources survey. It is recommended that any identified cultural resources be recorded on DPR 523 historic resource recordation forms, available online from the California Office of Historic Preservation (OHP): https://ohp.parks.ca.gov/?page_id=28351

If human remains are discovered, California Health and Safety Code Section 7050.5 requires you to protect the discovery and notify the county coroner, who will determine if the find is Native American. If the remains are recognized as Native American, the coroner shall then notify the Native American Heritage Commission (NAHC). California Public Resources Code Section 5097.98 authorizes the NAHC to appoint a Most Likely Descendant (MLD) who will make recommendations for the treatment of the discovery.

The California Office of Historic Preservation (OHP) contracts with the California Historical Resources Information System's (CHRIS) regional Information Centers (ICs) to maintain information in the CHRIS inventory and make it available to local, state, and federal agencies, cultural resource professionals, Native American tribes, researchers, and the public. Recommendations made by IC coordinators or their staff regarding the interpretation and application of this information are advisory only. Such recommendations do not necessarily represent the evaluation or opinion of the State Historic Preservation Officer in carrying out the OHP's regulatory authority under federal and state law.

Not all known cultural resources have been recorded and submitted to the OHP, so this record search should not be considered an exhaustive list of all cultural resources present in your project area. DPR forms and reports that are used for recording and evaluating sites and individual resources are submitted to the Northeast Information Center by private and public agencies. Please note that the Northeast Information Center is not responsible for misinformation of coordinates presented on the submitted DPR forms. If a discrepancy is found, please contact the lead agency for more information.

Due to processing delays and other factors, not all of the cultural resource reports and resource records that have been submitted to the OHP are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for cultural resource management work in the search area. Finally, Native American tribes have cultural resource information not in the CHRIS Inventory, and the NAHC should be contacted at (916) 373-3710 for information regarding Native American representatives in the vicinity of the project.

Thank you for your dedication to preserving California's irreplaceable cultural heritage. Please feel free to contact us if you have any questions or need any further information or assistance.

Sincerely,

Ashlyn Weaver

Ashlyn Weaver, M.A., RPA
Coordinator & GIS Specialist
Northeast Information Center
(530) 898-6256

# NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
**REGINALD PAGALING**
*CHUMASH*

VICE-CHAIRPERSON
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*YOKAYO POMO, YUKI, NOMLAKI*

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COMMISSIONER
**BENNAE CALAC**
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**VACANT**

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September 11, 2025

Kyler Dill
Provost & Pritchard Consulting Group

**Submitted via Electronic**
***Via Email to*: kdill@ppeng.com**

**Re: Temporary Water Transfers from 2026 to 2030 Project, Sutter County**

To Whom It May Concern:

As requested, a search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed based on information submitted for the above referenced project. The results were negative. Be aware that tribes do not always record their sacred sites in the SLF, nor are they required to do so. As such, an SLF search is not a substitute for consultation with all tribes that are traditionally and culturally affiliated with a project's geographic area.

Attached is a list of Native American tribes that are traditionally and culturally affiliated with the project's geographic area. Please contact all of the listed tribes as they may have information about sacred sites within the project area that is not listed with the NAHC.

If within two weeks of notification, a response has not been received, the Commission requests that you follow up with a telephone call or email to ensure that the project information was received.

If you receive notification of a change of address or phone number from a tribe, please inform the NAHC so that we can assure that our lists contain current information.

In addition to engaging in tribal consultation, you should consult the appropriate regional California Historical Research Information System (CHRIS) information center to determine whether it has information regarding the presence of recorded archaeological sites within the project area.

If you have any questions or need additional information, please contact me at: Pricilla.Torres-Fuentes@nahc.ca.gov.

Sincerely,

Pricilla Torres-Fuentes

Pricilla Torres-Fuentes
Cultural Resources Analyst

Attachment

# Appendix E- Groundwater Modeling Report

# Groundwater Modeling Report

February 2026

801 T Street
Sacramento, California 95811
800.426.4262

woodardcurran.com

0012992.00

**Butte Water District**

DRAFT

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## APPENDICES

Appendix A: Model Comparison Between C2VSimFG-Sutter and SVSim

# 1. Introduction

Butte Water District (BWD or District) is a Groundwater Sustainability Agency (GSA) with lands in both the Butte and Sutter Groundwater Subbasins of the Sacramento Valley Groundwater Basin. Each subbasin produced one Groundwater Sustainability Plan (GSP) that was approved by the California Department of Water Resources (DWR), and both are actively working on an update and five-year periodic evaluation as required under the Sustainable Groundwater Management Act (SGMA).

BWD is interested in evaluating the impact of potential one-year contracted surface water transfers during the period extending from calendar years 2026 through 2030. These water transfers would potentially involve crop idling (up to 14,000 acre-feet per year or AFY) and/or groundwater substitution transfer pumping (up to 10,000 AFY). This report describes the modeling conducted to support the analyses conducted for various water transfer scenarios.

# 2. Model Comparison

There are several different local and regional integrated surface water-groundwater water resource models that cover BWD's service area. These models include, but are not limited to:

- Regional Models
  - California Central Valley Groundwater-Surface Water Simulation Model (C2VSim), both coarse grid (C2VSimCG Version 1.0) and fine grid (C2VSimFG Version 1.01) versions developed and maintained by DWR on the Integrated Water Flow Model (IWFM) model platform.
  - Sacramento Valley Groundwater-Surface Water Simulation Model (SVSim) Version 1.0, developed by DWR on the IWFM model platform.
  - Central Valley Hydrologic Model version 2 (CVHM2) developed by USGS on the MODFLOW model platform.
- Local Models
  - C2VSimFG-Sutter Version 1.0, which was built off the C2VSimFG Version 1.01 with local refinements focused on the Sutter Subbasin. This model was used for the Sutter Subbasin GSP and has been updated annually for the Sutter Subbasin GSP annual reports.
  - Butte Basin Groundwater Model (BBGM) is an IWFM model that focuses on representing the Vina, Butte, and Wyandotte Creek Groundwater Subbasins, but covers portions of the surrounding subbasins. BBGM extends to the Sutter Buttes and contains only BWD's service area within the Sutter Subbasin.

For the impact analyses to be conducted, SVSim Version 1.0 and C2VSimFG-Sutter Version 1.0 were evaluated as the basis for forming a baseline and alternative scenarios to evaluate the impact of the proposed water transfers. These models were selected for evaluation because the SVSim Version 1.0 was specifically developed to simulate groundwater substitution transfers occurring in Sacramento Valley and to better represent the stream-groundwater interaction occurring during those transfers. C2VSimFG-Sutter Version 1.0, on the other hand, is the local update with calibration specifically focused on Sutter Subbasin to understand the groundwater aquifer and all water-related components impacting it.

### 2.1.1 Overview of Model Comparison and Model Selection

The model comparison between SVSim Version 1.0 and C2VSimFG-Sutter Version 1.0 was summarized in a PowerPoint presentation which is included in Appendix A. Overall, both models reasonably simulate the BWD service area and are well-calibrated models that could be used for the purposes of evaluating the proposed water transfers. Both models use the IWFM platform, which is a public domain finite element model developed and maintained by DWR. It is an analysis tool that computes agricultural and urban water demands and tries to meet those demands with groundwater pumping and stream diversions. It uses model elements (quadrilateral or triangular) and nodes to represent a given area and can represent multiple subsurface layers of aquitards and aquicludes to evaluate changes in unconfined and confined groundwater aquifers.

C2VSimFG-Sutter Version 1.0 was the model selected for the water transfer impact analyses. The following were the main factors in selecting this model:

- SVSim Version 1.0 has had no updates since its release in 2021 nor has DWR made any update plans available.
- C2VSimFG-Sutter Version 1.0 is a local calibration focused on the Sutter Subbasin, of which BWD is a GSA for the portion of their service area within Sutter Subbasin.
- BWD was directly involved in the development and calibration of C2VSimFG-Sutter Version 1.0 through Sutter Subbasin GSA meetings.
- All of the groundwater wells BWD intends to use for groundwater substitution transfers are located within the Sutter Subbasin portion of BWD.
- C2VSimFG-Sutter Version 1.0 was originally developed to cover Water Years 1986 through 2015, but it has been extended annually for the Sutter Subbasin GSP annual reports to go through WY 2024. This more recent data and hydrology is more representative of conditions that might occur over the next five years when BWD is proposing its transfer program.

# 3. Model Scenarios

BWD decided to evaluate the range of impacts from its proposed water transfer program based on the following six scenarios simulated using the selected model. The scenarios are listed below and summarized in **Table 3-1**, where an "X" denotes simulated conditions for each alternative:

1. No Project Alternative
2. Full Project (Full Groundwater Substitution Transfers [GWST] of 10 thousand AFY [TAFY} and Full Crop Idling of 14 TAFY)
3. Only Groundwater Substitution Transfers (10 TAFY GWST)
4. Only Crop Idling (14 TAFY Crop Idling)
5. 50% Crop Idling with Full GWST (7 TAFY Crop Idling and 10 TAFY GWST)
6. 50% GWST with Full Crop Idling (5 TAFY GWST and 14 TAFY Crop Idling)

**Table 3-1: Simulated Project Alternatives**

| Alternative | Groundwater Substitution Transfers (10 TAFY) | Crop Idling (14 TAFY) |
|---|---|---|
| 1 | | |
| 2 | X | X |
| 3 | X | |
| 4 | | X |
| 5 | X | 50% |
| 6 | 50% | X |

The section below summarizes how the scenarios were developed using the latest version of the C2VSimFG-Sutter (Version 1.0 extended through WY 2024).

## 3.1 Assumptions for Model Scenarios

This section summarizes the underlying assumptions embedded in the impact analyses conducted using C2VSimFG-Sutter (Version 1.0 extended through WY 2024). Both general assumptions and alternative-specific assumptions are discussed.

Alternatives 2, 3, 4, 5, and 6 are all variations to the existing conditions of the Current Conditions BaseLine (CCBL) model or Alternative 1 simulating 'typical' BWD operations. Alternatives 2, 3, 4, 5, and 6 represent the scenarios in which BWD undertakes its proposed crop idling and/or GWST pumping actions associated with the surface water transfer program.

Overlying simplifying assumptions used in the construction of all the alternatives scenarios are as follows:

- As discussed in Section 3.1.1 below, all potential water transfers will take place in the first five (5) years of the simulation in each alternative scenario where a water transfer occurs. The first five years of the simulation period include consecutive dry and critical water years (hydrology from WY 1987 through 1991) representing conditions under which BWD may decide to participate in a water transfer.

- As discussed in Section 3.1.1 below, the hydrology time period selected for the simulation period was conservative in that it is slightly dryer (less rain) than the recent historical time period. Additionally, the sixth year of the simulation (based on 1992 hydrology) is a critical year, which stresses the groundwater system further after the BWD's proposed water transfer(s) occurring in the first five years of the simulation.
- A 50-year simulation period was selected to provide enough time after the water transfer(s) occurs to evaluate the resultant impacts and to provide enough variable hydrology to test the system.
- After the first five years of the simulation period, there a no additional crop idling beyond what is in the CCBL already (based on 2023 land use) and no additional GWST pumping occurring in BWD service area.
- The surface water being substituted via either crop idling or groundwater substitution is not being used inside the BWD service area .

Alternative-specific assumptions used in the impact analyses are as follows:

- Alternative 1 is the No Project alternative where the proposed water transfers do not occur. Alternatives 2 through 6 are modifications of Alternative 1 to represent possible responses (GWST and/or crop idling) to the water transfers, and impacts are viewed as the difference in model results between the alternative scenario and Alternative 1.
- Assumptions specific to GWST pumping (Alternatives 2, 3, 5, and 6) are summarized below. Additional information as to how they are simulated within the model are discussed further in Section 3.2.3:
    - GWST pumping occurs only during the irrigation season of May through September, when groundwater levels tend to be at their lowest. This is a conservative assumption that stresses the groundwater system more than pumping in October through December when groundwater aquifers are recharged from precipitation and mountain front recharge.
    - BWD Well #3 is operating. At present, this well is planned, but has not yet been constructed. BWD Well #1 and Well #2, both existing wells, are also actively pumping.
    - BWD Well #3 is similar to BWD Well #2 in terms of construction and operation.
    - The percentage of groundwater pumped each month by well is the same as what occurred in BWD in 2014. This was selected because 2014 was the only year of BWD transfer pumping where pumping began close to early May and extended through September. It was also assumed that Well #3 would pump at the same rate and volume as Well #2
    - To achieve the total of 10,000 AF of GWST pumping, it is assumed that Well #1 pumps 3,000 AF and Wells #2 and #3 each pump 3,500 AF. These totals are assumed based on the historical maximum pumping in a given month for each well.
- Assumptions specific to crop idling (Alternatives 2, 4, 5, and 6):
    - Crop idling occurs on rice fields within the BWD service area. This was a simplifying assumption, and rice was selected as it's the predominant crop grown in the BWD

service area. This is consistent with BWD's previous water transfers where the District idled rice fields.

- No adjustments were made to the evapotranspiration value used for rice or idle lands in C2VSimFG-Sutter Version 1.0.

### 3.1.1 Scenario Simulation Period and Hydrology

As previously discussed, the model simulations involving GWST assume the substitution pumping would occur during the first five years of the model simulation period, with the simulation period providing enough years beyond that time period to evaluate the longer-term impact of the GWSTs and/or crop idling on the underlying subbasin. Therefore, it was necessary to find or create a hydrologic time period with at least five consecutive years that would be conducive to GWSTs and/or crop idling (e.g., dry or critically dry years that would trigger the need for the proposed water transfers). The Sacramento Valley Water Year Hydrologic Classification Index, published by DWR, was used to identify that hydrologic period. The Sacramento Valley Water Year Hydrologic Classification classifies water years (WY) 1901 through 2024 as Wet (W), Above Normal (AN), Below Normal (BN), Dry (D), and Critical (C) based on inflows to major reservoirs or lakes. A description of how this index is calculated and the specific data used to calculate this index is available online from the California Data Exchange Center (CDEC) at *http://cdec.water.ca.gov/cgi-progs/iodir/WSIHIST* (DWR CDEC).

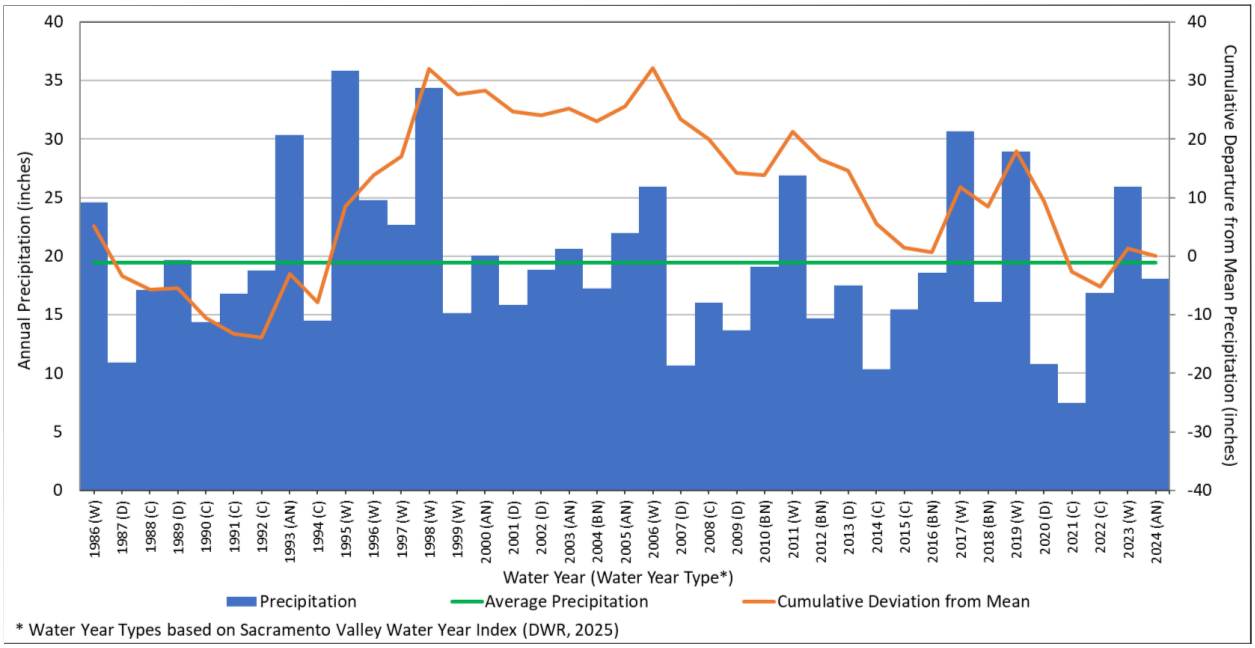
C2VSimFG-Sutter Version 1.0 extended through WY 2024 contains 39 water years and covers October 1, 1985 (WY 1986) through September 30, 2024 (WY 2024). WY 1987 through 1991 contains 2 Dry and 3 Critical water years. Assuming a simulation period starting in WY 1987 and extending through WY 2024 (the current simulation period in C2VSimFG-Sutter Version 1.0) results in a hydrologic period containing 38 years. This requires an additional 12 years of hydrologic record to have the desired 50-year simulation time period. WY 2008 through 2019 were selected for the additional 12 years of hydrologic record as they contained a variety of water year types and an average precipitation consistent with the long-term historical time period. Therefore, in the 50 years of hydrologic record used in simulation period, there are 13 Critical years, 10 Dry years, 9 Below Normal years, 5 Above Normal years, and 13 Wet years. **Table 3-2** lists the selected hydrologic water years for the simulation period.

**Table 3-2: Baseline Hydrology Years**

| Simulation Year | Hydrology Water Year | Sacramento Valley Water Year Type | | Simulation Year | Hydrology Water Year | Sacramento Valley Water Year Type |
|---|---|---|---|---|---|---|
| 1 | 1987 | D | | 26 | 2012 | BN |
| 2 | 1988 | C | | 27 | 2013 | D |
| 3 | 1989 | D | | 28 | 2014 | C |
| 4 | 1990 | C | | 29 | 2015 | C |
| 5 | 1991 | C | | 30 | 2016 | BN |
| 6 | 1992 | C | | 31 | 2017 | W |
| 7 | 1993 | AN | | 32 | 2018 | BN |
| 8 | 1994 | C | | 33 | 2019 | W |
| 9 | 1995 | W | | 34 | 2020 | D |
| 10 | 1996 | W | | 35 | 2021 | C |
| 11 | 1997 | W | | 36 | 2022 | C |
| 12 | 1998 | W | | 37 | 2023 | W |
| 13 | 1999 | W | | 38 | 2024 | AN |
| 14 | 2000 | AN | | 39 | 2008 | C |
| 15 | 2001 | D | | 40 | 2009 | D |
| 16 | 2002 | D | | 41 | 2010 | BN |
| 17 | 2003 | AN | | 42 | 2011 | W |
| 18 | 2004 | BN | | 43 | 2012 | BN |
| 19 | 2005 | AN | | 44 | 2013 | D |
| 20 | 2006 | W | | 45 | 2014 | C |
| 21 | 2007 | D | | 46 | 2015 | C |
| 22 | 2008 | C | | 47 | 2016 | BN |
| 23 | 2009 | D | | 48 | 2017 | W |
| 24 | 2010 | BN | | 49 | 2018 | BN |
| 25 | 2011 | W | | 50 | 2019 | W |

The overall average rainfall in the area over the simulation period (WY 1986-2024) in C2VSimFG-Sutter Version 1.0 is 19.4 inches (see **Figure 3-1)**. In order to maintain a similar precipitation over the entire 50-year simulation period, the 38 years from WY 1987 through 2024 plus the 12 additional years of WY 2008 through 2019 yields a comparable average precipitation of 19.2 inches. This is slightly dryer than the recent hydrology and is expected to provide more conservative results.

**Figure 3-1: Precipitation for the Region Containing BWD**




## 3.2 Alternative 1: No Project

The CCBL is also known as the No Project alternative since it is the simulation of the BWD service area without the proposed GWSTs or crop idling. The following sections discuss the changes made to create the CCBL from the C2VSimFG-Sutter Version 1.0 with hydrology through WY 2024. All of the other alternatives are compared against Alternative 1 with adjustments made to specific model files to estimate impacts resulting from GWST pumping and/or crop idling and the reduction in surface water use due to the proposed transfers.

### 3.2.1 IWFM Version Update

C2VSimFG-Sutter Version 1.0 uses IWFM2015.0.1129 as the base model. Due to enhancements in parallel processing and model run speed since that version, the CCBL was updated to the most recent release, IWFM2025.0.1688. The newer IWFM versions do not allow supply adjustment (where the model dynamically calculates the demand and automatically delivers the supply to meet that demand) to be active for both agricultural and urban purposes at the same time. As a result, one of the model files, the supply adjustment file, was modified due to this update. C2VSimFG-Sutter Version 1.0 did not adjust supplies for both agricultural and urban purposes at the same time, so file changes had no effect on model performance. Thus, the supply adjustment file was modified to remove Column 4, which contained the supply adjustment variable 11. No input files referenced the original supply adjustment Column 4, so the deletion of this column did not affect the simulation.

Model files edited to update the IWFM version series include:

- Supply Adjustment Specifications File

### 3.2.2 Alternative 1 Model Files

C2VSimFG-Sutter Version 1.0 extended through WY 2024 was the basis for the CCBL. The transformation of that model to the 50-year baseline model period was accomplished through edits to files associated with the model time series to construct a simulation based on the hydrology time period chosen as described in Section 3.1.1 and to represent current conditions existing in the BWD service area in calendar year 2025 ahead of the proposed water transfers. Model files edited to create Alternative 1 include the following:

- Main Input File: Simulation start and end time updated for the 50-year simulation period.
- Updates to follow the hydrology in Table 3-2, above, for simulations over the 50 years of monthly time series:
    - Evapotranspiration Data File
    - Precipitation Data File
    - Stream Inflow Data File
- Land use acreage based on DWR Statewide Crop Mapping for 2023 (most recent dataset available at the time) (DWR, 2023):
    - Native and Riparian Vegetation Area File
    - Non-Ponded Crop Area File
    - Ponded Crop Area File
    - Urban Area File
- Updates to files related to groundwater pumping:
    - Well Specification File: Added the three BWD wells to be used for GWST pumping. BWD well locations were obtained from a Google Earth file provided by BWD staff, including the location of the proposed Well #3. Used well depth and construction information provided by BWD staff for Wells #1 and #2, and assumed Well #3 has the same construction as Well #2. The wells deliver to a group of 90 elements in the BWD service area overlapping the surface water delivery area provided water via BWD's diversion from Thermalito Afterbay.
    - Element Pumping Specification File: Revisions to the element pumping file to remove element pumping related to non-BWD agencies and import/export processes not applicable to the BWD service area. Changed element pumping time series columns for Agricultural and Urban estimated pumping to be by C2VSimFG subregion instead of model element to improve model runtime.
    - Pumping Data Specifications File: Groundwater pumping time series set up for the alternative evaluated with the three BWD transfer wells and the Agricultural and Urban element pumping by subregion for a total of 45 columns (three for the BWD wells, 21 for Agricultural element pumping, and 21 for Urban element pumping). All columns are zero since the element pumping is determined during the model simulation and the BWD transfer wells are not pumping in Alternative 1.
    - Groundwater Component Main Data File: Turned off the simulation of subsidence since there is none in the BWD service area. Added in groundwater level hydrographs for the

nine representative monitoring network wells located in the BWD service areas in the Butte and Sutter Subbasins as set forth in the subbasin GSPs (with modifications as noted in subsequent GSP Annual Reports).

- Time series estimated based on historical averages of aggregated wet years (wet water year types), dry years (critical and dry water years), and normal years (below normal and above normal water years) averages as prescribed in C2VSimFG-Sutter Version 1.0:
    - Time Series Boundary Condition Data File: Used for the constrained head boundary conditions used to represent Black Butte Lake, Camanche Reservoir, and Thermalito Reservoir. Only Thermalito Reservoir is significant in this analysis.
    - Surface Water Diversion Data File: BWD receives surface water from Thermalito Afterbay in Diversion 493 using diversion time series column 488.
- Time series simplified to one year of repeating monthly data based on the last year (WY 2024) of C2VSimFG-Sutter Version 1.0:
    - Irrigation Period Data File
    - Rice/Refuge Pond Depth Data File
    - Rice/Refuge Operation Flow Rate Data File
    - Per Capita Water Use Data File
- Time series simplified to one time step of repeating annual data based on the last year (WY 2024) of C2VSimFG-Sutter Version 1.0:
    - Irrigation Target Soil Moisture Data File
    - Return Flow Fractions Data File
    - Population Data File
- Initial soil moisture updated based on the ending conditions (end of WY 2024) of the C2VSimFG-Sutter Version 1.0:
    - Small Watershed Component Main Data File
    - Groundwater Component Main Data File
    - Native and Riparian Vegetation Data File
    - Non-Ponded Agricultural Crops Data File
    - Rice and Refuge Lands Data File
    - Urban Lands Data File

### 3.2.3 Simulation of GWST Pumping in Alternatives 2, 3, 5, and 6

BWD's proposed GWST transfers pump up to 10,000 AFY from the three BWD wells located in the Sutter Subbasin for agricultural irrigation purposes in lieu of delivering 10,000 AFY of surface water from Thermalito Afterbay. Two of the wells are already in place, and the third well is planned but not yet drilled.

Based on records of BWD's historical GWST transfers using the two existing BWD wells, a percent pumping by month was constructed. Calendar year 2014 was the only year BWD began pumping in early May (May

3, 2014) and continued through September (September 30, 2014); the other transfer years had pumping start later. Therefore, calendar year 2014 monthly pumping records were used to estimate the rate of transfer pumping per month. **Table 3-3** shows these percentages, which are similar for Well #1 and Well #2, but are not exactly the same. For example, though the percent of pumping in June and July are both around 20%, Well #1 is closer to 20.44% in June and 20.26% in July, while Well #2 has 20.37% for one month and 20.36% for the second month. Thus, the values for June and July for Well #2 are identical, but are slightly different for Well #1. It was assumed, based on input from BWD staff, that Well #3 (the well not yet constructed) would operate similarly to Well #2.

The total volume of groundwater pumped by each well in 2014 was assumed based on an analysis of the historical BWD transfers and the maximum pumped by Wells #1 and #2 in each month. Based on the historical maximum pumping, Well #1 pumps about 2,900 AF and Well #2 pumps about 3,300 AF. In order to reach the assumed GWST pumping total of 10,000 AF, Well #1 was rounded up to 3,000 AF, and Well #2 (and Well #3) was rounded up to 3,500 AF. Therefore, the amount of groundwater pumped by month by BWD well in each GWST year is shown below in **Table 3-3**.

**Table 3-3: GWST Pumping by BWD Well**

| Month | Percent of 2014 GWST Pumping for Well 1 and 2 | Groundwater Substitution Transfer Pumping by BWD Well (AF) | | |
|---|---|---|---|---|
| | | Well #1 | Well #2 | Well #3 |
| May | 19% | 572 | 662 | 662 |
| June | 20% | 613 | 713 | 713 |
| July | 20% | 608 | 713 | 713 |
| August | 18% | 540 | 633 | 633 |
| September | 22% | 667 | 779 | 779 |
| **Total** | **100%** | **3,000** | **3,500** | **3,500** |

Due to the increase in groundwater pumping in the BWD service area for agricultural purposes during the first five years of the simulation period as GWST pumping is occurring, BWD's surface water diversion for agricultural purposes must be reduced by the same amount. The same percentage of pumping by month from the 2014 transfer period was used to determine the reduction in surface water irrigation within BWD each month.

Model files edited to simulate the GWST pumping include the following:

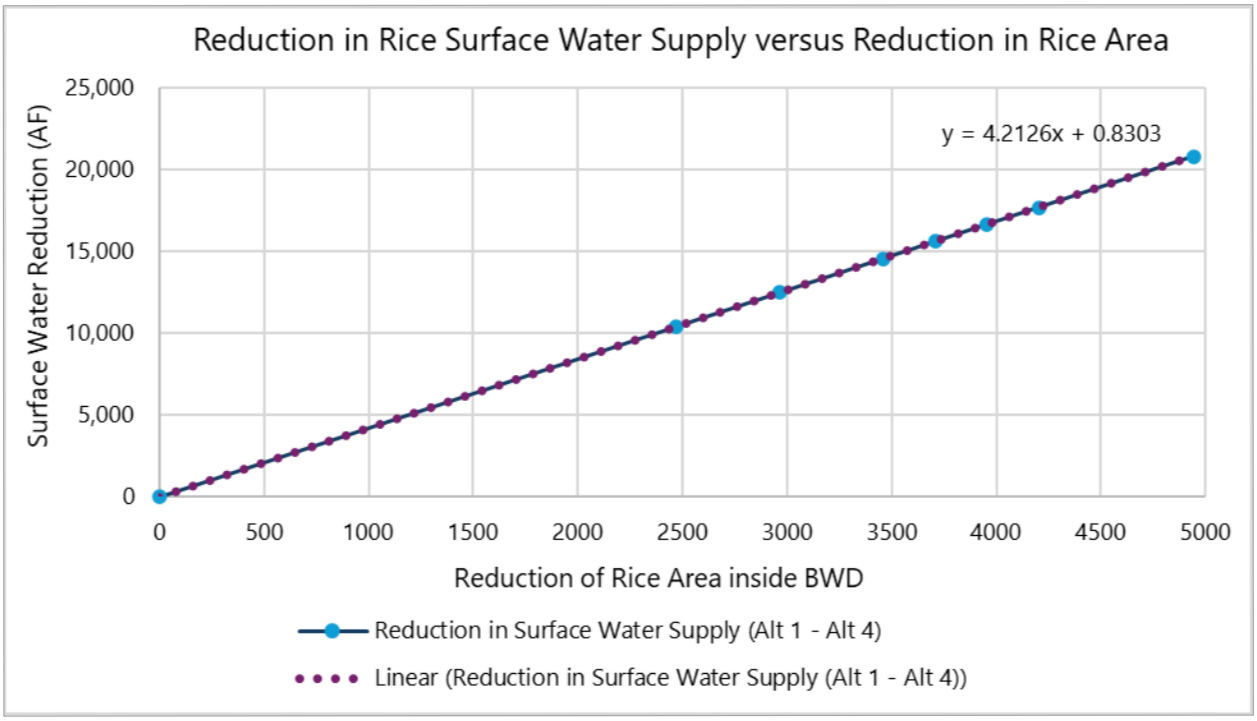
- For Alternatives 2, 3, and 5:
    - Pumping Data Specifications File: For each of the first five years of simulation, pump 10,000 AF for GWST spread across the three BWD wells (3,000 AF for Well #1 and 3,500 AF each for Wells #2 and #3). The remaining 45 years of simulation have 0 AF of GWST pumping.
    - Surface Water Diversion Data File: Column 488 representing surface water diversions to BWD from the Thermalito Afterbay is reduced by 10,000 AF for each of the first five years. The remaining 45 years of simulation have no reduction to the Alternative 1 diversion volume.

- For Alternative 6:
    - Pumping Data Specifications File: For each of the first five years, pump 5,000 AF for GWST spread across the three BWD wells (1,500 AF for Well #1 and 1,750 AF each for Wells #2 and #3). The remaining 45 years of simulation have 0 AF GWST pumping.
    - Surface Water Diversion Data File: Column 488 representing surface water to BWD from Thermalito Afterbay is reduced by 5,000 AF for each of the first five years. The remaining 45 years of simulation have no reduction to the Alternative 1 diversion volume.

## 3.3 Simulation of Crop Idling in Alternatives 2, 4, 5, and 6

BWD's proposed water transfers would idle rice fields, providing a reduction in surface water irrigation of up to 14,000 AFY. Though BWD may end up idling a variety of crops, for the purposes of modeling, only rice fields were idled as a simplifying assumption. In order to determine the number of acres of rice fields that would need to be idled to yield a 14,000 AFY (or 7,000 AFY for Alternative 5) reduction in surface water deliveries, various scenarios were run where the acreage of rice fields was reduced uniformly by percentage across the BWD service area and the resulting simulated rice water supply requirement reduction was noted. These scenarios were used to plot a rice reduction trendline that was then used to calculate the reduction in rice field acreage required to achieve the required reduction in surface water deliveries. **Figure 3-2**, below, shows the resultant trendline. Based on this analysis, a reduction of 14,000 AF in surface water deliveries for rice irrigation requires a reduction of about 3,323 acres of rice in the BWD service area. This is the same as idling approximately 67.2% of rice production in BWD elements uniformly across the BWD service area.

**Figure 3-2: Rice Idling Acreage**



Model files edited to simulate the required surface water delivery reduction achieved through crop idling include the following:

- For Alternatives 2, 4, and 6:
    - Ponded Crop Area File: For each of the first five years, remove about 3,320 acres of rice area from BWD elements by uniformly reducing rice production in BWD elements by 67.2%. The remaining 45 years of the simulation uses the rice acreage in Alternative 1.
    - Non-Ponded Crop Area File: For each of the first five years, add all area removed from rice production to the idle crop category. The remaining 45 years of the simulation uses the idle land acreage in Alternative 1.
    - Surface Water Diversion Data File: Column 488 representing surface water to BWD from Thermalito Afterbay is reduced by 14,000 AF for each of the first five years. The remaining 45 years of simulation have no reduction to the Alternative 1 diversion volume.
- For Alternative 5:
    - Ponded Crop Area File: For each of the first five years, remove about 1,660 acres of rice production area from BWD elements by uniformly reducing rice in BWD elements by 33.6%. The remaining 45 years of the simulation uses the rice acreage in Alternative 1.
    - Non-Ponded Crop Area File: For each of the first five years, add all area removed from rice production to the idle crop category. The remaining 45 years of the simulation uses the idle land acreage in Alternative 1.
    - Surface Water Diversion Data File: Column 488 representing surface water to BWD from Thermalito Afterbay is reduced by 7,000 AF for each of the first five years. The remaining 45 years of simulation have no reduction to the Alternative 1 diversion volume.

# 4. Model Results

The six model scenarios are evaluated together as the same general trends are observed in all the scenarios. The only changes to Alternative 1 to create Alternatives 2 through 6 were the implementation of water transfers in the first five years of the simulation period and the associated response actions. The results are analyzed in several different ways in the sections below.

### 4.1.1 Impact to Land Surface Budget

When reducing surface water deliveries and idling crops, there are many non-linearities in analyzing the results as the various water budget components are directly connected to many other model areas. Groundwater pumping is a simpler component to use in analyzing the impact of water transfers since the number of other components it affects are significantly fewer. Although the model separates land used for rice production from other agricultural lands, surface water deliveries and groundwater pumping is sent to agricultural land as a whole (rice and non-rice) within the model, so the reduction in surface water is applied to non-rice lands in the simulations, even in the case of idling only rice fields.

To analyze the results of the alternatives simulated, data from the C2VSimFG-Sutter model elements representing BWD in the land and water use budget (or land surface budget) were used. Over the 50 years of simulation, small changes are apparent in the land surface budget components between the six different alternatives (**Figure 4-1**). The agricultural land surface budget is made up of groundwater pumping, surface water deliveries, and surplus water supply. The net of those three components is the agricultural supply requirement.

In order to better understand the differences resulting from implementation of Alternatives 2-5 in the C2VSimFG-Sutter model, **Figure 4-2** shows the 50-year averages as the difference between Alternative 1 and each alternative analyzed. The value shown in the figure indicates that, under the alternative being analyzed, the water transfers either increased the land surface budget component relative to Alternative 1 (if positive value), decreased the component relative to Alternative 1 (if negative value), or had no impact relative to Alternative 1. These differences (positive or negative) do not indicate a positive or negative impact, as each water budget component must be interpreted individually, but rather represent the change by alternative relative to Alternative 1. Overall, relative to Alternative 1, the other alternatives simulated generally reduced the land surface components. Below **Figure 4-1** and **Figure 4-2** is a discussion of each land surface budget component individually and the annual pattern over the 50-year simulation period.

**Figure 4-1: Average Agricultural Land Surface Budget Over 50-Year Simulation Period**

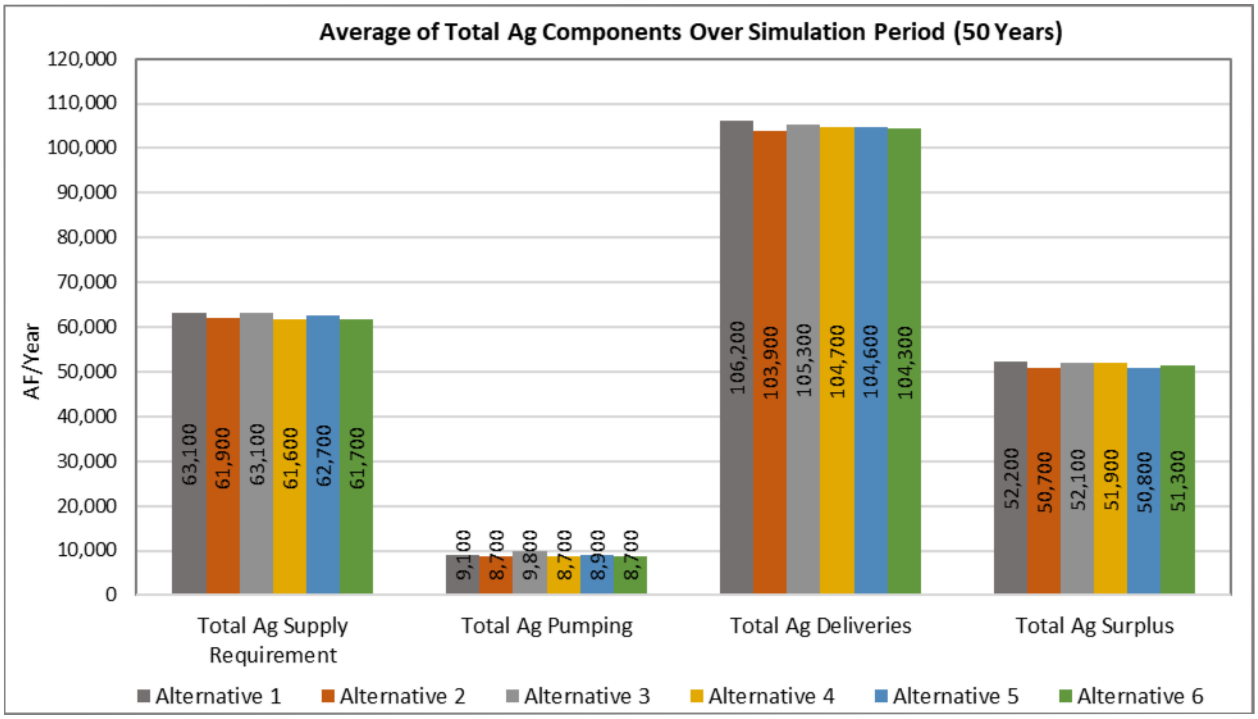
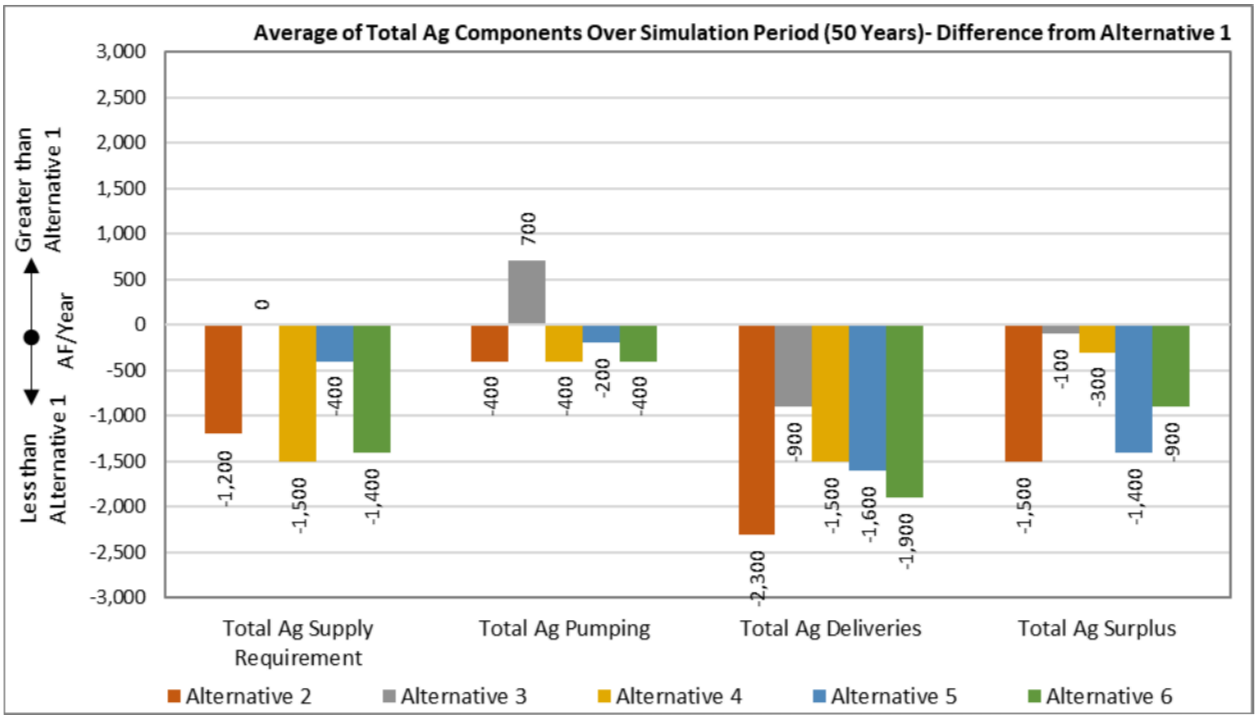



**Figure 4-2: Difference from Alternative 1- Average Agricultural Land Surface Budget (50 Years)**




Note: Positive values indicate the value is more than it was in Alternative 1 and vice versa for negative values.

The following figures show the annual agricultural land surface budget components individually relative to Alternative 1 with discussion on each following in the bullets below:

- Overall Differences between Alternatives
    - Alternatives 2, 4, 5 and 6 all have crop idling occurring (14,000 AFY for the first five years) and experience similar impacts as a result of the water transfers with crop idling.
    - Alternative 3 has only GWST pumping (10,000 AFY over the first five years) occurring, and the impacts to the land surface budget are different from the other scenarios as no crops are idled.
    - In general, impacts to the land surface budget components are most strongly influenced by the amount of crop idling occurring in the first five years.
- Agricultural Supply Requirement
    - The agricultural supply requirement is reduced when crop idling occurs during each of the first five years of the simulation for Alternatives 2, 4, 5, and 6 (Alternative 5 has 50% crop idling and the others have full crop idling). Because the water budget includes both rice and non-rice lands, the reduction in rice demand is balanced by a lesser increase in non-rice demand due to the switch from rice land to idle land. That is, the model assumes that there is a smaller amount of supply requirement or demand from the now-idled lands. In other words, the reduction in supply demand between Alternatives 2, 4, 5 and 6 versus in Alternative 1, as shown in **Figure 4-3** for any of the first five years, is not exactly the 14,000 AFY of savings from the crop idling that occurred.
    - **Figure 4-3** shows that the reduction in the supply requirement only occurs during the first five years of the simulation when the water transfers and crop idling are occurring. There are some minimal differences in years 6 through 8 of the simulation immediately after the project occurs. There are no changes from Alternative 1 in any other alternative from year 9 through the end of the simulation after the water transfers have ceased and the aquifer system has recovered.
- Agricultural Groundwater Pumping
    - When crop idling occurs, groundwater pumping is reduced due to the reduction in agricultural demand. As seen in **Figure 4-2** and **Figure 4-4**, Alternative 3 with full GWST pumping and no crop idling has increased groundwater pumping relative to Alternative 1 because of the GWST pumping at the three BWD GWST pumping wells. Even though other alternatives also have GWST pumping occurring, the amount of water saved as a result of crop idling is greater than the amount of GWST pumping, and the impact on the agricultural groundwater pumping is related to changes caused predominantly by crop idling instead of GWST pumping.
    - **Figure 4-4** shows that the reduction in agricultural groundwater pumping only occurs during the first five years of the simulation due to crop idling during that period. There is a minimal difference in year 6 of the simulation, immediately after the transfers occur. There are no changes from Alternative 1 in any other alternative from year 7 through the end of the simulation period.

- Agricultural Surface Water Deliveries
    - As seen in **Figure 4-2** and **Figure 4-5**, surface water deliveries are reduced in all alternatives due to the increase in GWST pumping and/or the idling of rice fields. BWD's response to the water transfers reduces surface water deliveries in all alternatives where the water transfers are simulated.
    - **Figure 4-5** shows that the reduction in the agricultural surface water deliveries only occurred during the first five years of the simulation when the crop idling occurred. There is a minimal difference in year 6 of the simulation, immediately after the water transfers cease. There are no changes from Alternative 1 in any other alternative from year 7 through the end of the simulation period.
- Agricultural Surplus
    - Water that is delivered in excess of its demand (surplus water) sometimes occurs if there is a mismatch between the supply and demand in the model. The volume of surplus water estimated in Alternative 1 is reduced in all of the alternative scenarios as less surface water is delivered from Thermalito Afterbay (**Figure 4-1** and **Figure 4-2**).
    - Similar to the other land surface budget components, the changes in agricultural surplus almost all occur within the first five years of the simulation. There are some minimal differences in years 6 through 8 of the simulation immediately after the water transfers cease. There are no changes from Alternative 1 in any other alternative from year 9 through the end of the simulation.

Overall, the land surface budget results indicate that changes to the land system are most impactful while the water transfers are actually occurring, and all impacts resulting from the transfers are negligible within three years after the transfers end.

**Figure 4-3: Difference from Alternative 1- Annual Agricultural Supply Requirement**

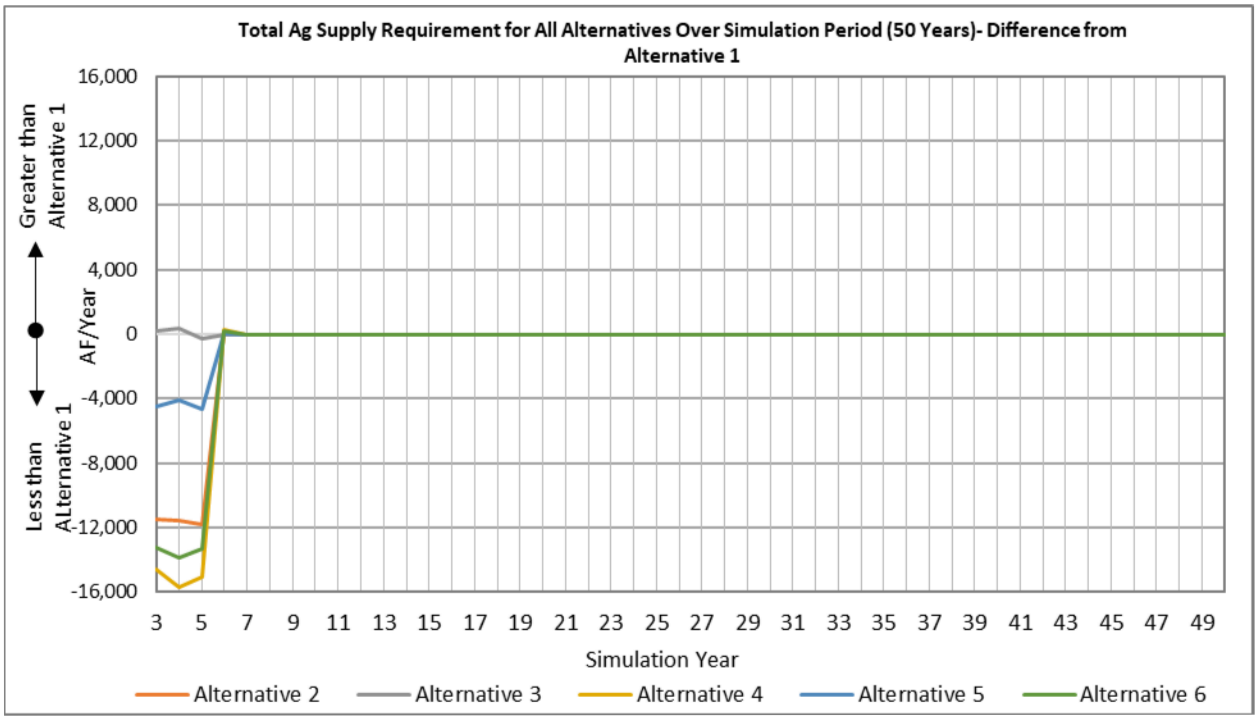



**Figure 4-4: Difference from Alternative 1- Annual Agricultural Groundwater Pumping**

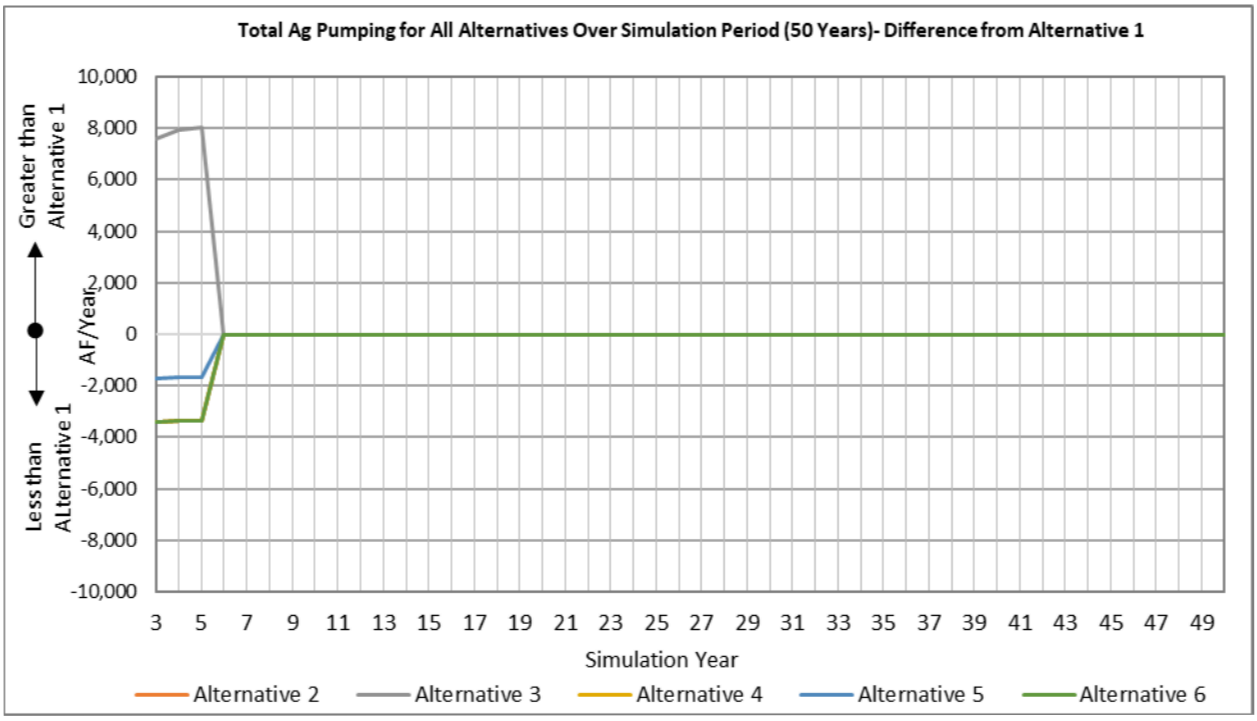


**Figure 4-5: Difference from Alternative 1- Annual Agricultural Surface Water Deliveries**

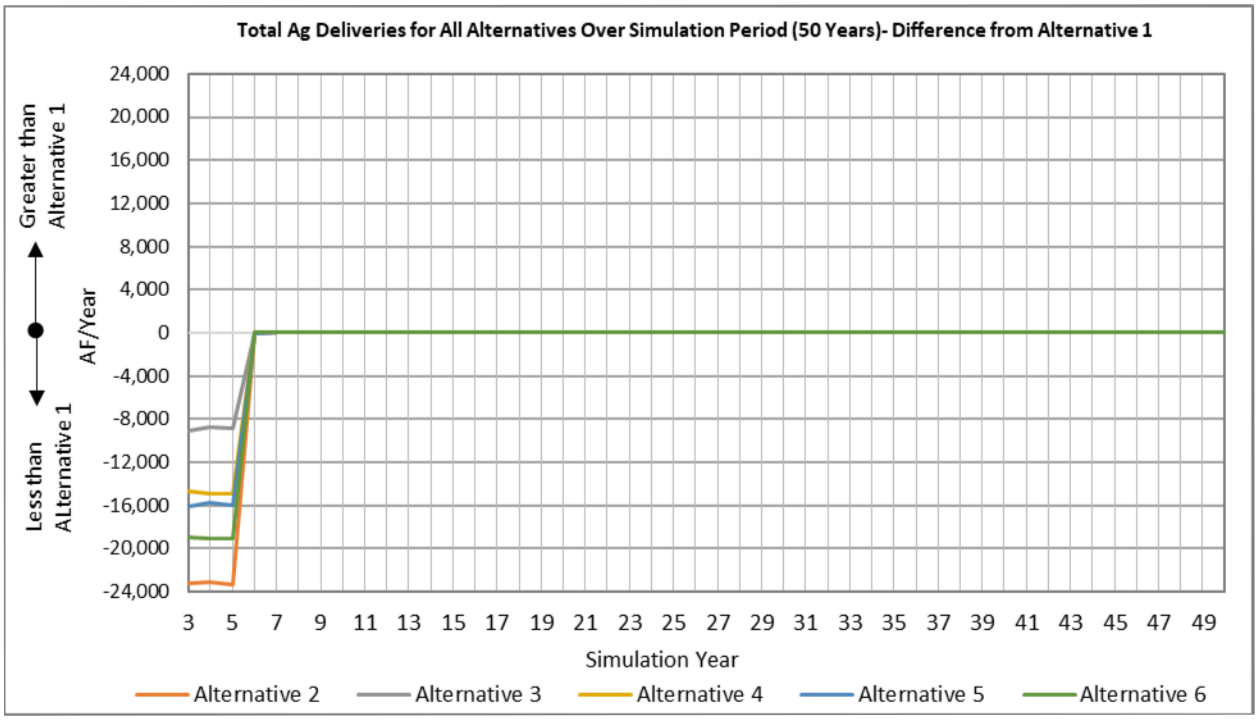
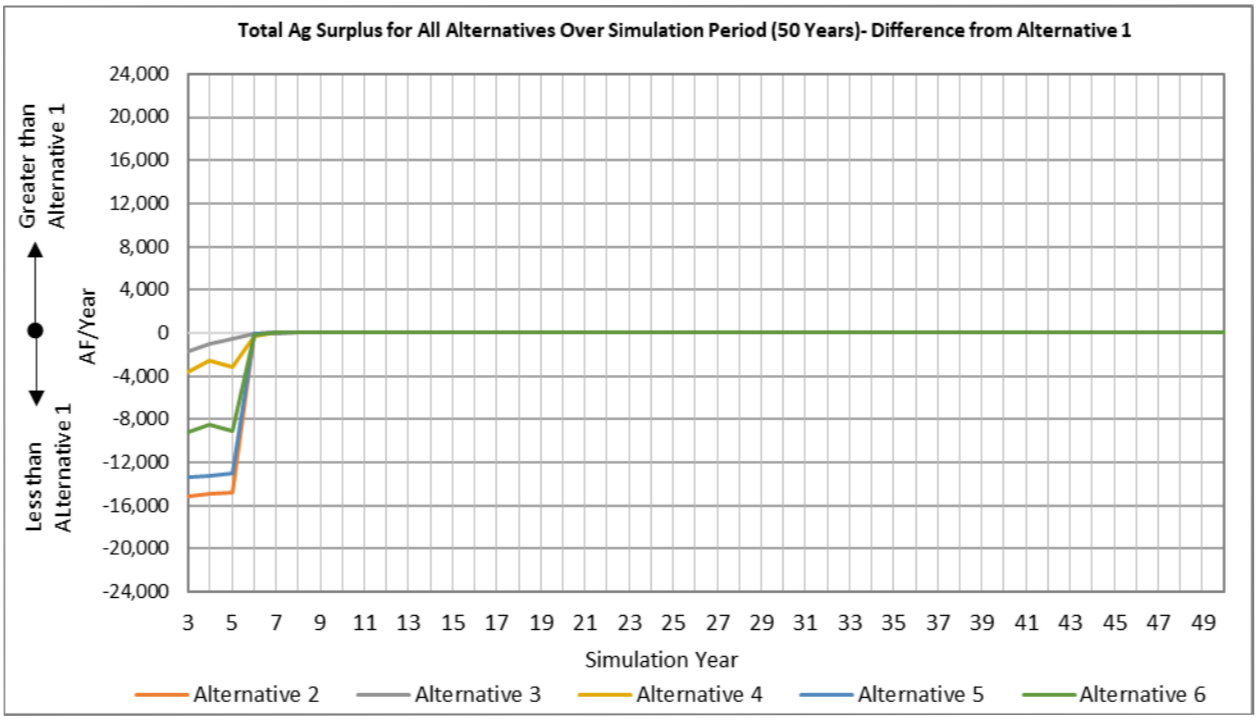



**Figure 4-6: Difference from Alternative 1- Annual Agricultural Surplus**

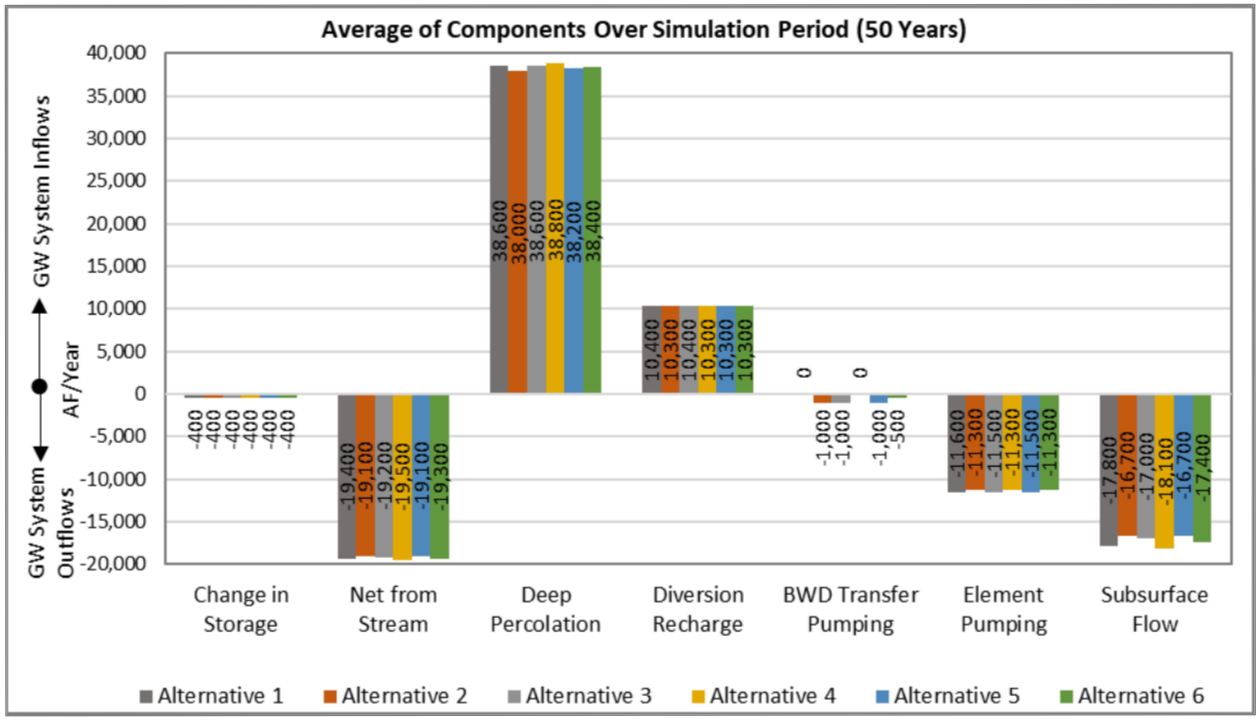


### 4.1.2 Impact to Groundwater Budget

To analyze the results of the alternative simulations, the groundwater budget for the model elements selected to represent the BWD service area in C2VSimFG-Sutter was analyzed. Over the 50 years of simulation, there does not appear to be significant variations among the major components of the groundwater budget between the six different alternatives (**Figure 4-7**). In **Figure 4-7**, positive values indicate inflows to the groundwater system and negative values represent outflows from the groundwater system. Therefore, the inflows to the groundwater system for elements comprising the BWD are primarily deep percolation with some diversion recharge, and the outflows from the groundwater system are groundwater going to Feather River, groundwater pumping, and subsurface flow away from BWD elements.

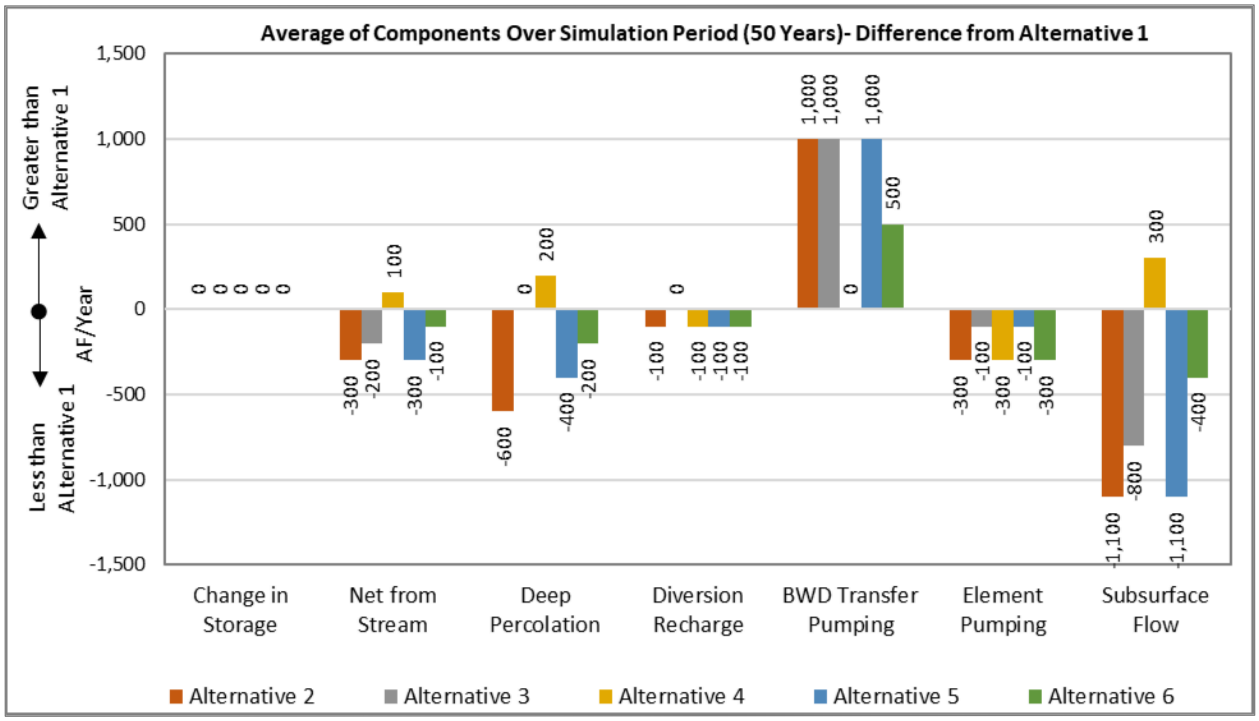
In order to better understand the differences due to the implementation of Alternatives 2 through 6, **Figure 4-8** shows the 50-year averages of each groundwater budget component as the difference from Alternative 1. The values indicate that the water transfers and associated responses either increased the groundwater budget component relative to Alternative 1 (if positive value), decreased the component relative to Alternative 1 (if negative value), or had no impact relative to Alternative 1. These differences (positive or negative) do not indicate a positive or negative impact as each component must be interpreted individually, but rather show the magnitude of the changes relative to Alternative 1. Overall, relative to Alternative 1, the other alternatives show a modest redistribution of water among budget components rather than large net changes. A discussion of each individual groundwater budget component is included following **Figure 4-7** and **Figure 4-8**.

**Figure 4-7: Average Groundwater Budget Over 50-Year Simulation Period**




Note: Positive values indicate inflows to the groundwater system and negative values represent outflows.

**Figure 4-8: Difference from Alternative 1- Average Groundwater Budget (50 Years)**




Note: Positive values indicate the value is more than it was in Alternative 1 and vice versa for negative values.

A summary of the impacts on each groundwater budget component is as follows:

- Overall Differences between Alternatives
    - Alternatives 3 and 5 are controlled mostly by the impact of GWST pumping (10,000 AFY during each of the first five years of the model simulation). Even though Alternative 5 also has 50% crop idling occurring, model impacts seem to mostly be the result of GWST pumping.
    - Alternative 4 is controlled by the impact of crop idling (14,000 AFY during each of the first five years), which has a lesser impact on many groundwater budget components compared to scenarios with GWST pumping.
    - Alternative 6, which has half GWST pumping (5,000 AFY) and full crop idling (14,000 AFY) for each of the first five years, generally displays behaviors closer to those of the GWST pumping scenarios.
    - Even though Alternative 2 contains both full crop idling and full GWST pumping, the groundwater budget response is more closely aligned to the impact of GWST pumping as seen in Alternatives 3 and 5.
    - In general, impacts to the groundwater budget components are most strongly influenced by the volume of GWST pumping occurring in the first five years.

- Change in Storage
    - In **Figure 4-7** and **Figure 4-8**, the change in groundwater storage is identical across all alternatives for the 50-year average. **Figure 4-9** shows the annual difference in change in storage between each alternative and Alternative 1.
    - In **Figure 4-9**, Alternatives 2, 3, 5, and 6 are controlled mostly by the impact of GWST pumping (10,000 AFY during each of the first five years for Alternatives 2, 3, and 5, and 5,000 AFY in Alternative 6) with the portion of the Butte and Sutter Subbasins within BWD service area experiencing an immediate reduction in groundwater storage as compared to Alternative 1 as water is pulled from storage to offset the increased pumping. Immediately after the five years of GWST pumping ceases, storage recovery begins, and eventually the change in storage matches that occurring in Alternative 1 after a period of about 20 years. On the other hand, crop idling in Alternative 4 actually increases the change in storage relative to Alternative 1 by reducing the pumping associated with agricultural irrigation under this scenario.
- Net from Stream
    - In **Figure 4-7,** a negative net from stream value indicates that water is leaving the groundwater system and going to the stream. This means the stream, the Feather River in this case, is gaining in the portion adjacent to the BWD service area.
    - In **Figure 4-8**, stream interaction and subsurface flow vary slightly among alternatives, with Alternatives 2 and 5 showing the greatest average reduction in net stream depletion as compared to Alternative 1. Alternative 4 is the only scenario that has an overall average net stream depletion greater than Alternative 1. This means that the stream gains slightly more under Alternative 4 as compared to Alternative 1, and the stream gains slightly less under the other four scenarios as compared to Alternative 1. However, the Feather River is still gaining under all alternatives.
    - In **Figure 4-10**, the annual changes show that all differences among the alternatives mostly disappear by about 20-25 years into the simulation, a similar time frame to that seen in the change in storage annual difference figure. All alternatives except for Alternative 4 cause a reduction in the stream gain compared to Alternative 1 due to the GWST pumping. Alternative 4, which does not have GWST pumping, has a slight increase in the stream gain most likely due to the reduction of surface water delivered that was instead able to stay in the stream.
- Deep Percolation
    - Deep percolation is the water percolating from the root zone system to the groundwater system. This is impacted by the applied water supply and the evapotranspiration needs of the agricultural lands receiving the supply. As seen in **Figure 4-11**, when GWST pumping occurs in Alternatives 2, 3, 5, and 6, there is slightly less deep percolation as compared to Alternative 1 because increased groundwater pumping lowers groundwater heads, which in turn can change soil moisture dynamics, irrigation demand, and surface water–groundwater interactions in ways that reduce percolation past the root zone. Alternative 4 is the only scenario without additional pumping occurring; in fact, there is less pumping because of the reduced agricultural demand due to crop idling. There are no changes in

deep percolation between Alternative 1 and any other alternative from year 8 through the end of the simulation period.

- Diversion Recharge
    - In **Figure 4-12**, diversion recharge is only different from Alternative 1 in the first five years when the water transfers are occurring and surface water from the Feather River is reduced. Where the scenarios fall relative to Alternative 1 is in the same order of how much surface water is reduced for the first five years: Alternative 3 reduces diversion recharge by 10,000 AFY; Alternative 4 reduces diversion recharge by 14,000 AFY; Alternative 5 reduces diversion recharge by 17,000 AFY; Alternative 6 reduces diversion recharge by 19,000 AFY; and Alternative 2 reduces diversion recharge by 24,000 AFY. There are no changes in diversion recharge between Alternative 1 and any other alternative from year 6 through the end of the simulation period.
- BWD Transfer Pumping
    - Relative to Alternative 1, Alternatives 2, 3, and 5 result in an additional 1,000 AFY average of groundwater pumping associated with BWD transfer operations throughout the entire 50-year simulation period, as indicated by increased negative values in the groundwater budget in **Figure 4-7** and a positive value in **Figure 4-8**. This pumping only occurs during the first five years of the simulation, so the averages include 45 years of zero BWD transfer pumping.
    - This additional pumping is more apparent in **Figure 4-13** where it is clear that BWD is pumping an additional 10,000 AFY for each of the first five years in Alternatives 2, 3, and 5 (the lines for Alternative 2 and 3 are underneath Alternative 5's line), and an additional 5,000 AFY for each of the first five years in Alternative 6. Alternative 4 has no difference from Alternative 1 since there is no GWST pumping. There are no changes in transfer-related pumping between Alternative 1 and any other alternative from year 6 through the end of the simulation period.
- Element Pumping
    - Element pumping is the other pumping that occurs in the simulation to meet the agricultural demand needs in the BWD service area as estimated by the model. The impact of water transfers to this groundwater budget component is mostly related to crop idling and the demand reduction as rice land is idled; therefore, Alternatives 2, 4, and 6, when the full crop idling occurs in the first five years, has the largest reduction in average element pumping in **Figure 4-8** as compared to Alternative 1.
    - This same trend is also apparent in **Figure 4-14** where Alternative 5 (with 50% crop idling) has about half the reduction in the first five years as Alternatives 2, 4, and 6 (in the figure, the lines for all three alternatives are essentially on top of each other). Even Alternative 3, with only GWST pumping occurring, has a small reduction in element pumping in the first five years as compared to Alternative 1. This result is most likely related to a slight mismatch in the delivery area of the additional GWST pumping and the reduction in the surface water delivery. There are no changes from Alternative 1 in any scenario from year 6 through the end of the simulation.

- Subsurface Flow
    - Annual subsurface flow is always negative in **Figure 4-7** and indicates the amount of water leaving the BWD groundwater budget area. Subsurface flow is impacted most strongly by groundwater levels, with higher groundwater levels leading to more outflow and lower groundwater levels resulting in less water movement away from the area. In **Figure 4-15**, alternatives with GWST pumping (Alternatives 2, 3, 5, and 6) all have reduced subsurface flow relative to Alternative 1 due to higher groundwater pumping leading to lower groundwater levels. Alternative 4, the only scenario without any additional GWST pumping, has slightly increased subsurface flow due to the raising of groundwater levels because of crop idling lowering agricultural demand.
    - In **Figure 4-15**, the annual change in subsurface flows show that all differences in the scenarios mostly disappear by about 20-25 years into the simulation, a similar time frame seen in the change in storage and net from stream annual difference figures.

Overall, the groundwater budget results indicate that changes to the groundwater system are most impactful while the water transfers are actually occurring, and all impacts from the transfers are negligible by about 20 years after the transfers cease.

**Figure 4-9: Difference from Alternative 1- Annual Change in Storage**

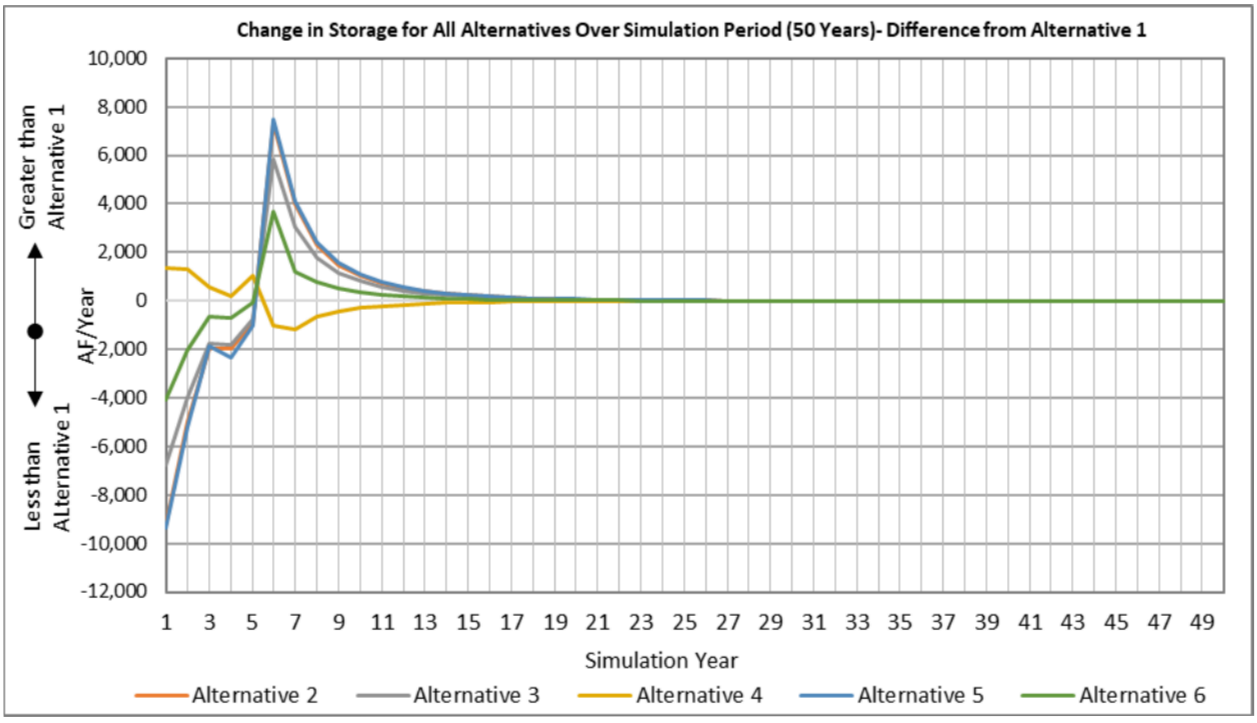


**Figure 4-10: Difference from Alternative 1- Annual Net from Stream**

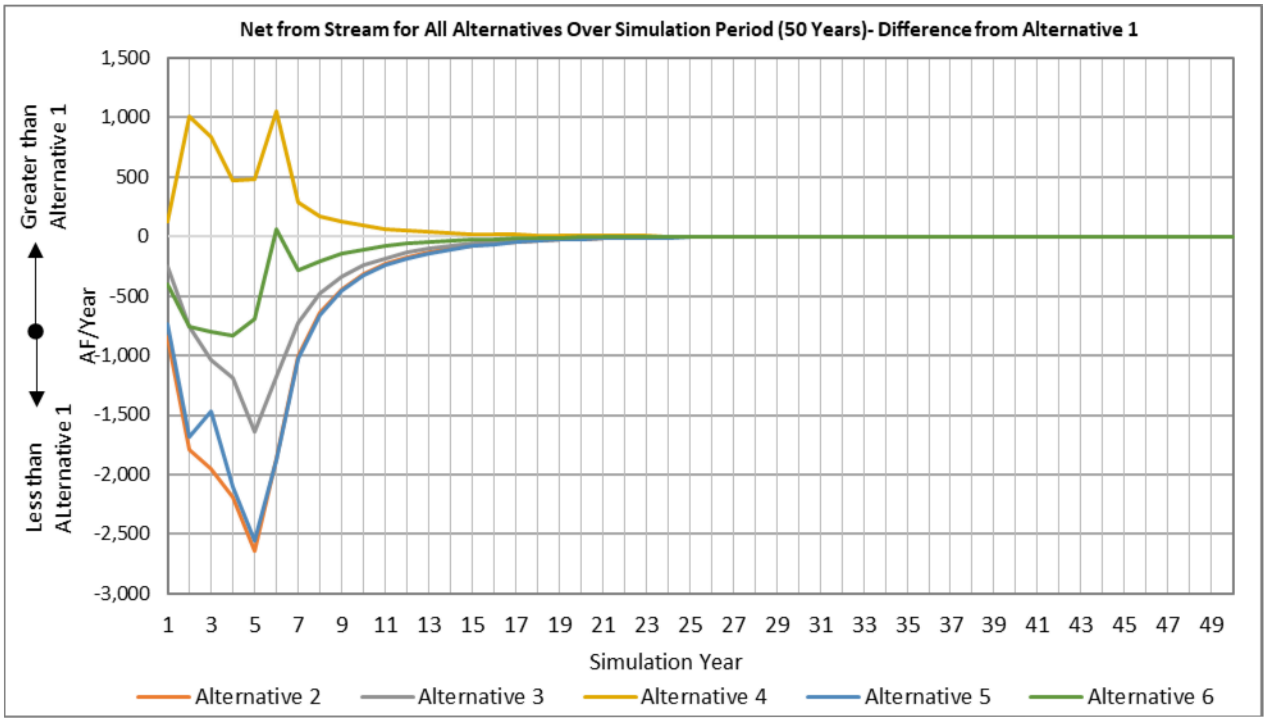



**Figure 4-11: Difference from Alternative 1- Annual Deep Percolation**

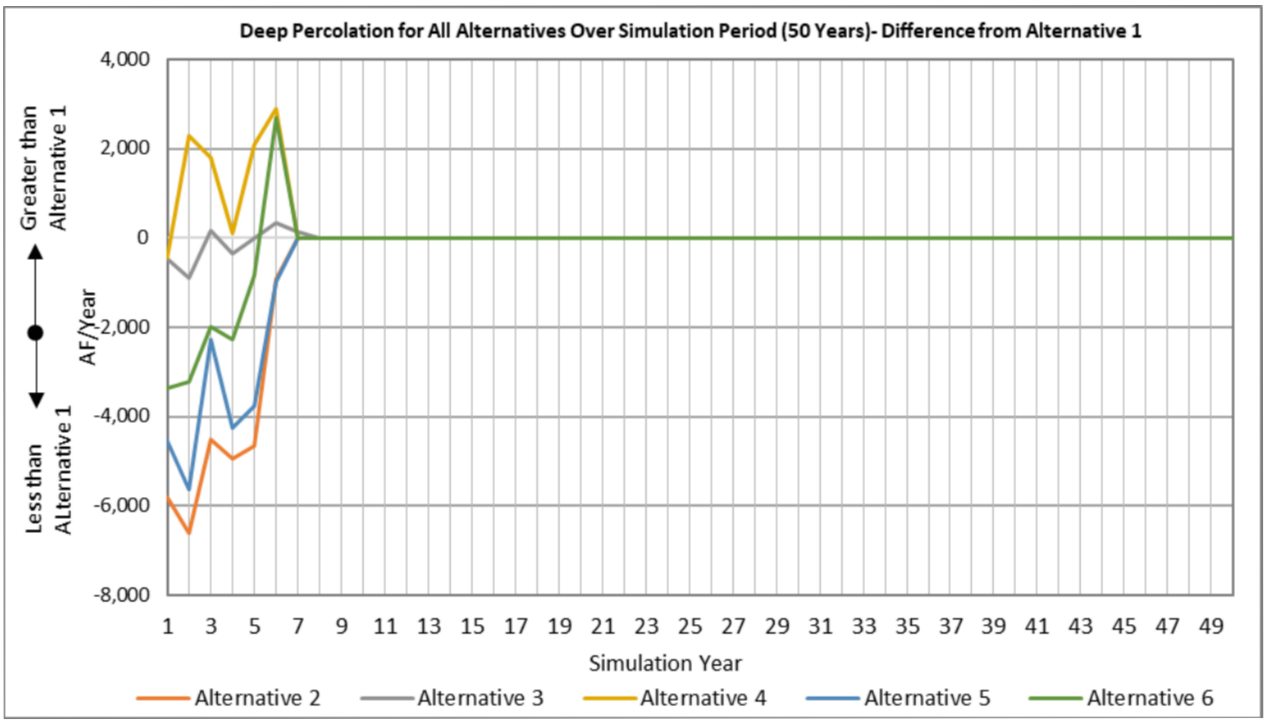


**Figure 4-12: Difference from Alternative 1- Annual Diversion Recharge**

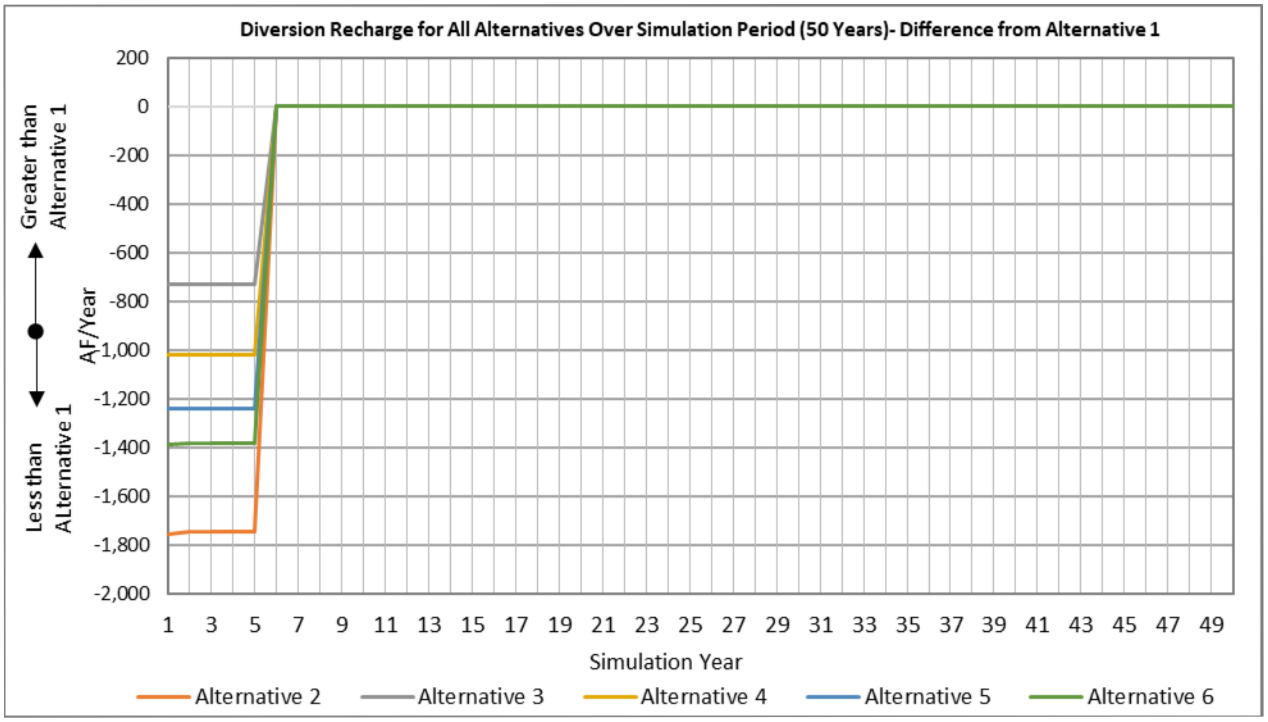



**Figure 4-13: Difference from Alternative 1- Annual BWD Transfer Pumping**

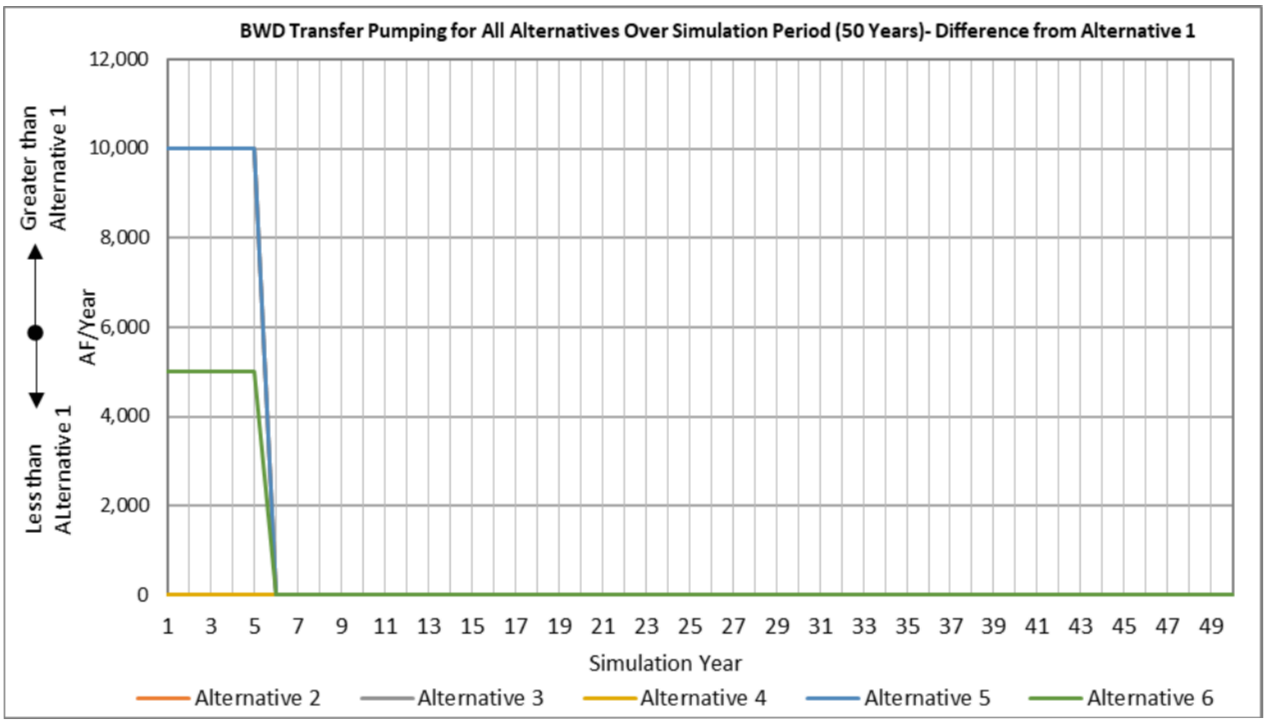


**Figure 4-14: Difference from Alternative 1- Annual Element Pumping**

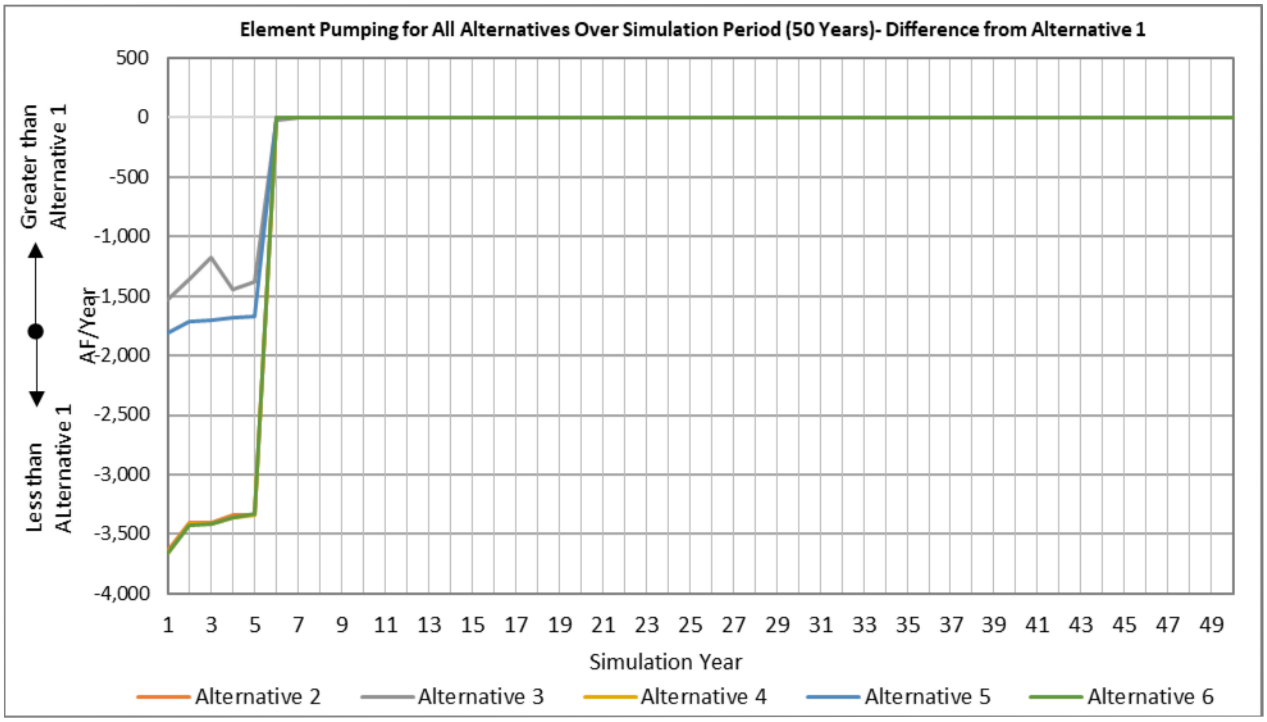
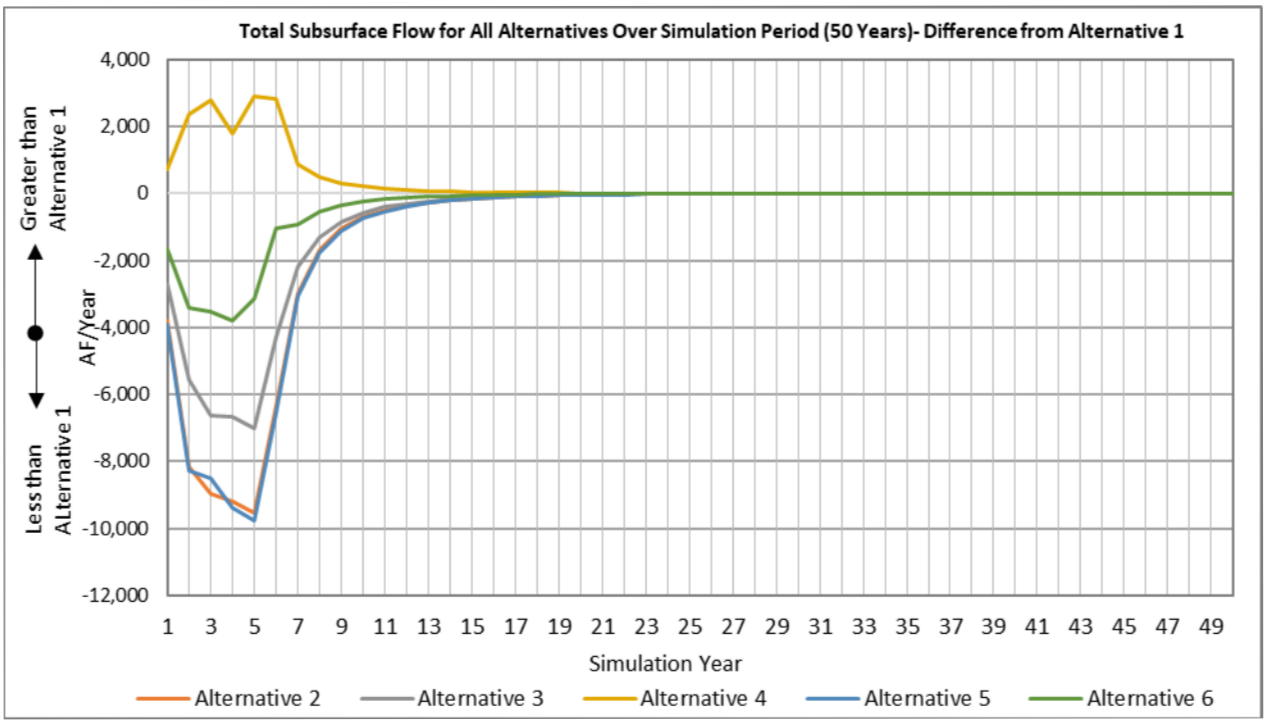



**Figure 4-15: Difference from Alternative 1- Annual Subsurface Flow**



### 4.1.3 Potential Effect to Streamflow

Based on **Figure 4-10**, Alternative 4 (full crop idling only) does not adversely affect streamflow as streamflow is greater under Alternative 4 when compared to Alternative 1 (no project). Alternatives 2, 3, 5, and 6 have the potential to effect streamflow.

The DWR and United States Bureau of Reclamation (USBR or Reclamation) published a White Paper titled Draft *Technical Information for Preparing Water Transfer Proposals* concluding that "[a]lthough real-time streamflow depletion due to groundwater pumping cannot be directly measured, impacts on streamflow due to groundwater pumping can be estimated using analytical and numerical groundwater models" (DWR and USBR, 2019; page 35). "To account for the anticipated streamflow depletion, Project Agencies [DWR and Reclamation] will apply an SDF [stream depletion factor] to the amount of water pumped pursuant to each transfer proposal in the Project Agency's respective conveyance contract or letter of agreement" (DWR and USBR, 2019; page 35-36). To the extent BWD's groundwater substitution transfers involve DWR facilities to store or convey the transfer water, BWD must comply with California Water Code section 1810(d) and ensure that the use is "made without injuring any legal user of water and without unreasonably affecting fish, wildlife, or other instream beneficial uses and without unreasonably affecting the overall economy or the environment of the county from which the water is being transferred."

Historically, DWR and Reclamation have assessed an assumed, agreed-upon streamflow depletion factor (SDF) on BWD transfers of between 12% and 20%. Future transfers under Alternatives 2, 3, 5 and 6 would continue to be subject to an assumed, agreed-upon SDF between BWD, DWR, and Reclamation. For purposes of this preliminary analysis, it is assumed that the SDF for BWD transfers would be consistent with the historical range (between 12% and 20%) and consistent with the 2019 DWR and Reclamation White Paper, which may be amended during the 5-year period of BWD's GWST pumping.

BWD, in coordination with DWR and Reclamation, is evaluating whether additional technical analyses would help inform the SDF for BWD's future transfers. A comprehensive evaluation of streamflow depletion for Alternatives 2, 3, 5, and 6 would require additional model scenarios to assess sensitivity to GWST pumping location, volume, timing (months within year and how long pumping occurs), and trailing water year types in conjunction with varying combinations of the acreage and location of any fields idled. Additionally, understanding the sensitivity of stream-aquifer interactions to model calibration parameters (e.g., saturated hydraulic conductivity, aquifer horizontal hydraulic conductivity, aquifer vertical hydraulic conductivity, streambed conductance) will add further uncertainties on the likely ranges of streamflow depletion due to GWST pumping in BWD. More information on BWD's operations and how they may effect streamflow depletion will be needed to assist with further analysis of a streamflow depletion factor specific to BWD. This additional analysis is beyond the scope of this report.

The portion of Feather River closest to BWD is predominantly a gaining reach under baseline conditions (Alternative 1) as indicated by model results and corroborated by the analyses conducted for four GSPs: Butte Subbasin, Wyandotte Creek Subbasin, Sutter Subbasin, and North Yuba Subbasin (Butte Subbasin, 2022; Sutter Subbasin, 2022; Wyandotte Creek Subbasin, 2021; Yuba Subbasins, 2024). As described in Section 4.1.2 above, the Feather River remains a gaining stream under GWST pumping conditions, but it is gaining at a lesser rate than it was in Alternative 1 (the No Project scenario). This invokes unique legal, technical, regulatory and policy implications for establishing an assumed, agreed-upon SDF for BWD transfers in coordination with DWR and Reclamation. Consequently, for purposes of Alternatives 2, 3, 5 and 6, the SDF is assumed to be within the historical range of 12% to 20% and will follow DWR and Reclamation's

White Paper. BWD, in coordination with DWR and Reclamation, may undertake additional site-specific technical analyses to more precisely estimate SDF for BWD, in which case the more specific SDF would apply.

### 4.1.4 Groundwater Level Hydrographs

In order to quantify the impacts of the proposed water transfers and associated response actions, simulated groundwater levels for the Representative Monitoring Network (RMN) wells that fall within BWD service area were compared to well-specific minimum thresholds (MTs) as defined in the Sutter and Butte Subbasins GSPs. Both Sutter and Butte Subbasins GSPs establish groundwater level minimum thresholds for the chronic lowering of groundwater levels, the reduction of groundwater storage, and the depletion of interconnected surface waters sustainability indicators, and use those MTs as a means of assessing whether 'undesirable results' (or significant impacts) are occurring in the subbasins.

The Butte Subbasin GSP contains six RMN wells inside BWD service area, four of which are used to evaluate groundwater levels and two of which are used to evaluate interconnected surface water. The Sutter Subbasin GSP contains three groundwater level RMN wells in one nested well location.

MT exceedances do not necessarily indicate an undesirable result (as defined in the GSPs) has occurred. Depending on the subbasin and the sustainable management criteria set forth in the GSP, a specified number of wells may need to exceed minimum threshold consistently for a specified period of time for an undesirable result to occur.

The simulated groundwater levels for each of the four model layers were extracted for each of the RMN hydrograph locations. For any given RMN well, the difference between model layers is relatively small (maximum of less than six feet across the wells), so it is reasonable to assume one layer is representative of groundwater levels for each well. In order to review the wells at their most conservative levels, the layer with the deepest simulated groundwater levels was assumed.

The simulated hydrographs were evaluated to determine if/when minimum thresholds were exceeded in each alternative. Of the nine RMN wells, one well exceeded its MT in at least one modeled alternative, and the other eight wells did not come close to exceeding their respective MTs. The well that exceeded its MT is in the Sutter Subbasin, which is where BWD's transfer pumping is occurring. The hydrographs below (**Figure 4-16** through **Figure 4-24**) show depth to water with the y-axis is flipped so 0 feet depth to groundwater is at the top and deeper levels are lower. The MT line in red represents the minimum threshold as noted in the respective GSP, and when the depth to water is below the red line, an MT exceedance is occurring. Some of the wells indicate that groundwater levels are above the ground surface elevation of the RMN well. This is occurring for a few wells due to discrepancies between the ground surface elevation of the model layering and the ground surface elevation of the RMN well. Adjusting the ground surface elevation of the model was beyond the scope of this project.

**Figure 4-16** shows the hydrograph for the well that exceeds its MT at least once. This well (17N02E25J003M or 392970N1216907W003 or BWD-01C) is the shallowest perforation of a nested monitoring well (depth = 127 feet below ground surface, screen interval = 70 to 90 feet below ground surface). This well exceeds its MT 18 times out of the 600 time steps (months) of the model simulation. MT exceedances only occurred when there was the full amount of transfer pumping occurring, which is in Alternatives 2, 3, and 5. The 18 times these exceedances occur are all during the beginning of the simulation when the transfer pumping is

happening (in the first five years of the simulation). The first time a well exceeds MTs is in Alternatives 2, 3, and 5 during September of the 1st year of the simulation. For each subsequent year where GWST pumping occurs, MT exceedances at this well occur in at least one of the alternatives:

- July, August, and September of the 2nd year;
- June, July, August, and September of the 3nd year;
- June, July, August, and September of the 4nd year; and
- May, June, July, August, and September of the 5nd year into October of the 6th year.

These exceedances are only occurring during dry or critical years when GWST pumping is occurring. Once the GWST pumping ends, the groundwater levels recover and remain at least five feet above the MT for the remainder of the simulation for all alternatives.

**Figure 4-16: Hydrograph #9**

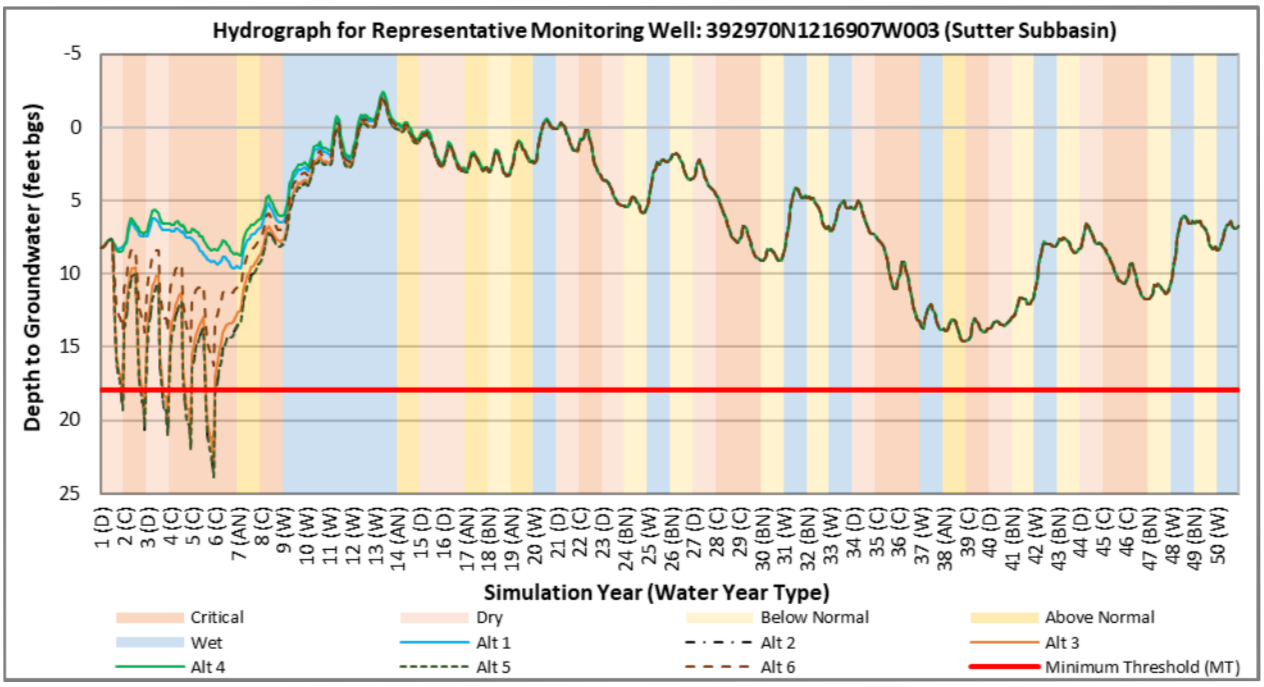


**Figure 4-17: Hydrograph #1**

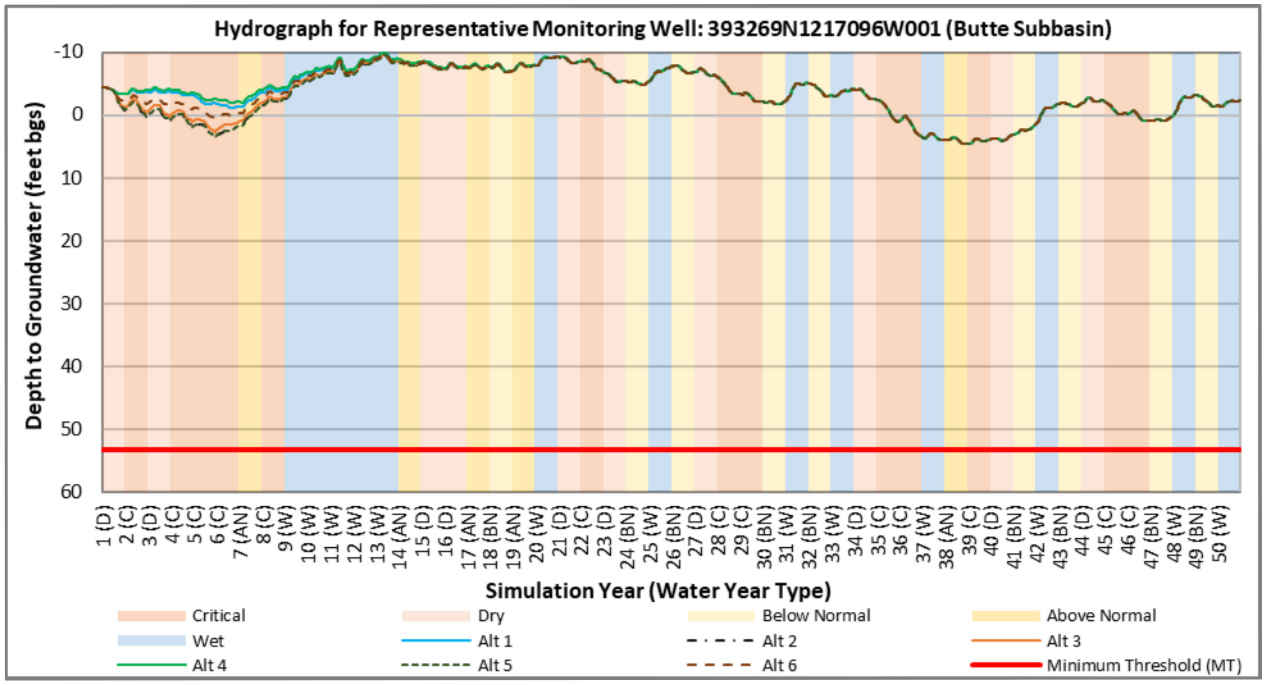



**Figure 4-18: Hydrograph #2**

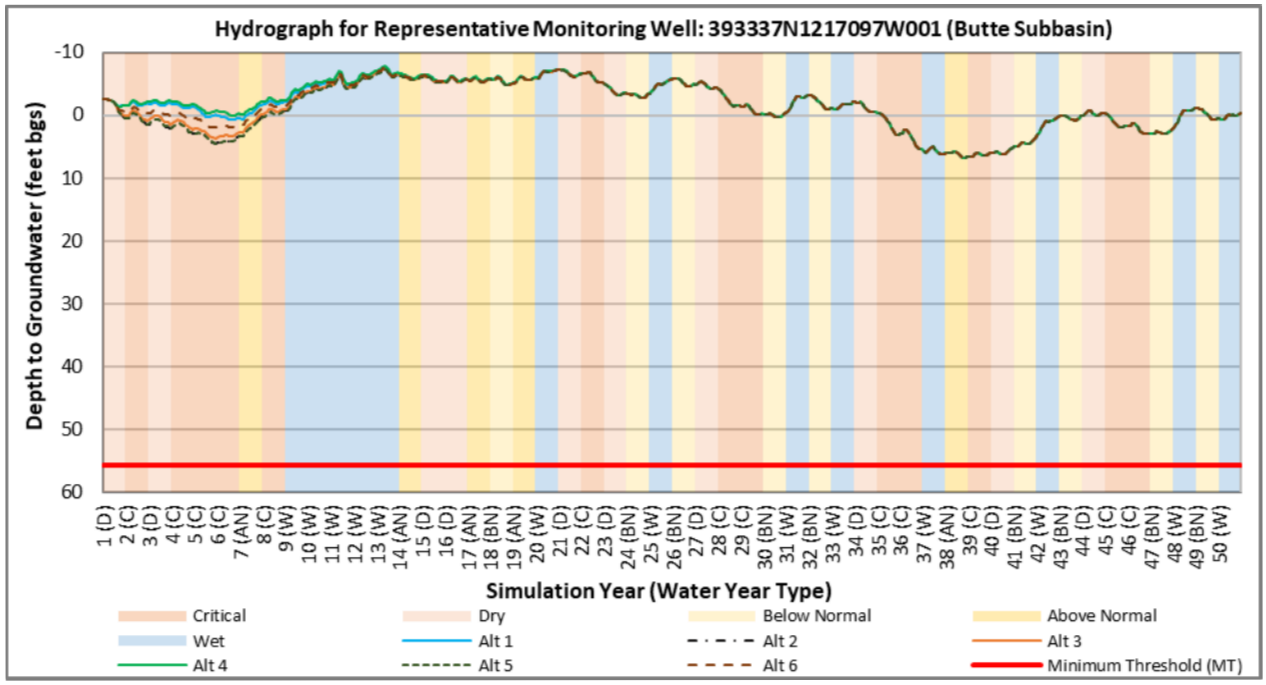


**Figure 4-19: Hydrograph #3**

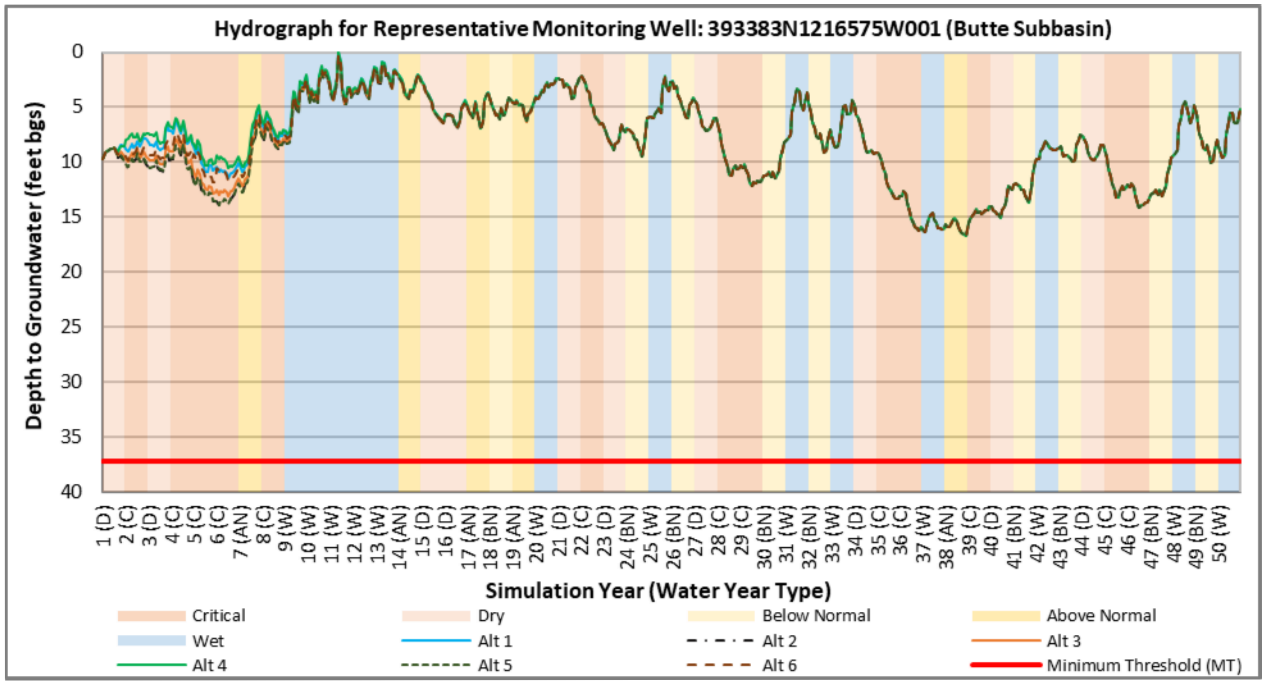



**Figure 4-20: Hydrograph #4**

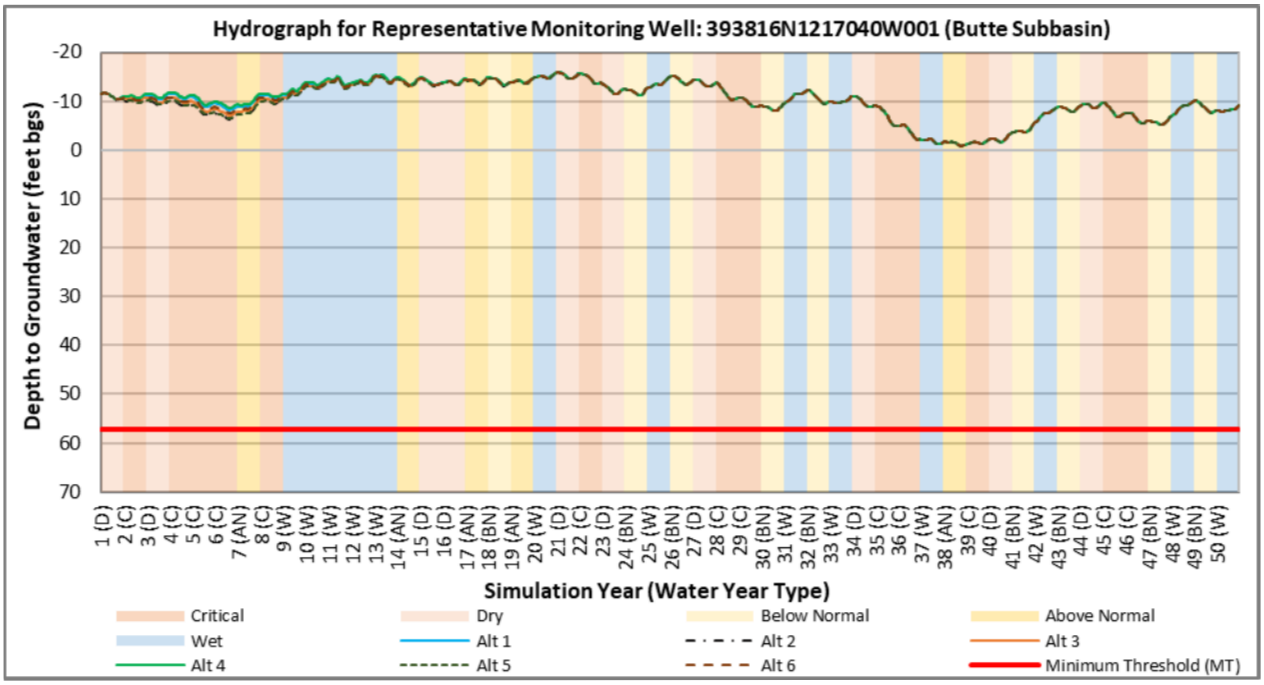


**Figure 4-21: Hydrograph #5**

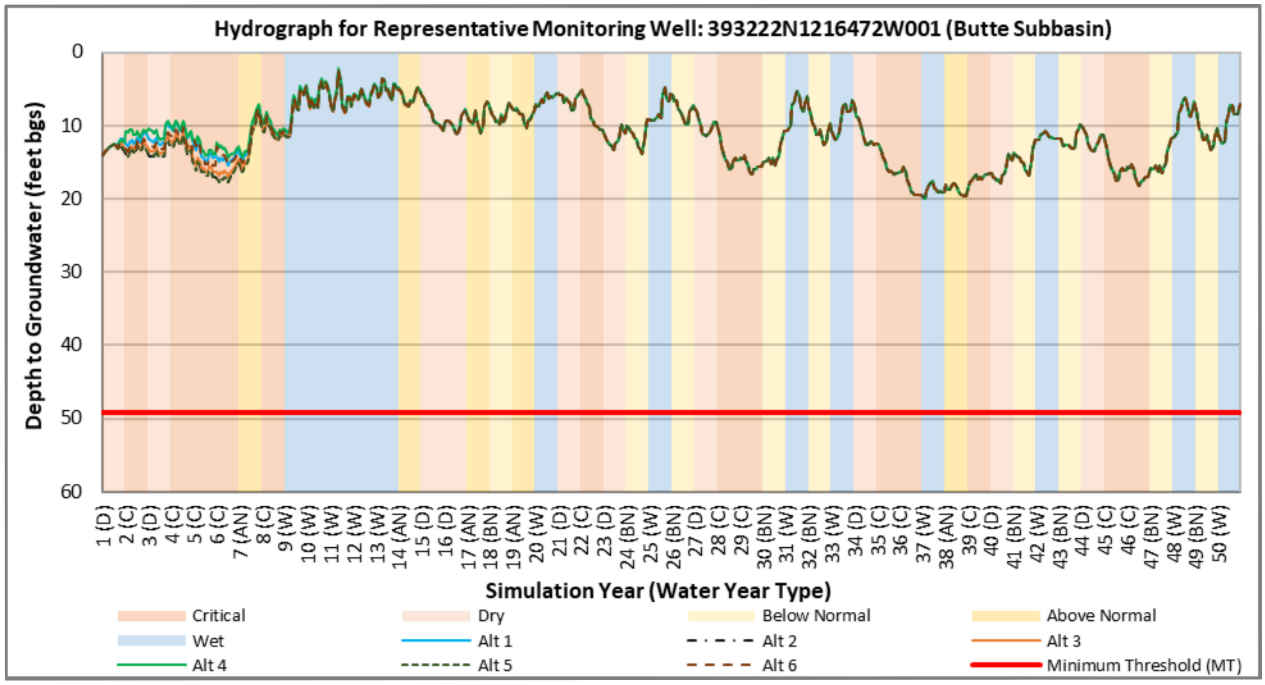



**Figure 4-22: Hydrograph #6**

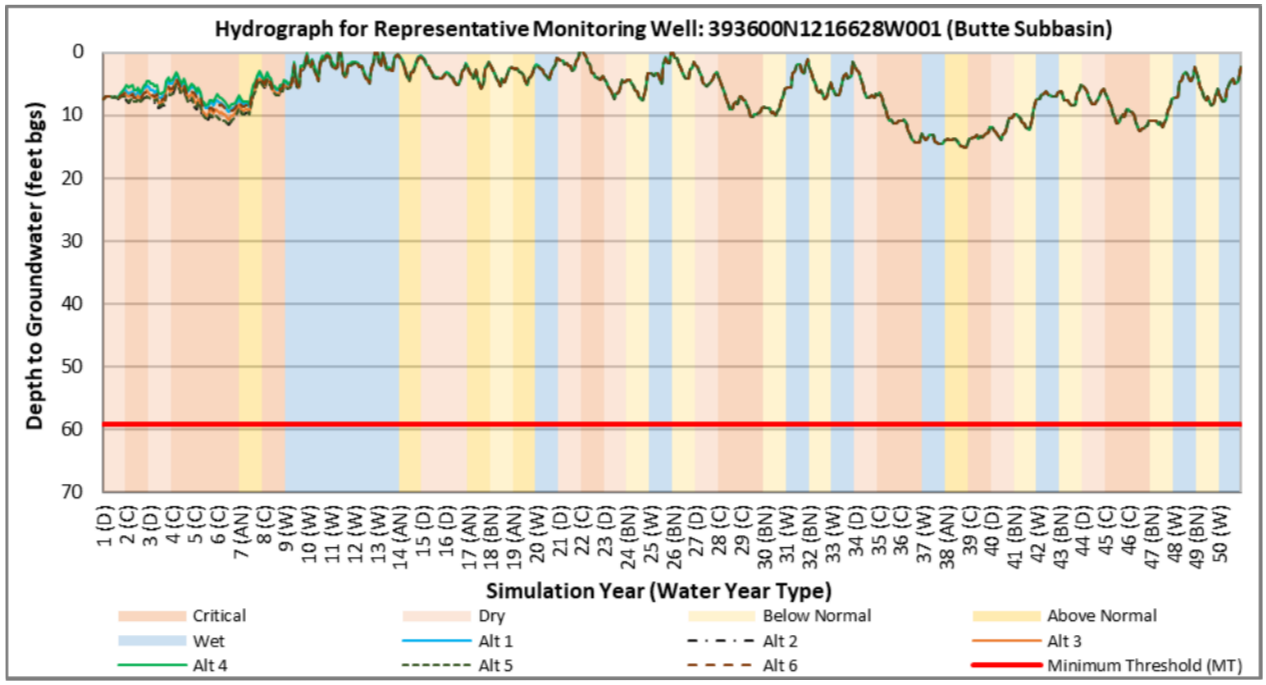


**Figure 4-23: Hydrograph #7**

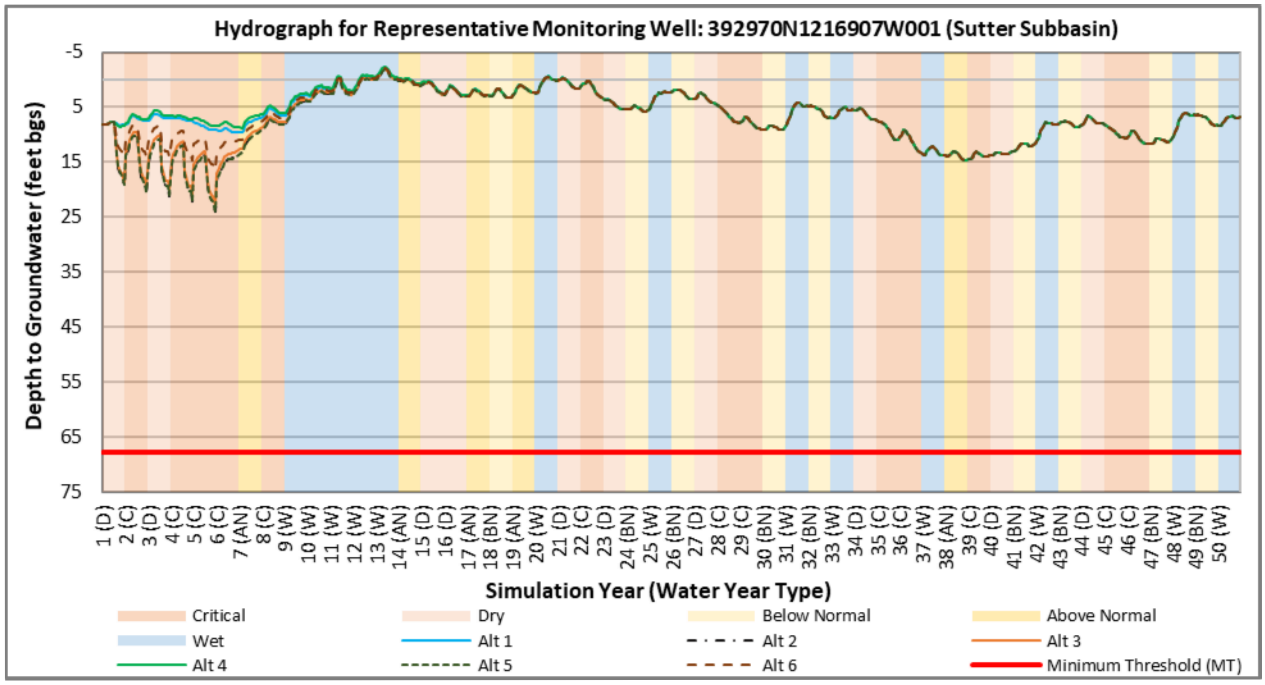
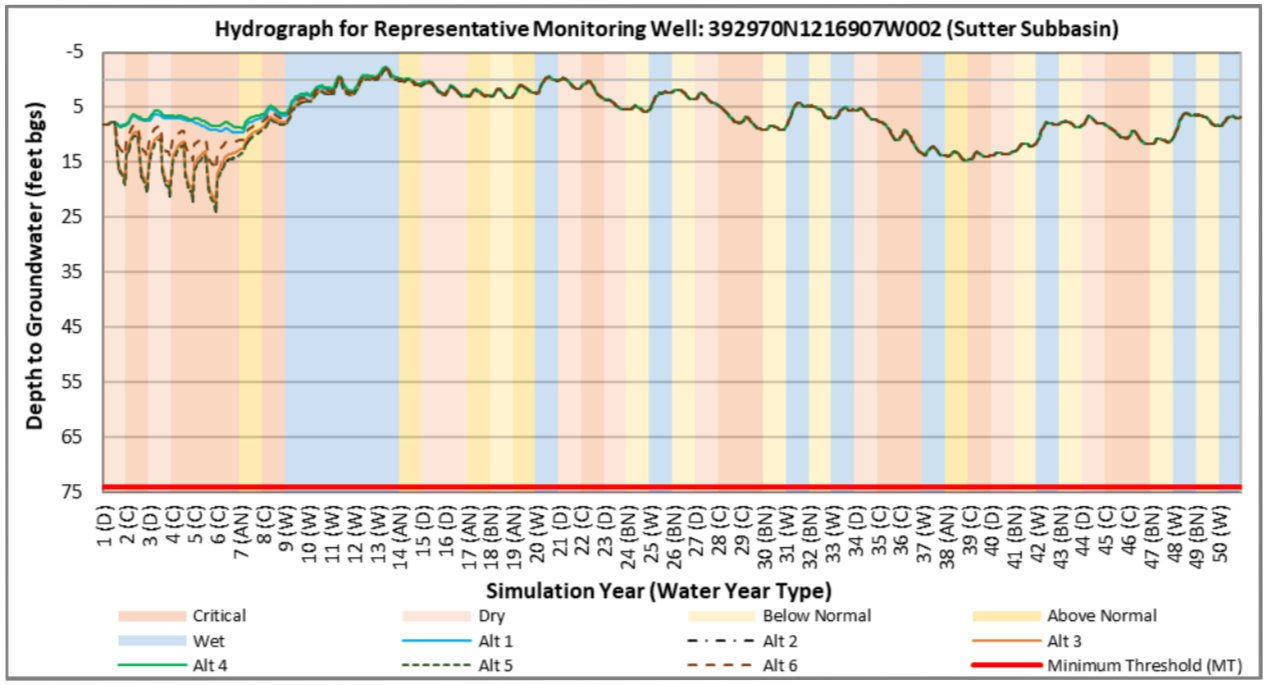



**Figure 4-24: Hydrograph #8**



# 5. References


Department of Water Resources (DWR). California Data Exchange Center (CDEC). San Joaquin Valley Water Year Hydrologic Classification Index. http://cdec.water.ca.gov/cgi-progs/iodir/WSIHIST.

DWR. California Open Data Portal. Provisional - 2023 Statewide Crop Mapping GIS Shapefile. Created July 18, 2025. https://data.ca.gov/dataset/statewide-crop-mapping.

DWR and Bureau of Reclamation, California-Great Basin Region (USBR). December 2019. DRAFT Technical Information for Preparing Water Transfer Proposals (Water Transfer White Paper).

Groundwater Sustainability Plans:

Butte Subbasin. January 2022. Butte Subbasin Sustainable Groundwater Management Act Groundwater Sustainability Plan. Figure 2-30, Page 2-87.

Sutter Subbasin. January 2022. Sutter Subbasin Groundwater Sustainability Plan. Figure 5-91, Page 5-171.

Wyandotte Creek Subbasin. December 2021. Wyandotte Creek Subbasin Groundwater Sustainability Plan. Figure 2-20, Page 79.

Yuba Subbasins. December 2024. Yuba Subbasins Water Management Plan: A Groundwater Sustainability Plan. Figure 2-81, Page 2-140.

# Appendix A: Model Comparison Between C2VSimFG-Sutter and SVSim



# Butte Water District

## Comparison of SVSim and C2VSimFG-Sutter

**Prepared by:**
Devin Hunt,
Sara Roche

October 2025

Woodard & Curran

# Presentation Outline

- Overview of Models Compared
- Comparison of Model Design
  - Model Grid (Elements and Nodes) and Layering
  - GWL Observation Wells and Stream Gages near BWD
- Comparison of Model Inputs
  - Land Use
  - Evapotranspiration
- Comparison of Model Outputs
  - Water Budgets
  - Groundwater Level Hydrographs
  - Stream Flow

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# Overview of Models Compared

## SVSim Version 1.0

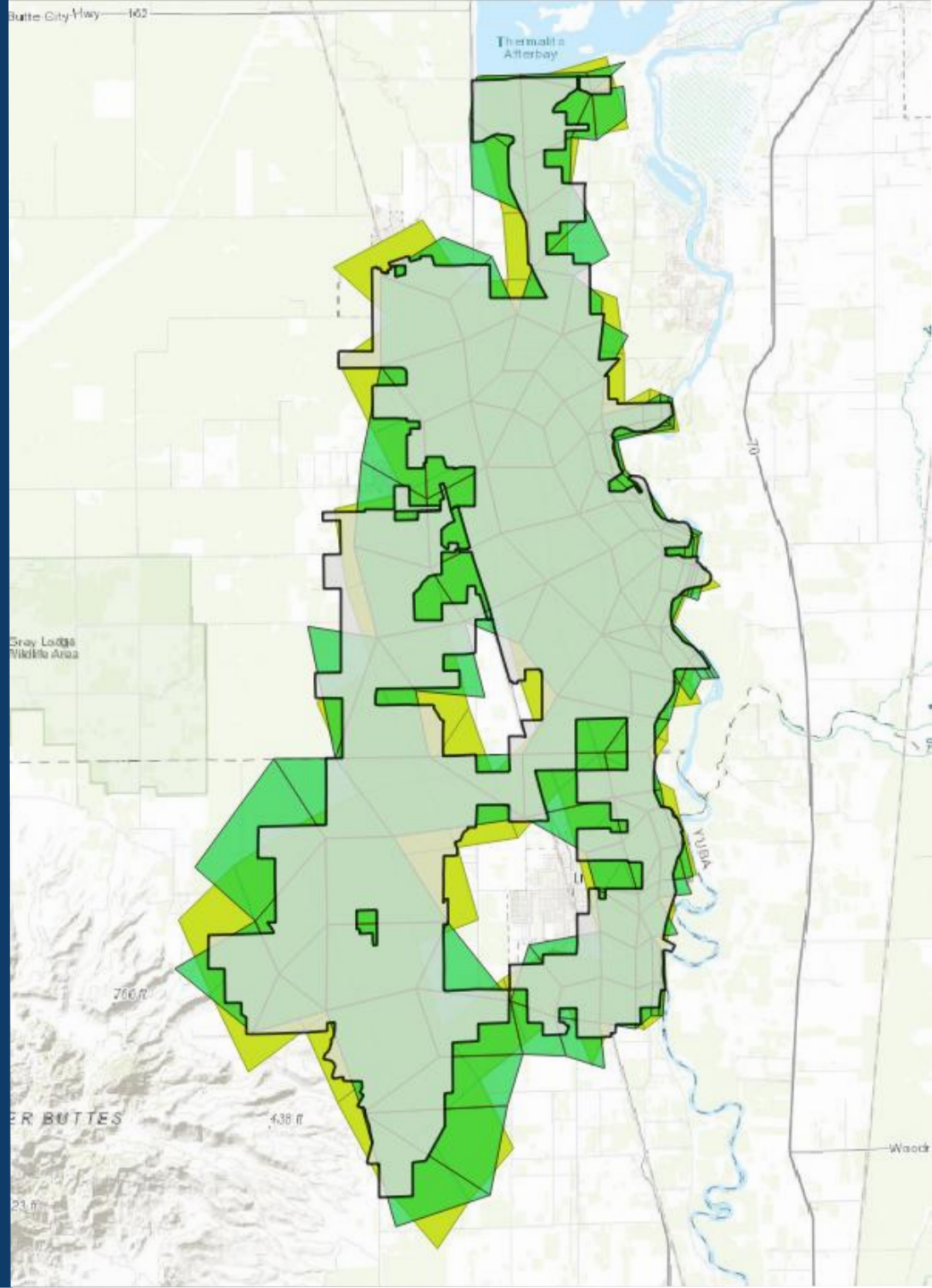
- Model Platform: Integrated Water Flow Model (IWFM)
  - Finite element model
  - Developed and maintained by DWR
- Model Extent: Sacramento Valley
- Model Time Period:
  WY 1974 to 2015, monthly time step
- Purpose: Built by DWR and the State Water Contractors to better evaluate project-specific assessments of stream depletion caused by groundwater substitution transfers.
- Maintenance and Update Schedule: Version 1.0 completed in 2021. No public updates since that time.

## C2VSimFG-Sutter Version 1.0

- Model Platform: Integrated Water Flow Model (IWFM)
  - Finite element model
  - Developed and maintained by DWR
- Model Extent: Entire Central Valley, edits focused on Sutter Subbasin
- Model Time Period:
  WY 1986 to 2024, monthly time step
- Purpose: Locally-refined version of Central Valley-wide model (C2VSimFG) to analyze historical, current, and projected conditions of Sutter Groundwater Subbasin.
- Maintenance and Update Schedule: Created and calibrated for 2022 GSP. Extended model time period for GSP Annual Reports. Current update and calibration for 2027 GSP in progress.

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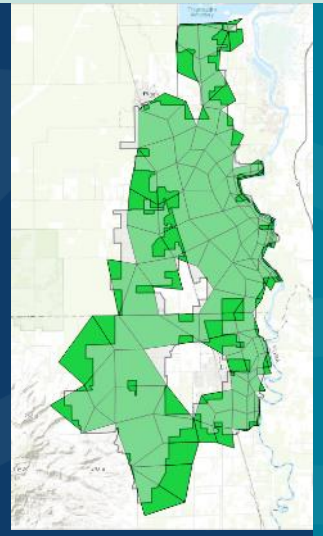
# Model Design



# Model Elements

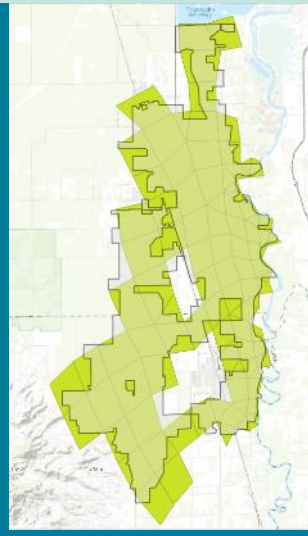
## SVSim

- 139 Elements
- Total acreage: 40,100.4
- Average element acreage: 288.5



## C2VSimFG-Sutter

- 93 Elements
- Total acreage: 40,285.7
- Average element acreage: 433.2



## BWD Service Area

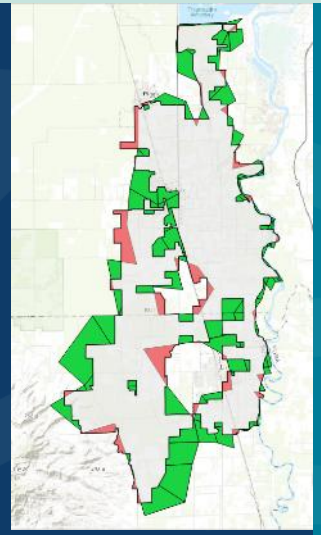
- 32,324 acres

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# Elements – Overlap Analysis

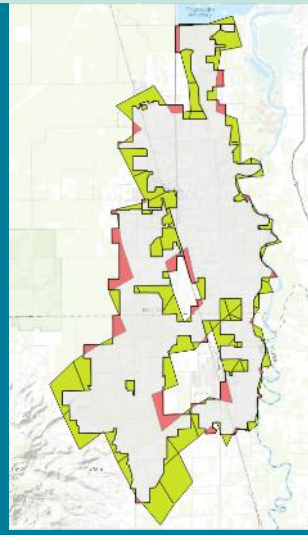
## SVSim

- Total coverage of BWD: 93.0%
- Element area overlap with BWD: 68.9%
- Element area outside BWD: 10,054 ac.
- BWD area outside of elements: 2,260 ac. (red)



## C2VSimFG-Sutter

- Total coverage of BWD: 93.6%
- Element area overlap with BWD: 69.0%
- Element area outside BWD: 10,017 ac.
- BWD area outside of elements: 2,056 ac. (red)

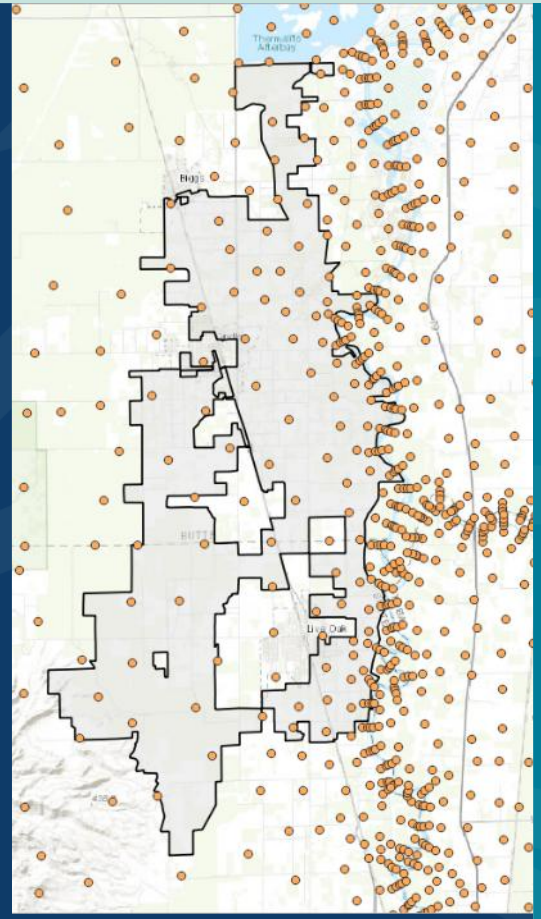


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# Groundwater Nodes

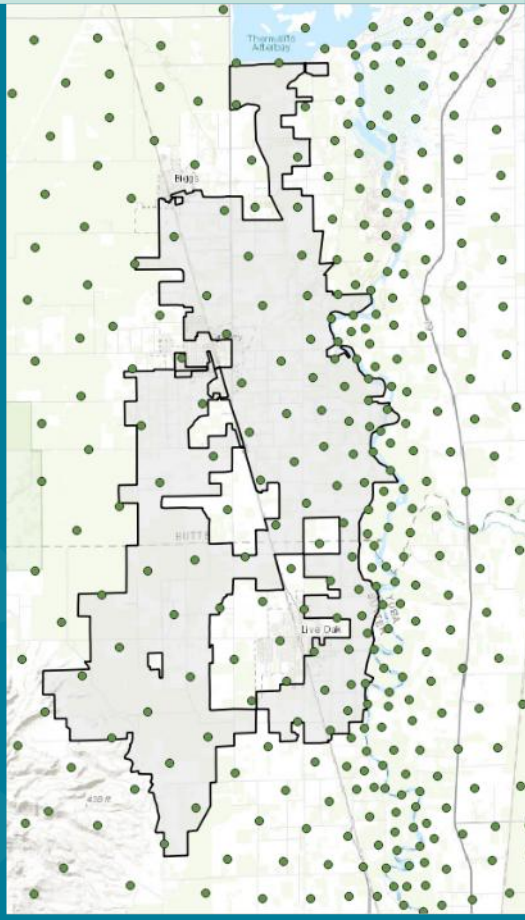
## SVSim

- Higher density of nodes along stream channels



## C2VSimFG-Sutter

- More consistent node distribution over BWD



Woodard & Curran

# Model Layering

## SVSim

- 9 Aquifer Layers
- Average aquifer thickness of 1,007 ft
  - Total thickness ranges from 604-1,572 ft
  - About 40% of the thickness contained in Layer 9
  - Layers 1-8 about 603 ft

## C2VSimFG-Sutter

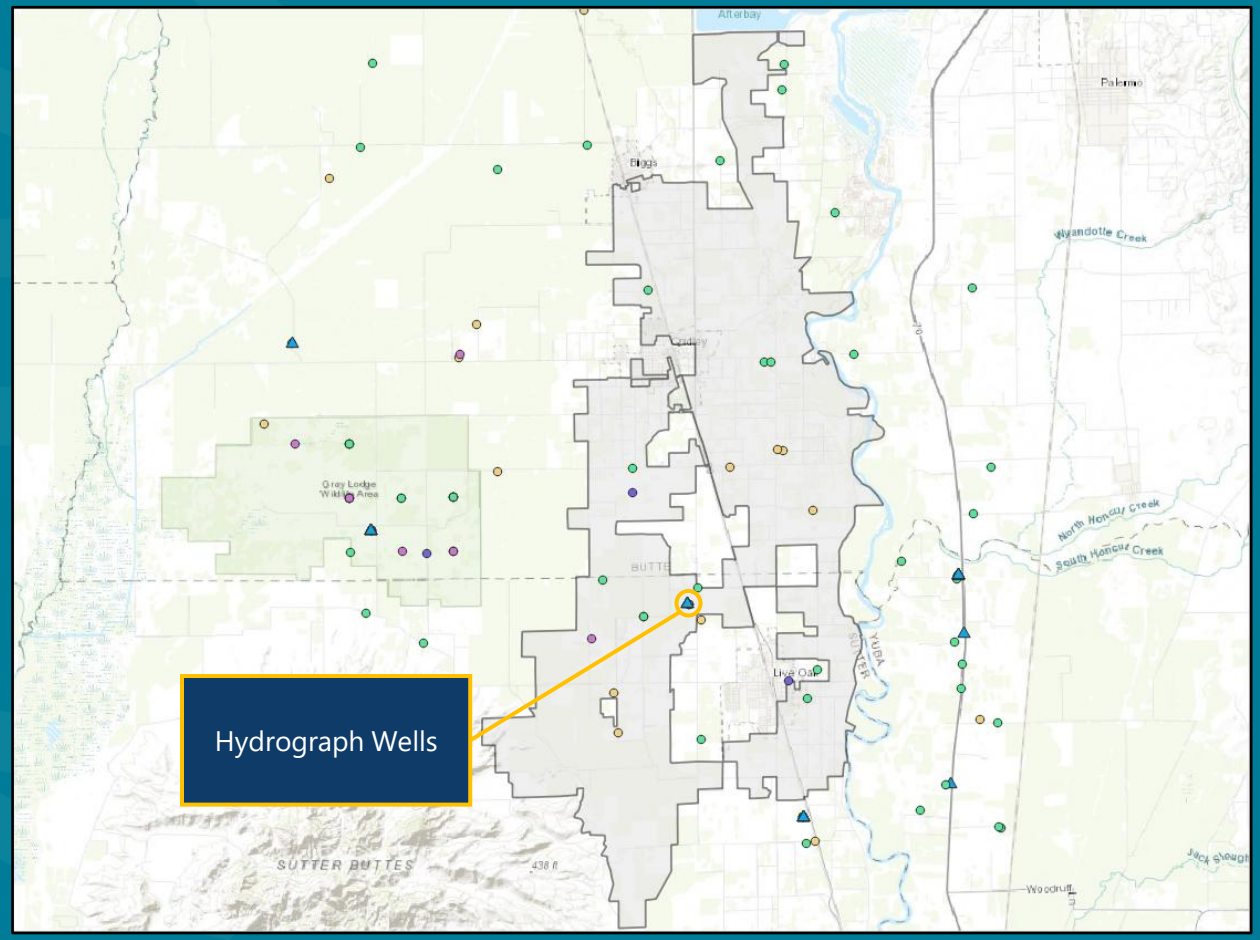
- 4 Aquifer Layers
- Average aquifer thickness of 1,090 ft
  - Total thickness ranges from 660-2,111 ft
  - Thickness roughly evenly distributed among the four layers
  - Layers 1-3 about 876 ft

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# Groundwater Level Observation Wells

GWL observation wells near BWD:

- 44 wells within 1 mile of BWD
  - 8 Observation wells
  - 13 Wells with data provided by BWD
  - 3 wells selected for hydrograph comparison (nested well location)

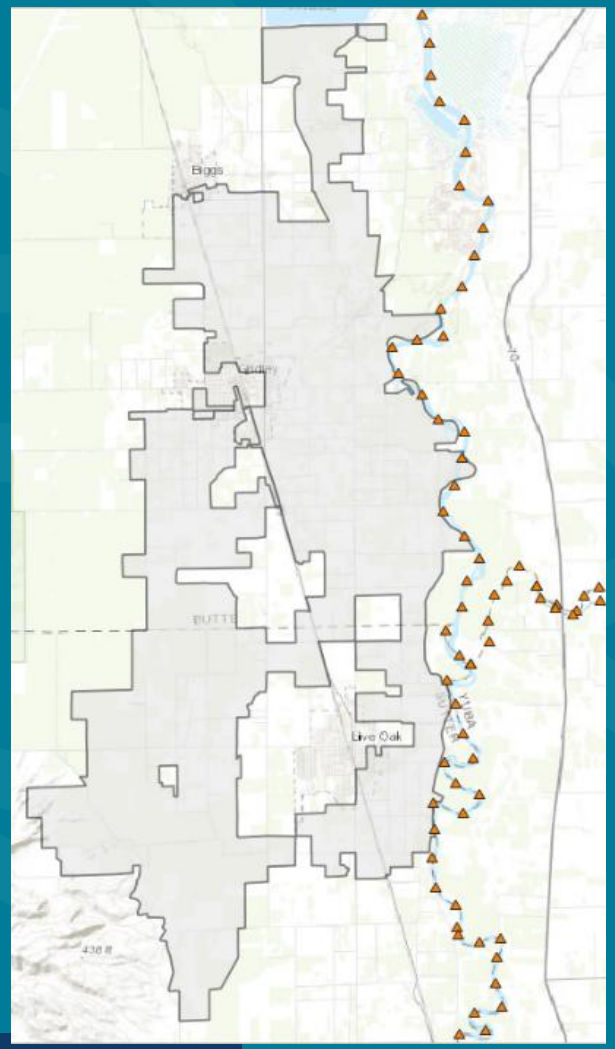


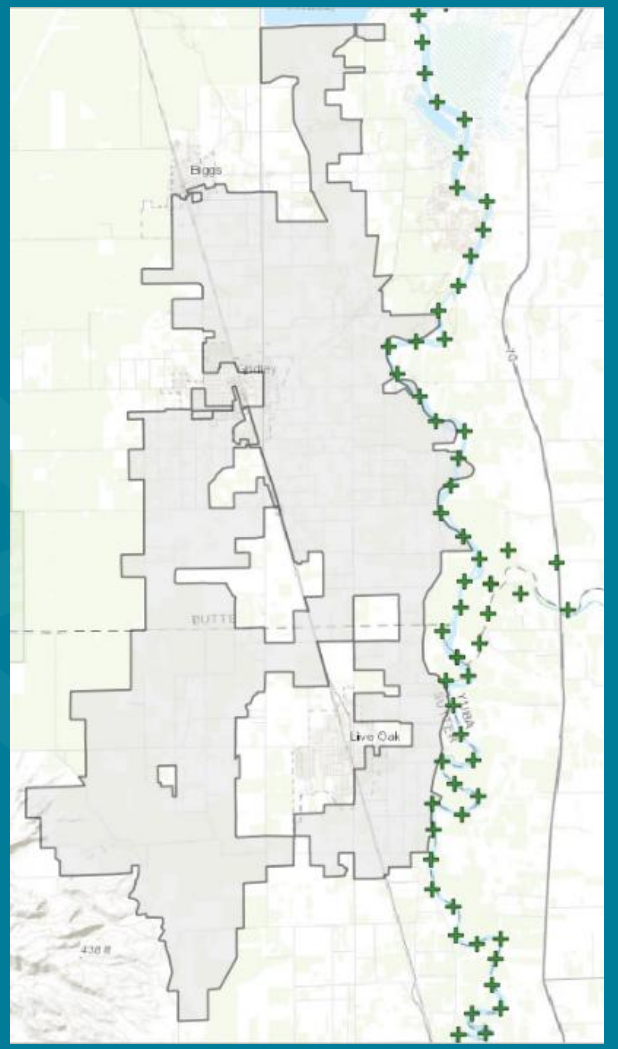

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# Hydrology – Stream Nodes

## SVSim and C2VSimFG-Sutter

- Adjacent to Feather River
- BWD receives water from 2 surface water diversions
  - Feather River via Joint Board Canal to Biggs-West-Gridley WD and Butte WD for Ag
  - Thermalito Afterbay via Joint Board Canal to Biggs-West-Gridley WD and Butte WD for Ag




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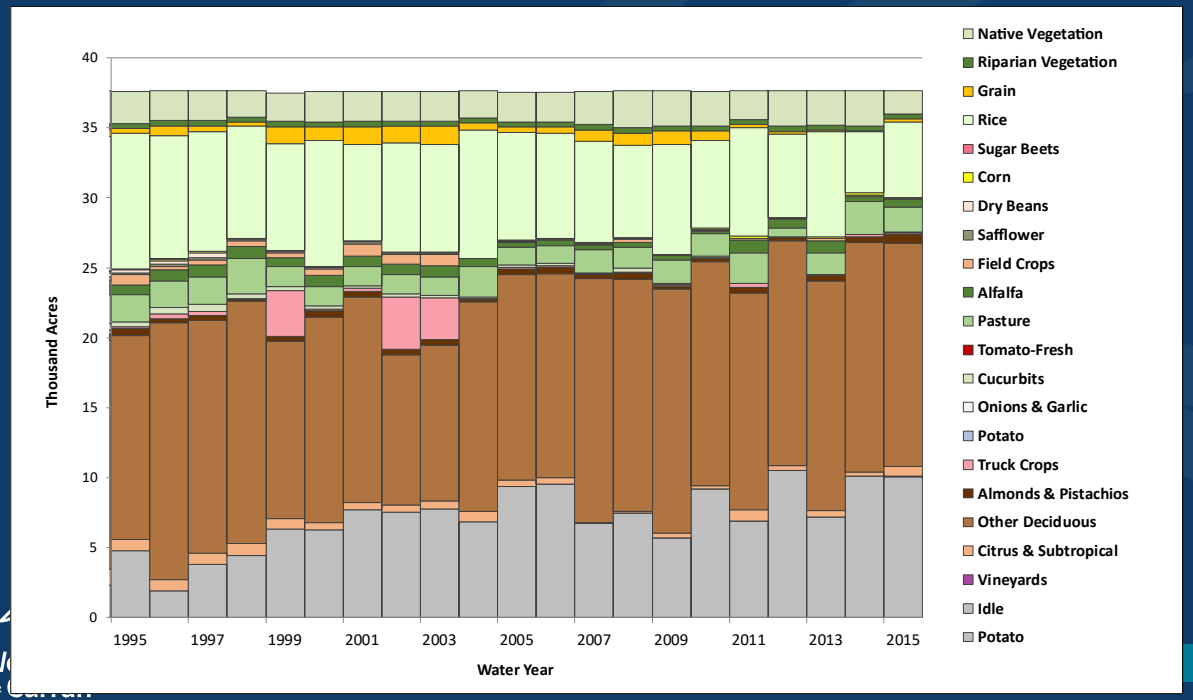
# Model Inputs

# Land Use*

*Numbers are not adjusted for the ~70% overlap of elements with BWD

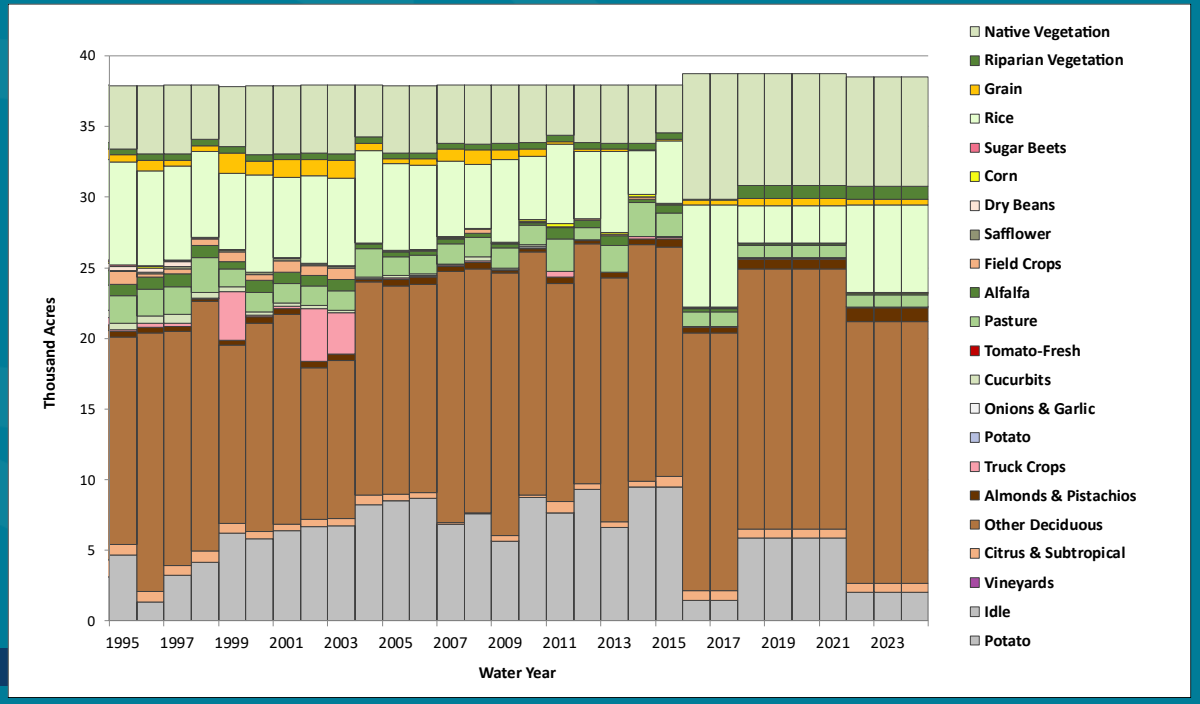
## SVSim

- Last updated with 2015 statewide crop mapping



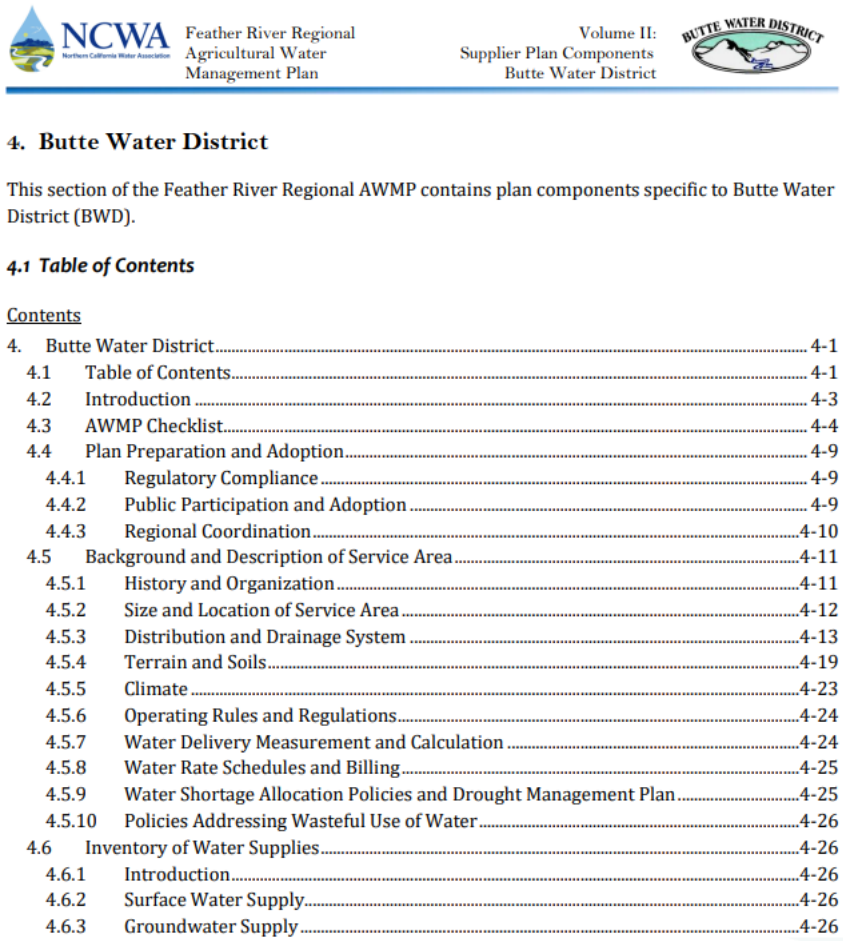

## C2VSimFG-Sutter

- Since there wasn't statewide crop mapping for 2017, Assumed 2016 land use applied to both 2016 and 2017
- Assumed 2018 applies to 2019-2021, and crop mapping for 2019 applies for 2022-2024



# Feather River Regional Agricultural Water Management Plan (BWD AWMP)

- Includes water budgets from 1999 to 2019
  - ET and land use
  - SW diversions, GW pumping
  - Substitutions / transfers



NCWA Feather River Regional Agricultural Water Management Plan — Volume II: Supplier Plan Components Butte Water District

**4. Butte Water District**

This section of the Feather River Regional AWMP contains plan components specific to Butte Water District (BWD).

***4.1 Table of Contents***

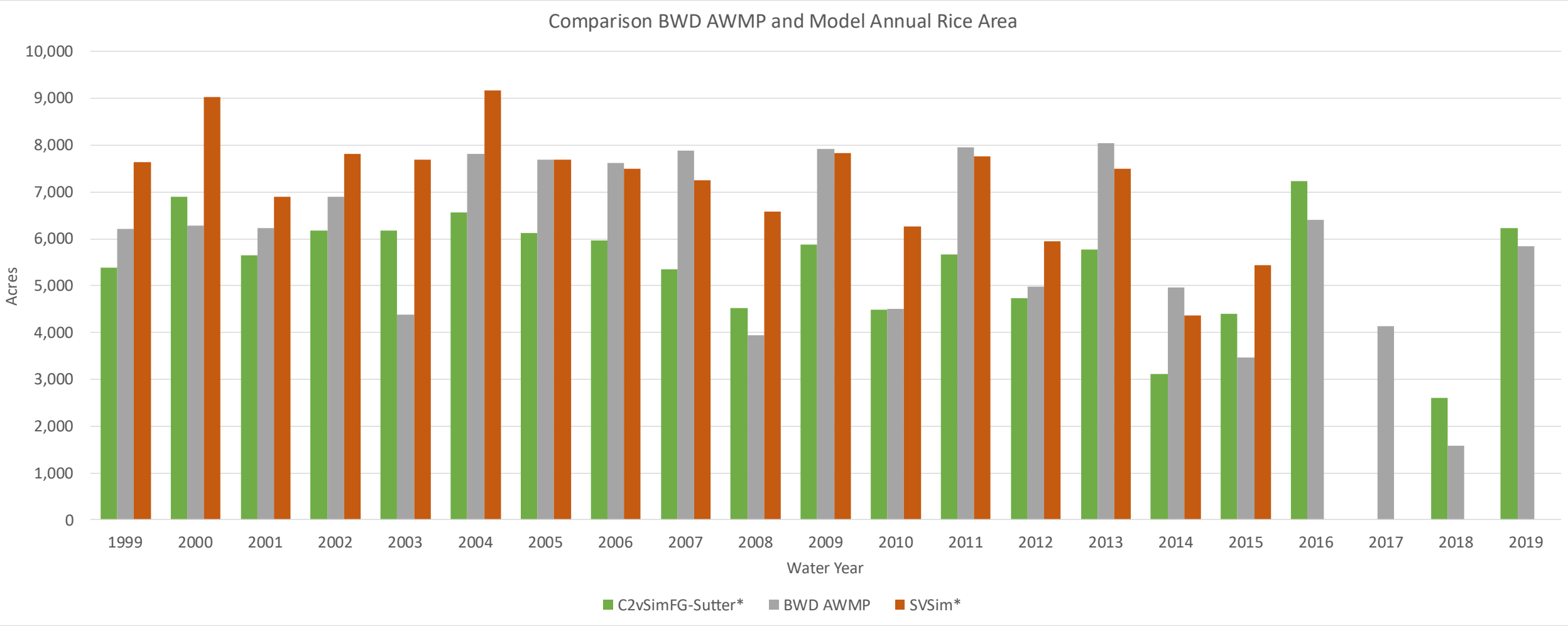
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Link to document

Woodard & Curran

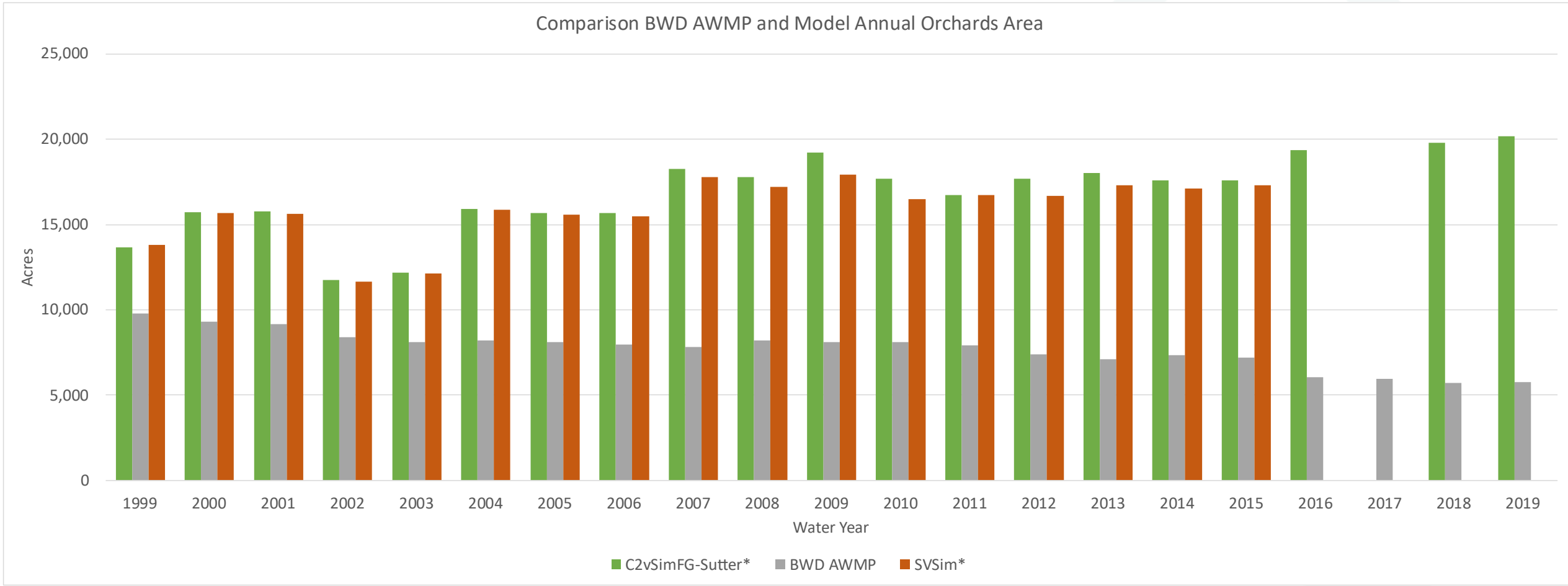
# Land Use – Rice




*Numbers are not adjusted for the ~70% overlap of elements with BWD
BWD AWMP Table 4.5: Rice

Woodard & Curran

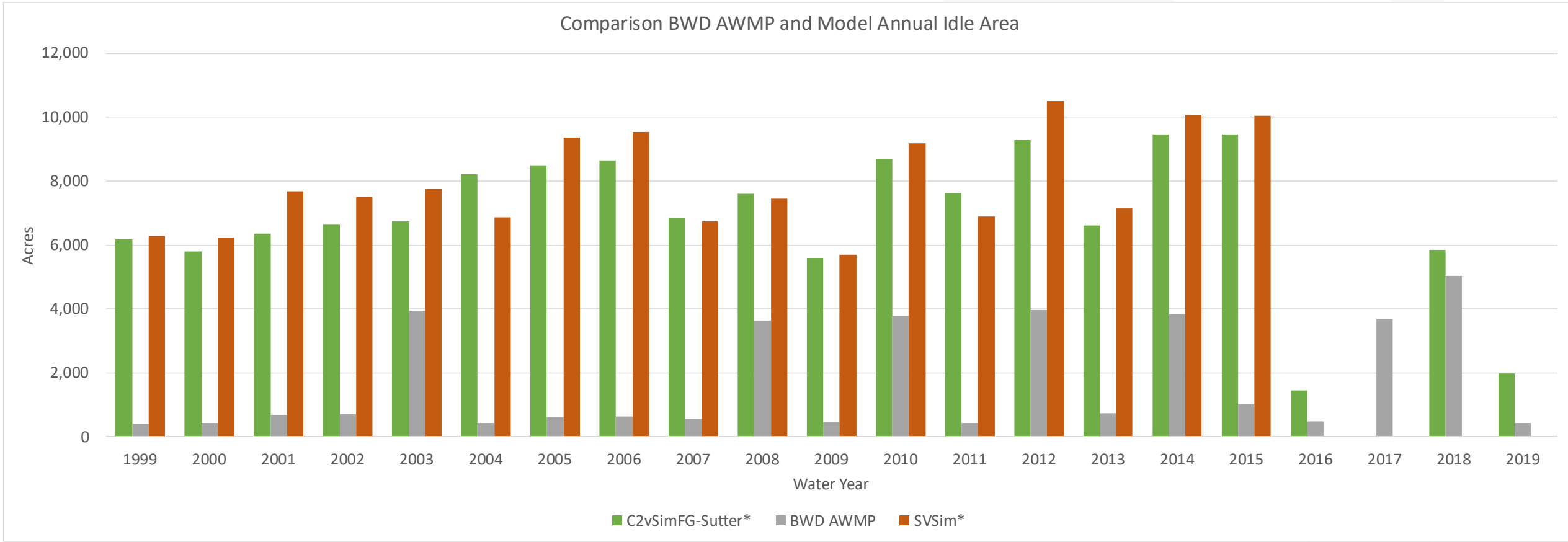
# Land Use – Orchards




*Numbers are not adjusted for the ~70% overlap of elements with BWD
*Crops classified as Orchard: Almonds and Pistachios, Citrus and Subtropical, Other Deciduous
BWD AWMP Table 4.5: Orchards

Woodard & Curran

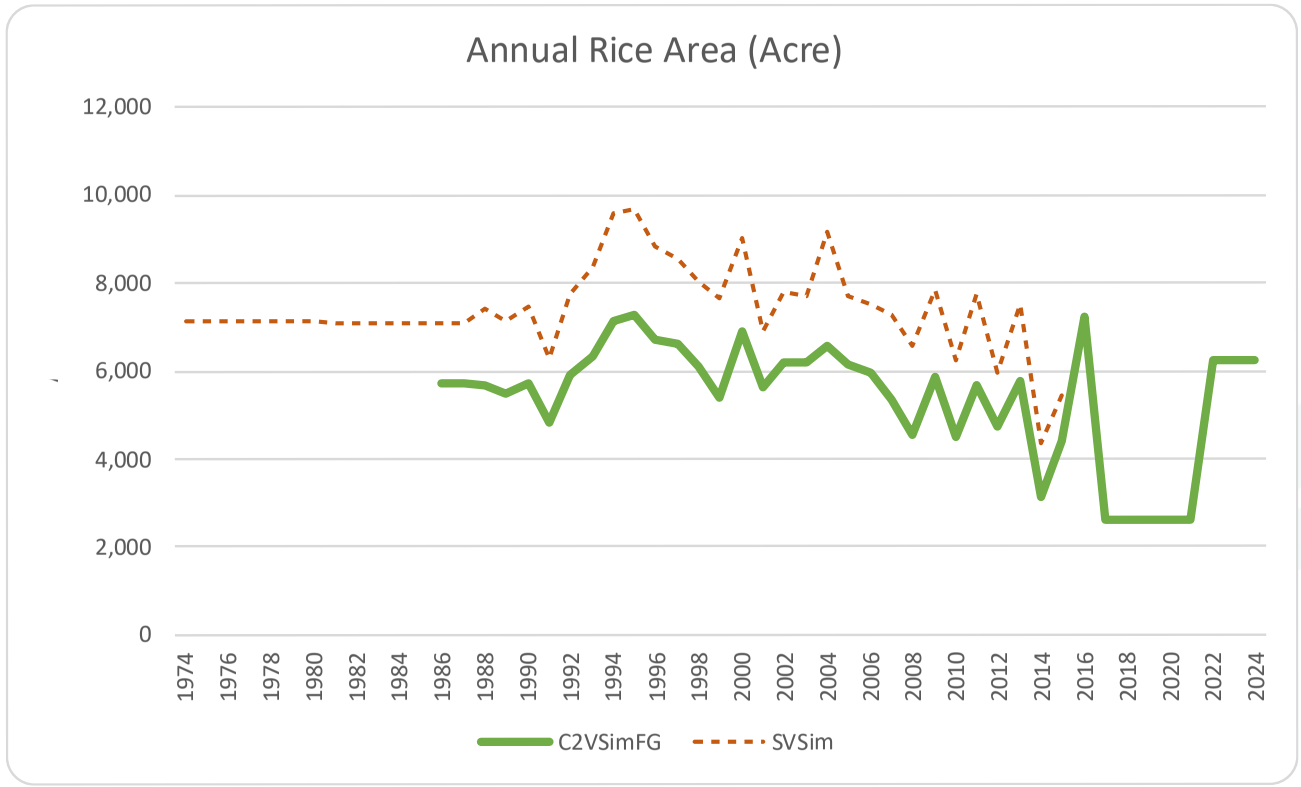
# Land Use – Idle

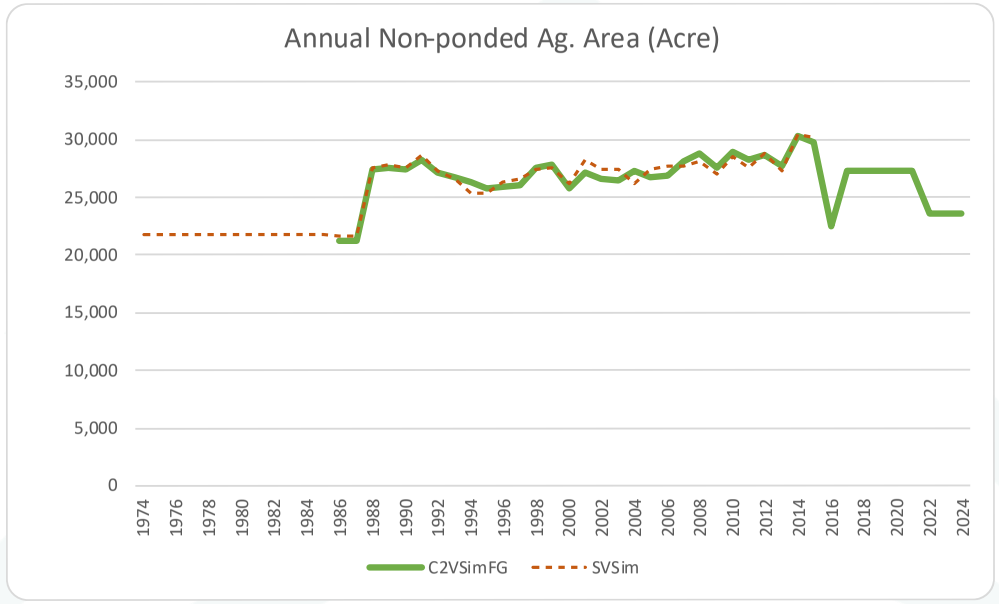


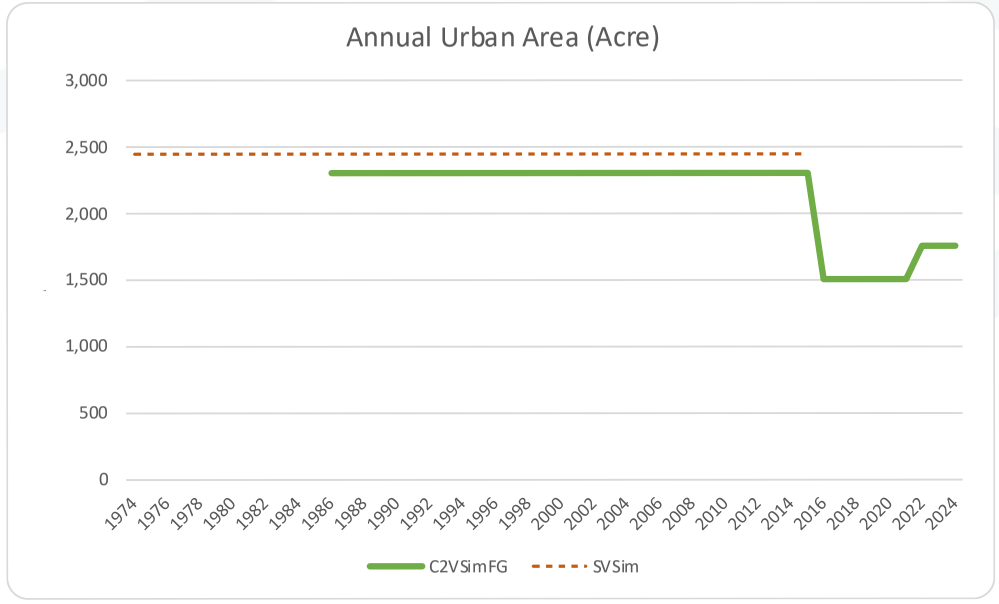

*Numbers are not adjusted for the ~70% overlap of elements with BWD
BWD AWMP Table 4.5: Idle

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# Land Use Comparison




Woodard & Curran

# Crop Evapotranspiration

## SVSim and C2VSimFG-Sutter

- Both models specify ET rates (inches/month) by broader model areas
- BWD is in Subregion 5 in both models
- Rice and idle lands have comparable ETs between the two models
  - Most important crops to focus on for crop idling
  - SVSim: 3.72 ft rice and 1.62 ft idle
  - C2VSimFG-Sutter: 3.88 ft rice and 1.79 ft idle
  - Difference between rice and idle is 2.10 ft in SVSim and 2.09 ft in C2VSimFG-Sutter

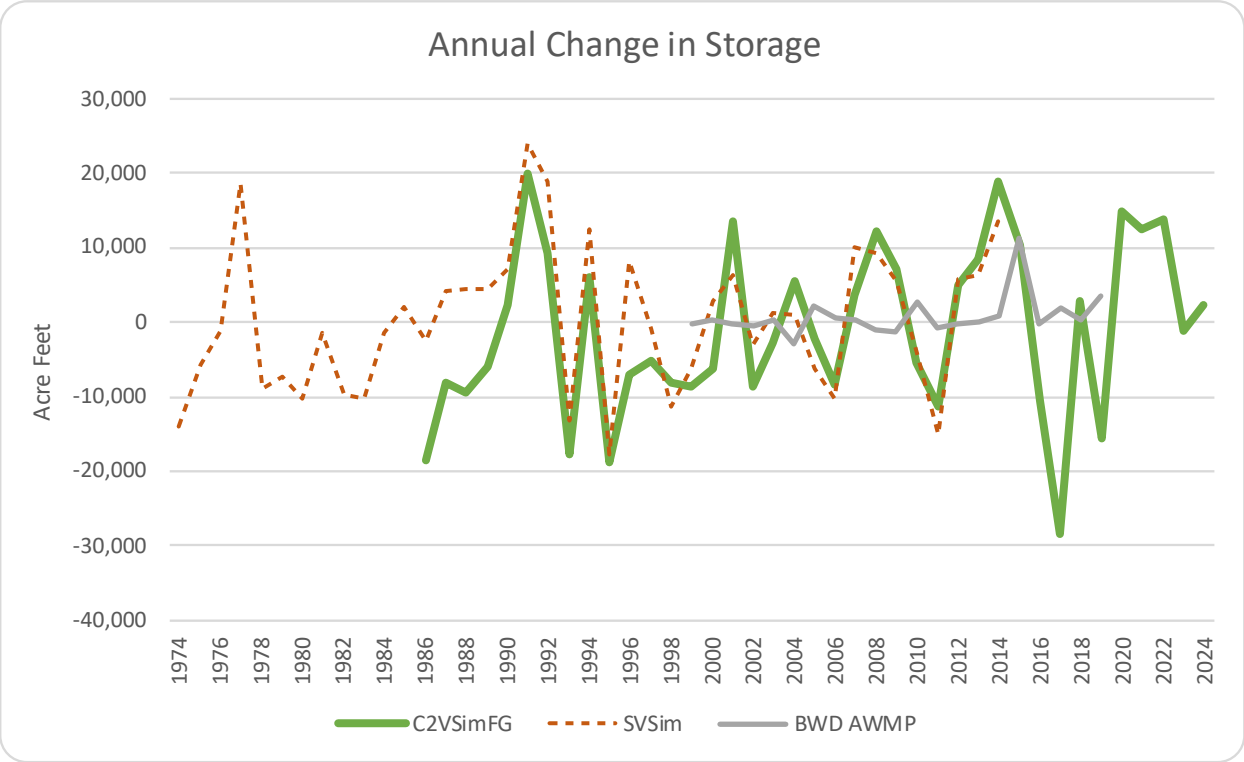
Woodard & Curran

| Model Crop Code | Model Crop | SVSim Long-term Average ET (inch/yr) | C2VSimFG-Sutter Long-term Average ET (inch/yr) |
|---|---|---|---|
| GR | Grain | 15.87 | 27.80 |
| CO | Cotton | 35.35 | 33.89 |
| SB | Sugar Beets | 41.37 | 33.86 |
| CN | Corn | 28.45 | 36.32 |
| DB | Dry Beans | 26.89 | 27.46 |
| SA | Safflower | 16.93 | 32.13 |
| FL | Field Crops | 28.61 | 33.43 |
| AL | Alfalfa | 46.17 | 41.65 |
| PA | Pasture | 47.74 | 33.89 |
| TP | Tomato Processing | 33.13 | 23.47 |
| TF | Tomato Fresh | 31.16 | 28.78 |
| CU | Cucurbits | 33.96 | 23.50 |
| OG | Onion & Garlic | 46.97 | 36.88 |
| PO | Potatoes | 35.91 | 29.41 |
| TR | Truck Crops | 31.43 | 28.56 |
| AP | Almonds & Pistachios | 47.64 | 37.70 |
| OR | Orchard | 42.63 | 35.34 |
| CS | Citrus & Subtropical | 34.27 | 29.27 |
| VI | Vineyards | 19.89 | 21.11 |
| ID | Idle | 19.40 | 21.47 |
| RI | Rice | 44.63 | 46.55 |
| RF | Refuges | 61.87 | 43.39 |
| UR | Urban | 41.82 | 24.77 |
| NV | Native Vegetation | 42.86 | 21.57 |
| RV | Riparian Vegetation | 61.87 | 45.04 |

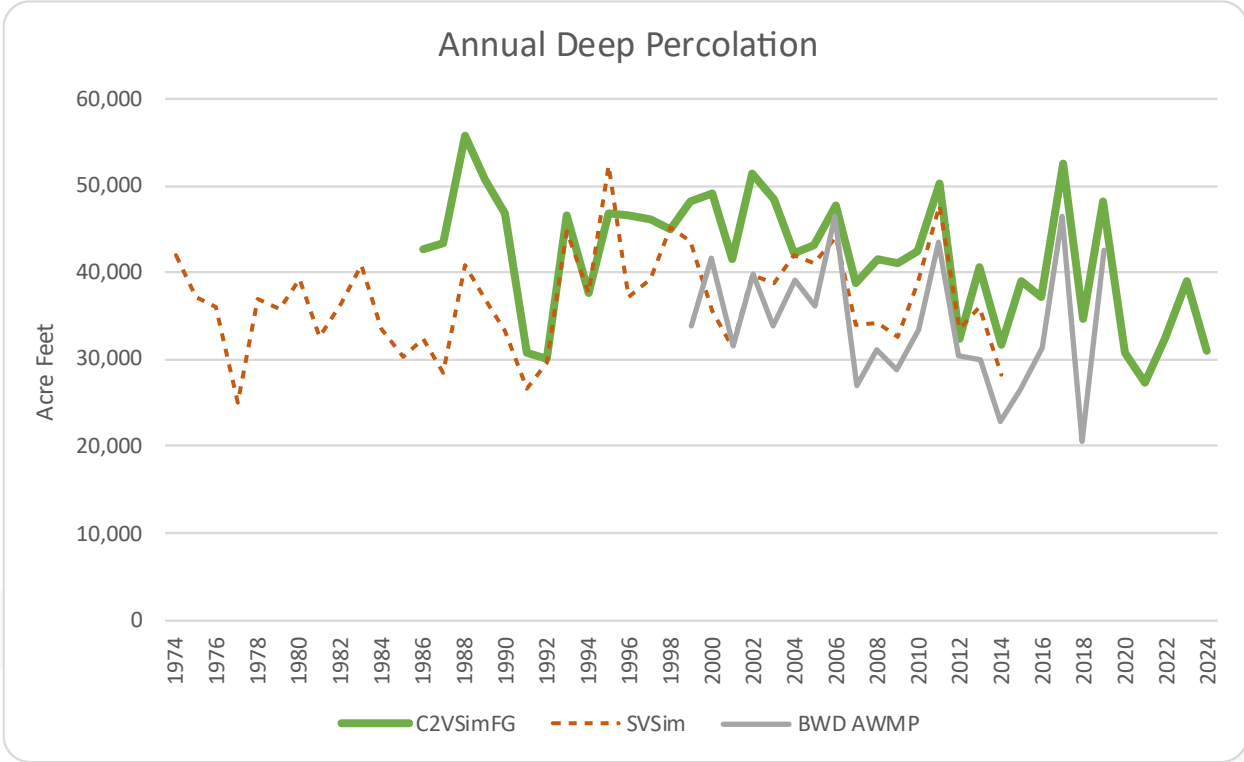
# Model Outputs

## Water Budgets & GWL/Stream Calibration

# Groundwater Budget: Comparison with AWMP




*BWD AWMP Table 4.14: Change in Storage

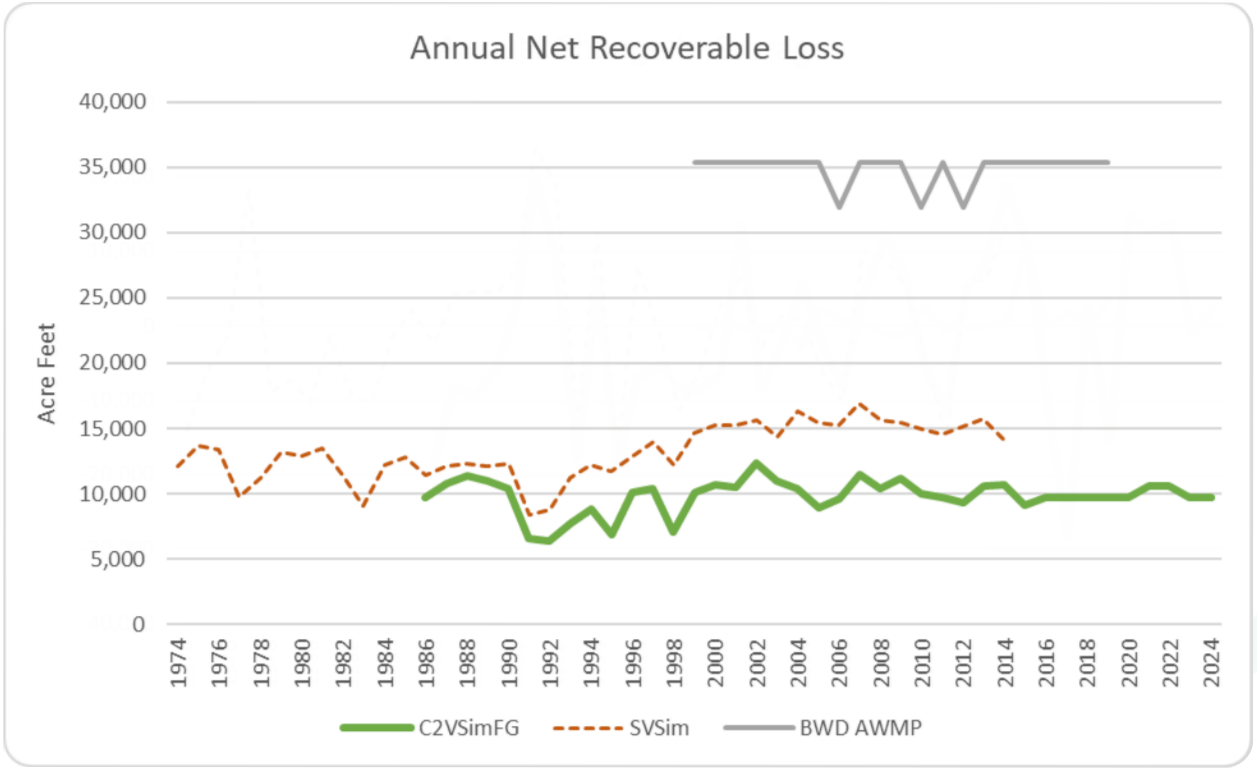



*BWD AWMP Table 4.8 or 4.14: Deep Percolation of Applied Water + Deep Percolation of Precipitation

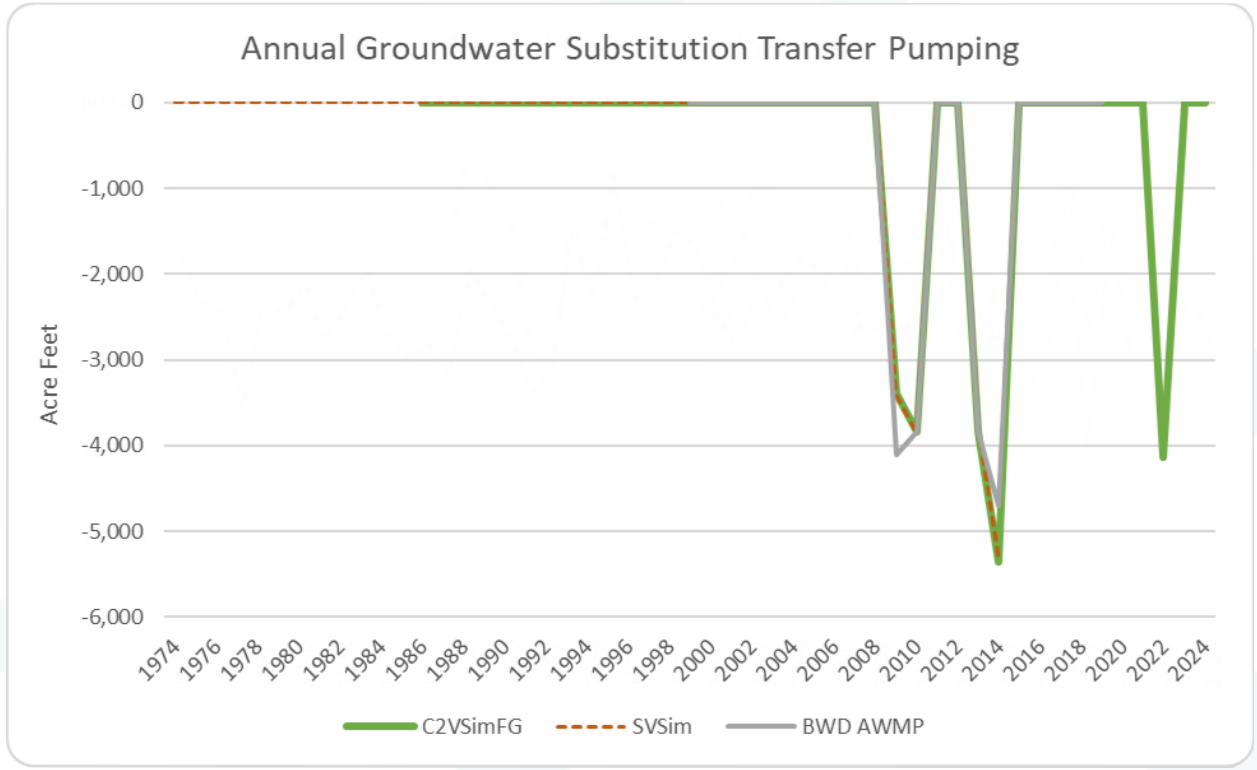
Woodard & Curran

*Numbers are not adjusted for the ~70% overlap of elements with BWD

# Groundwater Budget: Comparison with AWMP




*BWD AWMP Table 4.8 or 4.13 : Canal Seepage

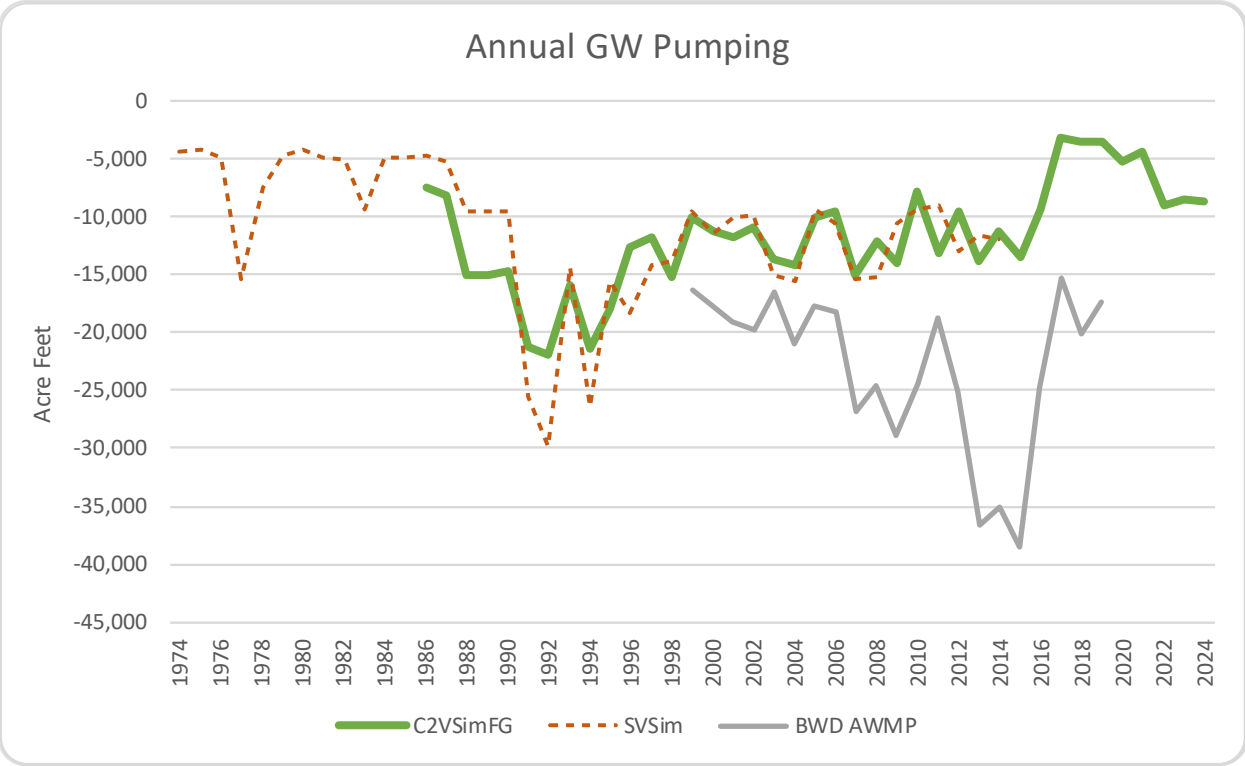



*BWD AWMP Page 4-47

Woodard & Curran

*Numbers are not adjusted for the ~70% overlap of elements with BWD

# Groundwater Budget: Comparison with AWMP



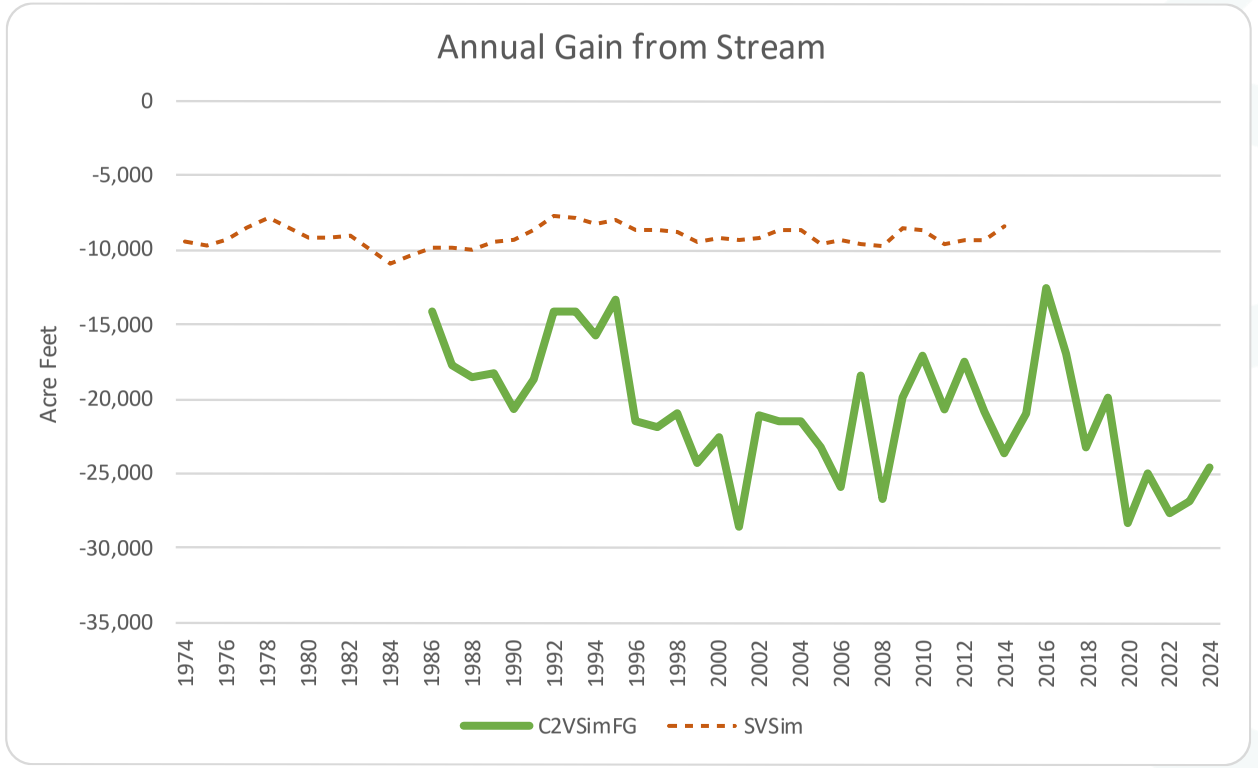

*BWD AWMP Table 4.9 or 4.14 : Groundwater Pumping

- SVSim most active pumping layer: Layer 6
  - Average of 5,131 AF/year over model period or 43% of total pumping
  - 74% of pumping in Layer 5 or 6 between 150-320 ft bgs on average
- C2VSimFG-Sutter most active pumping layer: Layer 1
  - Average of 11,655 AF/year over model period or 96% of total pumping
  - Pumping occurs between 0-300 ft bgs on average

*Numbers are not adjusted for the ~70% overlap of elements with BWD

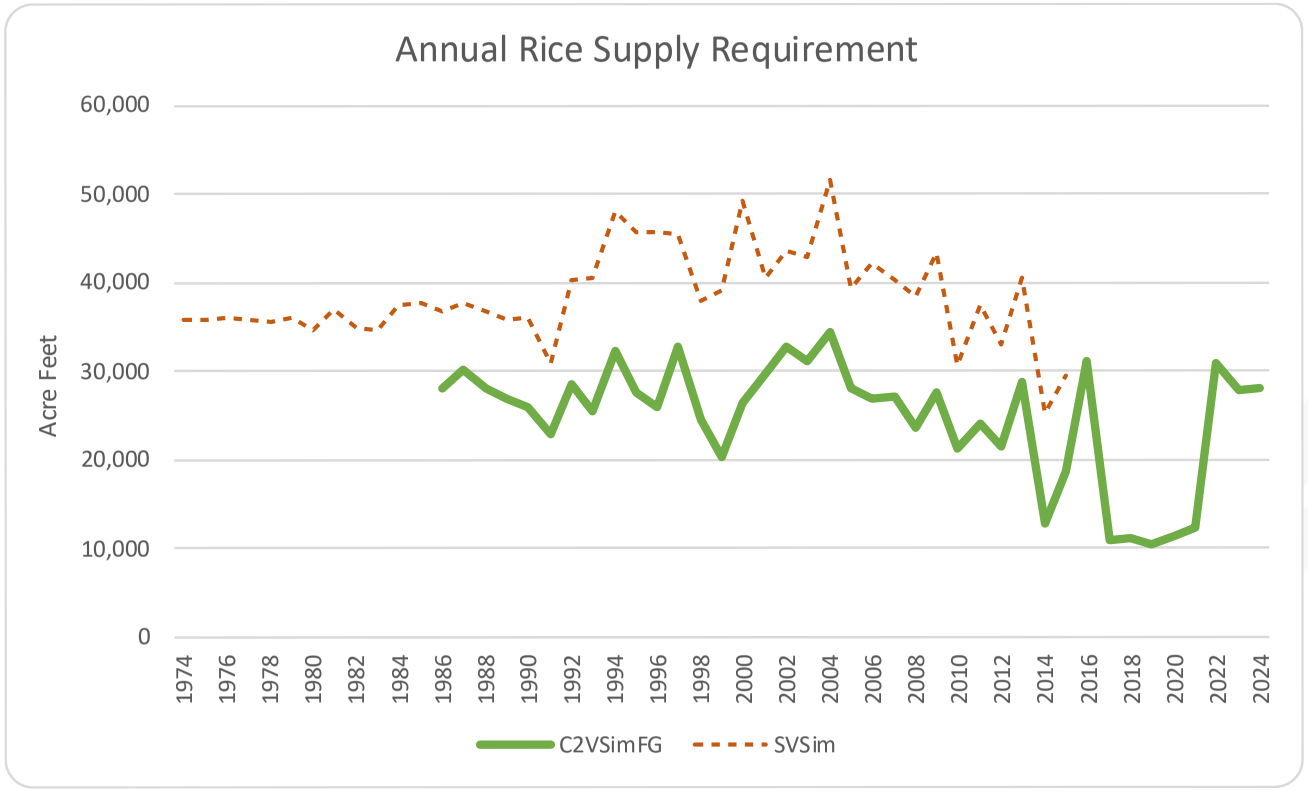
Woodard & Curran

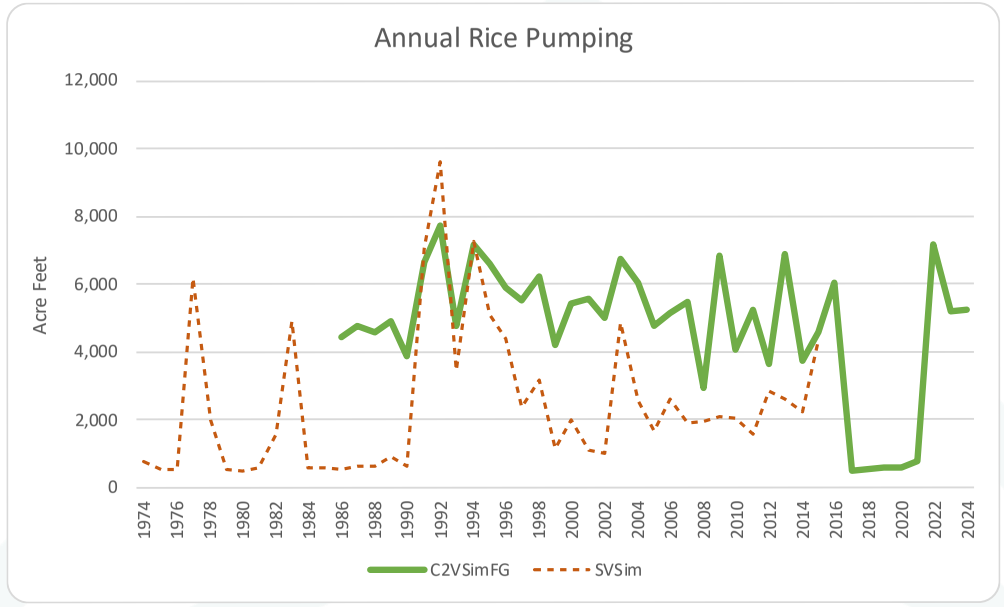
# Groundwater Budget: Surface Water to Groundwater Interaction

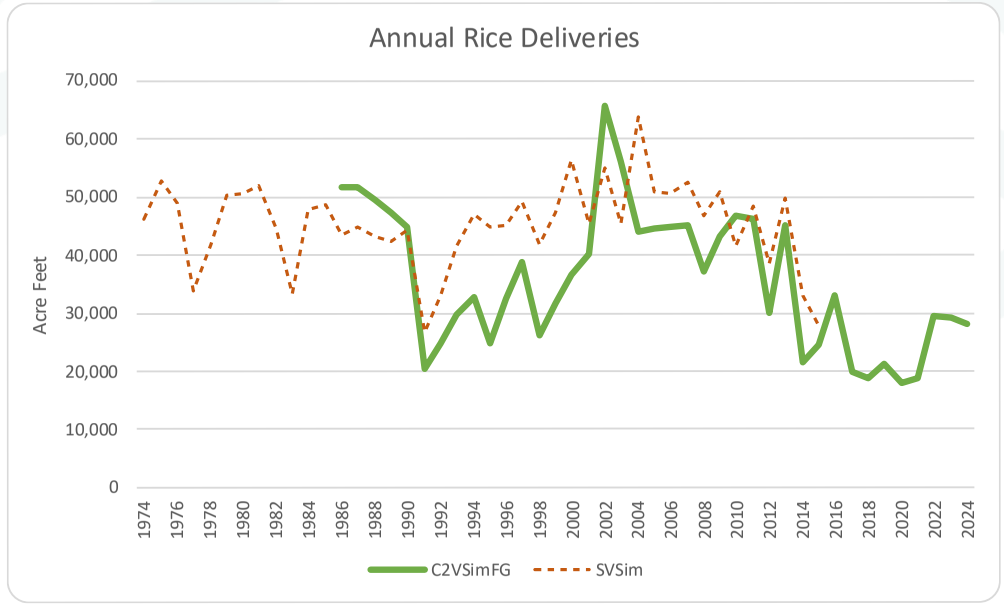



Woodard & Curran

# Land & Water Use Budget: Comparison of Rice

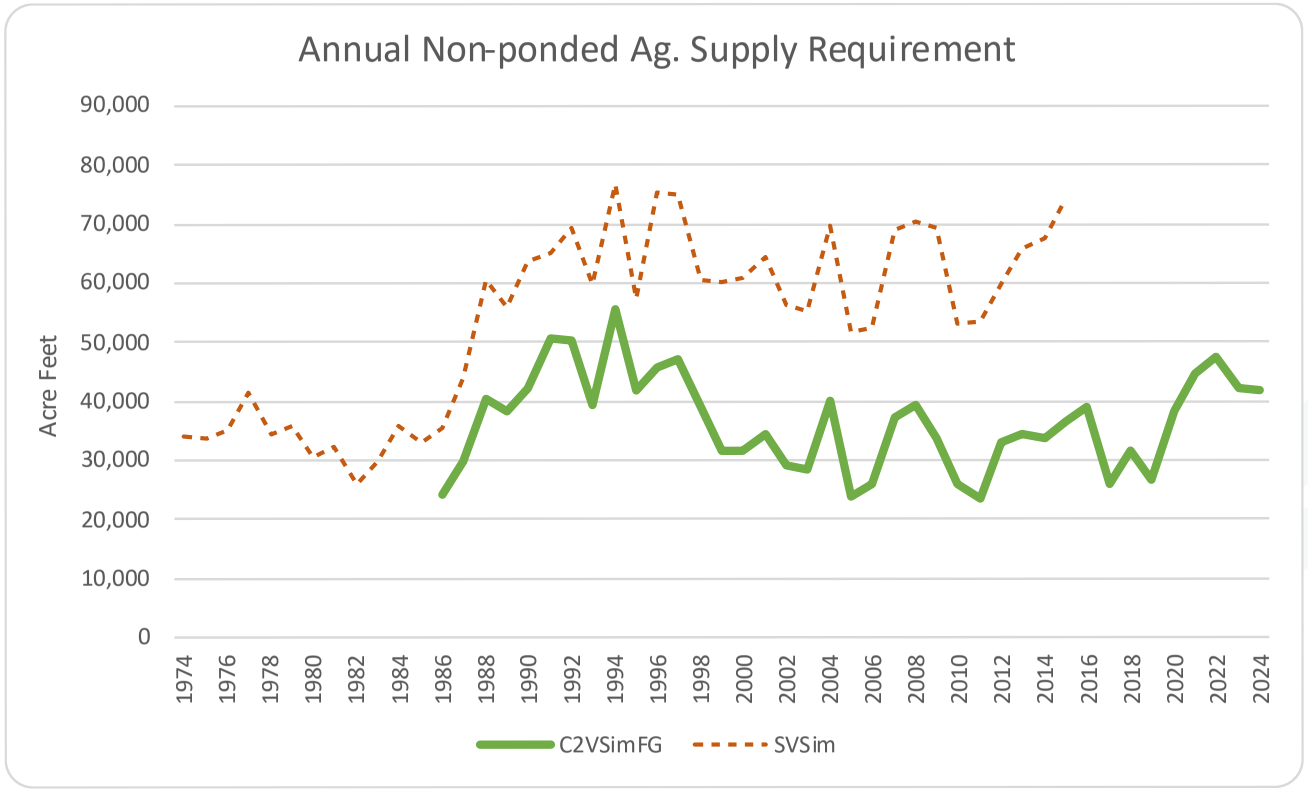


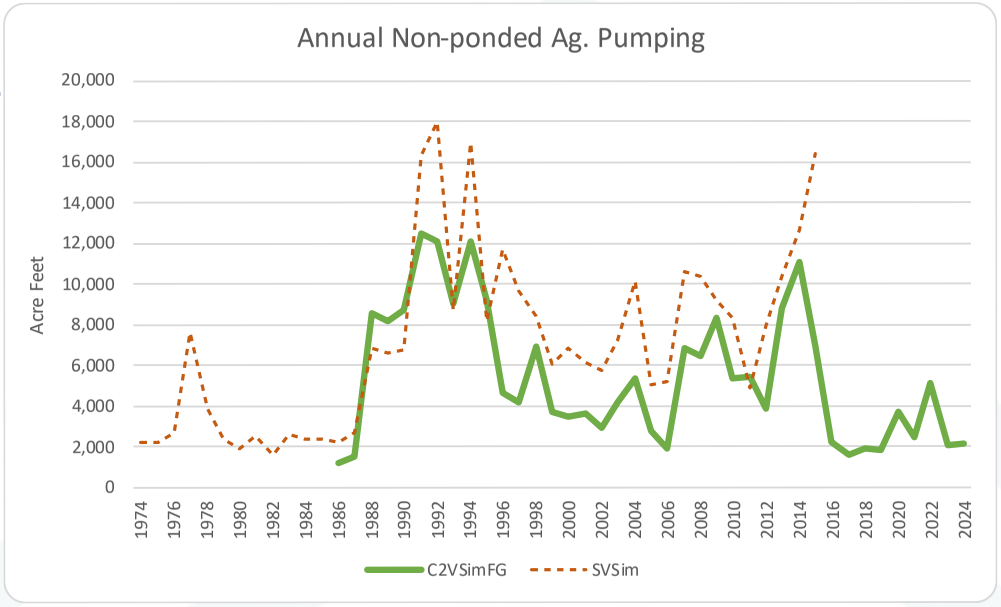



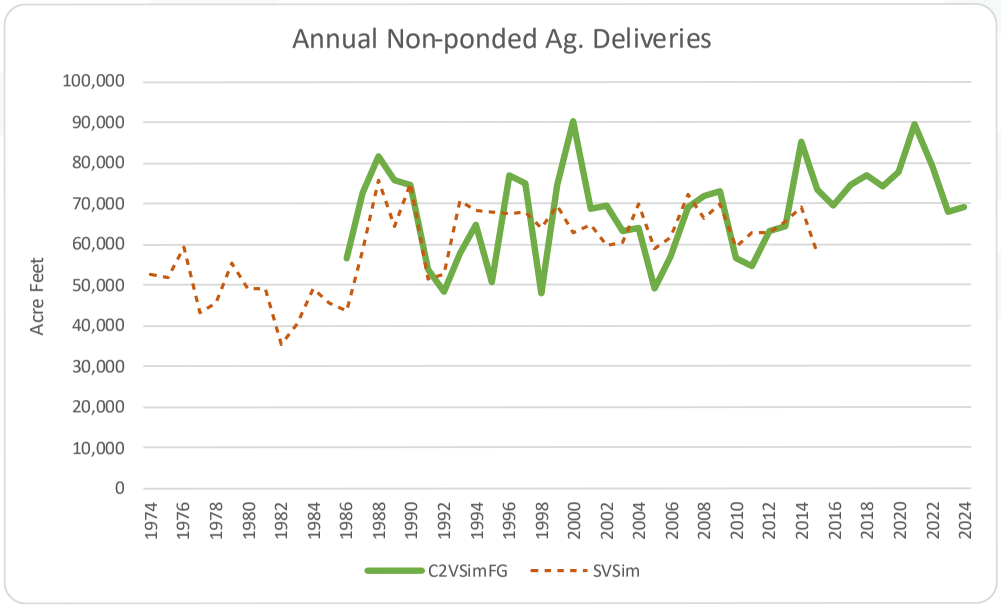




Woodard & Curran

# Land & Water Use Budget: Comparison of Non-Rice Crops

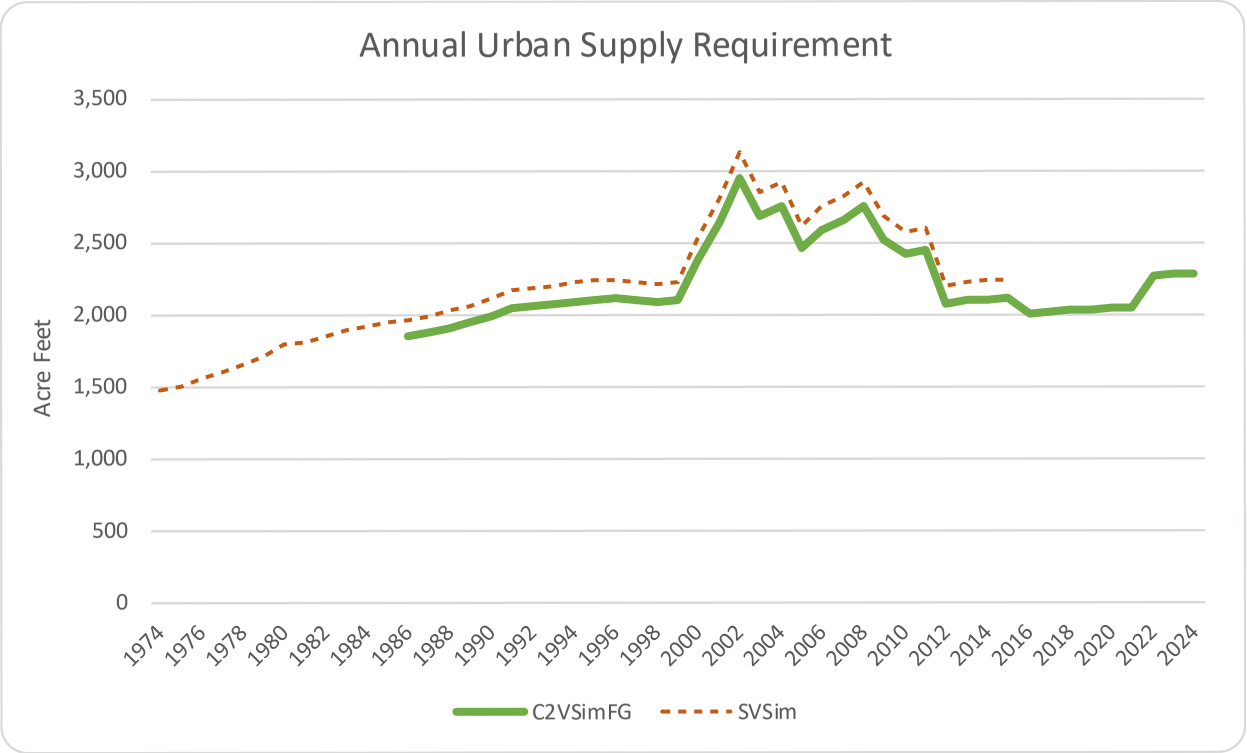


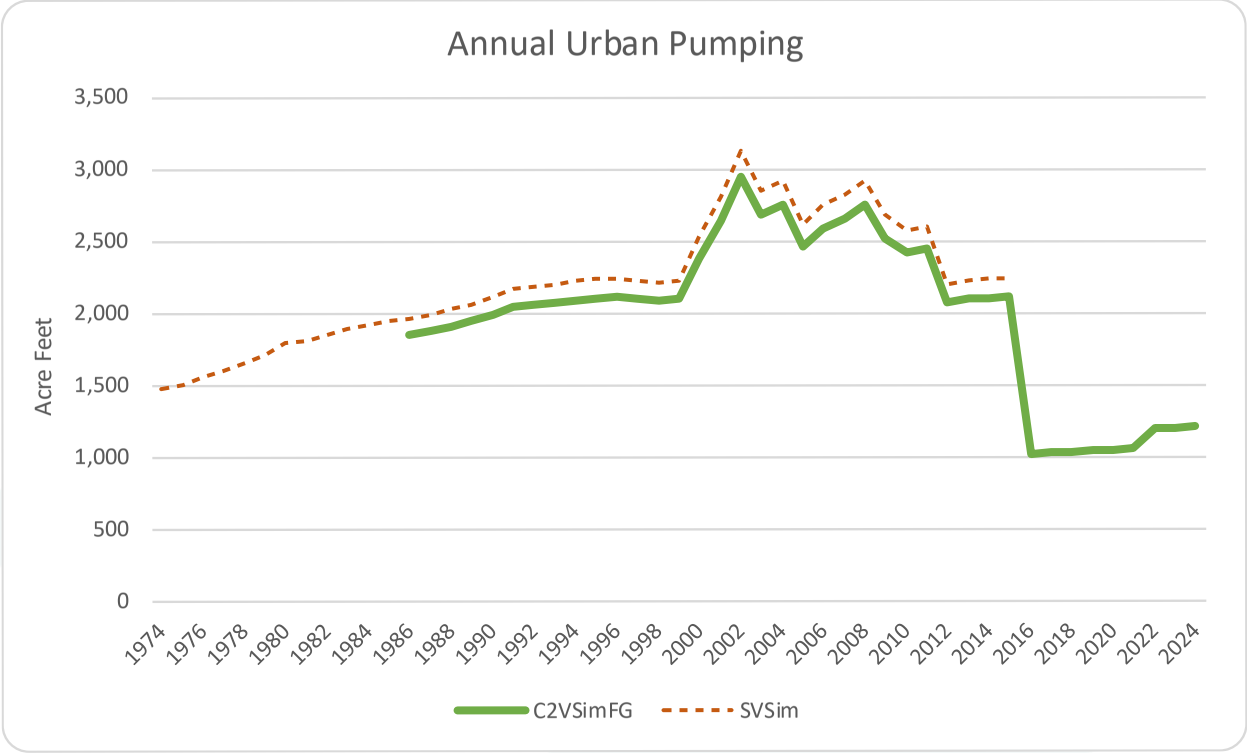




Woodard & Curran

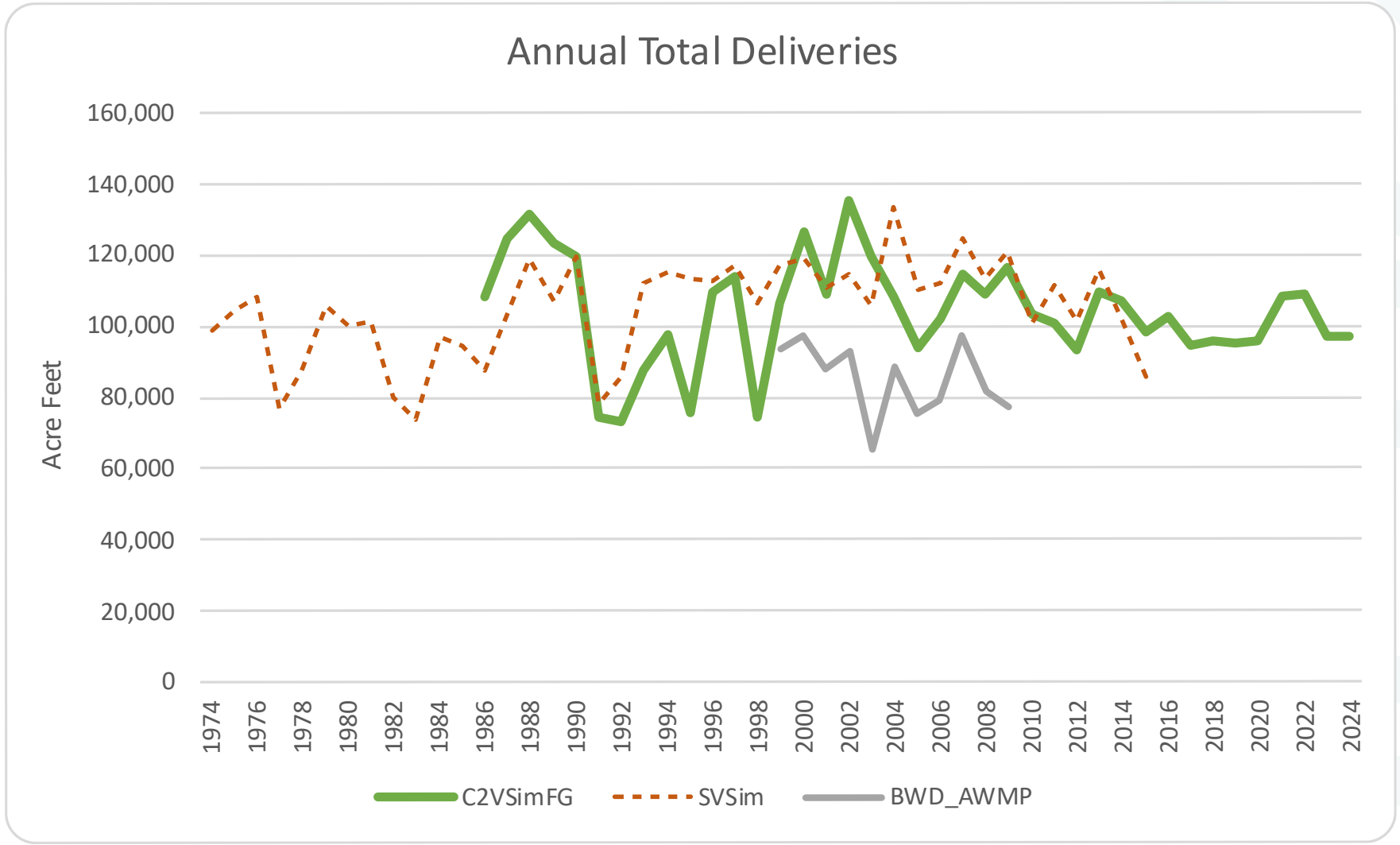
# Land & Water Use Budget: Urban Component




Woodard & Curran

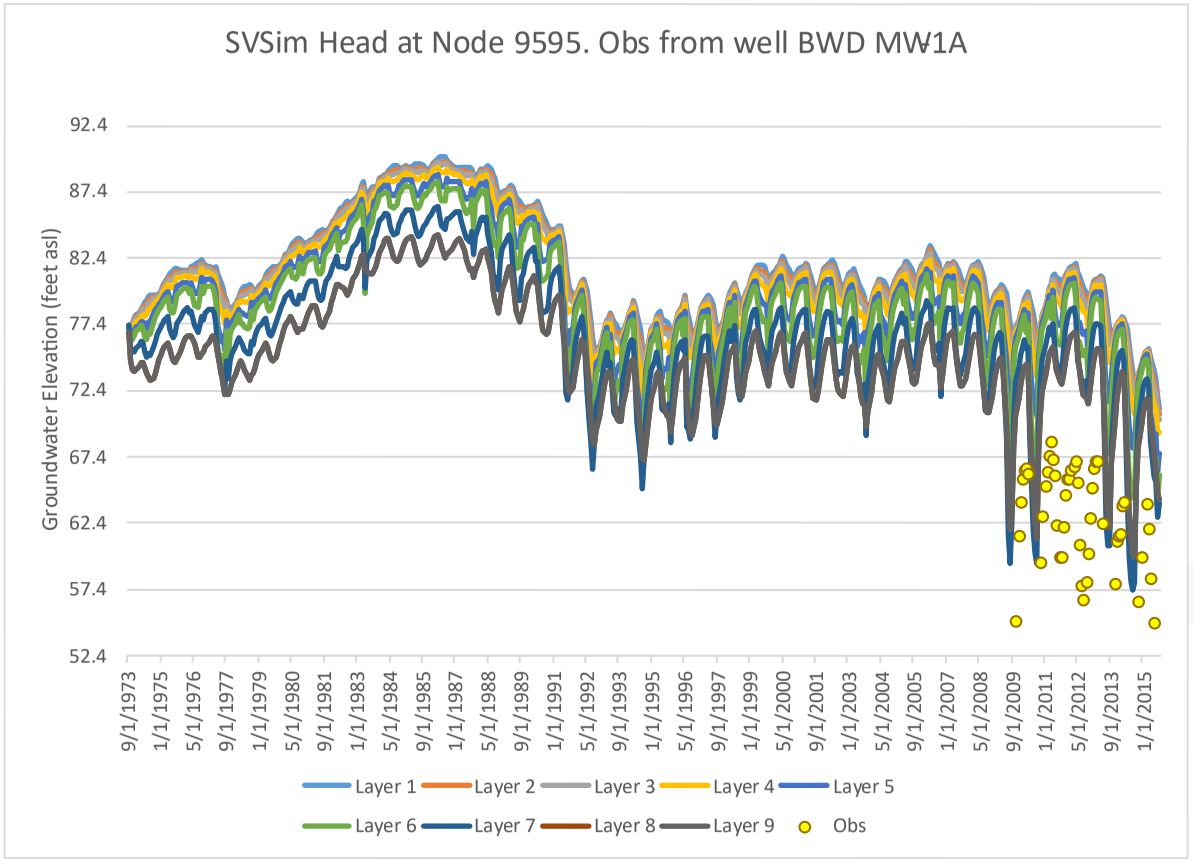
# Land & Water Use Budget: Comparison with AWMP

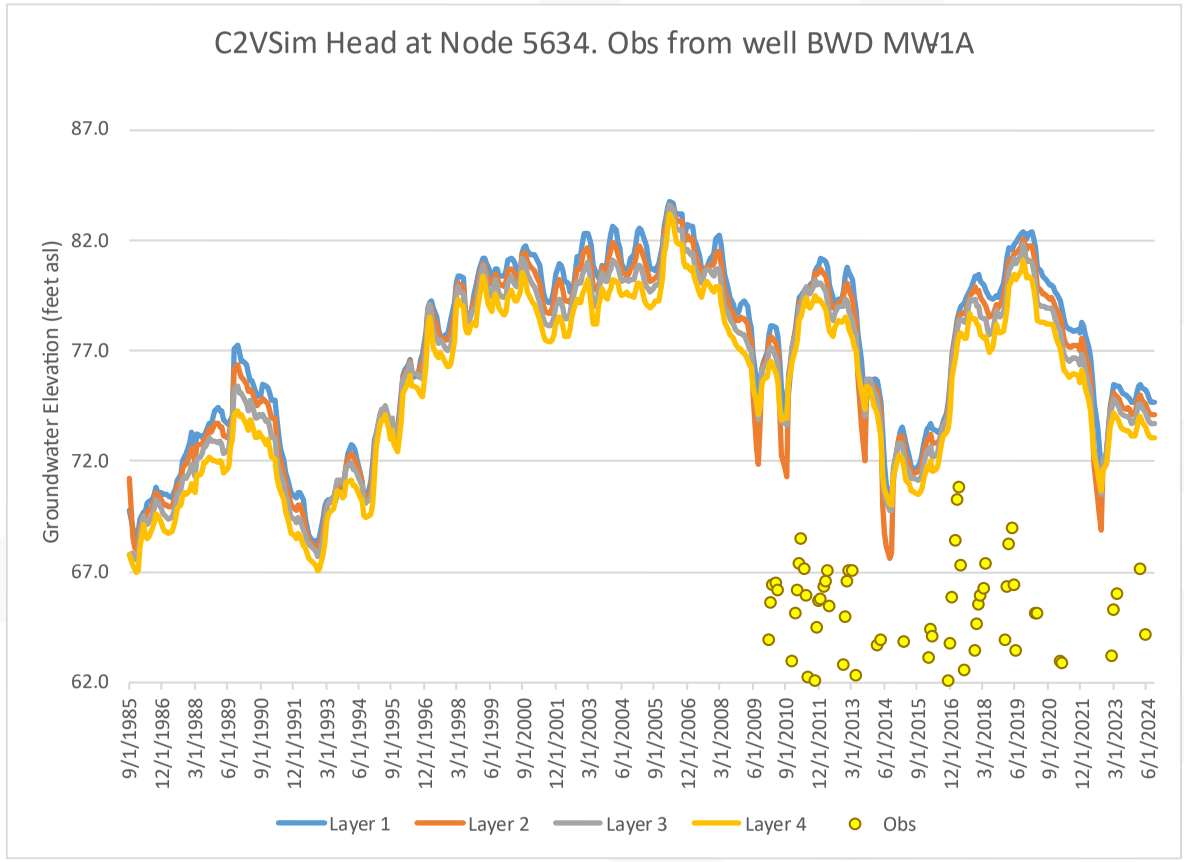



*Numbers are not adjusted for the ~70% overlap of elements with BWD

Woodard & Curran

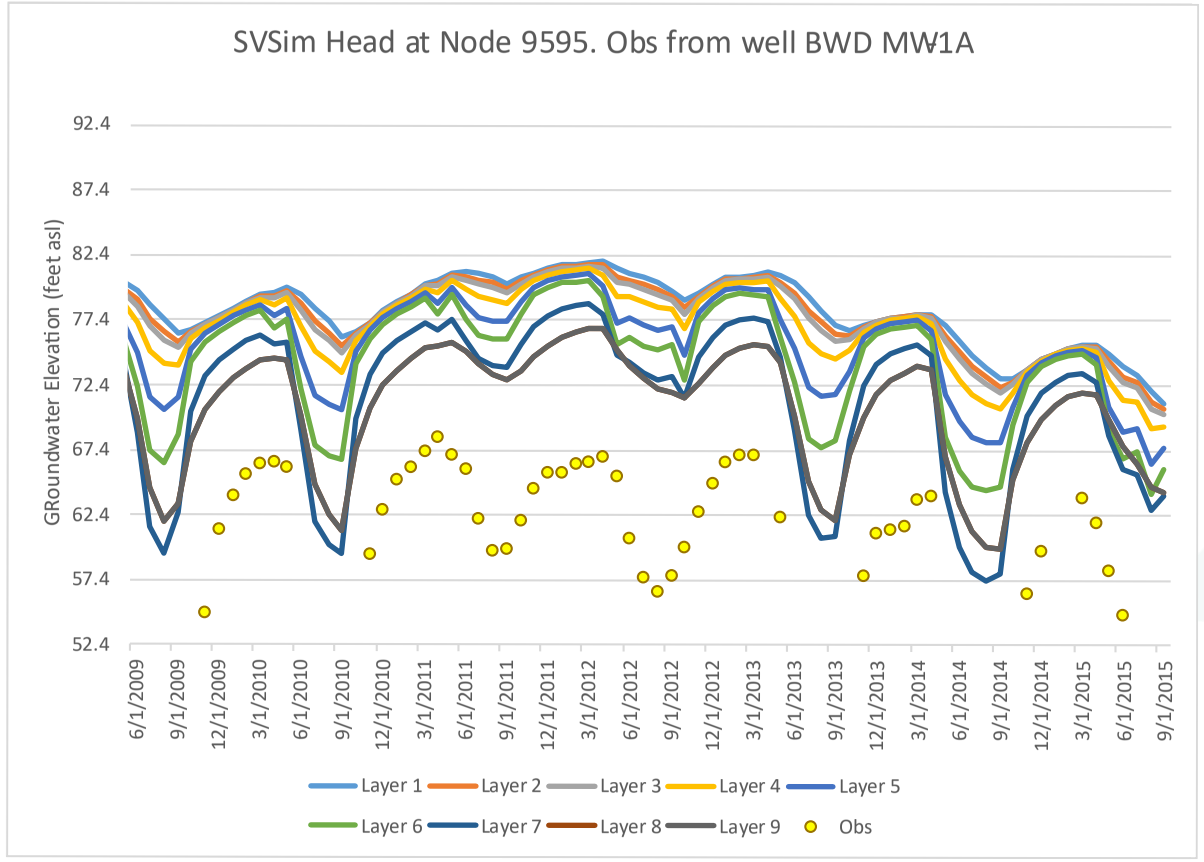
# Groundwater Level Hydrograph: BWD Observation Well – MW1A

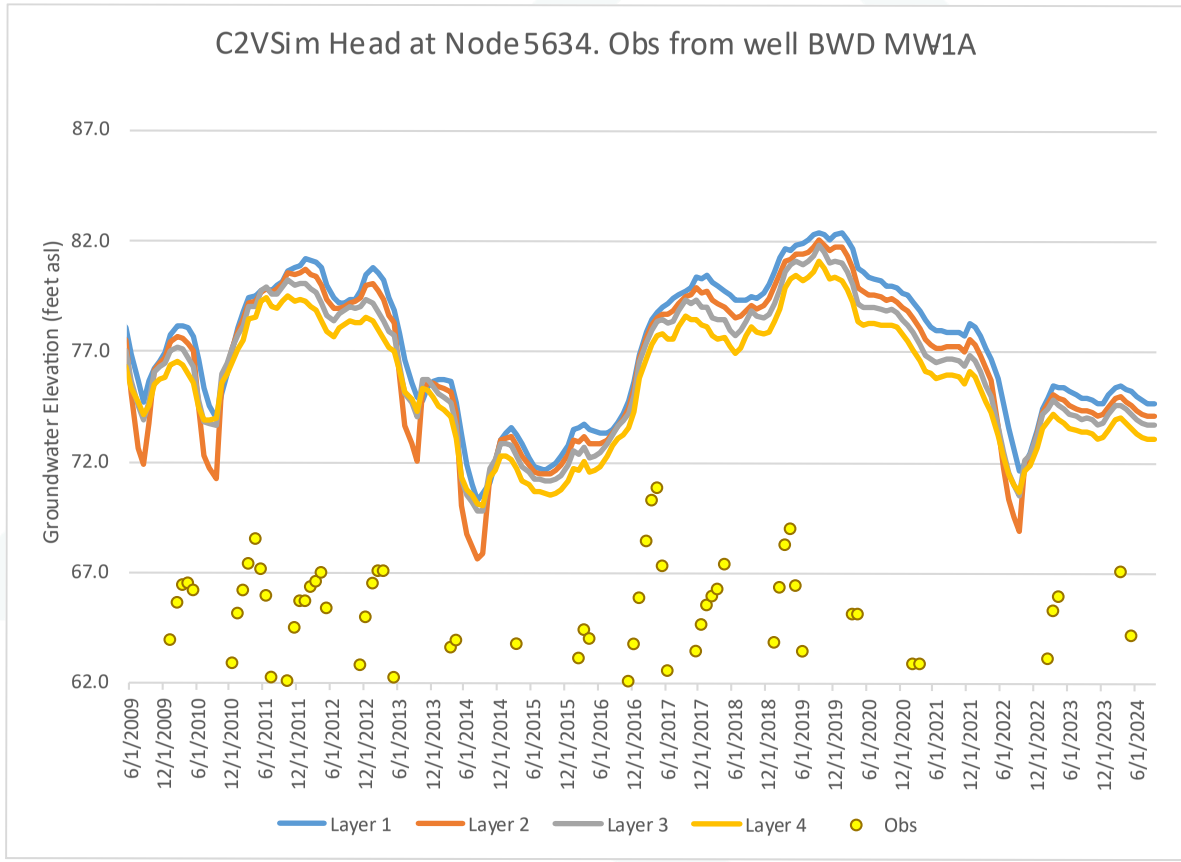



Woodard & Curran

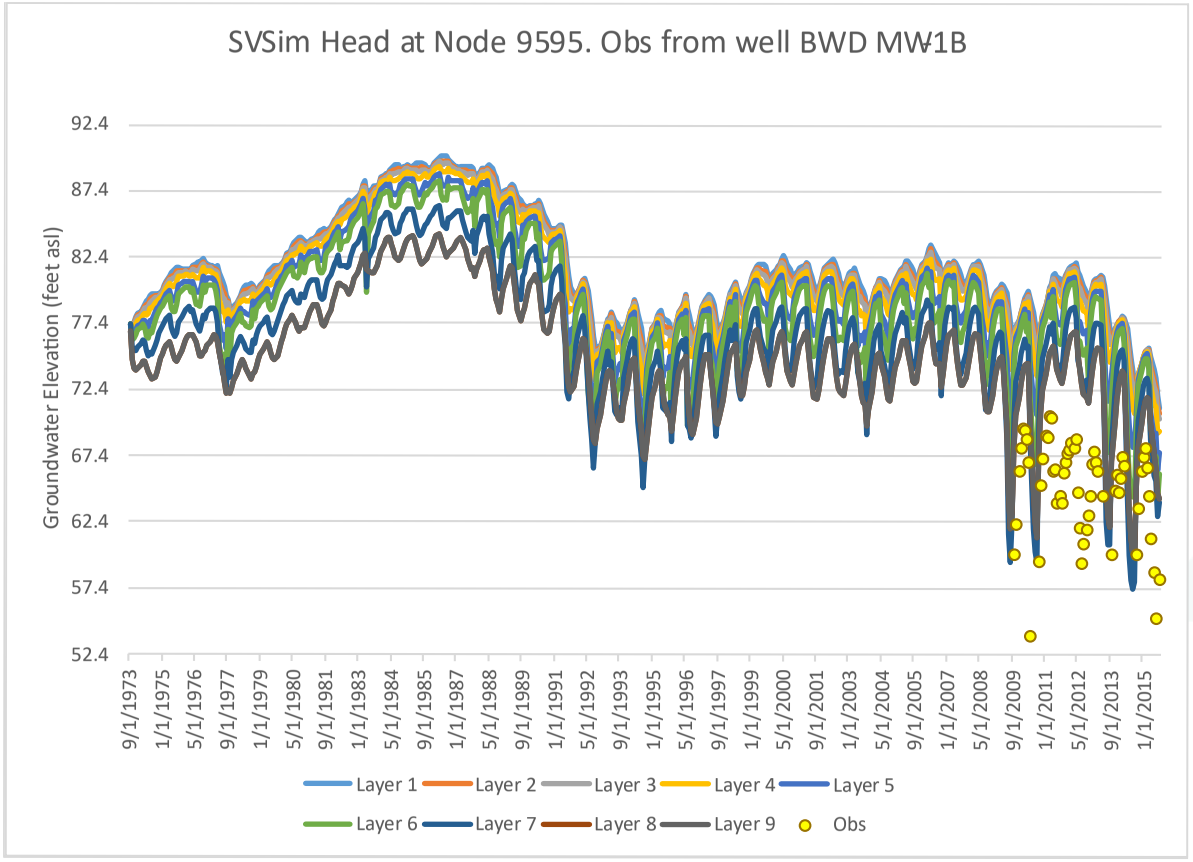
# Groundwater Level Hydrograph: BWD Observation Well – MW1A

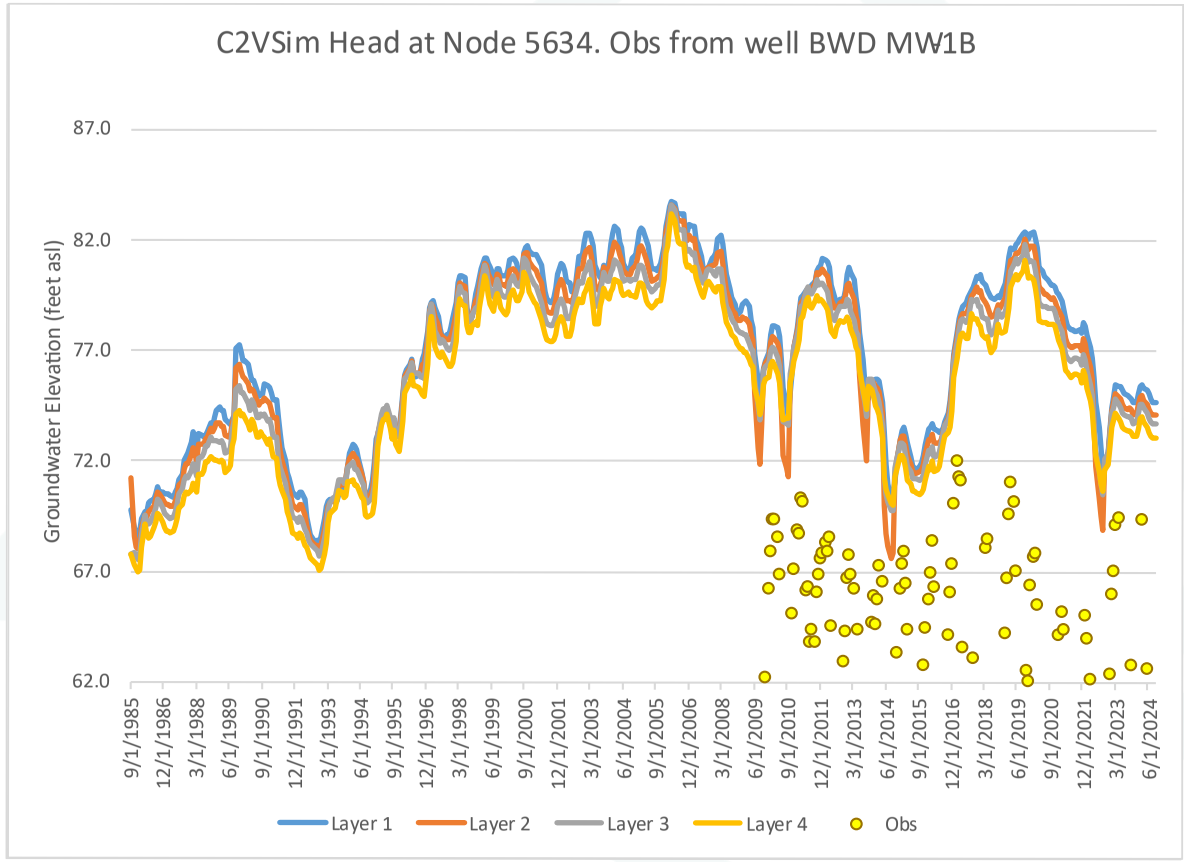



Showing only overlapping model years with observed data

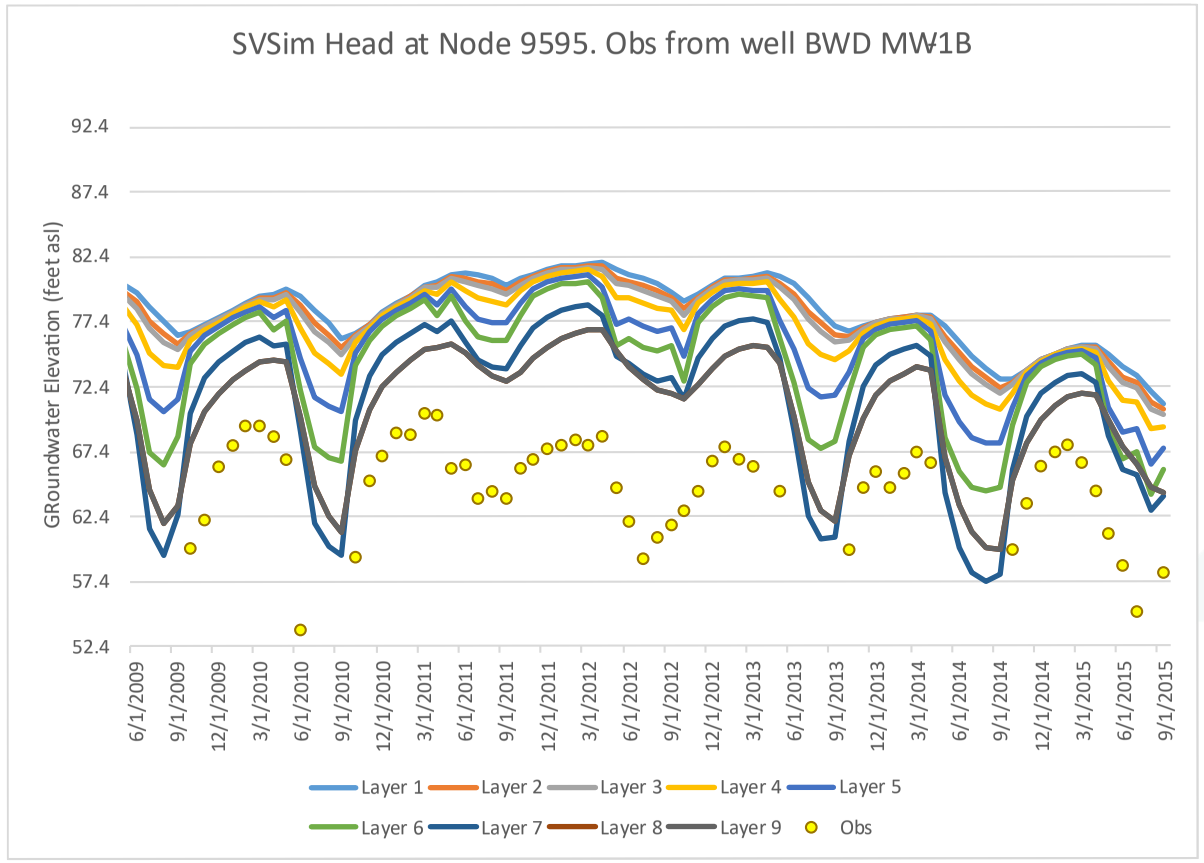
# Groundwater Level Hydrograph: BWD Observation Well – MW1B

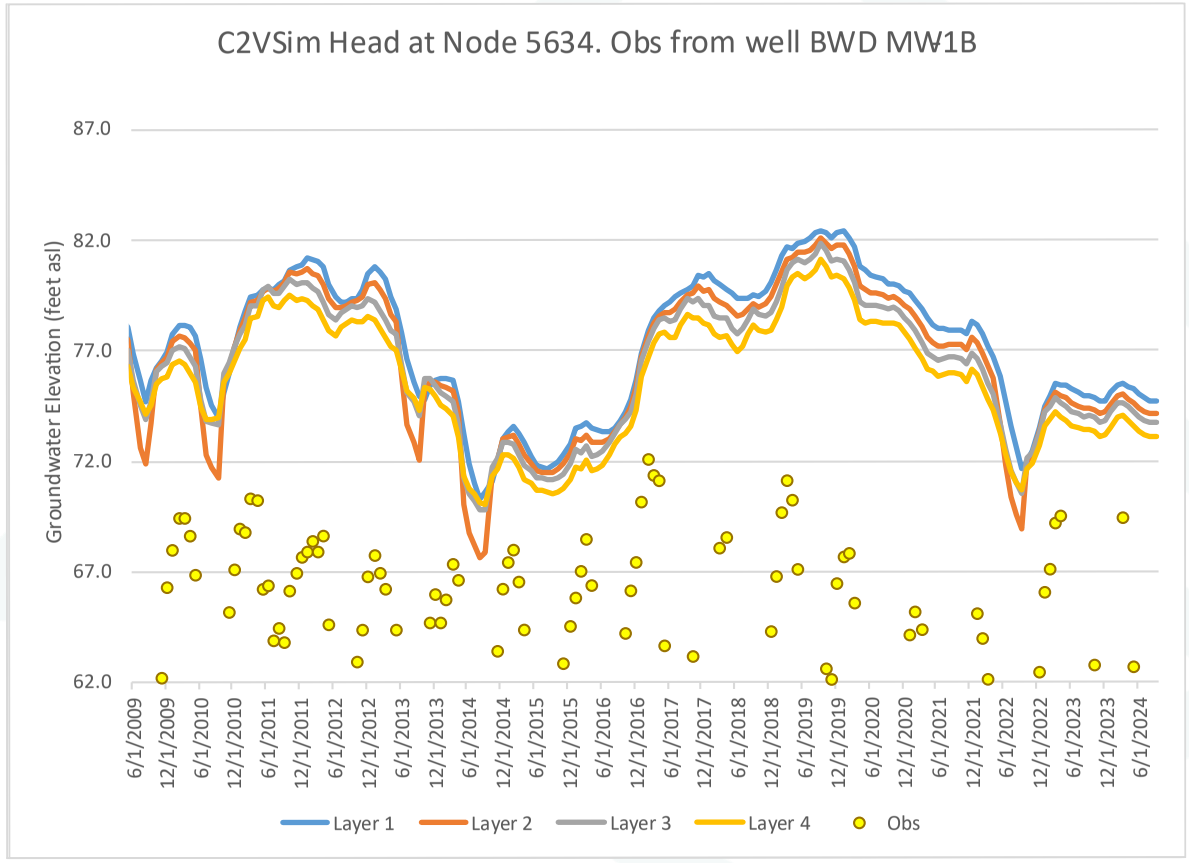



Woodard & Curran

# Groundwater Level Hydrograph: BWD Observation Well – MW1B

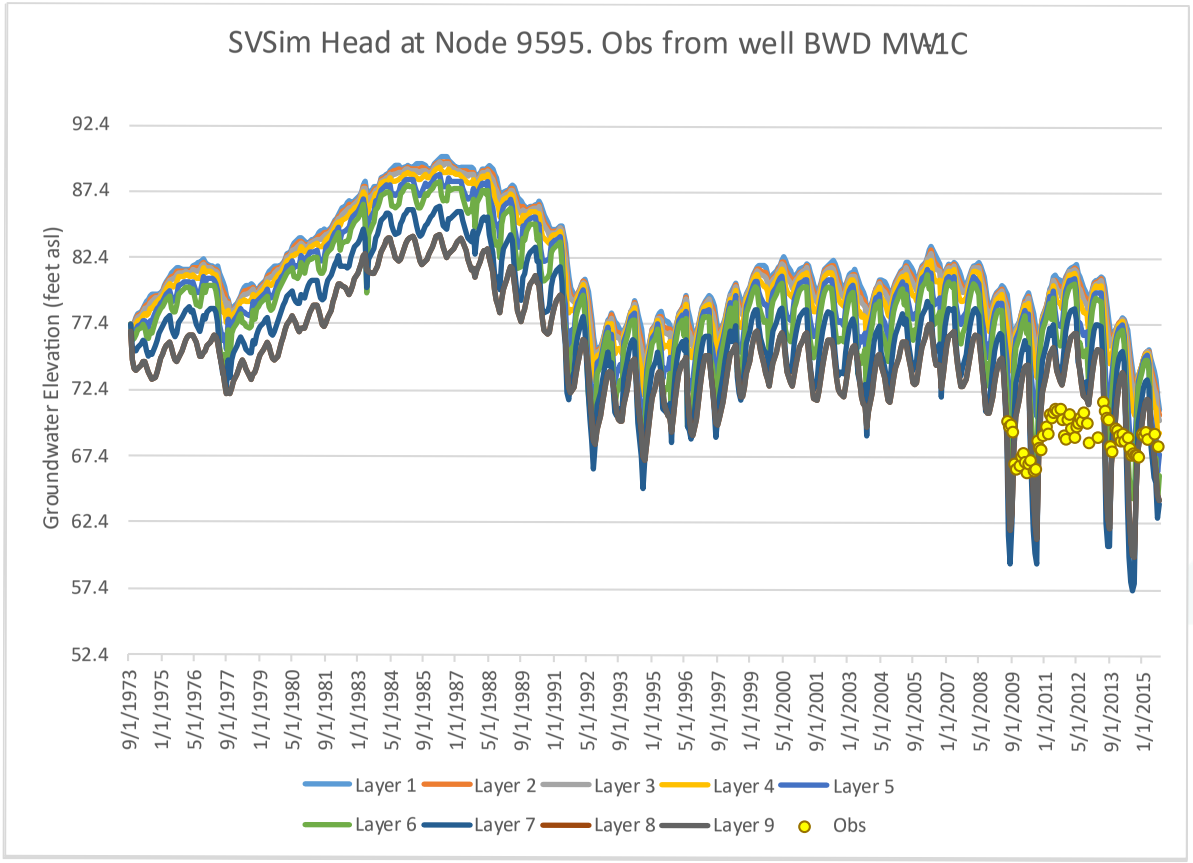


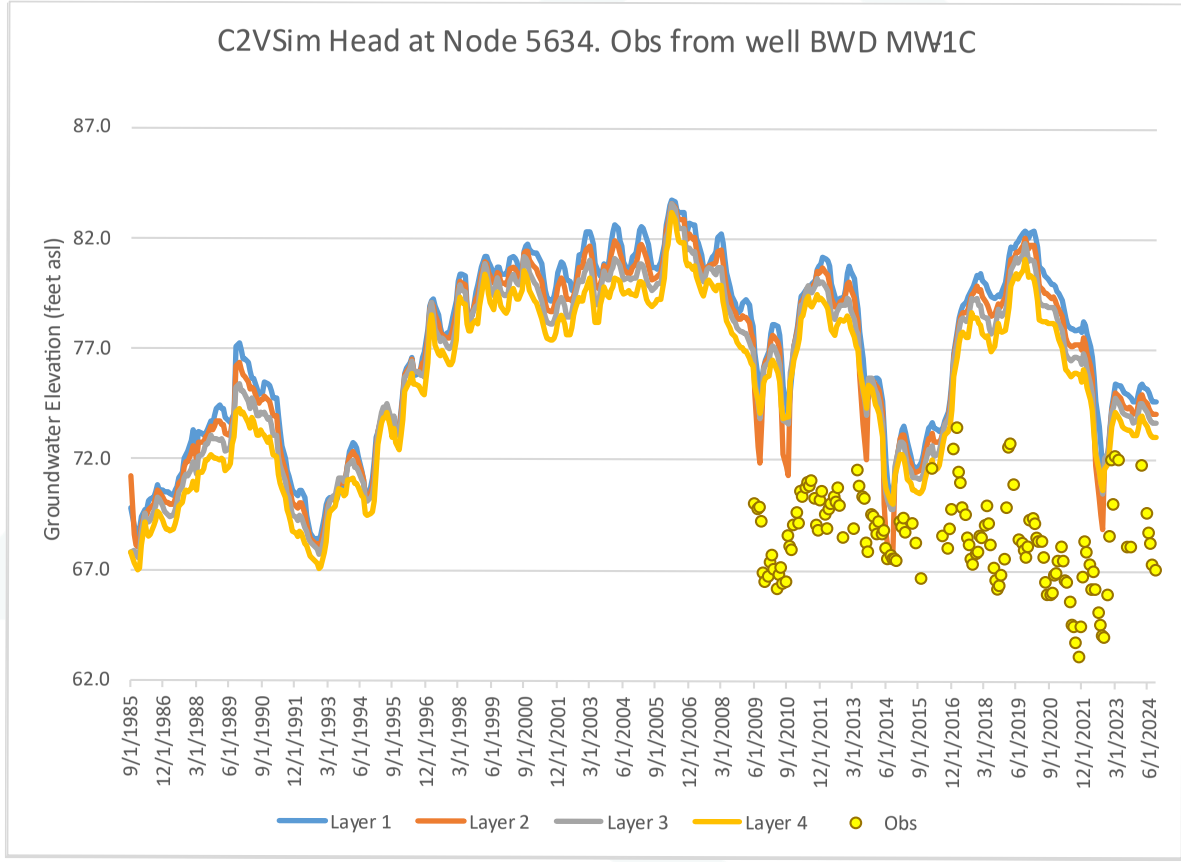




Showing only overlapping model years with observed data

Woodard & Curran

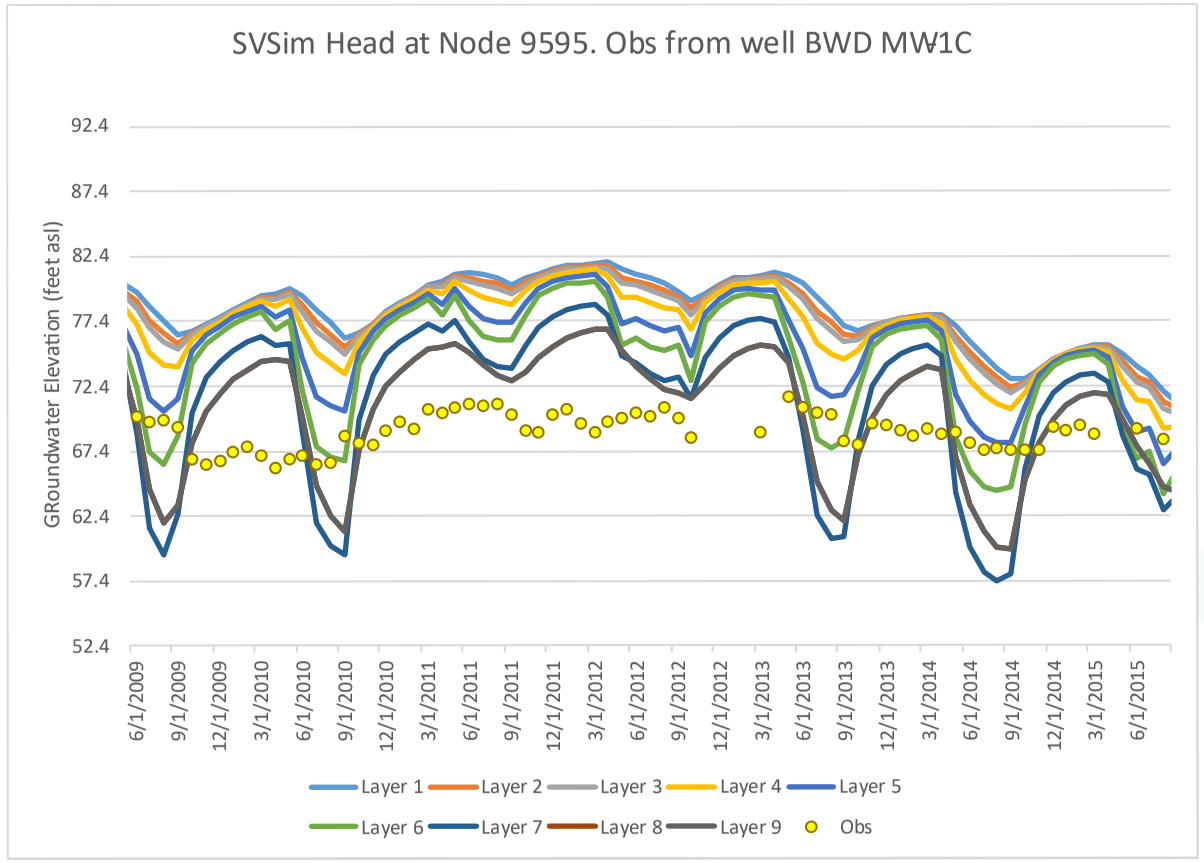
# Groundwater Level Hydrograph: BWD Observation Well – MW1C

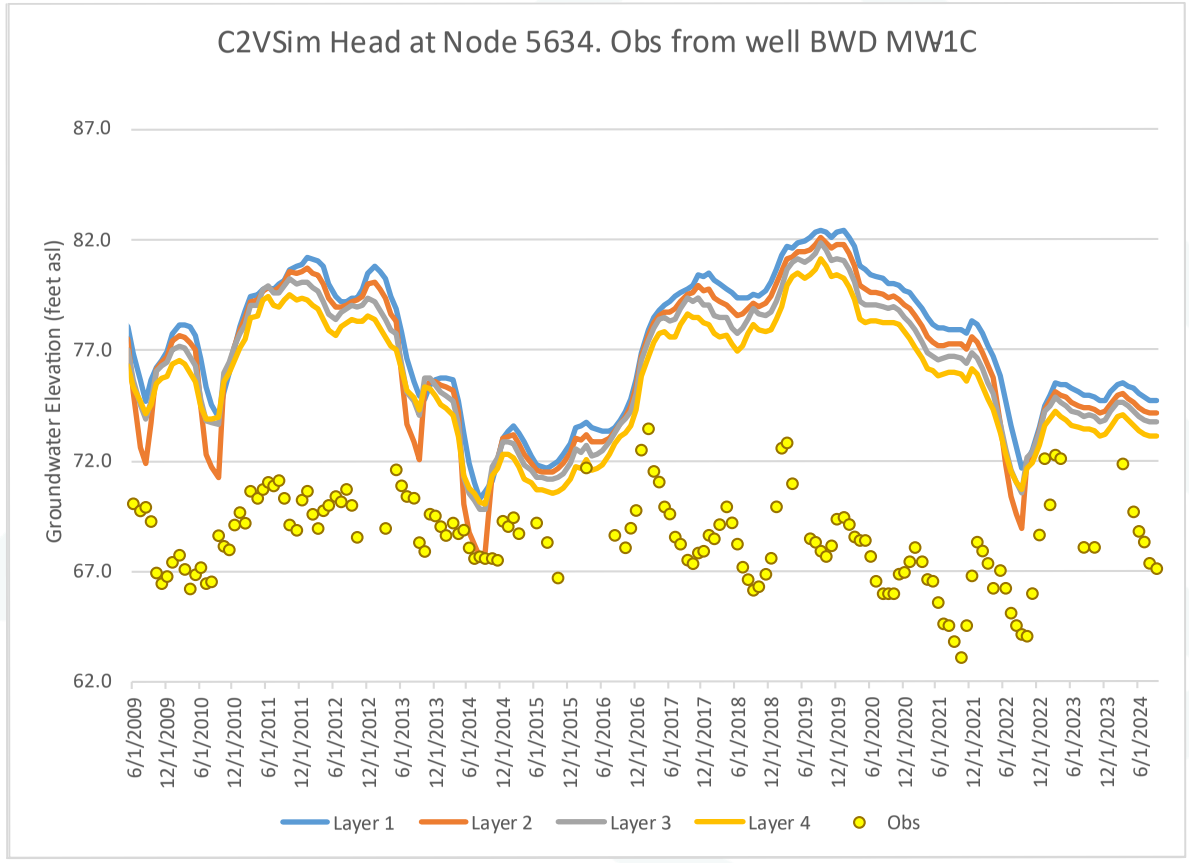



Woodard & Curran

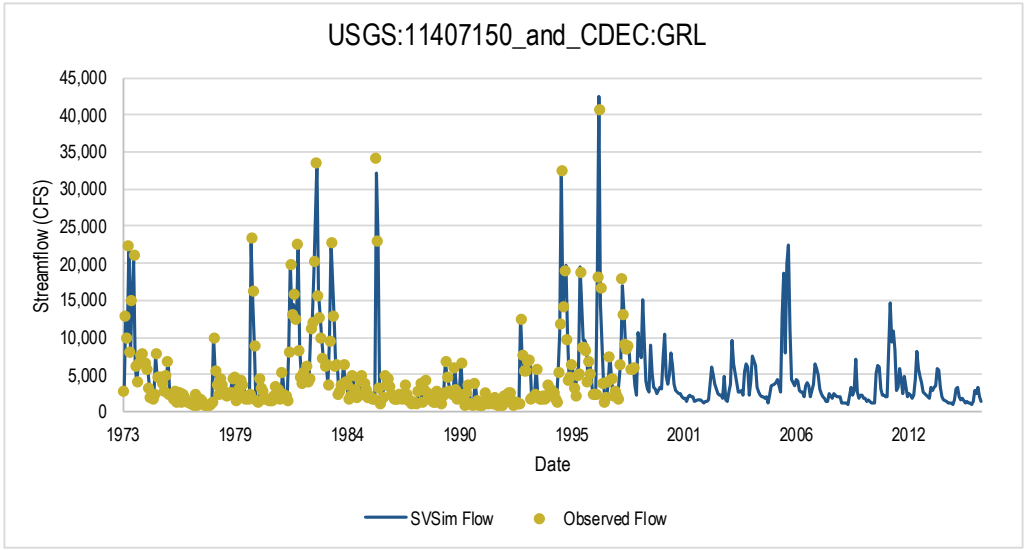
# Groundwater Level Hydrograph: BWD Observation Well – MW1C

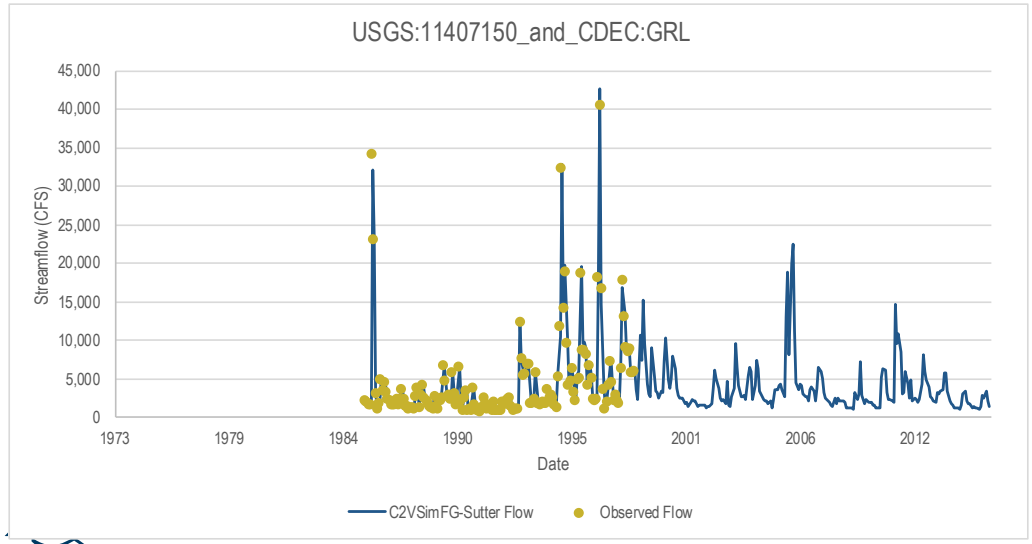


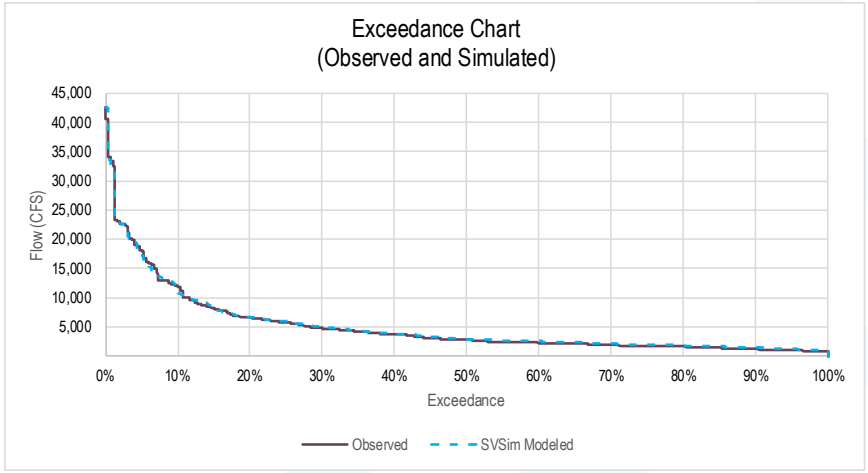



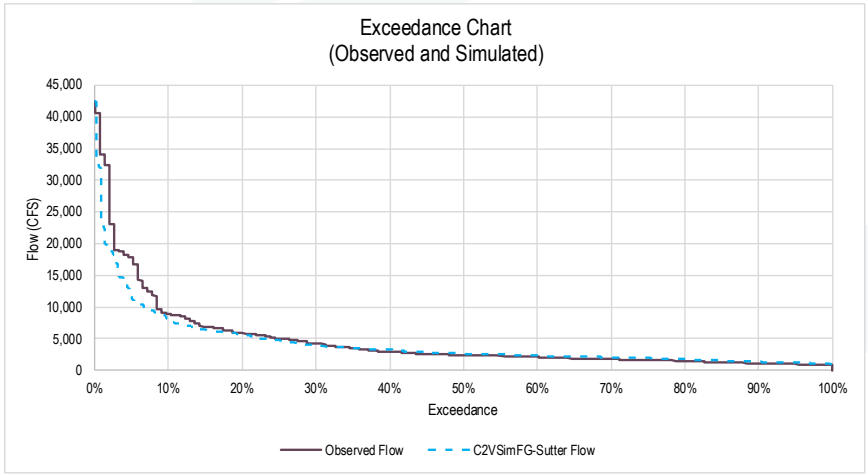

Showing only overlapping model years with observed data

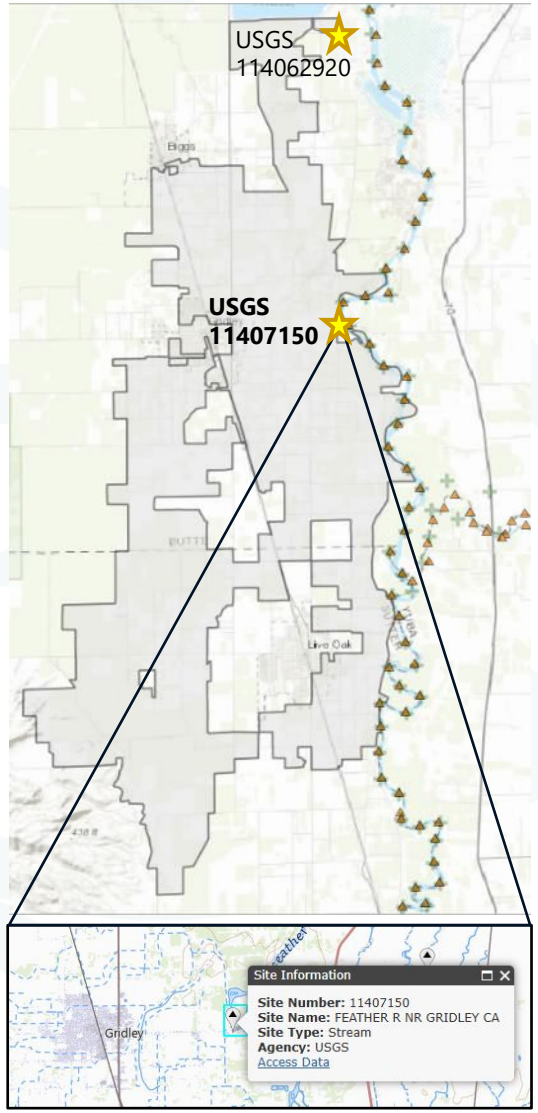
# Hydrology: Stream Stage Comparison



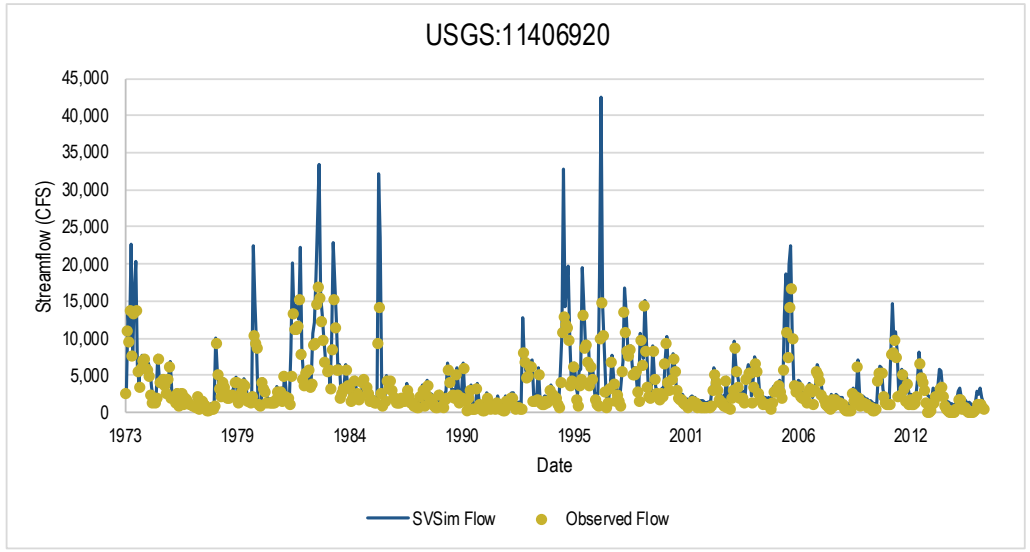



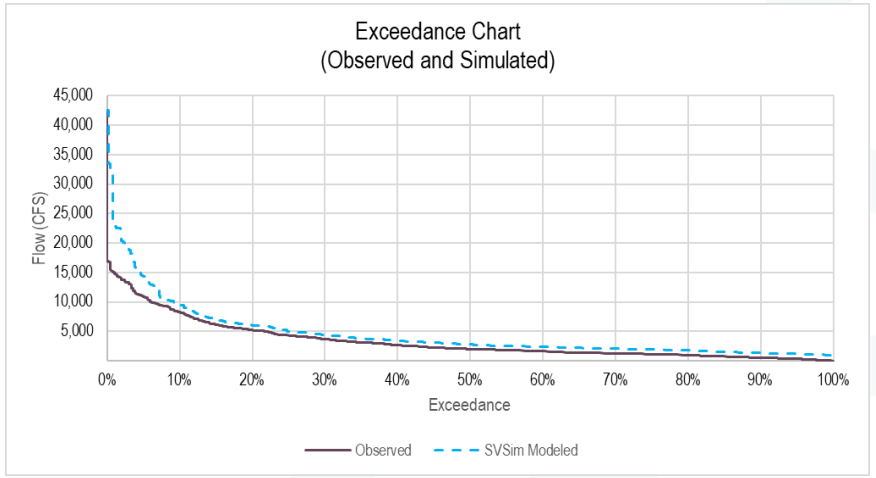



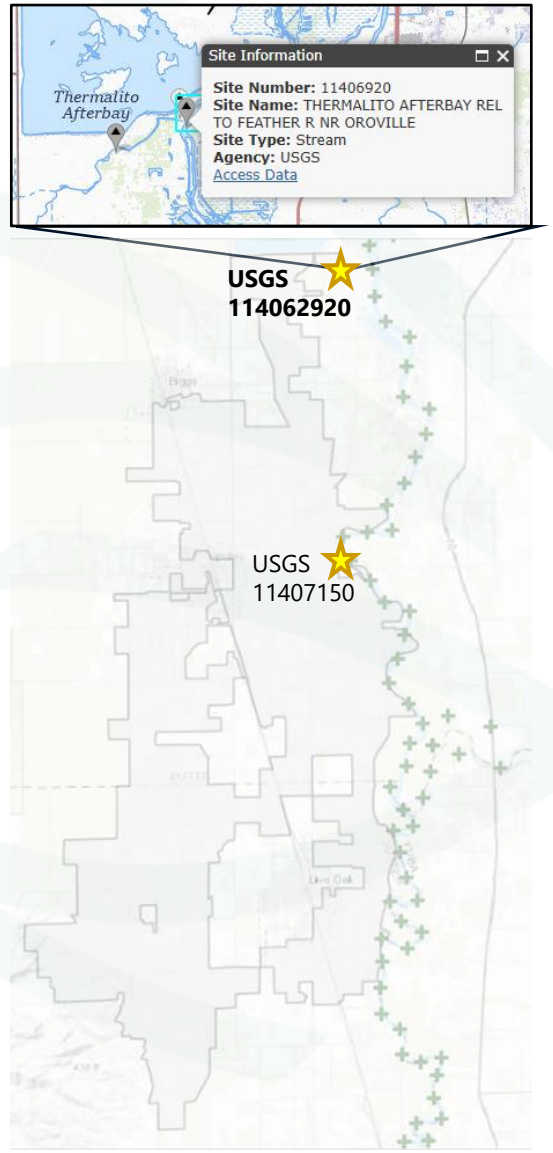




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# Hydrology: Stream Stage Comparison




Hydrograph not available for C2VSimFG-Sutter

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# Appendix F- Groundwater Sustainability Plan Figures

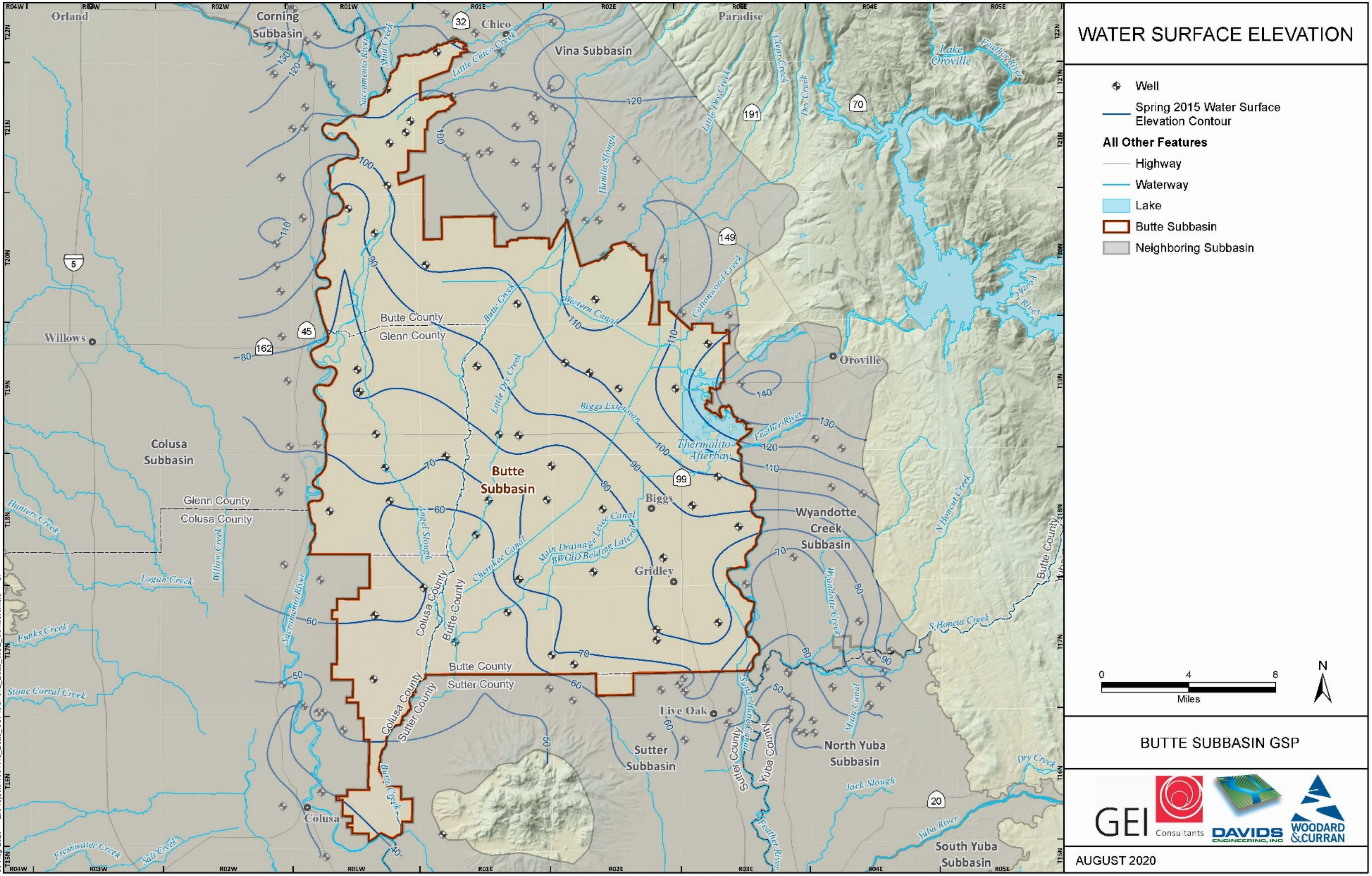



*Figure 2-16. Water Surface Elevation Contours – Primary Aquifer (Spring 2015)*

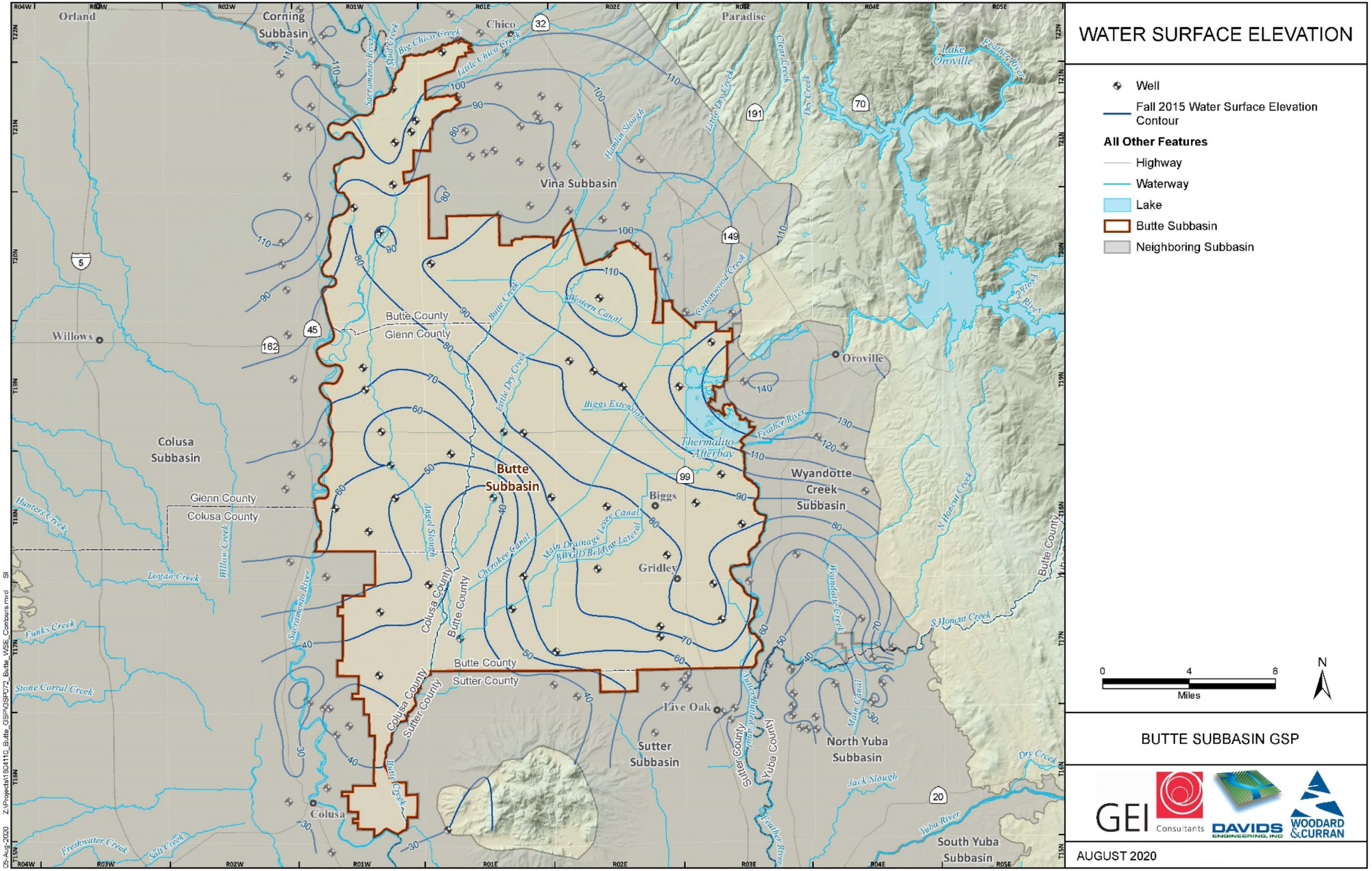



*Figure 2-17. Water Surface Elevation Contours – Primary Aquifer (Fall 2015)*

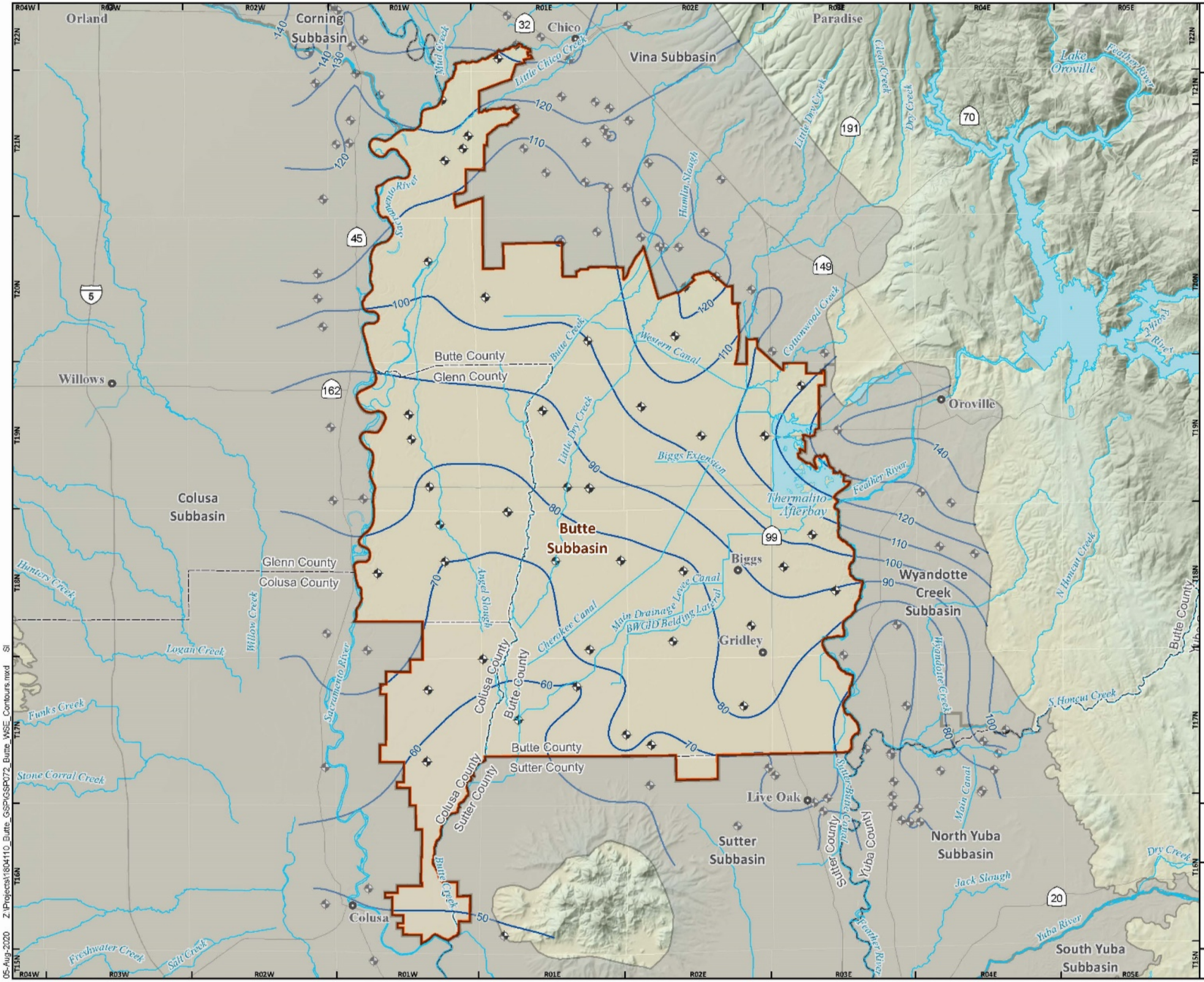



***Figure 2-18. Water Surface Elevation Contours – Primary Aquifer (Spring 2019)***

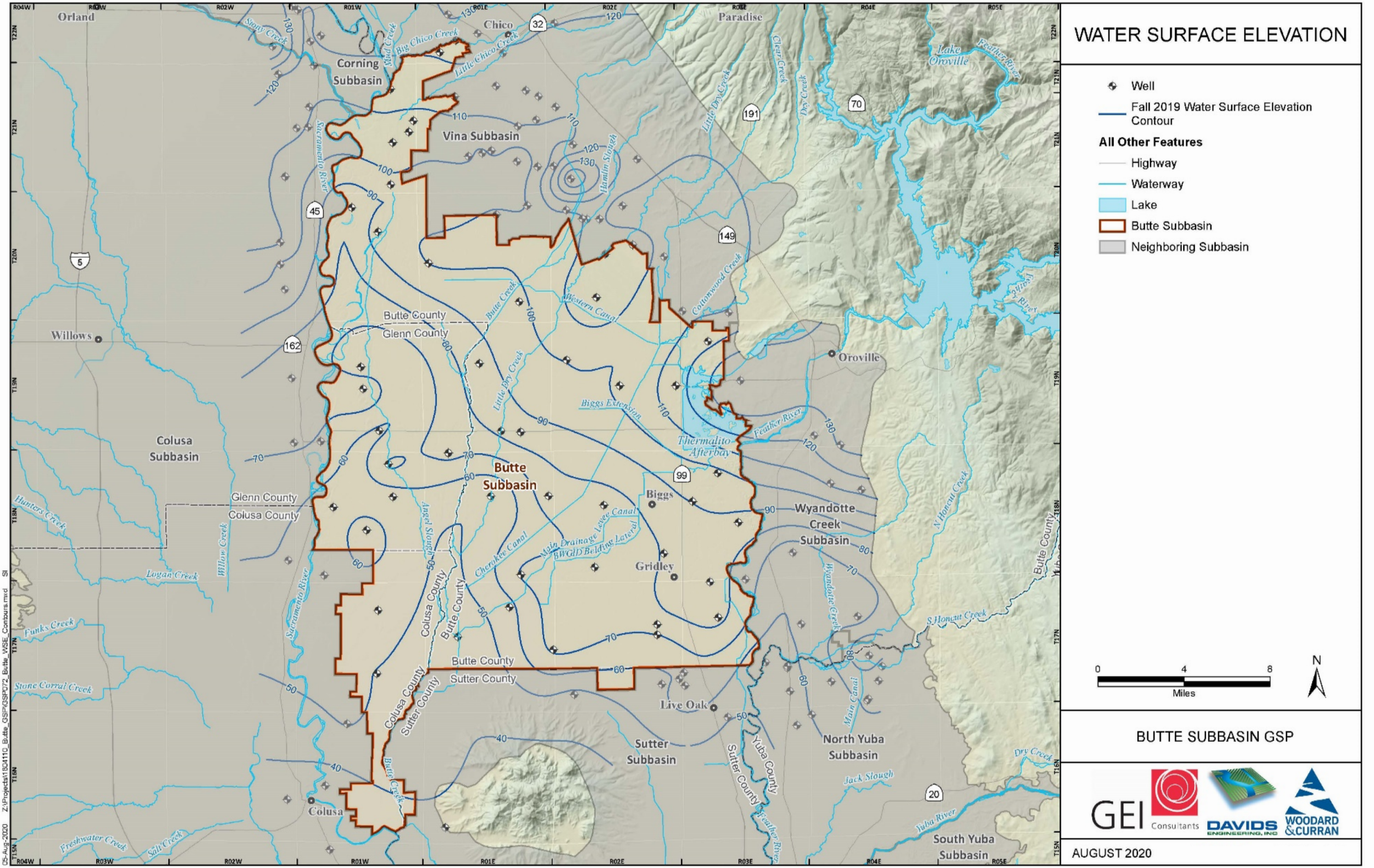



*Figure 2-19. Water Surface Elevation Contours – Primary Aquifer (Fall 2019)*

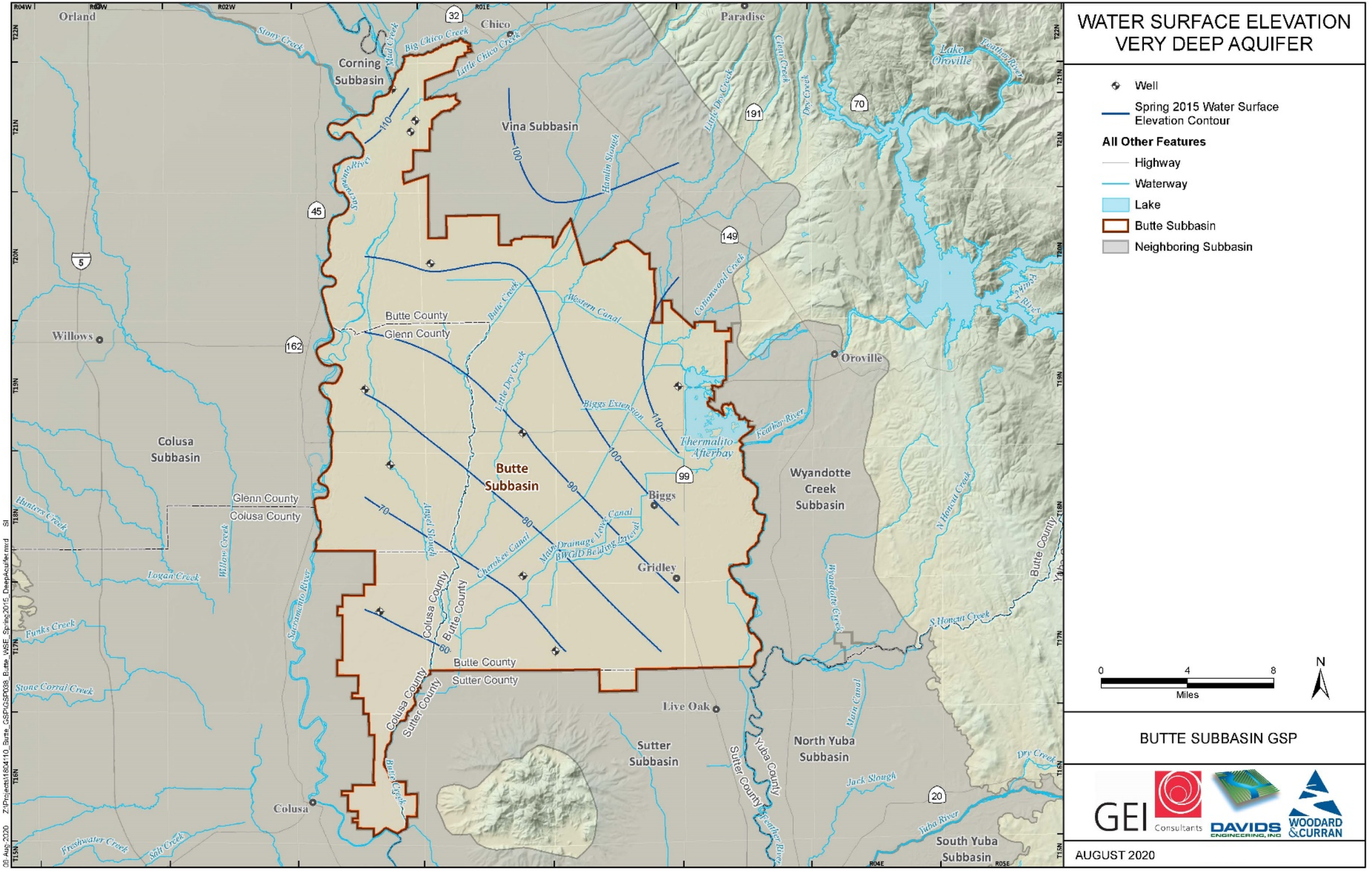



*Figure 2-20. Water Surface Elevation Contours – Very Deep Aquifer (Spring 2015)*

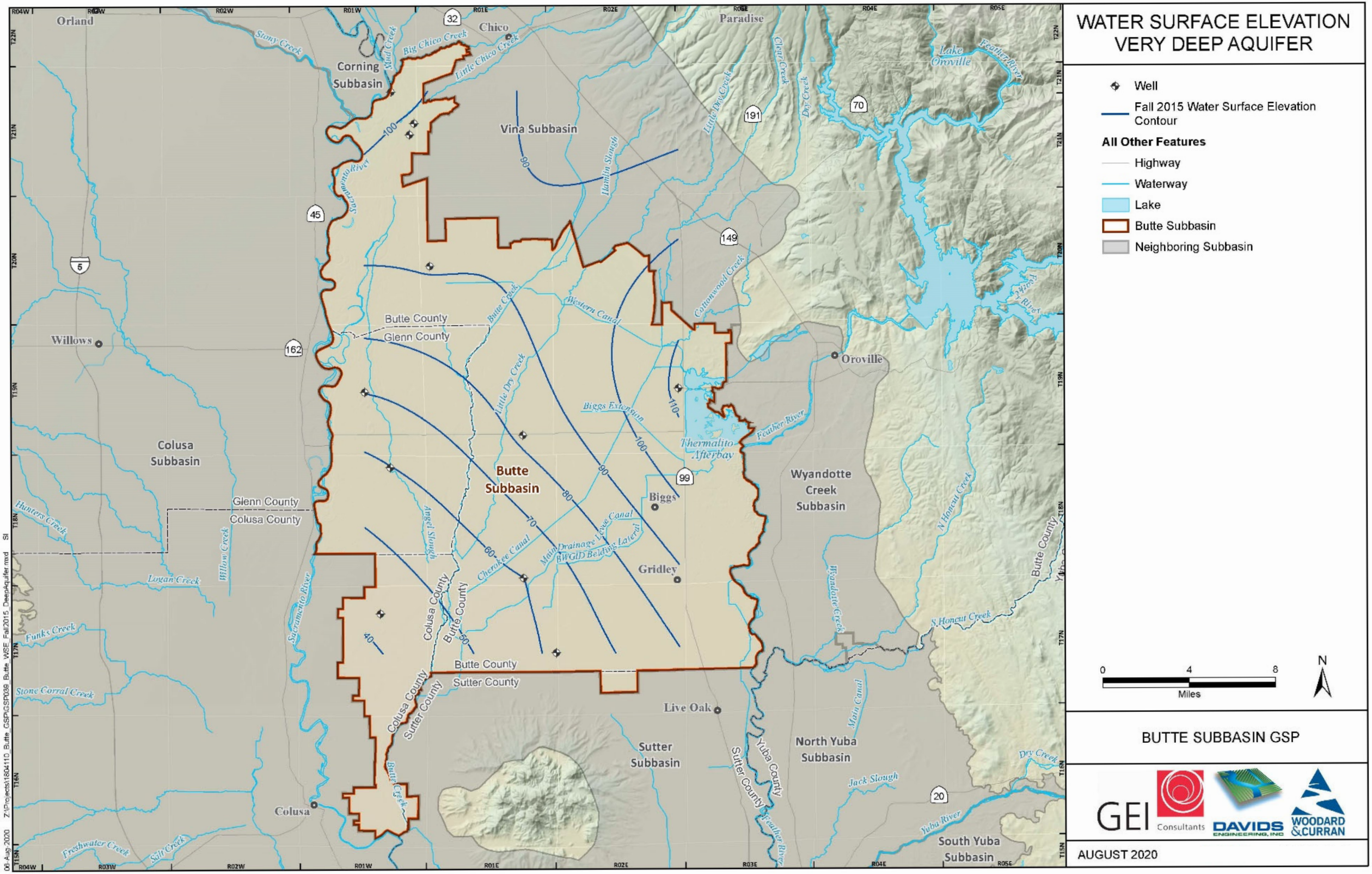



*Figure 2-21. Water Surface Elevation Contours – Very Deep Aquifer (Fall 2015)*

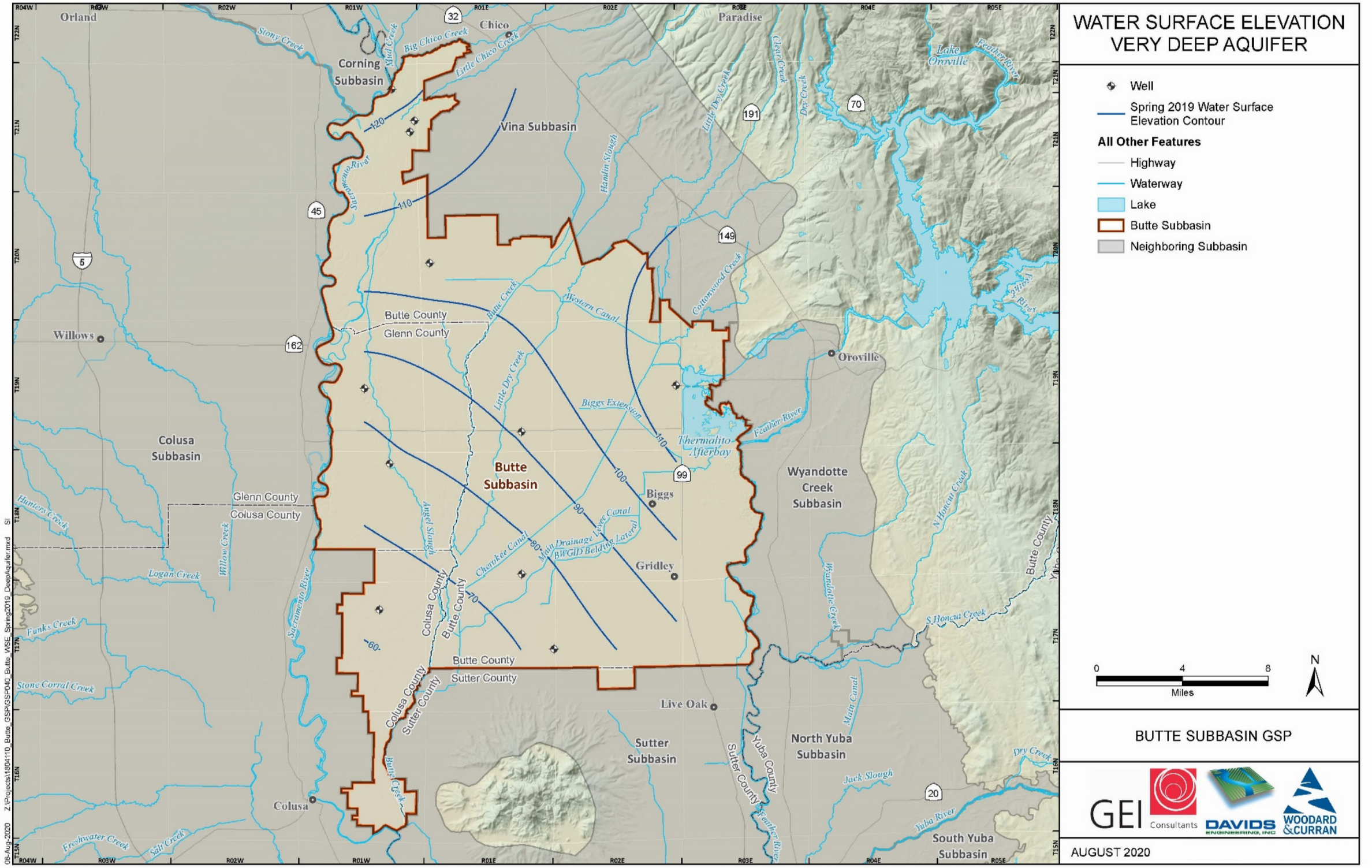



*Figure 2-22. Water Surface Elevation Contours – Very Deep Aquifer (Spring 2019)*

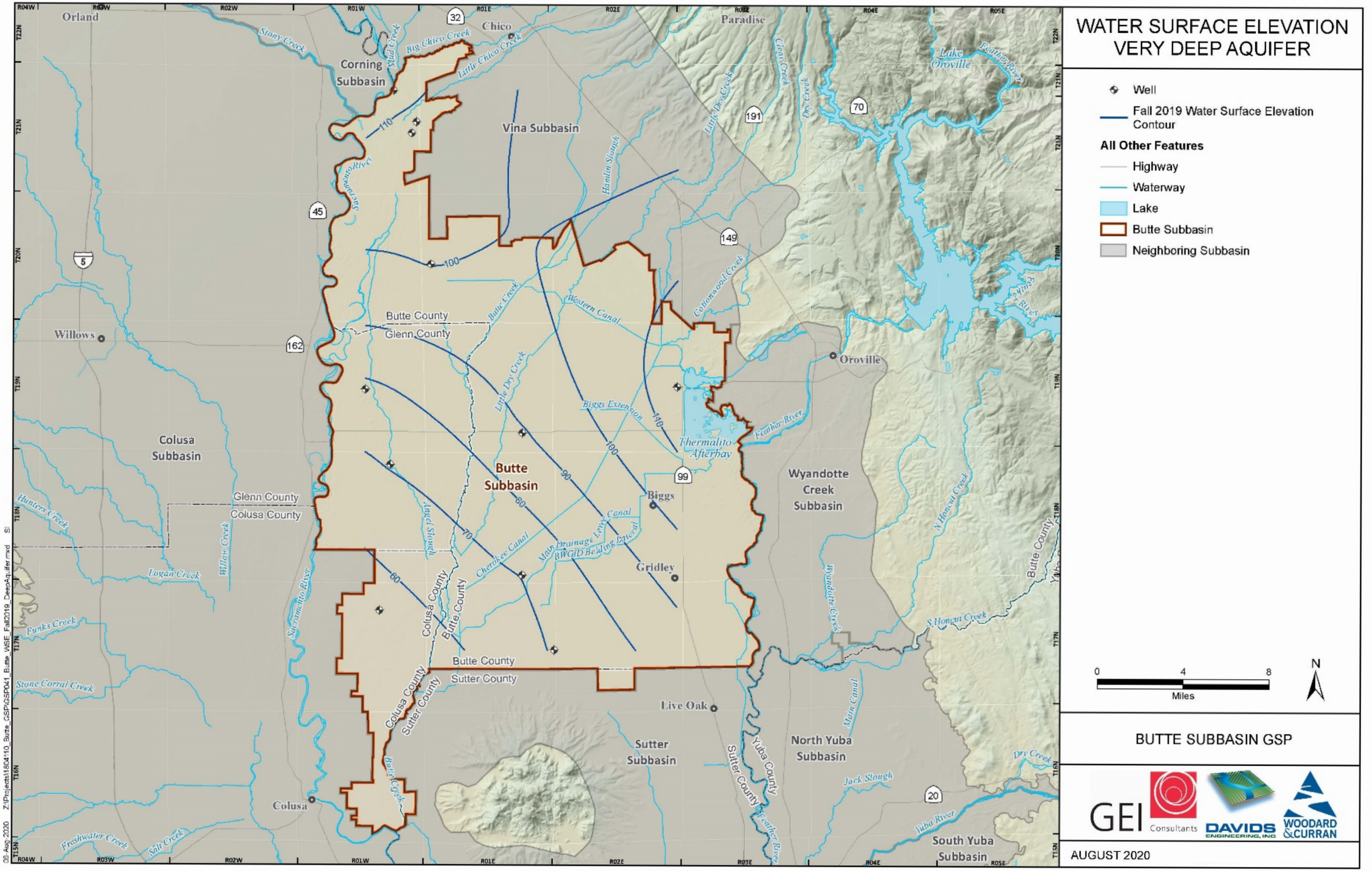



*Figure 2-23. Water Surface Elevation Contours – Very Deep Aquifer (Fall 2019)*

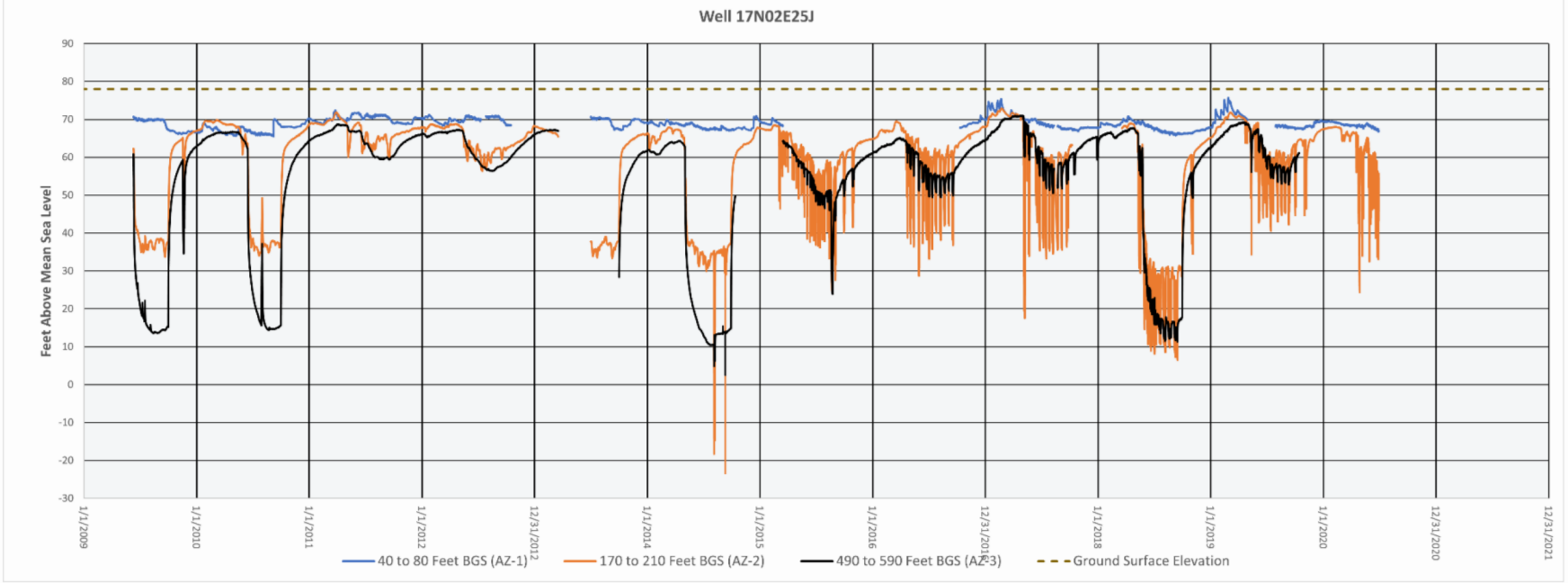



**Figure 5-60. Well 17N02E25J Hydrograph**

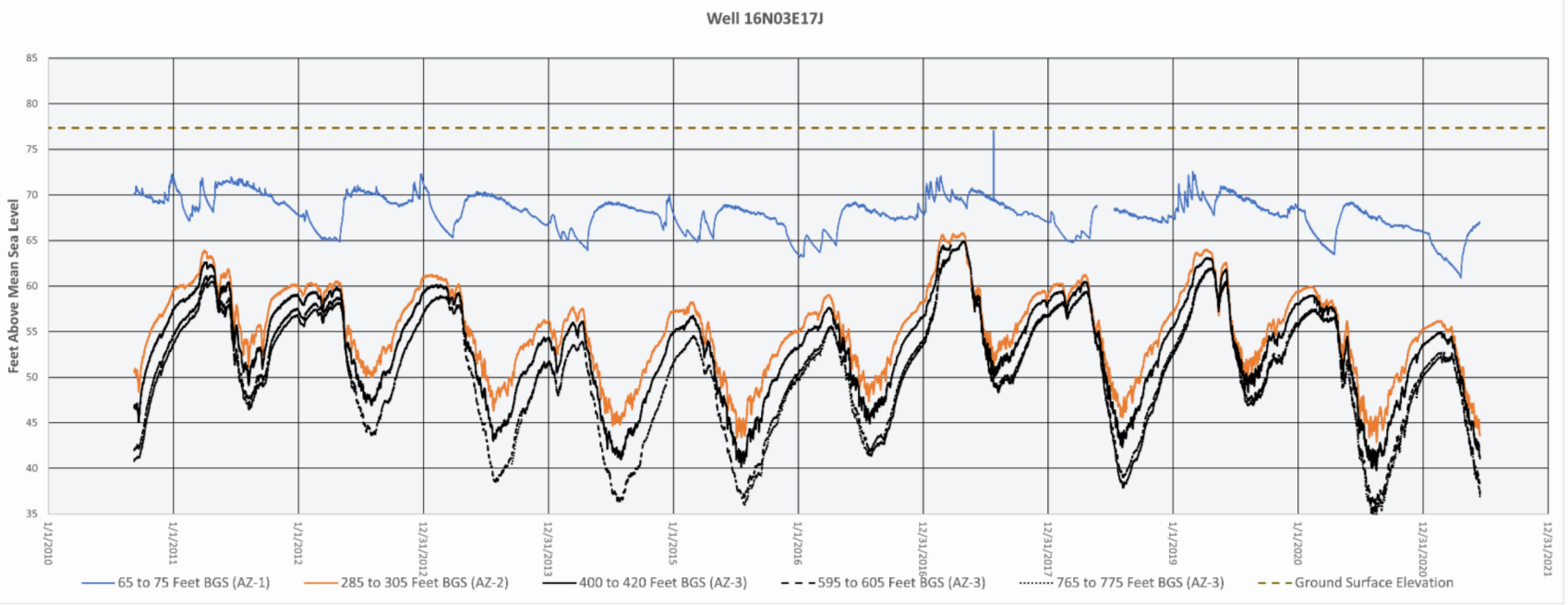



**Figure 5-61. Well 16N03E17J Hydrograph**

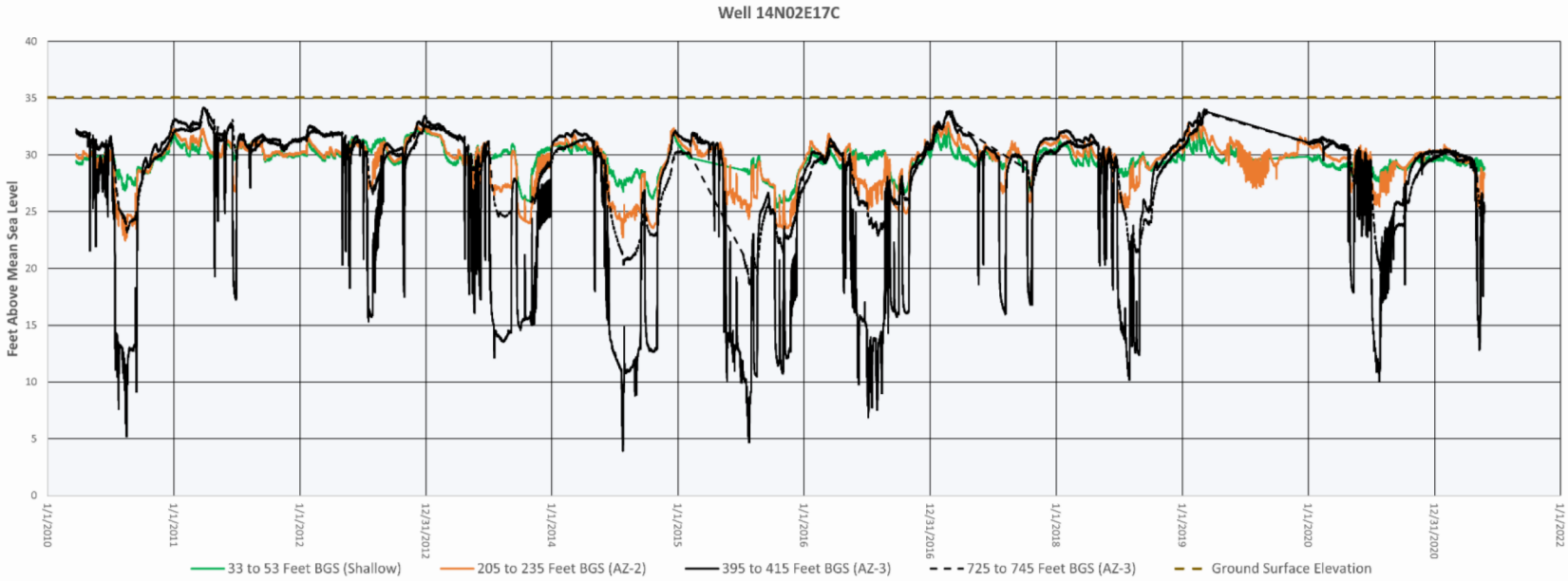



**Figure 5-62. Well 14N02E17C Hydrograph**

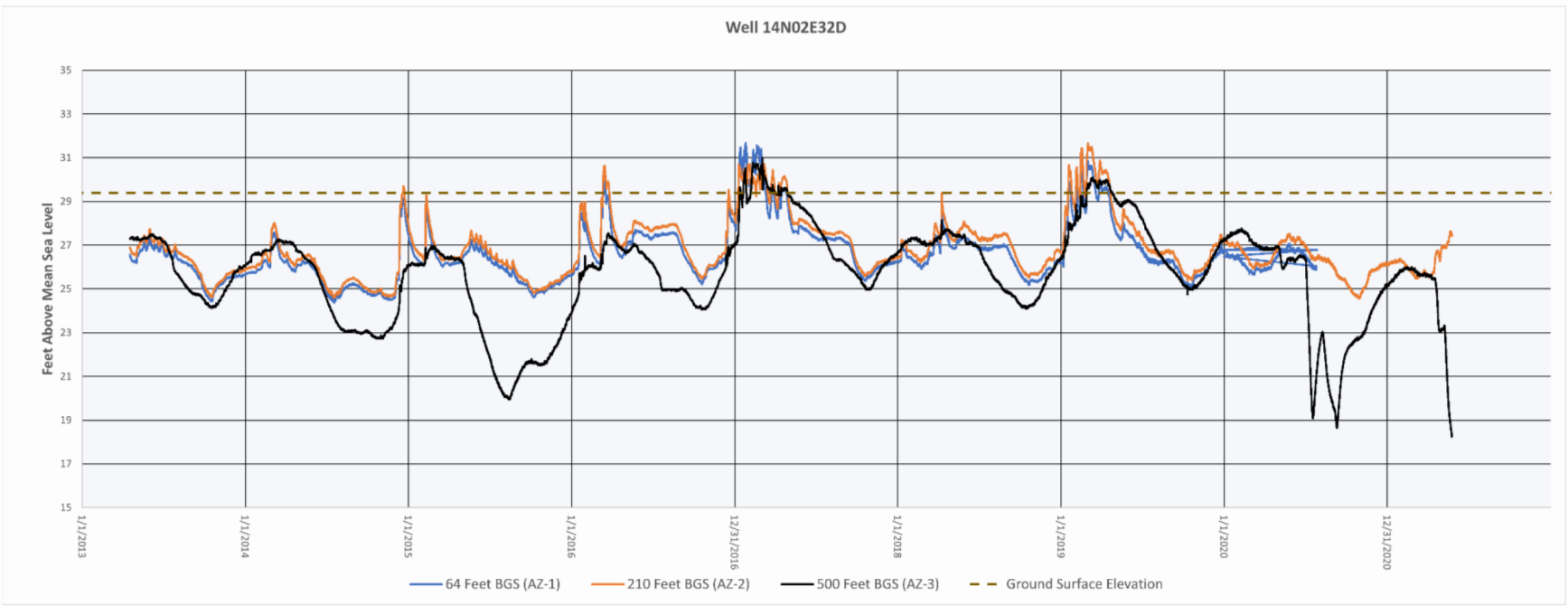



**Figure 5-63. Well 14N02E32D Hydrograph**

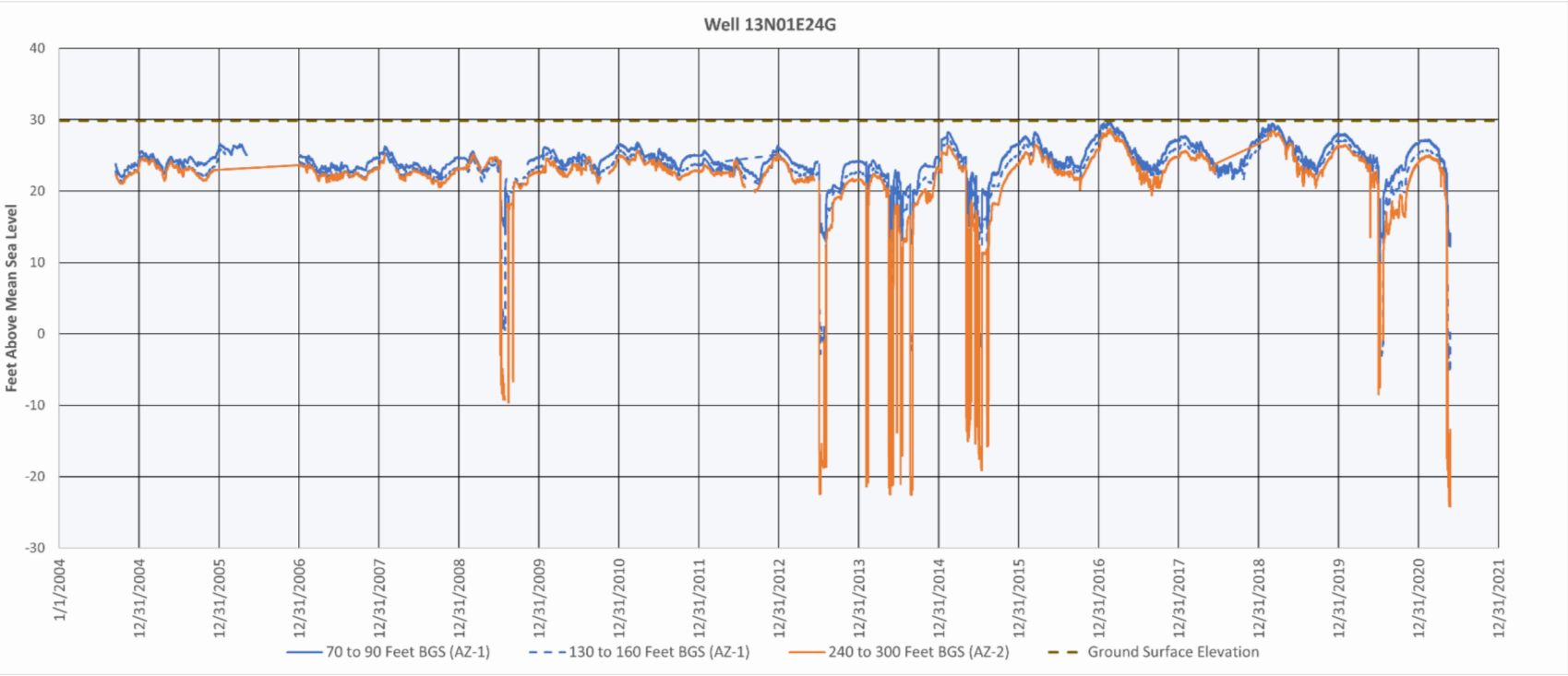



**Figure 5-64. Well 13N01E24G Hydrograph**

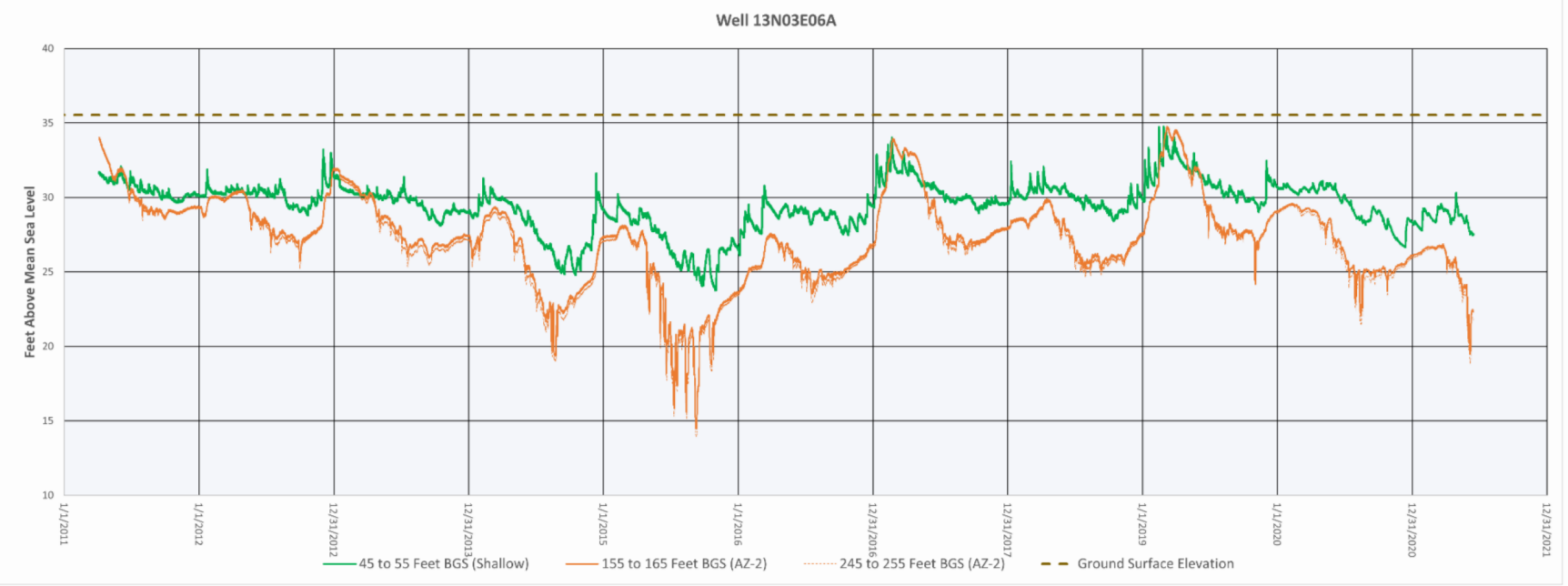



**Figure 5-65. Well 13N03E06A Hydrograph**

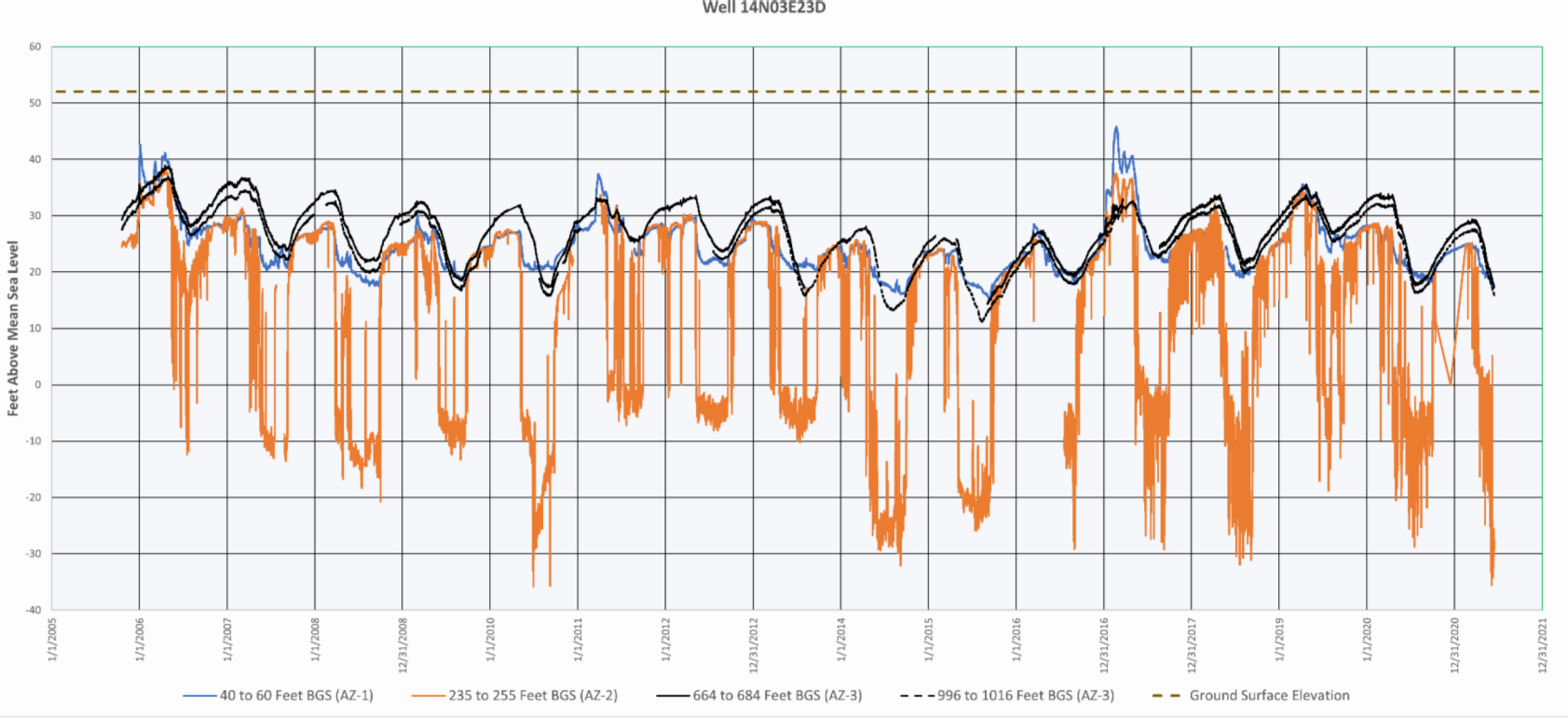



**Figure 5-66. Well 14N03E23D Hydrograph**

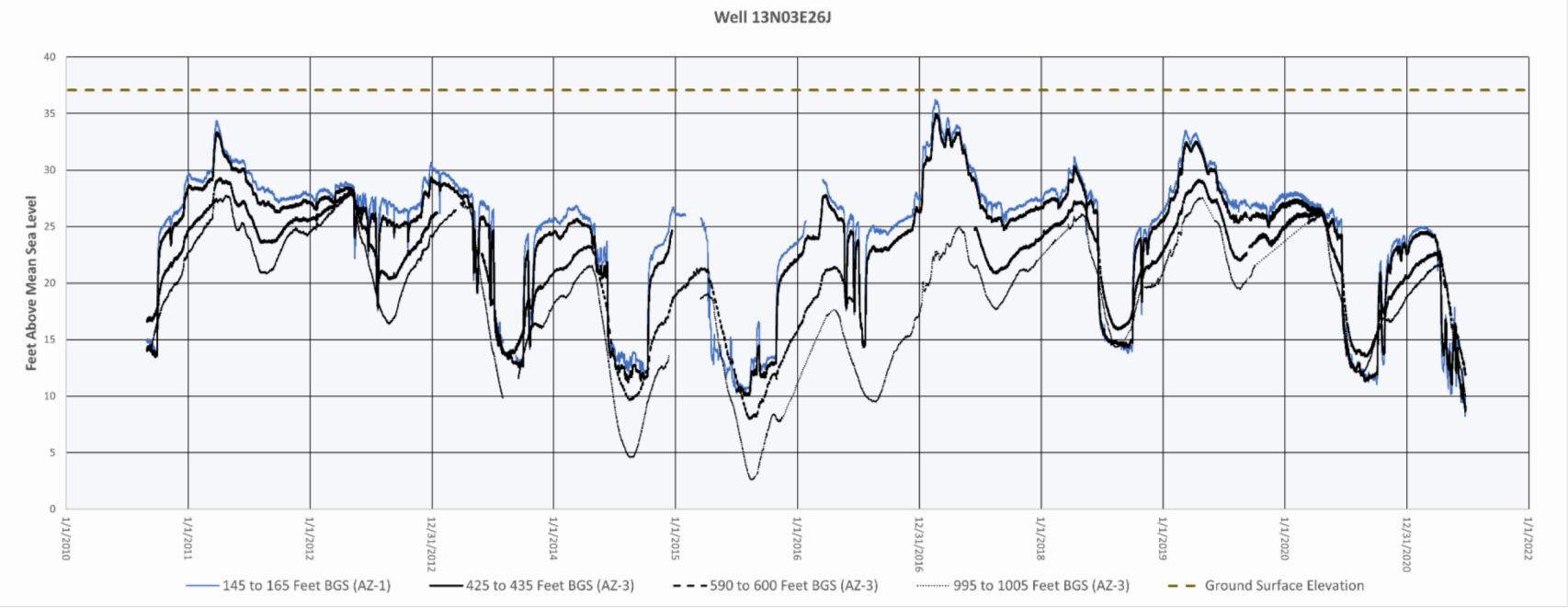



**Figure 5-67. Well 13N03E26J Hydrograph**

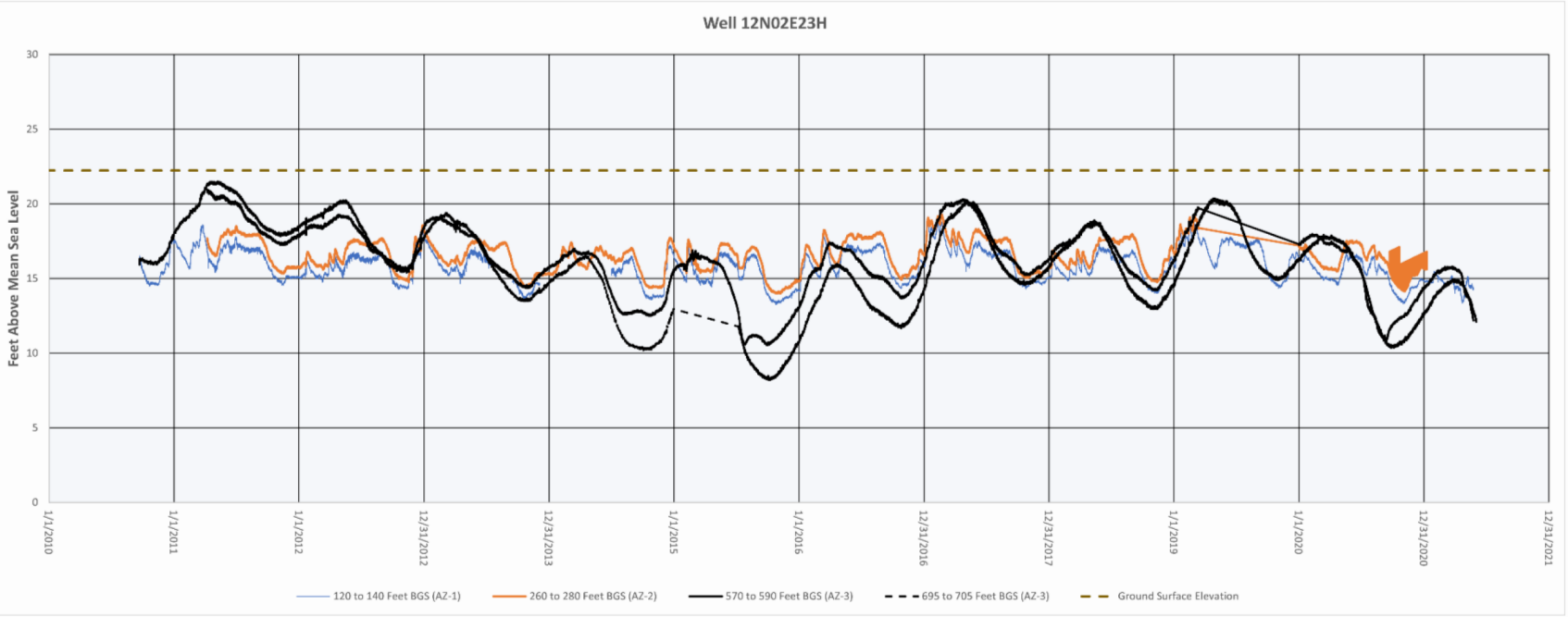



**Figure 5-68. Well 12N02E23H Hydrograph**

# Appendix G – 2022 Groundwater Substitution Transfer Summary Report

May 15, 2023

Consulting Engineers and Scientists

Mr. Mark Orme
Butte Water District
735 Virginia Street
Gridley, CA 95948-2107

**Re: 2022 Groundwater Substitution Transfer Summary Report**

Dear Mr. Orme:

GEI Consultants, Inc. (GEI), prepared this report to describe the groundwater conditions during the months of March 2022 through March 2023, in accordance with Butte Water District (BWD) 2022 groundwater substitution transfer monitoring program, as approved by the California Department of Water Resources (DWR). The 2022 Groundwater Substitution transfer period extended from 5/18/22 to 9/29/22.

## Monitoring

Monitoring for BWD's water transfer program included monitoring of two transfer wells and a monitoring well network, which consists of dedicated monitoring wells and privately-owned domestic and agricultural wells. The wells were chosen to provide a spatial distribution that allowed data to be collected and analyzed to determine any impact of the BWD pumping wells on two different aquifers and the extent of the drawdown from the pumping wells.

Transfer well monitoring was performed to monitor the quantity and quality of water produced during the transfer. Pumping groundwater levels, instantaneous flow rates and cumulative totalizer volumes, and power consumption were measured by BWD at production Wells #1 and #2 on a weekly basis during transfer pumping and for 1 month after transfer pumping stopped. Monthly monitoring continued through March 2023. Groundwater samples were collected from each well, while pumping, and analyzed for specific conductance by a state accredited laboratory. GEI staff measured the groundwater levels prior to the start of the water transfer period and at the end of the period and verified the totalizer readings. **Attachment A** contains the monitoring measurements made by BWD and GEI along with the laboratory measurements.

Groundwater levels in BWD's multi-level monitoring wells 17N02E25J001M through 003M (BWD MW-1 A/B/C) and some privately-owned wells were measured by BWD. BWD MW-1A and 1B were selected as suitable monitoring wells due to their interaction with the production aquifer, MW-1C is not screened



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916.631.4500 fax 916.634.4501

in the production aquifer and therefor is not a suitable monitoring well. Groundwater levels measured by DWR personnel were obtained from the California Statewide Groundwater Elevation Monitoring (CASGEM) website. All measurements were compiled monthly and graphed and analyzed to determine if any areas were being significantly affected by the pumping of the water transfer wells 17N03E30E001M (Well #1) and 17N02E26R001M (Well #2). **Figure 1** shows the locations of the production and monitoring wells.

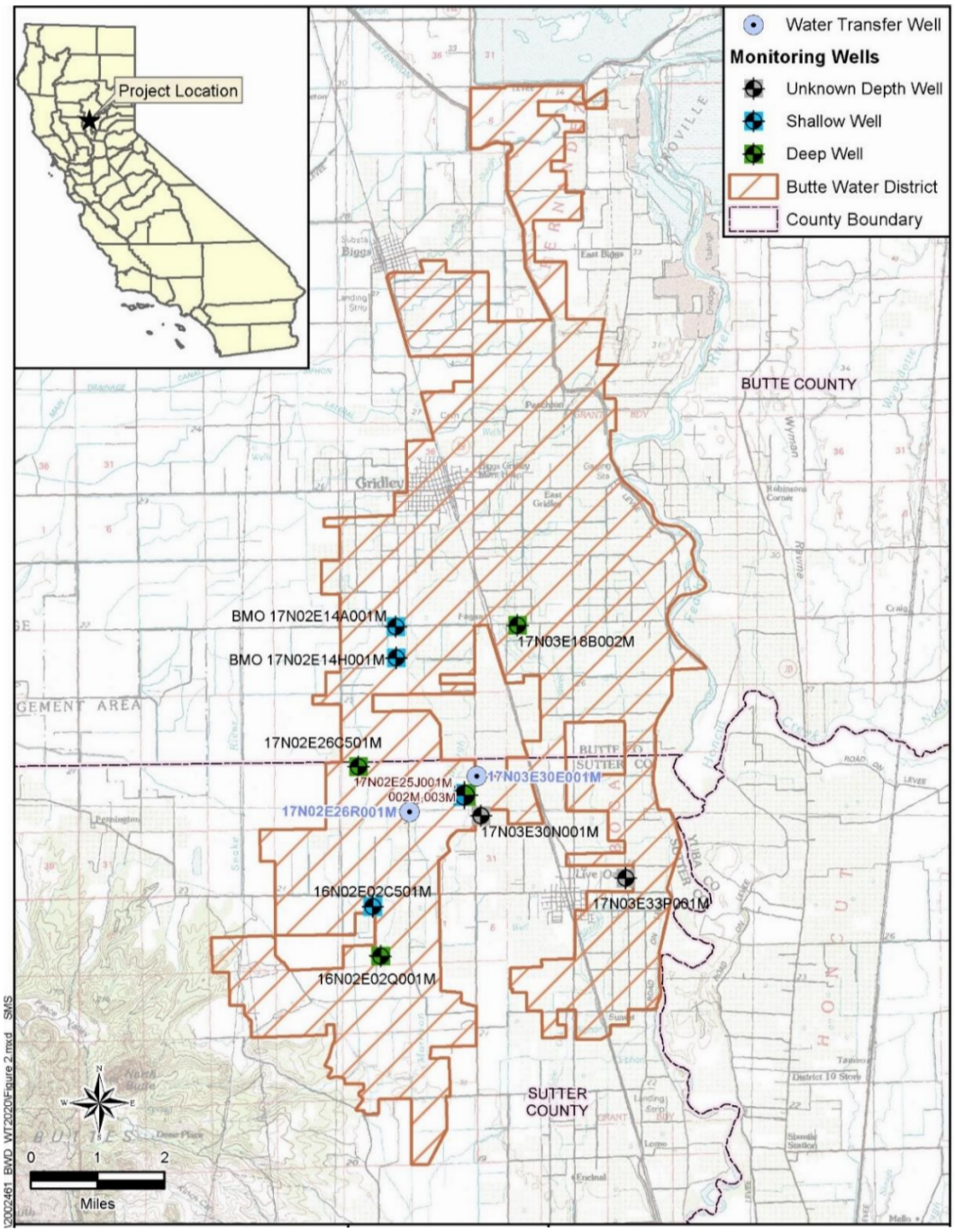



**Figure 1. BWD and DWR Well Location Map**

## Transfer Wells Summary

BWD's transfer wells were constructed in 2008 for water transfers. They were constructed to produce water from the lower aquifers of the Sutter Buttes Rampart Formation while minimizing water level drawdown on the shallow aquifer. Well construction details are provided in **Attachment A**. Well #1 is powered by a 300-horsepower (hp) motor and Well #2 is powered by a 350-hp motor. Both wells are supplied electrical power by Pacific Gas and Electric.

In late 2017, a new agricultural well (Lavy Well) was constructed about 1,700 feet from Well #1 and only 140 feet from BWD's monitoring well MW-1 A/B/C. Pumping of this agricultural well had been observed to effect groundwater levels in both Well #1 and the monitoring wells. BWD spoke with the agricultural well owner frequently to coordinate when they would pump so that BWD could increase monitoring frequency and as necessary reduce pumping at Well #1 to attempt to keep groundwater levels above groundwater trigger levels.

Spring groundwater levels for all monitoring wells were recorded to get baseline conditions for the aquifers prior to pumping. The pumping of Wells #1 and #2 for the water transfer program began on May 18, 2022. Well #1 pumping fluctuated throughout the transfer with adaptive management of the flow rates to prevent exceeding the groundwater trigger levels in MW-1 A/B.

Well #1 was turned on to a flow rate of 4,500 gallons per minute (gpm) but was decreased to about 3,800 gpm after 6 days of pumping due to the nearby Lavy well operating. The intermittent and irregular pumping at the Lavy well caused BWD to adjust flows up and mostly down to attempt to keep groundwater levels in the transfer and suitable monitoring wells from exceeding trigger levels. The flow rate was adjusted to as low as 2,900 gpm in late July. When the Lavy well was shut down for harvesting, near the end of the transfer, BWD increased pumping rates to about 3,000 gpm.

Well #2 was turned on shortly after Well #1 at a flow rate of 4,600 gpm, but was also affected by pumping of nearby wells and so the flowrate had to be reduced down to an average of 3,800 gpm for a majority of the transfer period to remain above the groundwater trigger level.

Pumping at both wells was stopped on September 29, 2022 after 134 days of pumping. The total volume of water produced from Well #1 was 1,865.74 acre-feet and 2,272.27 acre-feet were pumped from Well #2. BWD pumped a total of 4,138.01 acre-feet during the transfer. The Electronic Well Reporting forms that include the monitoring measurements are provided in **Attachment B**.

**Well #1 –** Before pumping began on May 18, 2022, the static water level in Well #1 was 28.85 feet below the reference point (brp). Throughout the transfer period, Well #1 had an average pumping rate of 3,300 gpm based on the totalizer measurements

and the pumping duration. The pumping water level for Well #1 was at a maximum of 189.85 feet brp (-108.0 feet below mean sea level) on May 31, 2022. The pumping level exceeded the trigger level of 183.25 feet brp a total of eight times during the transfer period due to the nearby Lavy well pumping, before BWD reduced the pumping rate to raise groundwater levels back above the trigger levels. Groundwater levels returned above the trigger level shortly after adjusting flow.

On September 29, 2022, just prior to shutting the pump off and ending the water transfer, the pumping water level was 181.90 feet brp. By March 2023, the post transfer groundwater levels were over 17 feet higher than at the start of the transfer. The specific capacity of Well #1 was about 21.6 gpm per foot (gpm/ft) drawdown near the end of the water transfer, similar to previous transfers, indicating the well does not need to be cleaned at this time. **Figure 2** shows a hydrograph of depth to water for production Well #1, and **Table 1** shows collected monitoring data for Well #1.

**Well #2 –** Prior to the beginning of the water transfer pumping, the static water level in Well #2 was 26.12 feet brp. Well #2 had an average pumping rate of 3,771 gpm. Well #2's lowest pumping water level was recorded on July 20, 2020 at 188.22 feet brp. The pumping level dropped below the trigger level of 184.25 feet brp eight times during the transfer period due to the pumping of the transfer and other nearby wells. The flow rate was reduced to compensate for the additional nearby well pumping until water levels rose to above the trigger levels. By March 2023, the post transfer groundwater levels were about 14 feet higher than at the start of the transfer. The specific capacity of the well near the end of the transfer was about 25 gpm/ft, similar to previous years, indicating the well does not need to be cleaned. **Figure 3** shows a hydrograph of depth to water for production Well #2, and **Table 2** shows monitoring data for Well #2.

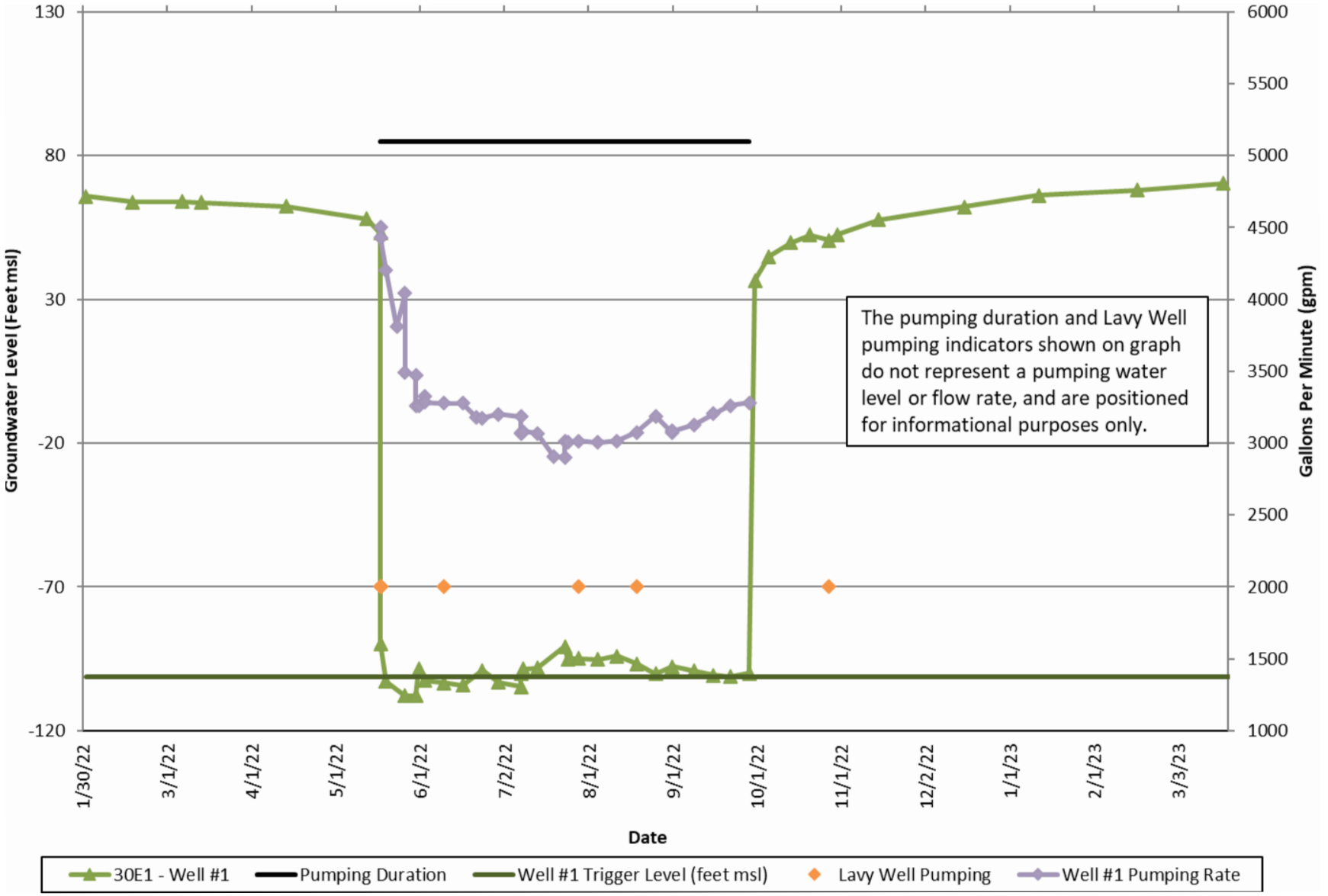



**Figure 2. BWD Well #1 Hydrograph**

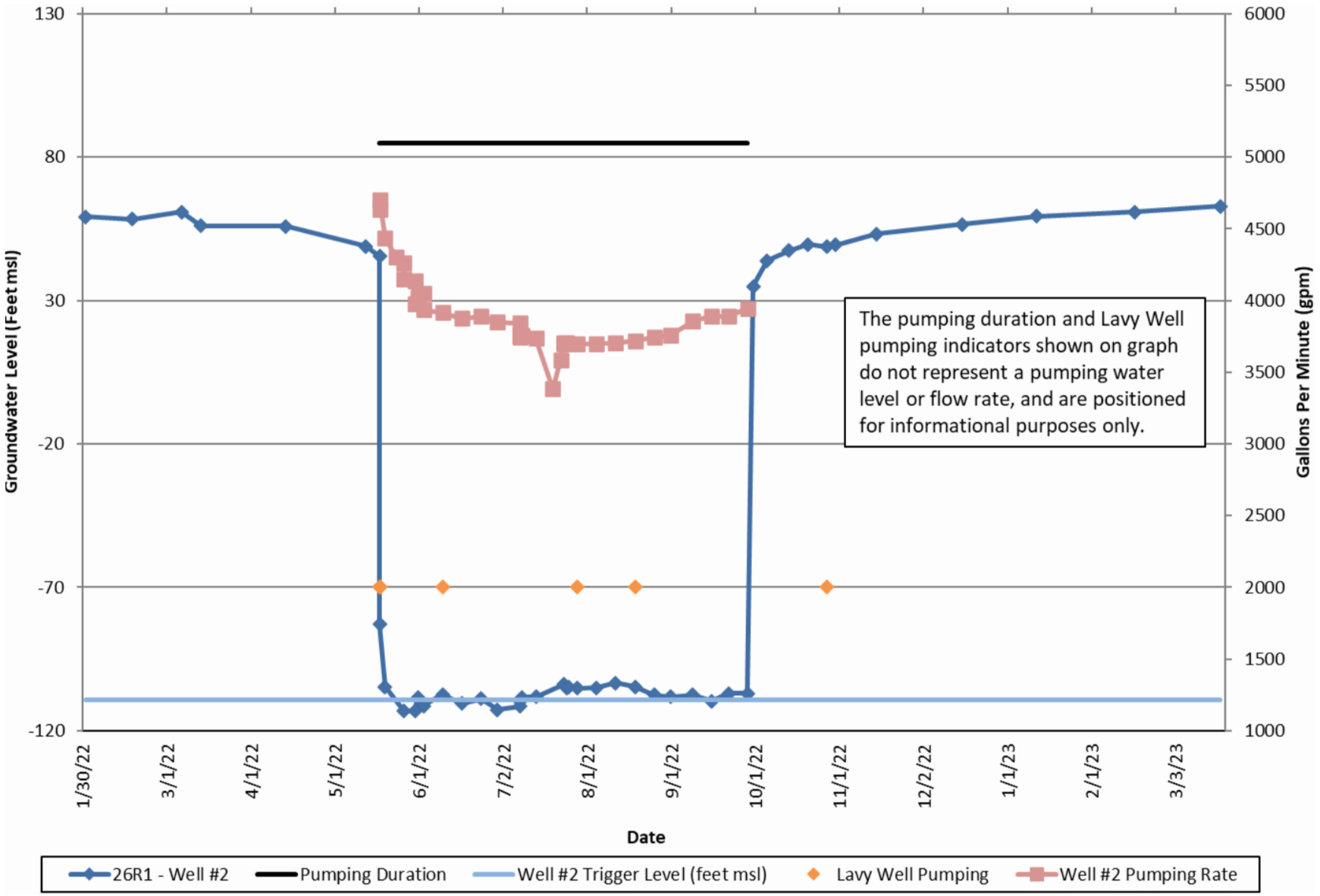



**Figure 3. BWD Well #2 Hydrograph**

## Table 1. BWD Well #1 Monitoring Data

| Date | WSE (feet msl) | Depth to Water (feet brp) | Production Well Operation | Pumping Rate (gpm) | Specific Capacity (gpm/ft dd) | Cumulative Totalizer Reading (acre-feet) | Specific Conductance (µS/cm) |
|---|---|---|---|---|---|---|---|
| 3/7/2022 | 64 | 21 | | | | | |
| 3/14/2022 | 63.61 | 18.29 | | | | | |
| 4/14/2022 | 62.43 | 19.47 | | | | | |
| 5/13/2022 | 58.0 | 23.86 | | | | | |
| 5/18/2022 | 53.1 | 28.85 | | 0 | | 0 | |
| 5/18/2022 | | | Turn on | 4,500 | | 0 | |
| 5/18/2022 | -89.7 | 171.60 | | 4,432 | | 1.03 | |
| 5/18/2022 | | | WQ Sample | | | | 260 |
| 5/20/2022 | -102.9 | 184.78 | | 4,202 | 26.3 | 29.61 | |
| 5/24/2022 | | | Decrease rate | 3,808 | | | |
| 5/27/2022 | -107.9 | 189.76 | | 4,043 | 24.5 | 126.87 | |
| 5/27/2022 | | | Decrease rate | 3,492 | | | |
| 5/31/2022 | -108.0 | 189.85 | | 3,470 | 21.0 | 187.51 | |
| 5/31/2022 | | | Decrease rate | 3,259 | | | |
| 6/1/2022 | -98.5 | 180.36 | | 3,260 | 21.0 | | |
| 6/3/2022 | -102.6 | 184.45 | | 3,324 | 20.8 | 231.32 | |
| 6/3/2022 | | | Decrease rate | 3,284 | | | |
| 6/10/2022 | -103.4 | 185.31 | | 3,277 | 20.4 | 333.14 | |
| 6/17/2022 | -104.2 | 186.05 | | 3,276 | 20.3 | 435.76 | |
| 6/22/2022 | | | Decrease rate | 3,179 | | | |
| 6/24/2022 | -99.1 | 180.98 | | 3,173 | 20.3 | 534.65 | |
| 6/24/2022 | | | WQ Sample | | | | 292 |
| 6/30/2022 | -103.2 | 185.07 | | 3,202 | 20.0 | 621.26 | |
| 7/8/2022 | -104.8 | 186.65 | | 3,184 | 19.7 | 734.60 | |
| 7/8/2022 | | | Decrease rate | 3,075 | | | |
| 7/8/2022 | -100.0 | 181.93 | | 3,065 | 19.5 | 735.56 | |
| 7/9/2022 | -98.6 | 180.49 | | 3,082 | 19.8 | 747.36 | |
| 7/14/2022 | -98.3 | 180.15 | | 3,069 | 19.8 | 818.25 | |
| 7/20/2022 | | | Decrease rate | 2,905 | | | |
| 7/24/2022 | -90.8 | 172.70 | | 2,903 | 19.7 | 947.23 | |
| 7/24/2022 | | | Increase rate | 3,011 | | | |
| 7/25/2022 | -95.1 | 177.00 | | 3,008 | 19.8 | 960.01 | |
| 7/26/2022 | -95.0 | 176.85 | WQ Sample | | | | 280 |
| 7/29/2022 | -94.9 | 176.80 | | 3,015 | 19.9 | 1,013.17 | |
| 8/5/2022 | -95.2 | 177.10 | | 3,005 | 19.8 | 1,109.86 | |
| 8/12/2022 | -94.1 | 176.02 | | 3,014 | 20.0 | 1,200.15 | |
| 8/12/2022 | | | WQ Sample | | | | 286 |
| 8/19/2022 | -96.8 | 178.66 | | 3,073 | 20.0 | 1,295.24 | |
| 8/26/2022 | -100.2 | 182.06 | | 3,188 | 20.3 | 1,389.23 | |
| 9/1/2022 | | | Decrease rate | 3,070 | | | |
| 9/1/2022 | -97.7 | 179.62 | | 3,085 | 19.9 | 1,469.14 | |
| 9/9/2022 | -99.2 | 181.12 | | 3,128 | 20.0 | 1,579.87 | |
| 9/16/2022 | -100.7 | 182.62 | | 3,203 | 20.3 | 1,678.59 | |
| 9/16/2022 | | | WQ Sample | | | | 282 |
| 9/22/2022 | -101.2 | 183.07 | | 3,261 | 20.6 | 1,768.37 | |
| 9/29/2022 | -100.0 | 181.90 | Turn Off | 3,280 | 20.9 | 1,865.44 | |
| 10/1/2022 | 36.6 | 45.31 | | 0 | 0 | 1,865.74 | |
| 10/6/2022 | 44.9 | 36.98 | | 0 | 0 | 1,865.74 | |
| 10/14/2022 | 49.7 | 32.17 | | 0 | 0 | 1,865.74 | |
| 10/21/2022 | 52.4 | 29.55 | | 0 | 0 | 1,865.74 | |
| 10/28/2022 | 50.5 | 31.37 | | 0 | 0 | 1,865.74 | |
| 10/31/2022 | 52.6 | 29.29 | | 0 | 0 | 1,865.74 | |
| 11/15/2022 | 57.7 | 24.18 | | 0 | 0 | 1,865.74 | |
| 12/16/2022 | 62.3 | 19.64 | | 0 | 0 | 1,865.74 | |
| 1/12/2023 | 66.1 | 15.77 | | 0 | 0 | 1,865.74 | |
| 2/17/2023 | 68.0 | 13.92 | | 0 | 0 | 1,865.74 | |
| 3/20/2023 | 70.3 | 11.59 | | 0 | 0 | 1,865.74 | |

| Transfer Period | Drawdown (feet) |
|---|---|
| March 7 to May 18, 2022 | -7.9 |
| May 18 to Sept 29, 2022 | -153.1 |
| May 18, 2022 to March 20, 2023 | 17.3 |

| Average Pumping Rate[1] (gpm) | Specific Capacity (gpm/ft dd) | Total Groundwater Transferred | Average S.C. (µS/cm) |
|---|---|---|---|
| 3,300 | 20.9 | 1,865.44 | 280 |

Notes: [1] = based on totalizer readings and total pumping duration

brp = below reference point gpm/ft dd = gallons per minute per foot of drawdown ft msl = feet from mean sea level

Transfer wells pumping

**Table 2. BWD Well #2 Monitoring Data**

| Date | WSE (feet msl) | Depth to Water (feet brp) | Production Well Operation | Pumping Rate (gpm) | Specific Capacity (gpm/ft dd) | Cumulative Totalizer Reading (acre-feet) | Specific Conductance (µS/cm) |
|---|---|---|---|---|---|---|---|
| 3/7/2022 | 60.8 | 17.1 | | | | | |
| 3/14/2022 | 55.99 | 19.01 | | | | | |
| 4/14/2022 | 55.95 | 19.05 | | | | | |
| 5/13/2022 | 48.9 | 26.12 | | | | 0 | |
| 5/18/2022 | 45.3 | 29.66 | | | | 0 | |
| 5/18/2022 | | | Turn on | 4,636 | | 1.16 | |
| 5/18/2022 | -82.9 | 157.90 | | 4705 | 35.4 | 1.16 | |
| 5/18/2022 | | | WQ Sample | | | 37.05 | 230 |
| 5/20/2022 | -104.7 | 179.70 | | 4439 | 28.7 | | |
| 5/24/2022 | | | Decrease rate | 4303 | | 169.93 | |
| 5/27/2022 | -113.2 | 188.22 | | 4261 | 26.1 | | |
| 5/27/2022 | | | Decrease rate | 4149 | | 241.96 | |
| 5/31/2022 | -113.1 | 188.08 | | 4136 | 25.4 | | |
| 5/31/2022 | | | Decrease rate | 3976 | | | |
| 6/1/2022 | -108.6 | 183.56 | | 4023 | 25.4 | 295.67 | |
| 6/3/2022 | -111.4 | 186.38 | | 4049 | 25.1 | | |
| 6/3/2022 | | | Decrease rate | 3935 | | 416.54 | |
| 6/10/2022 | -107.4 | 182.40 | | 3914 | 24.9 | 536.58 | |
| 6/17/2022 | -110.6 | 185.56 | | 3876 | 24.1 | 656.86 | |
| 6/24/2022 | -108.9 | 183.88 | | 3890 | 24.5 | | |
| 6/24/2022 | | | WQ Sample | | | 760.85 | 287 |
| 6/30/2022 | -112.7 | 187.70 | | 3850 | 23.7 | 897.45 | |
| 7/8/2022 | -111.6 | 186.56 | | 3842 | 23.8 | | |
| 7/8/2022 | | | Decrease rate | 3742 | | 899.01 | |
| 7/8/2022 | -109.7 | 184.72 | | 3758 | 23.5 | 912.61 | |
| 7/9/2022 | -108.3 | 183.30 | | 3,760 | 23.7 | 999.49 | |
| 7/14/2022 | -108.2 | 183.21 | | 3,735 | 23.6 | | |
| 7/20/2022 | | | Decrease rate | 3,383 | | | |
| 7/23/2022 | | | Increase rate | 3,586 | | | |
| 7/24/2022 | | | Increase rate | 3,699 | | 1,155.15 | |
| 7/24/2022 | -103.9 | 178.93 | | 3,706 | 24.1 | 1,170.95 | |
| 7/25/2022 | -105.2 | 180.19 | | 3,705 | 23.9 | | |
| 7/26/2022 | -104.9 | 179.88 | WQ Sample | | | 1,236.24 | 260 |
| 7/29/2022 | -105.2 | 180.19 | | 3,696 | 23.8 | 1,354.96 | |
| 8/5/2022 | -105.0 | 179.98 | | 3,700 | 23.9 | 1,465.82 | |
| 8/12/2022 | -103.4 | 178.40 | | 3,704 | 24.1 | | |
| 8/12/2022 | | | WQ Sample | | | 1,583.73 | 290 |
| 8/19/2022 | -104.7 | 179.72 | | 3,719 | 24.0 | 1,697.18 | |
| 8/26/2022 | -107.6 | 182.58 | | 3,742 | 23.7 | 1,792.21 | |
| 9/1/2022 | -108.2 | 183.16 | | 3,759 | 23.8 | 1,926.35 | |
| 9/9/2022 | -107.6 | 182.61 | | 3,857 | 24.5 | 2,046.01 | |
| 9/16/2022 | -109.7 | 184.65 | | 3,894 | 24.4 | | |
| 9/16/2022 | | | WQ Sample | | | 2,154.55 | 274 |
| 9/22/2022 | -107.1 | 182.10 | | 3,889 | 24.8 | 2,271.56 | |
| 9/29/2022 | -107.1 | 182.05 | | 3,944 | 25.1 | 2,272.27 | |
| 9/29/2022 | | | Turn off | 0 | | 2,272.27 | |
| 10/1/2022 | 34.9 | 40.14 | | 0 | 0.0 | 2,272.27 | |
| 10/6/2022 | 43.8 | 31.17 | | 0 | 0.0 | 2,272.27 | |
| 10/14/2022 | 47.4 | 27.57 | | 0 | 0.0 | 2,272.27 | |
| 10/21/2022 | 49.6 | 25.44 | | 0 | 0.0 | 2,272.27 | |
| 10/28/2022 | 48.7 | 26.32 | | 0 | 0.0 | 2,272.27 | |
| 10/31/2022 | 49.4 | 25.62 | | 0 | 0.0 | 2,272.27 | |
| 11/15/2022 | 53.2 | 21.83 | | 0 | 0.0 | 2,272.27 | |
| 12/16/2022 | 56.5 | 18.47 | | 0 | 0.0 | 2,272.27 | |
| 1/12/2023 | 59.4 | 15.56 | | 0 | 0.0 | 2,272.27 | |
| 2/17/2023 | 60.9 | 14.11 | | 0 | 0.0 | 2,272.27 | |
| 3/20/2023 | 62.8 | 12.19 | | 0 | 0.0 | 2,272.27 | |

| Transfer Period | Drawdown (feet) |
|---|---|
| March 7 to May 18, 2022 | -12.6 |
| May 18 to Sept 29, 2022 | -152.4 |
| May 18, 2022 to March 20, 2023 | 17.5 |

| Average Pumping Rate[1] (gpm) | Specific Capacity (gpm/ft dd) | Total Groundwater Transferred | Average S.C. (µS/cm) |
|---|---|---|---|
| 3,804 | 24.9 | 2,272.27 | 268 |

Notes: [1] = based on totalizer readings and total pumping duration

brp = below reference point gpm/ft dd = gallons per minute per foot of drawdown ft msl = feet from mean sea level

Transfer wells pumping

## Monitoring Well Summary

The groundwater levels were monitored weekly during and for 1 month after the transfer period (May 18, 2022 to Oct 31, 2022) and monthly during the recovery period (Nov 15, 2022 to Mar 20, 2023). The measurements were collected from the BWD's multi-level monitoring wells (MW-1 A/B/C) voluntarily by BWD and DWR as part of their usual monitoring frequency. These monitoring wells are equipped with pressure transducers. The monitoring wells are located about one-third of a mile from water transfer Well #1 and within 1 mile from Well #2. A new agricultural supply well was constructed in 2017 within 140 feet of the monitoring wells.

The BWD multi-level monitoring wells MW-1A/B/C monitor different depths of the aquifers in the area; level-C is the shallowest well and level-A is the deepest. The shallow level-C well monitors the shallow Modesto Formation aquifer. The level-A and -B wells monitor the Sutter Buttes Rampart Formation aquifers (production aquifers) that are used by the transfer wells. Suitable monitoring wells MW-1A and MW-1B have trigger levels while MW-1C does not. MW-1C originally had a groundwater trigger level until previous transfers showed that the groundwater transfer did not affect the shallow aquifer more than localized domestic well pumping, and now only has historical low levels for comparison purposes. **Attachment A** provides the monitoring well construction details. **Table 3** provides the groundwater level measurements from these wells and **Figure 4** provides a graph of the measurements.

The groundwater level in MW-1C, which monitors the shallow aquifer, was 11.8 feet brp prior to the start of water transfer pumping. During the transfer groundwater levels exceeded the historical low groundwater levels of 12.95 feet brp on June 10, 2022, when the Lavy well turned on. Water levels in MW-1C dropped even lower on June 24, 2022 and continued to drop below the historic low until two months after the transfer pumping ceased. Weekly measurements are provided in **Table 4**. Groundwater levels exceed the historical low level by 3.16 feet on October 21, 2022, while the Lavy well was actively pumping. Groundwater levels in MW-1C did not immediately increase after shutting down pumping at Well #1, this is due to the pumping of other wells affecting the recovery and continuing to lower groundwater levels. As shown by the detailed hydrograph on **Figure 4,** groundwater levels in MW-1C did not recover to pre-transfer levels until December 16, 2022. On March 20, 2023, the water level in MW-1C was 5.42 feet higher than prior to the beginning of the water transfer in May 2022.

MW-1A and MW-1B groundwater levels were about 20 to 22 feet below ground surface on May 13, 2022, just prior to the start of water transfer pumping and when the nearby Lavy well was not pumping. MW-1A and -1B showed the effects of the Lavy well pumping, which at times (July 5, August 1, 19, and September 14) drew

the groundwater levels down by up to 2.5 feet below the groundwater trigger levels in MW-1A, MW-1B was affected on July 5, exceeding trigger levels by 1 foot. BWD mitigated the exceedances by reducing the pumping rates for both production wells to allow groundwater levels to rise above the trigger levels. **Figure 4** shows the detailed hydrographs of the monitoring wells during the transfer period. Groundwater levels immediately rose in MW-1A and -1B after each adjustment, but it was not until September 8 when the agricultural well shut down that groundwater levels in MW-1B stayed consistent. The groundwater levels in MW-1B were affected more by the nearby Lavy well pumping, as shown on **Figure 4**. On October 28, 2022, about a month after the transfer ended, the Lavy well pumping dropped the water level in MW-1B by over 23 feet.

After the transfer ended, groundwater levels in both MW-1A and -1B recovered to pre-transfer levels by November 15 in MW-1B, and December 16 in MW-1A. By March 20, 2023, groundwater levels in MW-1A were 10 feet higher and in MW-1B were 12 feet higher than the pre-transfer groundwater level recorded on May 13, 2022.

**Figure 4. BWD MW-1 A/B/C Hydrographs**

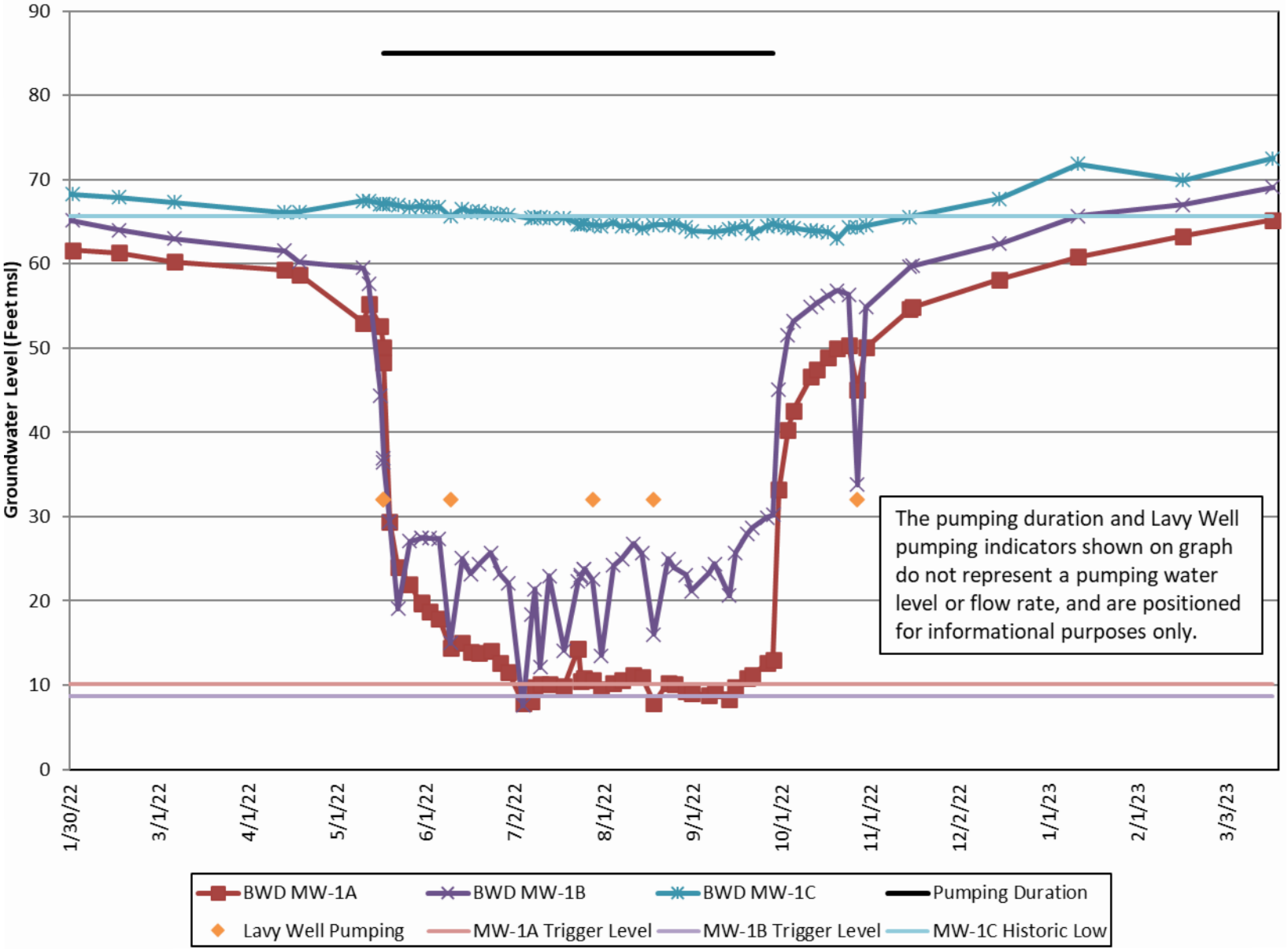


**Table 3. BWD Monitoring Well Data**

| Date | MW-1A | MW-1B | MW-1C | QM Code |
|---|---|---|---|---|
| | Depth to Water (feet brp) | | | |
| 3/7/2022 | 19.77 | 16.53 | 11.80 | |
| 4/14/2022 | 20.70 | 17.95 | 12.97 | |
| 4/19/2022 | 21.27 | 19.24 | 12.91 | |
| 5/11/2022 | 27.00 | 20.00 | 11.60 | |
| 5/13/2022 | 24.77 | 21.85 | 11.65 | |
| 5/17/2022 | 27.41 | 35.14 | 11.97 | 2 |
| 5/18/2022 | 29.89 | 42.57 | 12.01 | 2 |
| 5/18/2022 | 31.72 | 43.09 | 12.01 | 2 |
| 5/20/2022 | 50.61 | 50.17 | 11.98 | |
| 5/23/2022 | 56.05 | 60.46 | 12.17 | 2 |
| 5/27/2022 | 58.02 | 52.40 | 12.38 | |
| 5/31/2022 | 60.32 | 52.06 | 12.24 | |
| 5/31/2022 | 60.24 | 52.00 | 12.26 | |
| 6/3/2022 | 61.22 | 52.07 | 12.42 | |
| 6/6/2022 | 62.10 | 52.12 | 12.35 | |
| 6/10/2022 | 65.61 | 64.50 | 13.50 | 2 |
| 6/14/2022 | 64.97 | 54.48 | 12.59 | |
| 6/17/2022 | 66.07 | 56.30 | 12.91 | |
| 6/20/2022 | 66.2 | 55.1 | 12.80 | |
| 6/24/2022 | 65.96 | 53.81 | 13.13 | |
| 6/27/2022 | 67.35 | 56.27 | 13.21 | |
| 6/30/2022 | 68.50 | 57.45 | 13.32 | |
| 7/5/2022 | 72.15 | 71.90 | | |
| 7/8/2022 | 71.97 | 61.13 | 13.69 | |
| 7/9/2022 | 70.21 | 58.10 | 13.51 | |
| 7/11/2022 | 69.9 | 67.35 | 13.61 | |
| 7/14/2022 | 69.90 | 56.55 | 13.72 | 2 |
| 7/19/2022 | 70.07 | 65.40 | 13.66 | |
| 7/24/2022 | 65.69 | 57.15 | 14.36 | |
| 7/25/2022 | 65.69 | 56.75 | 14.40 | |
| 7/25/2022 | 69.50 | 56.50 | 14.35 | |
| 7/26/2022 | 69.42 | 55.75 | 14.27 | |
| 7/26/2022 | 69.21 | 55.70 | 14.30 | 2 |
| 7/29/2022 | 69.40 | 56.95 | 14.47 | 2 |
| 8/1/2022 | 70.50 | 66.00 | 14.60 | |
| 8/5/2022 | 69.80 | 55.28 | 14.17 | |
| 8/8/2022 | 69.41 | 54.50 | 14.70 | |
| 8/12/2022 | 68.82 | 52.73 | 14.51 | |
| 8/15/2022 | 69.00 | 53.88 | 14.90 | 2 |
| 8/19/2022 | 72.15 | 63.46 | 14.47 | |
| 8/24/2022 | 69.75 | 54.50 | 14.50 | |
| 8/26/2022 | 69.87 | 55.53 | 14.26 | |
| 8/30/2022 | 70.72 | 56.44 | 14.75 | |
| 9/1/2022 | 70.95 | 58.37 | 15.23 | |
| 9/7/2022 | 71.25 | 56.20 | | 2 |
| 9/9/2022 | 70.62 | 55.08 | 15.35 | |
| 9/14/2022 | 71.70 | 58.85 | 15.03 | |
| 9/16/2022 | 70.24 | 53.78 | 14.85 | |
| 9/20/2022 | 69.22 | 51.60 | 14.60 | |
| 9/22/2022 | 68.75 | 50.78 | 15.50 | |
| 9/27/2022 | 67.42 | 49.61 | 14.60 | |
| 9/29/2022 | 66.97 | 49.31 | 14.39 | |
| 10/1/2022 | 46.81 | 34.45 | 14.56 | |
| 10/4/2022 | 39.76 | 28.02 | 14.75 | |
| 10/6/2022 | 37.40 | 26.33 | 14.84 | |
| 10/12/2022 | 33.41 | 24.65 | 15.13 | |
| 10/14/2022 | 32.55 | 24.18 | 15.20 | |
| 10/18/2022 | 31.05 | 23.26 | 15.36 | |
| 10/21/2022 | 30.08 | 22.66 | 16.11 | 2 |
| 10/25/2022 | 29.70 | 23.15 | 14.76 | |
| 10/28/2022 | 34.90 | 45.70 | 14.82 | |
| 10/31/2022 | 29.94 | 24.62 | 14.57 | |
| 11/15/2022 | 25.37 | 19.88 | 13.55 | |
| 11/16/2022 | 25.17 | 19.77 | | |
| 12/16/2022 | 21.88 | 17.12 | 11.40 | |
| 1/12/2023 | 19.17 | 13.84 | 7.23 | 2 |
| 2/17/2023 | 16.71 | 12.52 | 9.15 | 2 |
| 3/20/2023 | 14.79 | 10.42 | 6.59 | 2 |
| Transfer Period | Drawdown (feet) | | | |
| March 7 to May 18, 2022 | -10.12 | -26.04 | -0.21 | |
| May 18 to Sept 29, 2022 | -37.08 | -6.74 | -2.38 | |
| May 18, 2022 to March 20, 2023 | 15.10 | 32.15 | 5.42 | |

Notes:

QM Code 2 = Nearby well pumping

--- = No measurement

Transfer Well #1 and #2 pumping

DWR and BWD monitored private wells to provide groundwater elevation data in the surrounding the transfer pumping wells. Groundwater levels from private wells monitored by DWR were obtained from the CASGEM website. The measurements are provided in **Table 4** and are shown on **Figure 5**. Five of the private wells are constructed into the shallow aquifer and three are constructed into the Sutter Buttes Rampart Formation aquifer, the production aquifer.

A number of wells that DWR monitors were affected by pumping at or near the monitoring location, as noted on the CASGEM website and as seen on the hydrographs. Some of the groundwater levels in wells 17N02E14A001M, 17N02E14H001M, 17N03E30N001M, 17N03E33P001M, 17N02E26C501M, and 16N02E02Q001M were affected by the well either being recently pumped or by pumping at a nearby well. Well 17N03E33P001M was also noted to have 'oil or foreign substance in casing,' which creates some uncertainty in these levels.

Groundwater levels in shallow private wells declined by up to 33 feet from the start to the end of the transfer period, but the wells furthest from the transfer wells showed greater changes due to local pumping effects. Wells in the production aquifer had declining groundwater levels in nearby wells by up to 11 feet while in distant wells the groundwater levels rose slightly. By March 2023 groundwater levels in the shallow aquifer ranged from 5 feet to 30 feet higher than at the start of the transfer pumping. In the production aquifer, groundwater elevations in the wells were from -2 to 8 feet higher than pre-transfer levels.

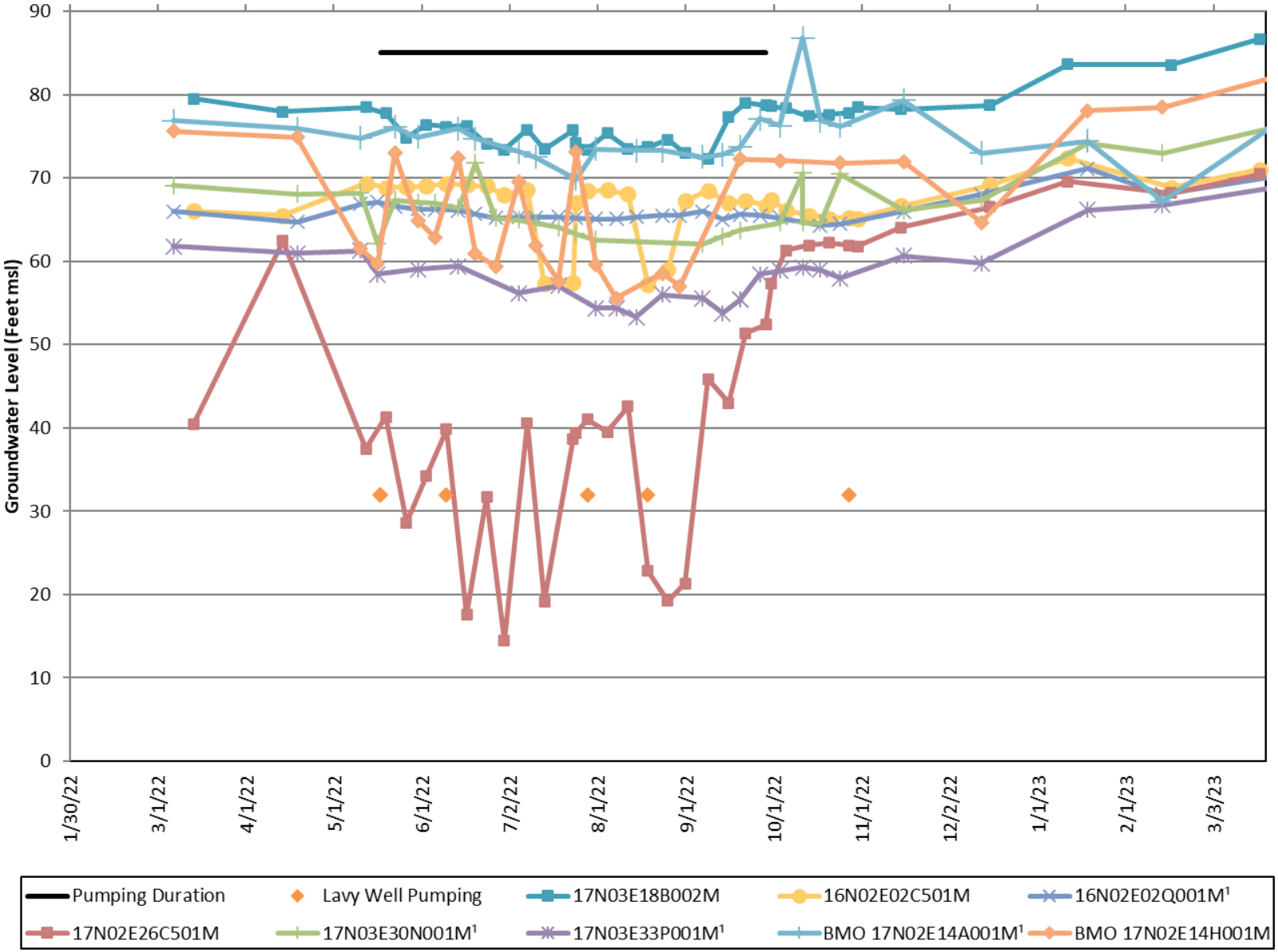



**Figure 5. Monitoring Well Hydrographs**

**Table 4. Monitoring Well Groundwater Levels**

| Date | BMO 17N02E14A001M[1] | BMO 17N02E14H001M[1] | 17N03E30N001M[1] | 17N03E33P001M[1] | 16N02E02C501M | 17N02E26C501M | 16N02E02Q001M[1] | 17N03E18B002M |
|---|---|---|---|---|---|---|---|---|
| | Depth to Water (feet brp) | | | | | | | |
| 3/14/2022 | 7.90 | 10.7 | 11 | 18 | 9.53 | 36.56 | 7 | 11.51 |
| 4/14/2022 | 8.90 | 11.4 | 12 | 18 | 10.10 | 14.52 | 9 | 13.07 |
| 5/13/2022 | 10.00 | 24.80 | 12 | 18 | 6.27 | 39.51 | 6 | 12.50 |
| 5/20/2022 | --- | 26.6 | 18 | 21 | 6.70 | 35.66 | 6 | 13.25 |
| 5/27/2022 | 8.70 | 13.3 | 13 | --- | 6.68 | 48.35 | 7 | 16.19 |
| 6/3/2022 | 9.90 | 21.4 | 13 | 20 | 6.56 | 42.75 | 7 | 14.62 |
| 6/10/2022 | --- | 23.40 | 13 | --- | 6.24 | 37.16 | 7 | 14.83 |
| 6/17/2022 | 8.90 | 13.90 | 14 | 20 | 6.44 | 59.41 | 7 | 14.74 |
| 6/24/2022 | 10.10 | 25.40 | 8 | --- | 6.52 | 45.28 | 8 | 16.92 |
| 6/30/2022 | --- | 26.9 | 15 | --- | 7.58 | 62.57 | 8 | 17.58 |
| 7/8/2022 | 11.60 | 16.80 | 15 | 23 | 7.02 | 36.38 | 8 | 15.18 |
| 7/14/2022 | 12.30 | 24.4 | 16 | --- | 18.28 | 57.84 | 8 | 17.51 |
| 7/24/2022 | --- | 28.70 | 16 | 22 | 18.14 | 38.31 | 8 | 15.25 |
| 7/25/2022 | 14.90 | 13.2 | 17 | --- | 8.52 | 37.61 | 8 | 16.83 |
| 7/29/2022 | 11.30 | 26.70 | 18 | | 7.12 | 35.96 | 8 | 17.60 |
| 8/5/2022 | --- | 30.7 | --- | 25 | 7.05 | 37.46 | 8 | 15.61 |
| 8/12/2022 | 11.50 | --- | --- | 25 | 7.48 | 34.43 | 8 | 17.48 |
| 8/19/2022 | | 27.7 | | 26 | 18.39 | 54.15 | | 17.30 |
| 8/26/2022 | 11.50 | | --- | 23 | 16.60 | 57.76 | 8 | 16.40 |
| 9/1/2022 | --- | 29.30 | --- | --- | 8.34 | 55.68 | 8 | 18.04 |
| 9/9/2022 | 12.30 | --- | 18 | 24 | 7.07 | 31.13 | 7 | 18.76 |
| 9/16/2022 | 12.00 | --- | 17 | 26 | 8.60 | 34.02 | 8 | 13.71 |
| 9/22/2022 | 11.10 | 14.00 | 16 | 24 | 8.30 | 25.60 | 8 | 11.97 |
| 9/29/2022 | 43.00 | --- | --- | 24 | 8.90 | 24.63 | 8 | 12.30 |
| 10/1/2022 | | | 16 | 21 | 8.23 | 19.62 | | 12.37 |
| 10/6/2022 | 43.00 | 58.30 | 10 | 20 | 9.45 | 15.71 | 8 | 12.61 |
| 10/14/2022 | 48.00 | --- | 16 | 20 | 10.09 | 15.07 | | 13.58 |
| 10/21/2022 | | --- | 16 | 20 | 10.42 | 14.81 | 9 | 13.38 |
| 10/28/2022 | 43.00 | | 10 | 21 | 10.30 | 15.09 | 9 | 13.14 |
| 10/31/2022 | 43.00 | 53.3 | | | 10.44 | 15.21 | | 12.50 |
| 11/15/2022 | 44.00 | 48.3 | 14 | 19 | 8.95 | 12.96 | 7 | 12.74 |
| 12/16/2022 | 40.00 | 63.30 | 13 | 20 | 6.40 | 10.45 | 5 | 12.25 |
| 1/12/2023 | 38.00 | 48.3 | 6 | 13 | 3.19 | 7.42 | 2 | 7.36 |
| 2/17/2023 | 35.00 | 38.3 | 7 | 13 | 6.75 | 8.79 | 5 | 7.42 |
| 3/20/2023 | 38.00 | 38.30 | 4 | 11 | 4.55 | 6.54 | 3 | 4.33 |
| Shallow Aquifer | | | | | | | | |
| March 7 to May 18, 2022 | -2.10 | -14.10 | -1 | -1 | 3.26 | | | |
| May 18 to Sept 29, 2022 | -33.00 | 10.80 | -5 | -6 | -2.63 | | | |
| May 18, 2022 to March 20, 2023 | -28.00 | -13.50 | 8 | 8 | 1.72 | | | |
| Production Aquifer | | | | | | | | |
| March 7 to May 18, 2022 | | | | | | -2.95 | 0.90 | -0.99 |
| May 18 to Sept 29, 2022 | | | | | | 11.03 | -1.60 | 0.95 |
| May 18, 2022 to March 20, 2023 | | | | | | 32.97 | 3.20 | 8.17 |

Notes:

[1] = Measurements taken within 5 days of date

--- = No measurement or unable to calculate due to lack of measurements

Transfer wells pumping

## Monitoring Analysis

Pumping of Wells #1 and #2 did not directly affect the monitoring wells in the shallow aquifer. **Table 5** provides a list of wells used to monitor the shallow aquifer and changes in groundwater elevations during the period from the pre-transfer start of the pumping to the end of the transfer monitoring period along with corresponding distances from the pumping wells. The table includes those wells that were affected by local pumping and shows the effects of BWD's water transfer on the shallow aquifer were no greater than 2.38 feet and, based on the closest monitoring well to the transfer wells and the hydrograph shown on **Figure 5** and was probably less. The overall stability of some of the groundwater levels during the pumping period indicates that BWD production Wells #1 and #2, while not directly affecting water levels in the shallow aquifer, may have indirectly influenced the shallow aquifer through vertical leakance due to partial confinement of the aquifers near the transfer wells.

The drawdown is greater in the deepest portion of the aquifer as shown in the BWD's MW-1A level monitoring well. **Table 6** provides a list of the monitoring wells and their

distance from the water transfer pumping wells. As would be expected the greatest drawdown of about 153 feet occurred in BWD's water transfer wells. At a distance of less than 2.3 miles (12,350 feet), based on well 17N03E18B002M, the transfer pumping has no effect on groundwater levels.

**Table 5. Shallow Aquifer BWD Pumping Effects**

| State Well No. | Local Well Name | Distance from Transfer Wells (feet) | Drawdown (May to Sep) (feet) | Influenced by Other Local Pumping | Comments |
|---|---|---|---|---|---|
| 17N02E25J003M | BWD MW-1C | 1,800 | -2.38 | Yes | Southwest of Well #1 |
| 17N03E30N001M | 17N03E30N001M | 3,200 | -4 | Yes | South of Well #1 |
| 16N02E02C501M | 16N02E02C501M | 8,000 | -2.63 | Yes | Southwest of Well #2 |
| 17N02E14H001M | BMO 17N02E14H001M[1] | 11,200 | 11 | Yes | Northwest of Well #1 |
| 17N02E14A001M | BMO 17N02E14A001M[1] | 13,400 | -33 | Yes | Northwest of Well #1 |
| 17N03E33P001M | 17N03E33P001M | 14,300 | -6 | Yes | Southeast of Well #1 |

Notes:

[1] = Affected by unknown pumping

**Table 6. Production Aquifer Pumping Effects**

| State Well No. | Local Well Name | Distance from Transfer Wells (feet) | Drawdown (May to Sep) (feet) | Influenced by Other Local Pumping | Comments |
|---|---|---|---|---|---|
| 17N03E30E001M | Well #1 | 0 | -153.05 | Yes | Transfer Well |
| 17N02E26R001M | Well #2 | 0 | -152.39 | Yes | Transfer Well |
| 17N02E25J001M | BWD MW-1A | 1,800 | -37.08 | Yes | Southwest of Well #1 |
| 17N02E25J002M | BWD MW-1B | 1,800 | 52.74 | Yes | Southwest of Well #1 |
| 17N02E26C501M | 17N02E26C501M | 5,400 | 11.30 | Yes | Northwest of Well #2 |
| 16N02E02Q001M | 16N02E02Q001M | 11,700 | -1.60 | Yes | South-southwest of Well #2 |
| 17N03E18B002M | 17N03E18B002M | 12,350 | 0.95 | Yes | Northeast of Well #1 |

As shown on **Tables 1 through 4**, the transfer wells and all the monitoring wells fully recovered by late December and exceeded the pre-pumping water levels by increments ranging from a few tenths of a foot to up to 33 feet by March 2023. This indicates the water transfer pumping did not adversely affect the aquifers.

## Groundwater Contours

Groundwater contours were developed for pre-transfer, end of transfer and post-transfer groundwater conditions for both the shallow and production aquifers. The contours are provided in **Attachment C**.

The pre-transfer groundwater contours for both aquifers show a general north south flow direction. The measurement dates used for contouring purposes are all within 1 week.

At the end of the transfer, a pumping depression is clearly evident surrounding the two transfer wells in the production aquifer, which altered the groundwater flow direction. The effects of the transfer pumping are not seen in the shallow aquifer.

Post-transfer groundwater contours were developed using measurements from March 2023. The contours show the groundwater levels recovered completely in the production aquifer and the flow direction returned to the general north-south flow direction.

Groundwater contours for the shallow aquifer were still slightly below the pre-transfer conditions but the overall north-south flow direction was similar to pre-transfer conditions.

## Water Quality Sampling

Groundwater quality samples were collected monthly during the transfer from a sampling spigot at each transfer well. The samples were analyzed for electrical conductivity by a state accredited laboratory. **Tables 1 and 2** provide these measurements. The total dissolved solids at Well #1 ranged between 260 and 292 micro-Siemens per centimeter (uS/cm). The specific conductance at Well #2 ranged between 230 and 290 uS/cm. Both wells remained below the agricultural water transfer limit of 700 uS/cm. The transfer pumping did not impact local groundwater quality.

The two transfer wells and MW-1A, B, and C were also sampled on July 26, 2022 by GEI. The samples were delivered on ice under chain-of-custody to California Laboratory Services of Rancho Cordova, California. The transfer wells were pumping at the time of sampling and the samples were collected from a spigot located on the discharge pipes. The monitoring wells were pumped using a Grundfos pump until three well and gravel pack volumes were purged. Samples were collected after purging the wells.

The samples from each well were analyzed for boron, arsenic, dibromochloropropane (DBCP) and total dissolved solids. The results from the analyses are presented in **Table 7** along with historical results. The laboratory results are provided in **Attachment D**.

The results of the water quality sampling showed the water quality during 2022 water transfer was similar to the historical results. DBCP was not detected in any samples. The groundwater transfer did not adversely affect water quality.

**Table 7. BWD Water Quality Monitoring Data**

| Constituents | Sample Date | Well Number | | | | | Units |
|---|---|---|---|---|---|---|---|
| | | Well #1 | Well #2 | MW-1A | MW-1B | MW-1C | |
| **TDS** | | | | | | | |
| | 7/1/2008 | -- | 210 | -- | -- | -- | mg/L |
| | 8/5/2008 | 200 | -- | -- | -- | -- | mg/L |
| | 3/22/2012 | 190 | 190 | 210 | 190 | 260 | mg/L |
| | 5/22/2012 | 190 | 190 | -- | -- | -- | mg/L |
| | 6/26/2013 | 200 | 200 | 210 | 190 | 260 | mg/L |
| | 9/10/2014 | 210 | 220 | 220 | 200 | 260 | mg/L |
| | 8/22/2018 | 180 | 210 | 210 | 170 | 210 | mg/L |
| | 8/20/2020 | 200 | 210 | 220 | 190 | 230 | mg/L |
| | 7/22/2021 | 210 | 220 | 220 | 190 | 230 | mg/L |
| | 7/26/2022 | 230 | 240 | 240 | 190 | 250 | mg/L |
| | **Average** | 201 | 208 | 219 | 189 | 243 | mg/L |
| **Arsenic** | | | | | | | |
| | 7/1/2008 | -- | 140 | -- | -- | -- | µg/L |
| | 8/5/2008 | 73 | -- | -- | -- | -- | µg/L |
| | 3/22/2012 | 190 | 150 | 26 | 240 | 18 | µg/L |
| | 5/22/2012 | 190 | 150 | -- | -- | -- | µg/L |
| | 6/26/2013 | 67 | 120 | 17 | 200 | 8.3 | µg/L |
| | 9/10/2014 | 62 | 130 | 18 | 170 | 8.9 | µg/L |
| | 8/22/2018 | 60 | 130 | 20 | 310 | 9.2 | µg/L |
| | 8/20/2020 | 66 | 130 | 19 | 290 | 8 | µg/L |
| | 7/22/2021 | 68 | 130 | 20 | 300 | 9.7 | µg/L |
| | 7/26/2022 | 63 | 130 | 18 | 300 | 6.6 | µg/L |
| | **Average** | 93 | 134 | 20 | 259 | 10 | µg/L |
| **Boron** | | | | | | | |
| | 7/1/2008 | -- | 170 | -- | -- | -- | µg/L |
| | 8/5/2008 | 220 | -- | -- | -- | -- | µg/L |
| | 3/22/2012 | 160 | 170 | 270 | 230 | 23 | µg/L |
| | 5/22/2012 | 160 | 170 | -- | -- | -- | µg/L |
| | 6/26/2013 | 120 | 210 | 280 | 210 | <20 | µg/L |
| | 9/10/2014 | 260 | 220 | 250 | 170 | 32 | µg/L |
| | 8/22/2018 | 210 | 170 | 230 | 240 | ND | µg/L |
| | 8/20/2020 | 260 | 200 | 240 | 260 | ND | µg/L |
| | 7/22/2021 | 240 | 210 | 260 | 270 | ND | µg/L |
| | 7/26/2022 | 380 | 340 | 420 | 490 | 160 | µg/L |
| | **Average** | 223 | 207 | 279 | 267 | 72 | µg/L |
| 1,2-Dibromo-3-chloropropane | | | | | | | |
| | 7/1/2008 | -- | ND | -- | -- | -- | µg/L |
| | 8/5/2008 | ND | -- | -- | -- | -- | µg/L |
| | 10/1/2010 | -- | -- | -- | -- | -- | µg/L |
| | 3/22/2012 | ND | ND | ND | ND | ND | µg/L |
| | 6/26/2013 | ND | ND | ND | ND | ND | µg/L |
| | 9/30/2013 | -- | -- | -- | -- | -- | µg/L |
| | 9/10/2014 | ND | ND | ND | ND | ND | µg/L |
| | 8/22/2018 | ND | ND | ND | ND | ND | µg/L |
| | 8/20/2020 | ND | ND | ND | ND | ND | µg/L |
| | 7/22/2021 | ND | ND | ND | ND | ND | µg/L |
| | 7/26/2022 | ND | ND | ND | ND | ND | µg/L |
| | **Average** | -- | -- | -- | -- | -- | µg/L |

Notes: ND = Not Detected, below laboratory minimum reporting limits

## Subsidence

BWD maintained their pumping water levels in transfer Wells #1 and #2 for the most part above trigger levels throughout the transfer period except for a few days. Groundwater trigger levels were exceeded for a few days with the maximum exceedance of about 6 feet.

Because the Lavy agricultural water supply well was constructed near BWD's monitoring wells and increased the drawdown in the area, in 2022, BWD voluntarily contracted with a California licensed surveyor to survey elevations at their monitoring wells (MW-1A/B/C) during the groundwater transfer. The surveyor's report is provided as **Attachment E**. The surveyor concluded that there had been no inelastic subsidence during the water transfer period or during previous transfers.

Subsidence is also being monitor using interferometric synthetic-aperture radar (InSAR). InSAR measures ground elevation using microwave satellite imagery data. InSAR measured ground surface elevations between January 1, 2022 to January 1, 2023, during the water transfer period, as provided by DWR.[1] These data show that rate of subsidence in the vicinity of the transfer pumping wells was -0.1 to +0.1 feet per year occurred in 2022, within method estimation error for interpretation of the data.

### Conclusions

Based on the available data, groundwater levels in the area have not been negatively affected by BWD's pumping of Wells #1 and #2 during the 2022 groundwater substitution transfer. Water samples collected from Wells #1 and #2 on a monthly basis did not change significantly during the transfer. Water samples collected from Well #1, Well #2, and MW-1A/B/C for additional constituents were similar to historic concentrations and do not indicate the transfer pumping adversely affected water quality.

While localized drawdown was observed in the Sutter Buttes Rampart Formation near the transfer wells, water levels fully recovered and rose above pre-transfer conditions. Transfer pumping effects in the aquifer are negligible at less than 2.2 miles. In most wells the production aquifer fully recovered between October and December 2022. By March 2023 groundwater levels were up to 8 feet higher than pre-transfer levels. The full recovery of the wells screened in the production aquifer indicate that groundwater levels were not adversely affected by BWD's transfer program.

Water levels in the shallow aquifer declined by up to 4 feet by the end of the transfer period. The shallow aquifer groundwater levels recovery varied from slightly positive to

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1 https://storymaps.arcgis.com/stories/41574a6d980b4e5d8d4ed7b90f9698d2?utm_medium=email&utm_source=govdelivery

negative but may have been due to the varying pre-transfer starting dates and post-transfer dates and unknown domestic wells pumping.

Groundwater trigger levels exceeded the groundwater low levels at MW-1A/B/C for short periods of time, even though BWD coordinated with the owner of the agricultural well and adaptively managed the pumping rates at Well #1 and Well #2. However, the land survey showed no inelastic subsidence occurred during the monitoring period.

Please contact Sean Storey at (916) 521-7727 if you have any questions pertaining to this report.

Sincerely,

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Enclosure – Attachment A – Well Construction Details
Attachment B – Electronic Well Reporting Forms
Attachment C – Groundwater Level Contour Maps
Attachment D – Water Quality Results
Attachment E – Land Survey Report

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