RECLAMATION
Managing Water in the West

Environmental Assessment

Five-Year Warren Act Contracts for Conveyance of Groundwater in the Tehama-Colusa Canal – Contract Years 2018 – 2022 (March 1, 2018 through February 28, 2023)

EA 18-01-NCAO

U.S. Department of the Interior
Bureau of Reclamation
Mid-Pacific Region
Northern California Area Office

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Mission Statements

The Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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Section 1 Introduction

1.1 Background

The Bureau of Reclamation proposes to issue five-year Warren Act Contracts (WACs) to requesting Central Valley Project (CVP or Project) water service contractors within the Sacramento Canals Unit (SCU) to convey groundwater in Federal facilities.

Fifteen water districts (WDs or Districts) within the SCU of the CVP request approval of five-year WACs to pump groundwater into the Tehama-Colusa Canal (TCC or Canal) to supplement their supply to avoid shortages and potential loss of permanent crops (Table 1). In addition, other WDs served by the Canals could request WACs if drought-like conditions occur.

Table 1. Non-Project Water Quantities Previously Approved (EAs 13-03 and 14-02) and Quantities of the Proposed Action v. Highest Conveyance Volume

Water District	Contract Maximum (AF)	Highest Year's Annual Conveyance (AF) 2013 - 2016
4-M WD	600	107
Colusa County WD	30,000[1]	10,569
Cortina WD	1,000	200
Davis WD	4,000	433
Dunnigan WD	10,000	698
Glenn Colusa ID	5,000	0
Glenn Valley WD	600	335
Glide WD	500[2]	71
Holthouse WD	0	0
Kirkwood WD	0	0
Kanawha WD	2,500[2]	161
La Grande WD	0	0
Myers-Marsh Mutual Water Company	0	0
Orland-Artois WD	10,800	4,323
Westside WD	15,000	5,978
Total	**75,000**	**22,875**

1. Value corrected from 32,000 AF, as indicated in prior EA, per the final WAC.
2. WAC established in 2014, subsequent to the completion of the prior EA.

3. Bolded names represent Districts that have formally requested WACs for the contract years 2018 - 2022. Italicized names represent districts that have requested inputs from groundwater wells that do not pass existing contractual water quality requirements to the TCC.

The Warren Act (Act of February 21, 1911, CH. 141, (36 STAT. 925) authorizes Reclamation to negotiate agreements to store or convey Non-Project Water when excess capacity is available in Federal facilities. Section 3408(c) of P.L. 102-575, Title 34, Central Valley Project Improvement Act (CVPIA) allows for the exchange, impoundment, storage, carriage, and delivery of CVP and Non-Project Water for domestic, municipal, industrial, fish and wildlife, and any other beneficial purpose. For more than 30 years, Reclamation has issued WACs for introduction and conveyance of groundwater into canals by individual landowners for use on properties downstream owned by these same individual landowners. Most recently, Reclamation approved five-year WACs for 11 of the 17 WDs of the SCU to convey groundwater beginning in contract water year 2012 (Reclamation 2013). A full list of authorities relevant to the Proposed Action is provided in Section 1.3.

This environmental assessment (EA) evaluates the Proposed Action to approve WACs to pump groundwater into the Canal during the period of March 1, 2018 through February 28, 2023; a contract water year begins March 1 and ends February 28 of the following calendar year. The evaluation describes the existing environmental resources in the Proposed Action area, evaluates the effects of the No Action and the Proposed Action Alternative on these resources, and proposes measures to avoid, minimize, or mitigate any adverse effects, if any, for approval of WACs.

Assessment of the potential for impacts from Reclamation WACs with both the TCC and Corning Canal (CC; collectively Canals) member Districts was last documented in the Environmental Assessment: *Five-Year Warren Act Contracts for Conveyance of Groundwater in the Tehama-Colusa and Corning Canals – Contract Years 2013 through 2017 (March 1, 2013, through February 28, 2018)*; EA 13-03 (Reclamation 2013), hereby incorporated by reference, and the signing of a Finding of No Significant Impact (FONSI) for the Proposed Action. The Proposed Action incorporated a water quality monitoring program to assure that groundwater conveyed in Reclamation facilities would continue to meet Reclamation's standards and environmental commitments. Water quality criteria for groundwater to be conveyed in the Canals were adopted from existing criteria used elsewhere for the protection of the quality of water applied for beneficial uses of agriculture and freshwater aquatic life. These criteria and their origins are documented in Appendix A of EA 13-03.

A subsequent formal declaration of a "Drought State of Emergency" by the Governor of California prompted concern from agricultural interests served by the TCC and CC that Project Water allocations would be severely reduced and the previously-approved quantities of groundwater that may be conveyed in Reclamation facilities via WACs would be inadequate to meet irrigation needs. Thus, in 2014, Reclamation prepared a Supplemental EA: *Supplement to the Program Allowing Five-Year Warren Act Contracts for Conveyance of Groundwater in the Tehama-Colusa and Corning Canals – Contract Years 2013 through 2017 (March 1, 2013, through February 28, 2018*); EA 14-02 (Reclamation 2014a), also

hereby incorporated by reference. The new Proposed Action incorporated modifications to the Proposed Action to: 1) accommodate requests by Districts to discharge greater quantities of groundwater for conveyance in the Canals; and 2) change the water quality criteria used to determine eligibility of groundwater discharges to the Canals during years that are classified as being in a "Drought State of Emergency" by California. Reclamation signed a FONSI for this modified action that included water quality monitoring to verify anticipated conditions. In conjunction with the preparation of the supplemental EA and signing of the FONSI, the Quality Assurance Project Plan (QAPP) was revised to include two distinct sets of water quality criteria: one for application in non-drought years (Non-Drought criteria) and a less stringent criteria for application in drought years (Drought criteria). The criteria are documented in Appendix A of EA 14-02). The Drought criteria were developed with the intent of making the Warren Act program more inclusive of groundwater wells, but not groundwater of such a quality that it would negatively impact the overall quality of water in the Canals when the effects of mixing were considered, thereby making a greater amount of water available for conveyance in the Canals when irrigation water need was greatest.

As detailed in Section 3.2 of this EA, the results of groundwater monitoring conducted during the drought years (2014 and 2015) of the existing WACs confirm that inputs from groundwater wells did not significantly affect the overall quality of the surface water in the TCC and CC in those years. At the request of the Tehama Colusa Canal Authority (TCCA) and Colusa County WD, Reclamation has agreed to explore the theory that, because the inputs to the TCC from groundwater wells had no negative impact on the quality of Canal water in drought years, use of the Drought water quality criteria in any year would not affect Canal water quality, particularly in wet years when groundwater contributions are a lesser proportion of the overall inputs to the Canal. Therefore, in addition to the same matters of concern identified in Reclamation 2013 and 2014, this EA examines the application of the less stringent Drought water quality criteria in non-drought years as well as the Drought State of Emergency years for which they were originally developed. The environmental review is intended for water contract years 2018 through 2022.

1.2 Need for the Proposal

California has experienced severe droughts in recent years that have reduced water supplies to many Districts. The dry hydrologic conditions over these drought years have dictated that District contractors north of the San Francisco Bay Delta receive a reduced or zero allocation of their Project Water supply in some contract years. As a result, Districts served by the Canal may need additional water to supplement their surface water supply to maintain perennial crops. WACs provide a mechanism to allow non-Project Water (i.e. groundwater) in CVP facilities to supplement water supplies to maintain perennial crops in times of greatest need.

1.3 Relevant Legal and Statutory Authorities

Several Federal laws, permits, licenses, and policy requirements have directed, limited, or guided the National Environmental Policy Act (NEPA) analysis and decision making process of this environmental assessment (EA) and include the following:

- Reclamation Act of 1902 (32 Stat. 388) and acts amendatory thereof or supplementary thereto which established the Bureau of Reclamation and its general authority to manage water in 17 states.

- Warren Act of February 21, 1911, CH. 141 (36 Stat 925) which authorizes Reclamation to negotiate agreements to store or convey Non-Project water when excess capacity is available in Federal facilities.

- Contracts for Additional Storage and Delivery of Water–Central Valley Project Improvement Act (CVPIA) of 1992, Title 34 (of Public Law 102-575), Section 3408 Additional Authorities (c), which authorizes the Secretary of the Interior to enter into contracts pursuant to Reclamation law and this title with any federal agency, California water user or water agency, state agency, or private non-profit organization for the exchange, impoundment, storage, carriage, and delivery of CVP and non-CVP groundwater for domestic, municipal, industrial, fish and wildlife, and any other beneficial purpose. The CVPIA is incorporated by reference.

- Section 305 of the Reclamation States Emergency Drought Relief Act of 1991, enacted March 5, 1992 which indicates that "the Secretary (of the Interior) is authorized to enter into contracts with municipalities, public water districts and agencies, other Federal agencies, State agencies, and private entities, pursuant to the Act of February 21, 1911 (43 U.S.C. 523), for the impounding, storage, and carriage of non-project water for domestic, municipal, fish and wildlife, industrial, and other beneficial purposes using any facilities associated with the Central Valley Project…".

- Standard Article 19 of the Reclamation Manual (PEC 10) which mandates that: "Project facilities used to make available and deliver water to the Contractor shall be operated and maintained in the most practical manner to maintain the quality of the water at the highest level possible as determined by the Contracting Officer". (This EA serves as the basis for the Contracting Officer's determination on the "most practical manner" and highest level of water quality possible.) Standard Article 19 also assigns responsibility for compliance with all applicable Federal, state and local water quality standards to the Contractor.

1.4 Scope

This EA has been prepared to analyze the affected environment of the Proposed Action and the No Action Alternatives in order to determine the potential direct, indirect, and cumulative effects to water resources and biological resources. The EA examines the

potential impacts on environmental resources as a result of the No Action Alternative of not conveying Non-Project Water (i.e. groundwater) in Federal facilities and the Proposed Action to allow conveyance of groundwater in Federal facilities.

The area considered in the effects analysis of this EA is shown on Figure 1. Historical use of the WACs considered in the effects analysis is provided in Table 1.

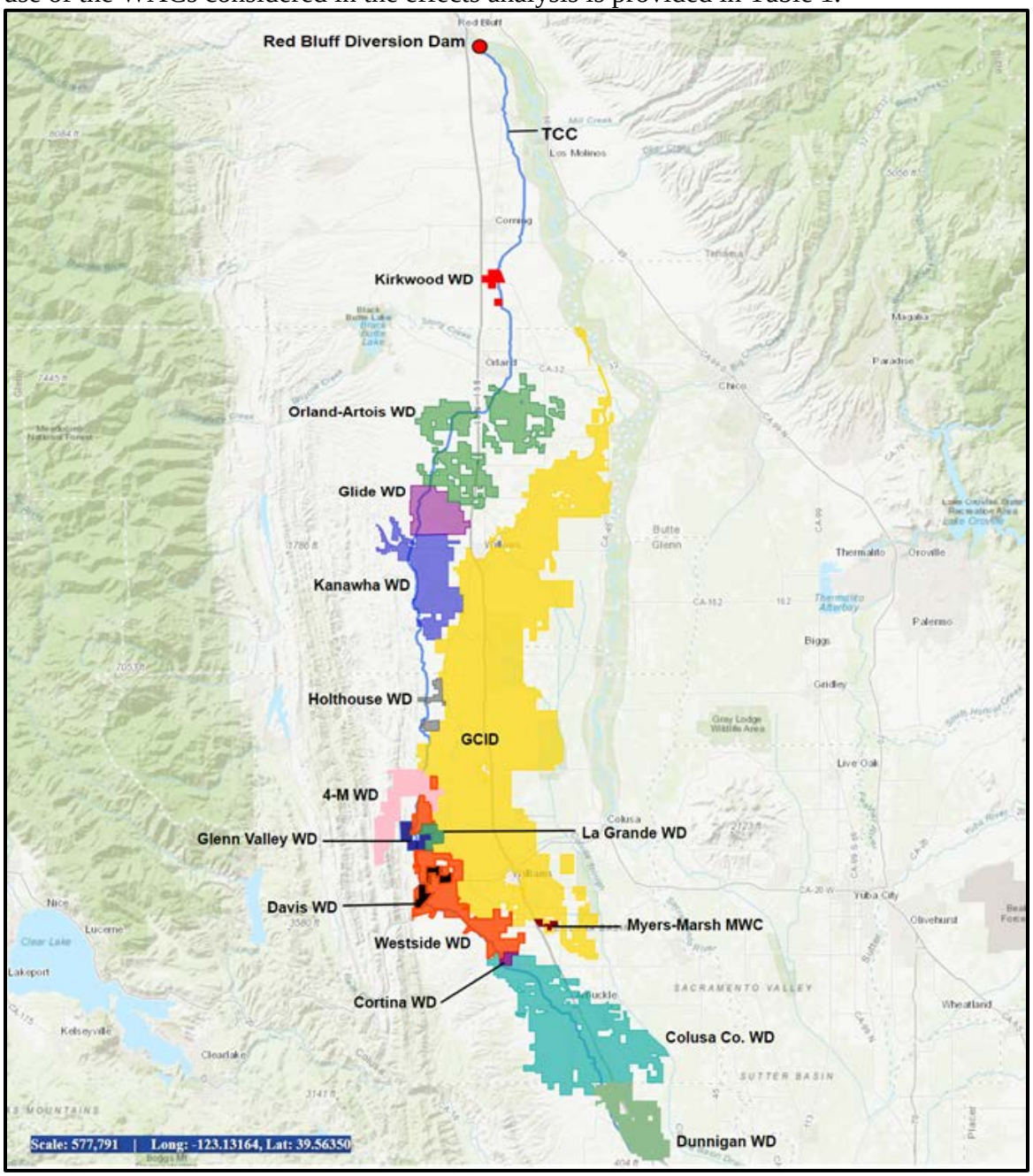

Figure 1 - District Service Areas Considered in the Proposed Action

The timeframe considered in this EA is contract years 2018 through 2022 (March 1, 2018 through February 28, 2023). Districts that have formally requested or that may request WACs for conveyance of groundwater in the TCC during the five-year period and their

respective contractual amounts considered in this assessment are indicated in Table 2. The amounts analyzed in the Proposed Action represent an increase in use of WACs in the SCU relative to historical use.

Table 2. Proposed Use of WACs to Convey Water in the TCC - Contract Year 2018

Water District	Current Contractual Maximum (AF)	2018 Proposed Contractual Maximum (AF)	Increase
Cortina Water District	1,000	2,500	150%
Orland-Artois Water District	10,800	15,000	39%
Kanawha Water District	2,500	3,000	20%
4M Water District	600	600	0%
Glide Water District	500	500	0%
Davis Water District	4,000	4,000	0%
Colusa County Water District	30,000	30,000	0%
Dunnigan Water District	10,000	10,000	0%
Glenn-Colusa Irrigation District	5,000	5,000	0%
Glenn Valley Water District	600	600	0%
Westside Water District	15,000	15,000	0%
Totals	**80,000**	**86,200**	**8%**

This EA contains a continued evaluation of the potential for impacts to TCC surface water from groundwater determined eligible to be discharged to, and conveyed in, the TCC in "Drought Years", or those declared as a "Drought State of Emergency" (DSOE) by California (Attachment A), in comparison to the potential for impacts from discharges of groundwater to the TCC in Non-Drought years. The "Drought Year" criteria were based on standards for agricultural water with aquatic life standards applied for a few constituents where agricultural standards were not available. In contrast, the water quality criteria for Non-Drought Years were comparably more stringent and comprised mainly of criteria for aquatic life with a few agricultural standards. (See EA 13-03 Appendix A). The Drought Year criteria were intended to protect for the beneficial use of agricultural water supply. To assure attainment of the beneficial use goal, any District that may have concerns relative to water quality in the TCC can perform a review at any time. Both the TCCA and Reclamation have the jurisdiction to stop any discharge to the Canals at any time, should a review identify a water quality concern that cannot be resolved. Groundwater and surface water monitoring criteria associated with the WACs are indicated in Section 3.2.1.

The TCCA has indicated that CC Districts do not have continued interest in the use of WACs. The action assessed in this EA is therefore limited to the issuance of WACs for conveyance of groundwater in the TCC only.

Section 2 Proposed Action and Alternatives

2.1 No Action Alternative

Reclamation would not issue new WACs; there would be no approval of Districts' requests to convey up to 86,200 AF of Non-Project groundwater in the Canal. Reliant Districts would be required to operate within the confines of the water supplies provided under their CVP water service contracts or obtain water by means other than transport through Reclamation facilities.

2.2 Proposed Action

Reclamation proposes to issue WACs to up to 11 CVP water service contractors served by the SCU over a five-year period beginning with water contract year 2018. WD-specific quantities of groundwater that would be authorized to be conveyed in Reclamation facilities have been identified for these contractors, as indicated in Table 2. Combined, the quantity of groundwater that could be pumped in any one year could be up to 86,200 AF (Table 2). Water considered for transport in Federal facilities would be limited to groundwater pumped from existing wells and discharged to, and removed from, the Canals through existing facilities or through facilities reviewed and permitted on an individual basis. In addition, conveyance of groundwater in CVP facilities would be subject to available capacity and suitable quality and the environmental commitments identified in Section 2.2.1.

2.2.1 Environmental Commitments

Participating WDs shall also implement the following environmental commitments to reduce the potential for environmental consequences:

- Each participating WD would be required to confirm that the proposed pumping of groundwater would be compatible with local groundwater management plans, as applicable. Each WD would be limited to pumping a quantity below the "safe yield" as established in their groundwater management plan or county-specific requirements, as applicable, in order to prevent groundwater overdraft and avoid adverse impacts.

- Water quality and monitoring requirements are established by Reclamation. Each contracted WD would be responsible for accurate water measurement and associated costs as well as assuring the Non-Project groundwater meets all Federal and California water quality standards and the Reclamation standards for acceptance of Non-Project groundwater prior to entering the Canals (See Attachment A). These standards ensure that water imported into the Canals does not impair existing uses, including downstream users, or negatively impact existing water quality conditions.

- The water would be used for irrigation and/or M&I purposes on established lands. There would be no new construction or excavation occurring as part of the Proposed

Action. Pumping and conveyance would occur within existing wells, meters, pipes, water diversion, and field delivery facilities. No native or untilled land (fallow for 3 years or more) may be cultivated with the water involved with these actions.

- Each participating WD would comply with applicable Federal, state, or local air pollution laws and regulations.

Section 3 Affected Environment & Environmental Consequences

This EA analyzes the affected environment of the Proposed Action and the No Action Alternatives in order to determine the potential direct, indirect, and cumulative effects to water resources, land use, air quality, biological resources, and socioeconomic resources.

3.1 Resources Eliminated from Further Analysis

Reclamation analyzed the affected environment and determined that the Proposed Action did not have the potential to cause direct, indirect, or cumulative adverse effects to the resources listed in Table 3.

Table 3. Resources Eliminated from Further Analysis

Resource	Reason Eliminated
Air Quality	There would be no construction or modification of facilities as a result of the Proposed Action. Therefore, there would be no construction-related emissions. Any pumping would make use of existing equipment operating within typical ranges. Therefore, no air emissions are anticipated beyond what has already been evaluated and permitted.
Cultural Resources	There would be no impact to Cultural Resources under the No Action Alternative as conditions would remain the same as existing conditions. Reclamation determined that the Proposed Action does not have the potential to cause effects to historic properties pursuant to 36 CFR Part 800.3(a)(1). See Attachment C for Reclamation's determination.
Environmental Justice	The Proposed Action would not cause dislocation, changes in employment, increase flood, drought, disease, and would not disproportionately impact economically disadvantaged or minority populations. Therefore, the Proposed Action carries no Environmental Justice implications.
Global Climate Change	No new construction or new facilities are proposed. Some pumping would be required to move water under the Proposed Action, but power usage would be within the typical range for the facilities involved and are a part of the baseline conditions. No greenhouse gas emissions are anticipated outside normal operational fluctuations. As such, there would be no additional impacts to global climate change. Global climate change is expected to have some effect on the snow pack of the Sierra Nevada and the runoff regime. Current data are not yet clear on the hydrologic changes and how they will affect the Sacramento Valley. CVP water allocations are made dependent on hydrologic conditions and environmental requirements. Since Reclamation operations and allocations are flexible, any changes in hydrologic conditions due to global climate change would be addressed within Reclamation's operation flexibility under either alternative.
Indian Sacred Sites	The Proposed Action would not limit access to ceremonial use of Indian Sacred Sites on Federal lands by Indian religious practitioners or significantly adversely affect the physical integrity of such sacred sites. Therefore, there would be no impacts to Indian Sacred Sites as a result of the Proposed Action.
Indian Trust Assets	The Proposed Action would not impact Indian Trust Assets as there are none in the Proposed Action area. (See Attachment D for Reclamation's determination.)
Land Use	The Proposed Action would not facilitate unplanned growth, land use changes, or conflict with existing land uses. Therefore, there would be no adverse impacts to land use in this area as a result of the Proposed Action.
Socioeconomic Resources	In the near-term, the Proposed Action would allow groundwater resources of suitable quality to be distributed to sustain permanent crops that may otherwise not receive adequate water supply in the No Action Alternative and would therefore assist in maintaining agribusiness that supports local and regional economies. The long-term socio-economic implications are dependent on the sustainability of the groundwater resource as it relates to future use, as discussed in Section 3.3.1.

3.2 Water Resources

3.2.1 Affected Environment

CVP Facilities

Authorized in 1950, the SCU consists of Red Bluff Diversion Dam, Funks Dam, Corning Pumping Plant, and the Canals, serving areas north of Sacramento, California. The TCC begins at the Red Bluff Pumping Plant on the Sacramento River and extends south for approximately 110 miles flowing through the counties of Tehama, Glenn, Colusa, and Yolo. The TCC terminates about two miles south of Dunnigan. The initial capacity of the TCC is 2,500 cubic feet per second (cfs) diminishing to 1,700 cfs at the terminus.

Fourteen WDs are served by the TCC. An additional three Districts in the SCU are served by the Corning Canal (Table 4).

WDs

WDs served by the Canal have different CVP water supply contract quantities (Table 4). Under 100% allocation, approximately 318,000 AF of CVP water can be delivered to these WDs, but, in dry years, this allocation/quantity can be reduced. Groundwater is one source that has been actively used, in particular in drought years, to supplement water demands of the Districts.

Table 4. Contract Water Supplies for WDs Served by the SCU of the CVP

WD	100 % CVP Contract Volume (AF)
Corning WD	23,000
Proberta WD	3,500
Thomes Creek WD	6,400
4-M WD	5,415
Colusa County WD	67,866
Cortina WD	1,615
Davis WD	4,000
Dunnigan WD	19,000
Glenn Valley WD	1,730
Glide WD	10,500
Holthouse WD	2,327
Kanawha WD	45,000
Kirkwood WD	2,100
La Grande WD	7,090
Myers-Marsh Mutual Water Company	242
Orland-Artois WD	53,000
Westside WD	65,000
Totals	**317,785**

Groundwater Resources

Districts included in the WAC proposal are located within the Sacramento Valley Groundwater Basin (Figure 2): a north-northwest trending asymmetrical trough filled with marine and continental rocks and sediment. Overlying the basement rock are marine sandstone, shale and conglomerate rocks, which generally contain brackish or saline water. The freshwater-bearing rock formation in the basin is comprised of sedimentary and volcanic rocks; Depth to this formation is approximately 1,150 feet (ft) below ground surface (bgs) in the northern portion of the valley and 1,600 ft bgs in the southern portion. (Reclamation 2014b)

Annual precipitation in the Sacramento Valley Groundwater Basin averages 13 to 26 inches, 85% of which occurs from November to April. Although groundwater accounts for less than 30 percent of the annual water supply used for agricultural and municipal and industrial purposes in the Sacramento Valley, groundwater recharge in the basin is primarily from deep percolation of excess applied irrigation water. Other sources of

Figure 2 - Sacramento Valley Groundwater Basin (adapted from Figure B-7 of DWR Bulletin 118 Interim Update 2016).)

recharge include leakage from streambeds and lateral inflow from other basins along basin boundaries. (Reclamation 2014b)

The availability of groundwater in the aquifer for use in supplementation of Canal surface water is subject to the recharge potential of the aquifer from which the groundwater is withdrawn, which could also be affected by multiple, consecutive drought years.

The CA Department of Water Resources (DWR) and other entities monitor groundwater recharge in the basin and have identified a declining trend in groundwater availability and storage over the long term (Figure 3). However, sharp declines in groundwater levels associated with drought have been observed to rebound quickly, as exemplified by the 2008-2009 dry years from which aquifers recovered by 2010 and the 2016 Drought year by which the aquifers largely recovered by 2017 (Figure 4). Likewise, localized areas of ground subsidence recorded during the irrigation season have been documented to partially rebound the next winter. Generally, California's greatest problems with subsidence are located in the San Joaquin Valley. However, DWR has identified an area of localized long-term subsidence linked with groundwater pumping activities in the southern portion of the affected area for the Proposed Action that underlies portions of the service areas for Colusa County, Dunnigan, Westside, Cortina, Meyers-Marsh and Davis water districts (Figure 5). The extent of land subsidence in this area has been documented as greater than one ft but less than 10 ft and is located in portions of Colusa and Yolo Counties.

Groundwater quality in the north Sacramento Valley is generally good. In the North Sacramento Valley (Redding to Los Molinos) study unit of a groundwater assessment conducted by the State of California Groundwater Ambient Monitoring and Assessment (GAMA) Program, 86 percent of inorganic (predominantly naturally-occurring) constituents and 98 percent of organic constituents reported were at low or non-detectable concentrations (USGS 2011a). In comparison, only 40 percent of inorganic constituents were reported at low or non-detectable concentrations in the Southern Sacramento Valley Unit from Yolo County south to San Joaquin County (USGS 2011b).

3.2.1 Environmental Consequences

No Action Alternative

Under the No Action Alternative, Reclamation would not issue WACs to requesting CVP water service contractors of the SCU. Deliveries of CVP water supply would continue in accordance with the terms and conditions of the applicable District's CVP water service contracts. In dry years, WDs would seek additional sources and methods by which to meet water demands. These sources and methods include local groundwater pumping and purchase of additional Project Water through water transfers with Settlement Contractors via programs such as the Accelerated Water Transfer Program (Reclamation 2016). Groundwater pumped locally could not be conveyed in the Canal to meet agricultural demand in areas of WDs that may otherwise not have available water to support their crops under the No Action Alternative. Participation in water transfer programs, when established, may also be an option when WACs are in place as well as when they are not. It is therefore assumed that there is no change in Canal water quantity or quantity as a result of the No Action Alternative.

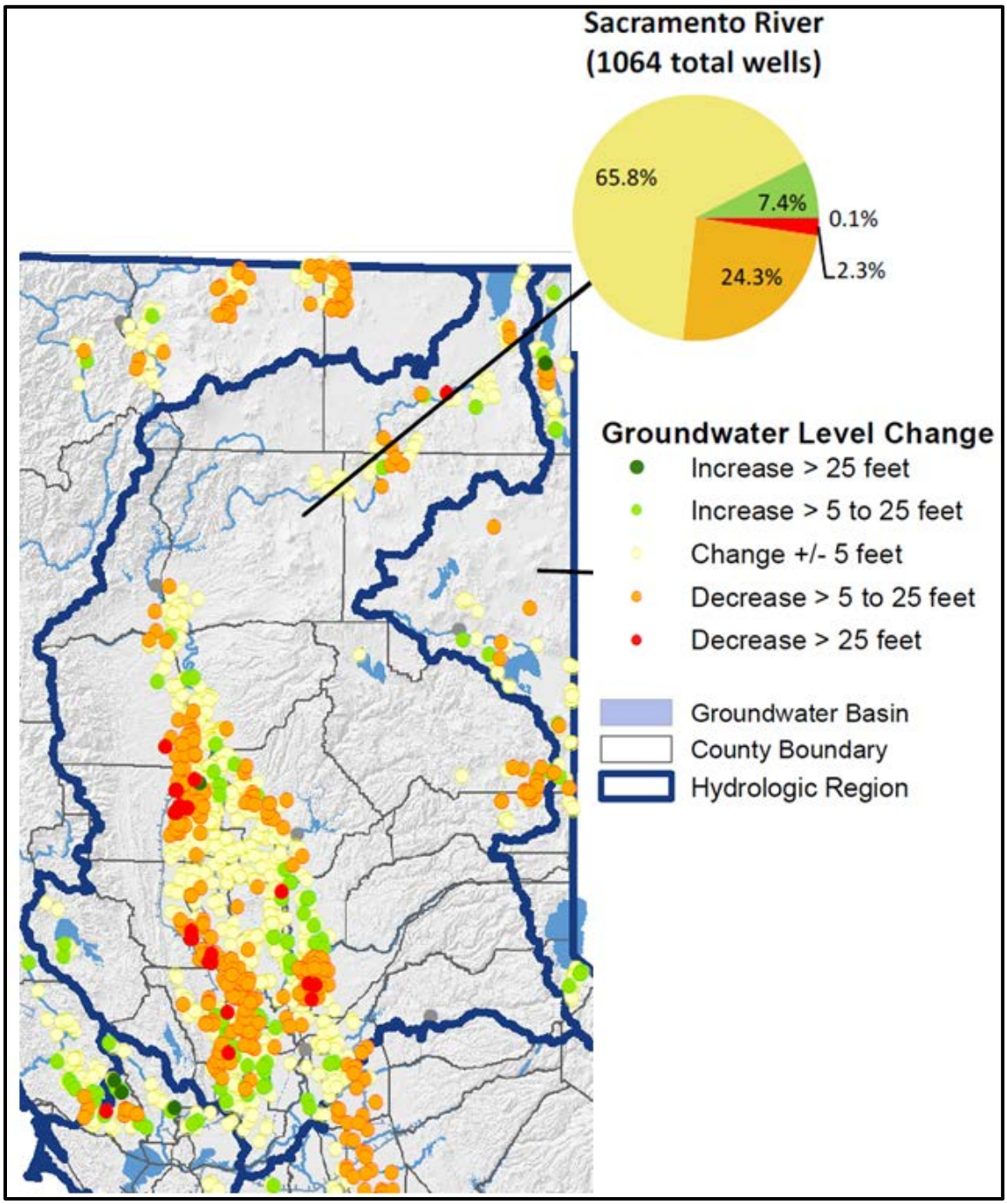

Figure 3 - Groundwater Level Change - Spring 2011 to Spring 2017 (adapted from Figure 4 of DWR Spring 2017 Groundwater Level Data Summary)

Proposed Action

Water Quantity and Canal Capacity

The total amount of groundwater assessed under the Proposed Action is 86,200 AF annually (Table 3). This maximum conveyance amount accommodates requests from three Districts (Cortina, Orland-Artois and Kanawha) to increase the contractual maximum water qualities in their proposed WACs in comparison to their current WACs (Table 3).

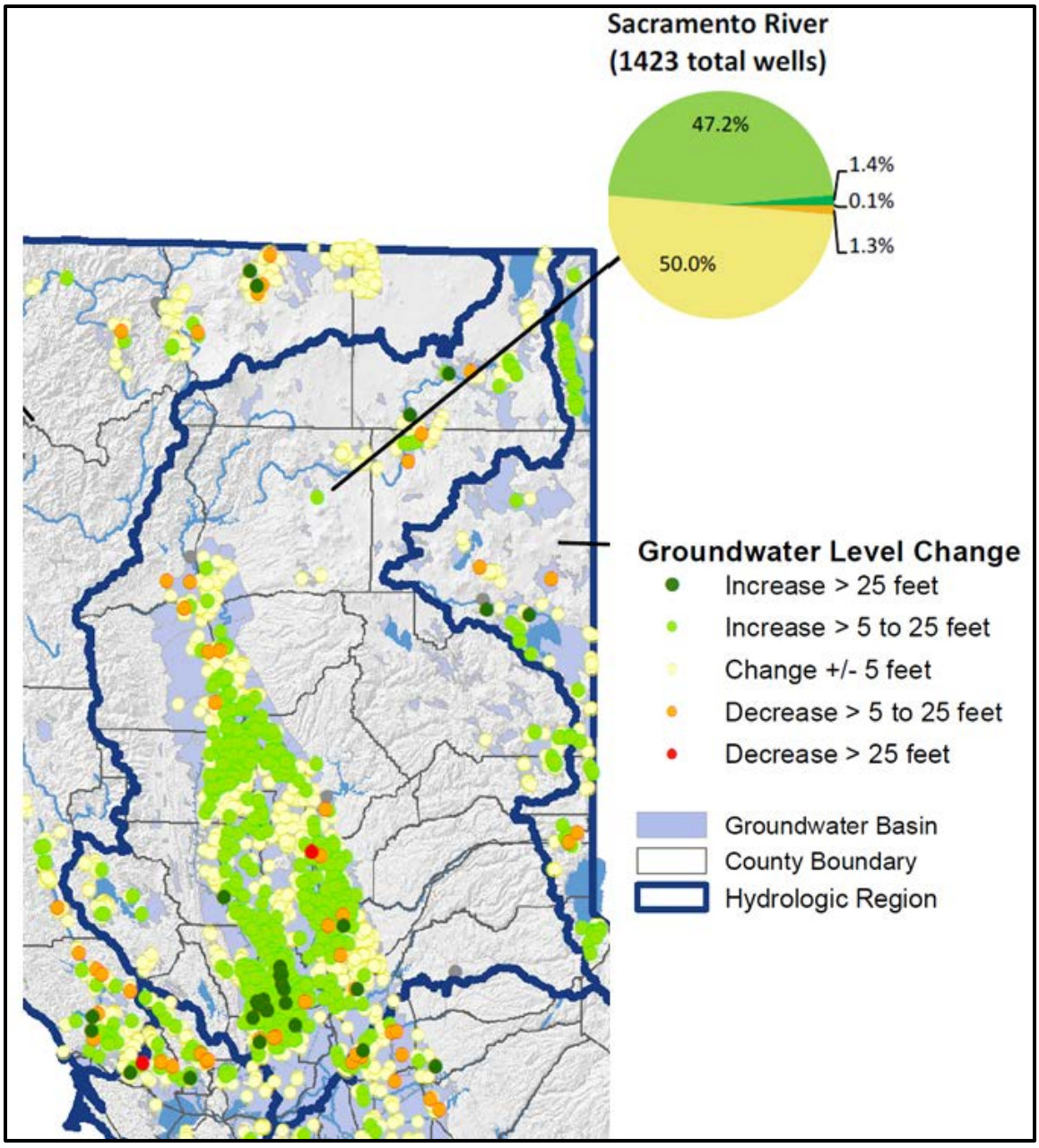

Figure 4 - Groundwater Level Change - Spring 2016 to Spring 2017 (adapted from Figure 3 of DWR Spring 2017 Groundwater Level Data Summary)

It is assumed for assessment purposes that the remaining Districts that have participated in the WAC program in the past will request new contracts at their current contract maximum sometime during the period assessed. The quantity of the overall increase in

groundwater inputs to, and conveyance in, the TCC as a result of the requests from the three Districts is 6,200 AF per year, which represents a marginal, eight percent increase in the amount of water that could be conveyed under the current WAC program.

Under the Proposed Action, the quantity of water that would be allowed in the TCC would be greater than the No Action Alternative. In addition, eliminating the restriction on the use of wells that would not pass Non-Drought year water quality criteria established in the 2014 Quality Assurance Project Plan (QAPP), based on pre-irrigation monitoring, entirely would also maximize the number of wells that could participate in the program and the potential quantity of water that would be conveyed in the TCC. However, the increased inputs would occur over several months (February thru September) and the groundwater conveyed to the TCC would be removed for use by the landowner downstream. As a consequence, the spatial and temporal distribution of the quantities contemplated would be small relative to the overall capacity of the TCC.

Under the Proposed Action, the quantity of Non-Project water discharged to, and conveyed in, the TCC would correspond to annual hydrological conditions and the associated need to supplement allocated Project Water. The use of WACs in the past decade has demonstrated that, while there is a substantial quantity of water approved for conveyance by Districts served by the TCC under the WACs, the quantity of groundwater that is actually conveyed is typically small: 30 percent or less of that approved for conveyance, even during drought years when presumably a greater need would be present (Table 4). In the driest years of the latest drought (2013 – 2015), the total quantity of water conveyed averaged 67,600 AF, representing between 7 and 30 percent of the approved WAC quantities for the participating Districts (Table 4). In contrast, in years of greater Project Water availability, the conveyance of Non-Project water is usually much lower. For example, in 2010, 2012 and 2016, the quantities of Non-Project water conveyed were 14 AF, 163 AF and 213 AF, respectively, representing less than one percent to less than four percent of the approved WAC quantities for the participating Districts and less than 25% of the water made available in the Canal in zero allocation years (Table 4). In 2017 WACs weren't used because of the abundant CVP water supply.

In most years, only a few Districts participate in the WAC program. Colusa County WD is the only District that has consistently participated in the program on an annual basis.

Table 5. Historic Use of WACs to Convey Groundwater in the TCC - 2008-2017

Contract Water Year	North of Delta CVP Allocation (AF)[a]	Water District	WAC Water (AF)		
			Approved	Conveyed	% WAC Used
2008	27,146 (40%[c])	Colusa Co. WD	**4,500**	**2,277**	**50.6**
2009	27,146 692 21,200 (40%)	Colusa Co. WD Glenn Valley WD Orland-Artois WD **Total**	4,500 500 10,000 **15,000**	3,043 45 169 **3,257**	67.6 9.0 1.7 **21.7**
2010	67,866 (100%)	Colusa Co. WD	**4,500**	**14**	**0.3**
2011	67,866 (100%)	Colusa Co. WD	**4,500**	**508**	**11.3**
2012	67,866 (100%)	Colusa Co. WD	**4,500**	**163**	**3.6**
2013	50,899.5 1,297.5 39,750 48,750 (75%)	Colusa Co. WD Glenn Valley WD Orland-Artois WD Westside WD **Total**	30,000 600* 10,800* 15,000 **56,400**	2,707 335 64 864 **3,970**	9.0 55.8 0.6 5.8 **7.0**
2014	Zero Allocation Year	Colusa Co. WD Cortina WD Davis WD Dunnigan WD Glenn Valley WD Orland-Artois WD Westside WD **Total**	30,000 1,000 4,000 10,000 600 10,800 15,000 **71,400**	8,115 52 360 26 114 3,341 5,978 **17,986**	27.05 5.2 9.0 0.3 19.0 30.9 **39.9** **25.2**
2015	Zero Allocation Year	4M Water District Colusa Co. WD Cortina WD Davis WD Dunnigan WD Glenn Valley WD Glide WD Kanawha WD Orland-Artois WD Westside WD **Total**	600 30,000 1,000 4,000 10,000 600 500 2,500 10,800 15,000 **75,000**	107 10,569 200 433 698 58 71 161 4,323 5,915 **22,535**	17.8 35.2 20.0 10.8 7.0 9.7 14.2 6.4 40.0 39.4 **30.0**
2016	67,866 19,000 (100%)	Colusa Co. WD Dunnigan WD **Total**	30,000 10,000 **40,000**	192 21 **213**	0.01 0.2 **0.5**
2017	100%	No WAC Requests	N/A	0	0
			10-Yr Total	**48,646**	N/A
			Annual Average	**5,405**	**11%**

a – Final CVP allocations to Agricultural Contractors.

b – Transfer water includes Project Water from the Accelerated Water Transfer Program, forbearance of Base Supply and Base Supply transfers.
c - Percent of water service contract that AF quantity represents.
d – Average of participating districts
*Glenn Valley WD's contractual maximum increased by 100 AF with the expiration of their 2009 WAC contract and issuance of their new WAC in 2013. Likewise, Orland Artois WD's contractual maximum increased by 800 AF with the expiration of their 2009 WAC contract and issuance of their new WAC in 2013.

As would be anticipated, and demonstrated in Table 4, WAC use is greatest when TCC inputs from CVP allocations are lowest. Table 5 demonstrates water conveyance in the TCC from Base Supply forbearance and transfer programs in zero CVP allocation years. Although the total amount of water conveyed in the TCC during these years is significant, it is dwarfed by the potential contribution of water from CVP allocations in a 100% allocation year: approximately 320,000 AF. In addition, the WAC contribution is a small proportion of the total water conveyed even in drought years (Table 5). Therefore, competition between Districts for TCC space as a result of WAC inputs to the Canal is not anticipated.

Table 6. TCC Conveyance in Zero Allocation Drought Years

Contract Water Year	Forbearance of Base Supply (AF)	AWTP* (AF)	Other CVP (AF)	WAC Water (AF)	Total TCC Conveyance (AF)	WAC % of TCC Water
2014	36,393	23,878	3,929	17,986	82,186	22%
2015	25,265	42,119	7,197	22,535	97,116	23%

*AWTP = Accelerated Water Transfer Program

In the event of an unforeseeable circumstance in which multiple Districts plan to exercise their ability to pump a greater proportion of their approved WAC quantity into the TCC simultaneously, the TCCA would exercise its oversight authority to deny or stop pumping of groundwater to the TCC and prevent a shortage in Canal capacity in reviewing the monthly schedule for discharges.

The Proposed Action would allow groundwater to be conveyed in CVP facilities when excess capacity is available. During years of reduced CVP supply, this excess capacity would afford opportunities to meet agricultural demand in areas of WDs that may otherwise not have available water to support their crops. The water would be used for irrigation and/ or M&I purposes on established lands. Pumping and conveyance would be limited to use of existing wells, meters, pipes, water diversion, and field delivery facilities; no new construction or excavation would occur. No native or untilled land (fallow for 3 years or more) may be cultivated with the water involved with the Proposed Action. In this manner, implementing the Proposed Action avoids adverse effects on unique geological features such as wetlands, Wild and Scenic rivers, refuges, floodplains, rivers placed on the Nationwide River Inventory, or prime or unique farmlands.

The Proposed Action would allow for greater groundwater pumping than the No Action Alternative, in the event that farmers choose to fallow fields or work within the confines of the surface water provided under the No Action Alternative. Assuming a worst case scenario (that all eligible Districts convey the amount of groundwater that is their WAC contractual limit), groundwater pumping from the Sacramento groundwater basin could increase by 86.2 TAF over the No Action Alternative. However, depending on the allocation and timing of water deliveries, there could be a reduction in groundwater pumping in comparison to this maximum under the Proposed Action because of reduced canal capacity or lower demand.

While it is unlikely the maximum contractual amount of water would be pumped (based on historic use of WACs; Table 4), implementation of the Proposed Action could mean that existing and new well pumps could be operated for an extended duration to meet the demand. Increased groundwater pumping could cause localized and temporary declines of groundwater levels or cones of depression near pumping wells. Because the recent drought represents a near worst case scenario for precipitation and thus groundwater recharge, the groundwater table in many areas served by the Canal would likely decrease further; however the effect would be expected to be temporary as the Sacramento basin aquifer does show resiliency and rapid recharge in years of higher precipitation (Faunt 2009).

In addition, depending on the real-time cost of pumping groundwater in comparison to purchasing CVP water when it is adequately available, farmers could chose to use their own groundwater in lieu of Canal water, which would result in a currently unmeasurable increase in pumping (S. Murphy, personal communication). Ultimately, well owners in the action area will be limited to pumping a groundwater quantity below "safe yield", to be established by 2020 per California's 2014 Sustainable Groundwater Management Act (SGMA), in order to prevent groundwater overdraft and avoid adverse impacts. The SGMA mandates that all local public agencies and Groundwater Sustainability Agencies (GSAs) in high- and medium-priority groundwater basins in California develop and implement Groundwater Sustainability Plans (GSPs) or Alternatives to GSPs. These plans must achieve sustainability of the groundwater resources by the early 2040's. Due to the uncertainty in how farmers would chose to accommodate a Project Water shortage or greater cost of CVP water in comparison to the Proposed Action, the effects of pumping are considered independent of the Proposed Action for assessment purposes.

Water Quality

Several environmental commitments associated with the Proposed Action alleviate potential environmental concerns. These include the provision that water in each well must meet water quality standards prior to approval for conveyance. This provision ensures that water imported into the Canal does not impair existing uses, including downstream users, or negatively impact existing water quality condition.

As previously indicated, under the Proposed Action, eliminating the restriction on the use of wells that do not pass the more stringent Non-Drought criteria established in the QAPP

would also maximize the number of wells that could participate in the program and the potential quantity of water that would be conveyed in the TCC. The greater the proportion of groundwater to Project Water in the TCC, the greater the potential for affects to TCC surface waters from agricultural or naturally-occurring contaminants in groundwater such as metals. In wet years, Project Water allocations improve the volume of water available to meet irrigation needs, but also provide improvement to the Canal water quality as Project Water is generally low in most constituents of concern (S. Angerer Pers. Comm.). Because of this, the addition of surface water to the Canal would dilute contaminants in the groundwater discharges to the Canal with upstream Districts nearest Red Bluff generally having better water quality than those at the end of the Canal (e.g. Dunnigan WD).

In addition to the influence of mixing with surface water, the discharge of groundwater to the Canal is unlikely to produce a dramatic difference in the chemical quality of water that most irrigators would receive because discharges are typically used within the District and diverted within a few miles of the point of discharge. In these instances, the user of WAC water is likely to receive water of a chemical quality that is similar to that which he would receive had he installed his own groundwater well, rather than choosing to fallow a crop in times of low surface water availability, or better due to the mixing potential. Diversion of a discharge that travels a longer distance (tens of miles) is more complex because, over such long distances, there could be varying proportions of groundwater from several different wells blended to make up this water. Also, to a lesser extent, evaporation could affect the constituent concentrations.

Sampling Program – General TCC Sampling

In order to assure an acceptable chemical quality of surface water in the TCC for irrigation use, the TCCA performs routine sampling and analysis of the water at two locations in the Canal near the start (April) and the end (August) of the peak irrigation season (i.e. not withstanding water used for crop decomposition in fall). The locations are representative of water quality conditions near the beginning and terminus of the TCC. Samples are analyzed for a series of 15 constituents and parameters: 5 metals, boron, chloride, total dissolved solids (TDS), carbonates and bicarbonates, sulfate, nitrate (as nitrogen), specific conductance, sodium absorption ratio (to determine alkalinity), pH and Langelier Index (saturation of calcium carbonate in water). The results of the 2017 sampling events indicate that the chemical quality of the Canal water is suitable for even sensitive crops, as determined by the independent laboratory (Attachment B).

Sampling Program – WAC Program Specific

Since the time of the WAC program inception, the quality of water in wells that participate in the WAC program has been analyzed for a series of 24 constituents and parameters: 17 metals, boron, selenium, chloride, total dissolved solids (TDS), pH, specific conductance and sodium absorption ratio. Well owners that choose to participate in the program must have their wells sampled and the groundwater analyzed for these constituents and parameters within two years of the contract year when they chose to

participate. The analytical results are then compared to the maximum concentrations in the QAPP for Reclamation's use in determining WAC eligibility.

In addition to sampling the contributing groundwater wells from which WAC water may be discharged, the TCCA collects water samples from pools representative of Canal segments to which groundwater may be discharged through the WAC program. The frequency of this sampling is weekly to monthly, depending on the results of water quality sampling for participating wells.

In 2014, analyzed constituents that exceeded the Non-Drought criteria in sampled pools were limited to concentrations of aluminum in wells that discharge to Pools 21 through 26. None of these aluminum concentrations exceeded the Drought Year criteria applied in 2014 or 2015. In 2015, the results were similar with reported concentrations of aluminum exceeding the Non-Drought criteria in Pools 1 and 13, as well as Pools 21 through 26. None of these aluminum concentrations exceeded the Drought Year criteria. Concentrations of boron reported in wells that discharge to Pools 24 through 26 also exceeding the Non-Drought criteria in 2015, as well as the Drought criteria as these limits are the same. The boron exceedances were marginal and less than 18% higher than the criteria.

Based on the sampling results, Reclamation concluded that, despite the greater participation in the WACs that would likely occur in drought years, water quality issues are not anticipated to arise from the use of WACs. Concentrations of contaminants reported in the pools are reflective of surface water conditions that are suitable for even sensitive crops.

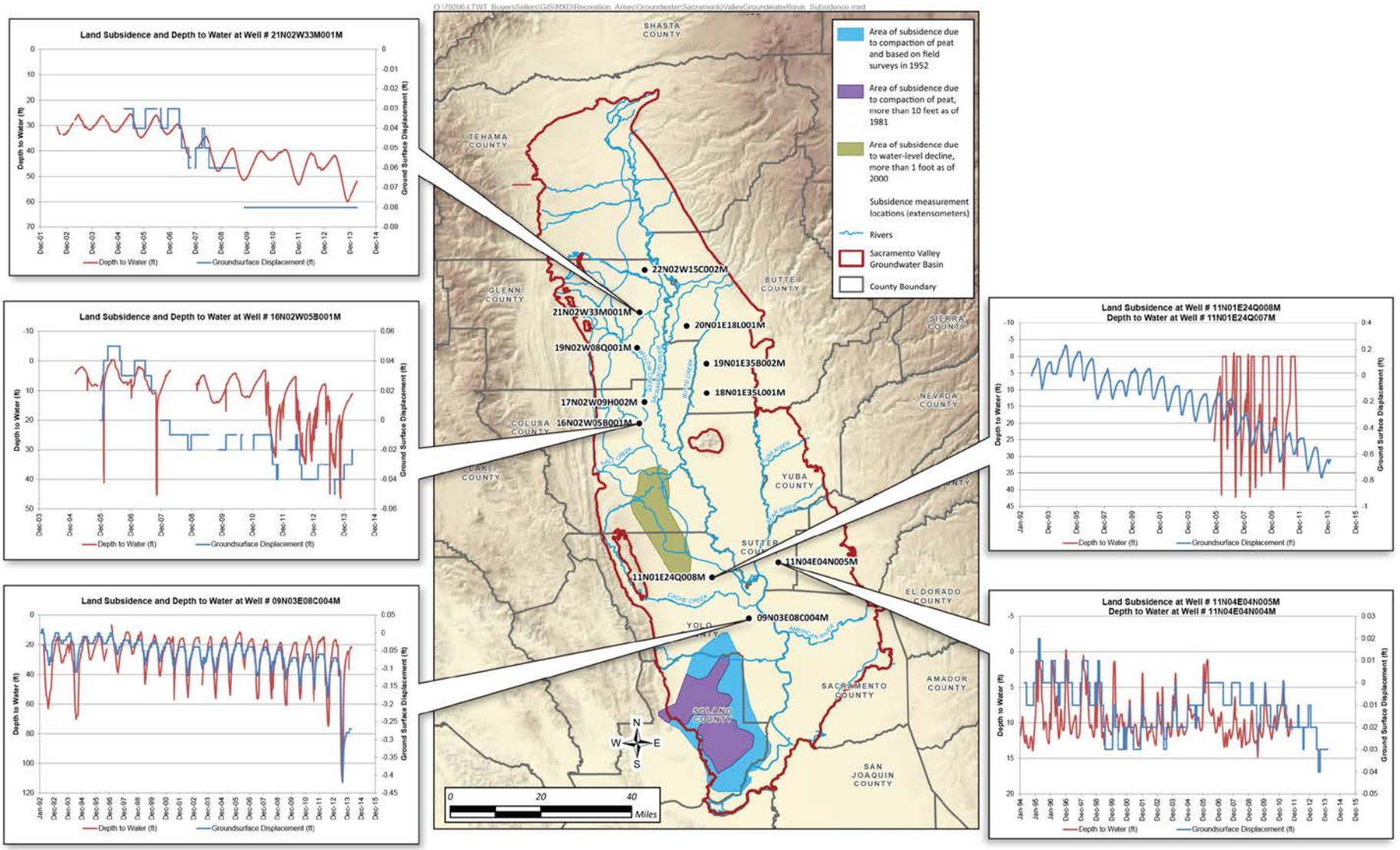

Figure 5 - Sacramento Valley Groundwater Basin Land Subsidence (Reclamation 2014b)

Sampling Program – Path Forward/Pilot Program for Use of Drought Year Criteria Exclusively

Groundwater monitoring will continue through the five-year term of the WAC program assessed by this EA. Analytical results will be compared to the previously-established Drought Year criteria only; Non-Drought criteria will not be used as a basis to determine well owner participation in the program or the acceptability of Canal water quality.

Owners of wells that wish to participate in the program will continue to have their wells tested and the laboratory analytical results reviewed by the TCC and Reclamation prior to Reclamation's approval of their participation in the program. This sampling will continue to be conducted within two years of participation in the program. The results of individual well monitoring will be compared primarily to the higher Limit value in the Drought Year criteria previously established to determine program eligibility. The higher Limit values are selected as the well/source criterion in recognition of the mixing and dilution effect on these contributions once conveyed to the Canal. Owners of wells with reported concentrations of constituents that exceed these criteria will not be allowed to participate in the WAC program.

In addition to their semi-annual monitoring at their established locations representative of the upper and lower Canal regions, the TCCA will sample the TCC pools monthly for a refined list of constituents including boron and aluminum and other agricultural or naturally-occurring contaminants, as determined appropriate based on the results of prior sampling efforts at the groundwater wells and in the Canal. The analytical results of these sampling efforts will be compared to the lower Threshold value of the Drought Year criteria for use in determining the overall acceptability of Canal waters for irrigation, and irrigation of sensitive crops in particular. The use of the lower Threshold values is selected in recognition that any mixing or dilution effect should be expressed in pool concentrations. Wherein the reported concentration of a constituent exceeds the Threshold, a 20% buffer will be applied before corrective measures are mandatory. The 20% buffer is established based on a review of the monitoring effort for 2014 and 2015 in which some reported constituent concentrations exceeded the criteria but no subsequent effects on lands irrigated with Canal water were observed or reported.

In the event that the water quality criteria are exceeded at one or more of the pools, the TCCA will approach the District members to determine path forward which will include an investigation to determine the source(s) of the contamination and will also include either ending a well owner's(s) participation in the WAC program/terminating pumping and/or adjusting the timing of groundwater discharges to the TCC until the water quality issue can be rectified.

In addition to the monthly pool sampling, the TCCA will begin collecting field parameters indicative of groundwater quality conditions (e.g. specific conductance as it relates to boron levels) at select pool locations. Data will be collected daily to weekly, as appropriate, based on in-situ conditions in the Canal. The intent of this supplemental data collection is to identify times when pool sampling frequency should be increased from

monthly to weekly. The frequency of field parameter data collection will be increased as appropriate based on the results of prior field data collection and pool sampling.

Cumulative Effects

Cumulative impacts result from incremental impacts of the Proposed Action or No Action Alternatives when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time.

As in the past, hydrological conditions and other factors result in fluctuating water supplies that drives requests for water service actions. Annually, Reclamation reviews and approves a myriad of actions related to these water service actions. In some cases, multi-year projects are approved following environmental review. Reclamation has determined that the Proposed Action, and attendant environmental commitments, would not result in any adverse cumulative impacts to the water resources within the Canals or the WDs they serve.

3.3 Biological Resources

Many of the natural habitats in the Central Valley have been converted to agricultural lands. Today, much of the Central Valley is intensely managed for pasture, orchard, vineyard, and row crops. Intensive management of land to support these crops has diminished the value of the habitat used by remaining native fish and wildlife species.

The biological resources of the service areas involved in these potential water movements consist predominantly of the biota of orchards and herbaceous crops and isolated remnants of native vegetation, mainly the riparian strips along the seasonal streams and oak savannahs in the as yet undeveloped portions of the service areas of the Canal. Crops planted in the service areas also include a minor amount of rice (approximately 5,000 acres or roughly 3% of 150,000-acre service area), which serves as habitat for some species including snakes and migratory birds.

Species Federally-listed as Threatened or Endangered species, or those proposed for listing, that occur within or near the Districts served by the Canal are shown in Table 7. This list was generated by querying the U.S. Fish and Wildlife Service (Service Database: http://www.fws.gov/sacramento/ES_Species/Lists/es_species_lists-form.cfm (Event Code 08ESMF00-2018-E-00725) using a free-hand but conservative outline of the affected Districts. Reclamation also queried the California Natural Diversity Database (CNDDB) for records of Federally-protected species in the area of the Proposed Action; these records were combined with the Service list to determine the likelihood of the presence of special status species or critical habitat within the action area (Table 7). The CNDDB was queried by the 27 USGS topographic quadrants in which portions of the action area are located. The Service's Environmental Conservation Online System (ECOS) was also used to refined results.

Table 7. Federally-listed ESA Species for the SCU of the CVP

Species	Status[1]	Effects[2]	Presence and Summary Basis for ESA Determination[3]
AMPHIBIANS			
California red-legged frog (*Rana draytonii*)	E	NE	**Absent**: Species absent from Sacramento River Valley floor and from vicinity of the Proposed Action area. No suitable habitat is located in the Proposed Action area. No change to wetland or riparian habitat would occur. No CNDDB occurrences in affected quads.
California tiger salamander (Sonoma County Population) (*Ambystoma californiense*)	T, X	NE	**Possible.** Occurrences in affected quads reported in CNDDB. No land use changes would occur to habitat for this species as a result of the Proposed Action, no conversion of habitat is involved, and no new facilities would be constructed.
BIRDS			
northern spotted owl (*Strix occidentalis caurina*)	T	NE	**Possible.** No land use changes would occur to habitat for this species as a result of the Proposed Action, no conversion of habitat is involved, and no new facilities would be constructed.
Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	T	NE	**Possible.** Occurrences in affected quads reported in CNDDB. No land use changes would occur to habitat for this species as a result of the Proposed Action, no conversion of habitat is involved, and no new facilities would be constructed.
Least Bell's vireo (*Vireo bellii pusillus*)	E	NE	**Absent.** Occurrences in affected quads reported in CNDDB. Species range is outside the area of the Proposed Action, according to ECOS. No land use changes would occur to habitat for this species as a result of the Proposed Action, no conversion of habitat is involved, and no new facilities would be constructed.
FISH			
Central Valley steelhead (*Oncorhynchus mykiss*)	T, X	NE	**Absent:** Occurrences in affected quads reported in CNDDB. No natural waterways within the species' range would be affected by the Proposed Action.
Chinook salmon - Central Valley spring-run (*Oncorhynchus tshawytscha*)	T, X	NE	**Absent:** No natural waterways within the species' range would be affected by the Proposed Action.
Chinook salmon -Sacramento River winter-run (*Oncorhynchus tshawytscha*)	E, X	NE	**Absent:** Occurrences in affected quads reported in CNDDB. No natural

Species	Status[1]	Effects[2]	Presence and Summary Basis for ESA Determination[3]
			waterways within the species' range would be affected by the Proposed Action.
Delta smelt (*Hypomesus transpacificus*)	T	NE	**Absent:** No natural waterways within the species' range would be affected by the Proposed Action.
North Amer.green sturgeon (*Acipenser medirostris*)	T	NE	**Absent:** No natural waterways within the species' range would be affected by the Proposed Action.
longfin smelt (*Spirinchus thaleichthys*)	C	NE	**Absent:** Occurrences in affected quads reported in CNDDB. No natural waterways within the species' range would be affected by the Proposed Action.
INVERTEBRATES			
Conservancy fairy shrimp (*Branchinecta conservatio*)	E	NE	**Possible.** Occurrences in affected quads reported in CNDDB. No land use changes would occur to habitat for this species as a result of the Proposed Action, no conversion of habitat is involved, and no new facilities would be constructed.
Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*)	T	NE	**Possible.** Occurrences in affected quads reported in CNDDB. No land use changes would occur to habitat for this species as a result of the Proposed Action, no conversion of habitat is involved, and no new facilities would be constructed.
Vernal pool fairy shrimp (*Branchinecta lynchi*)	T, X	NE	**Possible**. Occurrences in affected quads reported in CNDDB. No land use changes would occur to habitat for this species as a result of the Proposed Action, no conversion of habitat is involved, and no new facilities would be constructed.
Vernal pool tadpole shrimp (*Lepidurus packardi*)	E	NE	**Possible.** Occurrences in affected quads reported in CNDDB. No land use changes would occur to habitat for this species as a result of the Proposed Action, no conversion of habitat is involved, and no new facilities would be constructed.
PLANTS			
Hoover's spurge (*Chamaesyce hoover*i)	T	NE	**Possible.** Occurrences in affected quads reported in CNDDB. No land use changes would occur to habitat for this species as a result of the Proposed Action, no conversion of habitat is involved, and no new facilities would be constructed.

Species	Status[1]	Effects[2]	Presence and Summary Basis for ESA Determination[3]
palmate-bracted bird's-beak (*Chloropyron palmatum*)	E	NE	**Possible.** Occurrences in affected quads reported in CNDDB. No land use changes would occur to habitat for this species as a result of the Proposed Action, no conversion of habitat is involved, and no new facilities would be constructed.
Colusa grass (*Neostapfia colusana*)	T	NE	**Possible**. Occurrences in affected quads reported in CNDDB. Occurs in vernal pools along the eastern side of the central Sierra Nevada foothills.
hairy Orcutt grass *(Orcuttia pilosa*)	E	NE	**Possible.** Occurrences in affected quads reported in CNDDB. Occurs in vernal pools along the eastern side of the central Sierra Nevada foothills.
Keck's checker-mallow (checkerbloom) (*Sidalcea keckii*)	E	NE	**Possible**. Found or believed to occur in Colusa and Yolo counties. No CNDDB occurrences in affected quads. No land use changes would occur to habitat for this species as a result of the Proposed Action, no conversion of habitat is involved, and no new facilities would be constructed.
Greene's tuctoria (*Tuctoria greenei*)	E	NE	**Possible**. Occurrences in affected quads reported in CNDDB. No land use changes would occur to habitat for this species as a result of the Proposed Action, no conversion of habitat would occur, and no new facilities would be constructed.
slender Orcutt grass	T, X	NE	**Possible.** Found or believed to occur in Tehama County. No CNDDB occurrences in affected quads. Critical habitat is outside the area of the Proposed Action. No land use changes would occur to habitat for this species as a result of the Proposed Action, no conversion of habitat would occur, and no new facilities would be constructed.
REPTILES			
Giant garter snake (*Thamnophis gigas*)	T	NE	**Present**. Occurrences in affected quads reported in CNDDB. No land use changes would occur to habitat for this species as a result of the Proposed Action, no conversion of habitat would occur, and no new facilities would be constructed.

1 Status= Listing of Federally special status species, unless otherwise indicated.
C: Candidate species
E: Listed as Endangered.
T: Listed as Threatened.

Species	Status[1]	Effects[2]	Presence and Summary Basis for ESA Determination[3]
X: Critical habitat designated 2 Effects = NE = No Effect determination. 3 Definition of Occurrence Indicators in Proposed Action area. Present: Species observed and suitable habitat present. Possible: Species reported in area but suitable habitat suboptimal or entirely lacking. Absent: No species records and habitat requirements not met.			

No Action

The No Action Alternative consists of the continuation of deliveries of CVP water supply in accordance with the terms and conditions of the applicable WD's CVP water service contracts. WDs would continue to look for other water supplies to augment their supply or use groundwater pumping for local use where feasible. The No Action Alternative would neither hinder nor enhance populations of Federally-listed species or their habitat.

Proposed Action

There would be no impacts to biological resources as a result of the Proposed Action. The Proposed Action would not involve the conversion of any land fallowed and untilled for 3 or more years. There would be no change in land use patterns of cultivated or fallowed fields that do have some value to listed species or to birds protected by the Migratory Bird Treaty Act (MBTA). Groundwater would be moved into the Canal through existing facilities and would be limited by its quality (as identified in Attachment A). Maintaining high water quality as a condition of conveyance assures there would be no direct or indirect impacts to listed species or their critical habitat. Additionally, since water conveyed as part this action does not flow into any natural waterways within the range of protected fish species, there would be no potential effect to listed fish species.

Cumulative Impacts

As the Proposed Action is not expected to result in any direct or indirect impacts to biological resources, there would be no cumulative impacts.

Section 4 Consultation and Coordination

In consideration of the lack of significant impacts identified from the Proposed Action, no consultation or coordination with other Federal agencies were performed.

4.1 Public Review Period

Reclamation intends to sign a Finding of No Significant Impact (FONSI) for this project, and will make the EA available for a 10-day period that begins on the day of formal public noticing on Reclamation's website. All substantive comments will be addressed in a final EA/FONSI. Additional analysis will be prepared if substantive comments identify impacts that were not previously analyzed or considered.

4.2 Endangered Species Act (16 USC § 1531 et seq.)

Section 7 of the Endangered Species Act requires Federal agencies to ensure that discretionary Federal actions do not jeopardize the continued existence of special status species or result in the destruction or adverse modification of the critical habitat of these species.

Because there are no ground-disturbing activities that could impact critical habitat or impacts to water resources that could impact special status species, there would be no effect to ESA-listed species. As a consequence, Reclamation has determined consultation is unnecessary.

4.3 Migratory Bird Treaty Act (MBTA) (16 U.S.C. § 703 et seq.)

The MBTA implements various treaties and conventions between the United States and Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Unless permitted by regulations, the Act provides that it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not. Subject to limitations in the Act, the Secretary of the Interior may adopt regulations determining the extent to which, if at all, hunting, taking, capturing, killing, possessing, selling, purchasing, shipping, transporting or exporting of any migratory bird, nest or egg would be allowed, having regard for temperature zones, distribution, abundance, economic value, breeding habits and migratory flight patterns.

Because there are no ground-disturbing activities that could impact habitat or impacts to water resources that could impact migratory birds, there would be no effect to migratory birds.

Section 5 References

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Section 6 Personal Communications

Stuart Angerer, U. S. Bureau of Reclamation, Sacramento, CA

Shelly Murphy, Colusa County Water District, Arbuckle, CA

Attachment A: Water Quality Criteria

Constituent	Threshold[1]	Limit[2]
Aluminum	5,000	20,000
Arsenic	100	2,000
Beryllium	100	500
Boron	700	2,000
Cadmium	10	500
Chloride	142 mg/L	355 mg/L
Chromium III	100	1,000
Cobalt	50	5,000
Copper	200	5,000
Fluoride	1,000	15,000
Iron	5,000	20,000
Lead	5,000	10,000
Manganese	200	10,000
Mercury	0.77	0.77
Molybdenum	10	50
Nickel	200	2,000
pH	6.5 – 8.4	4.5 - 9.0
Selenium	5	20
Silver	0.71	0.71
Sodium Absorption Ratio	3	9
Specific Conductance	700 µS/cm	3,000 µS/cm
Total Dissolved Solids	450 mg/L	2,000 mg/L
Zinc	2,000	10,000

Units, where applicable, are µg/L unless otherwise specified.

1. Upper threshold of no effects, to be applied as Canal pool water quality acceptance criteria.
2. Upper limit to avoid a potential adverse effect, to be applied as well acceptance criteria.

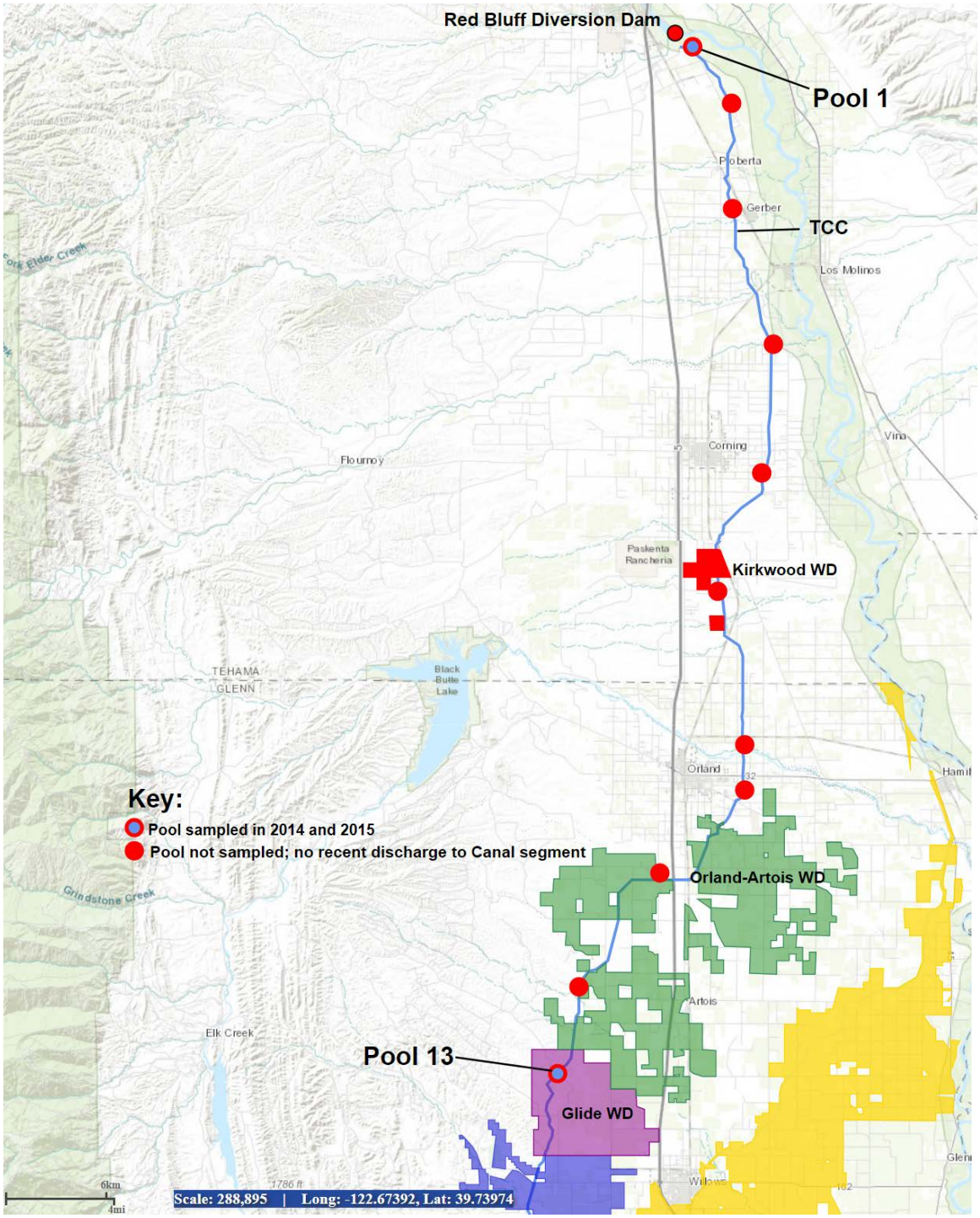
Attachment B: Water Quality Monitoring

2017 TCC Sampling Results

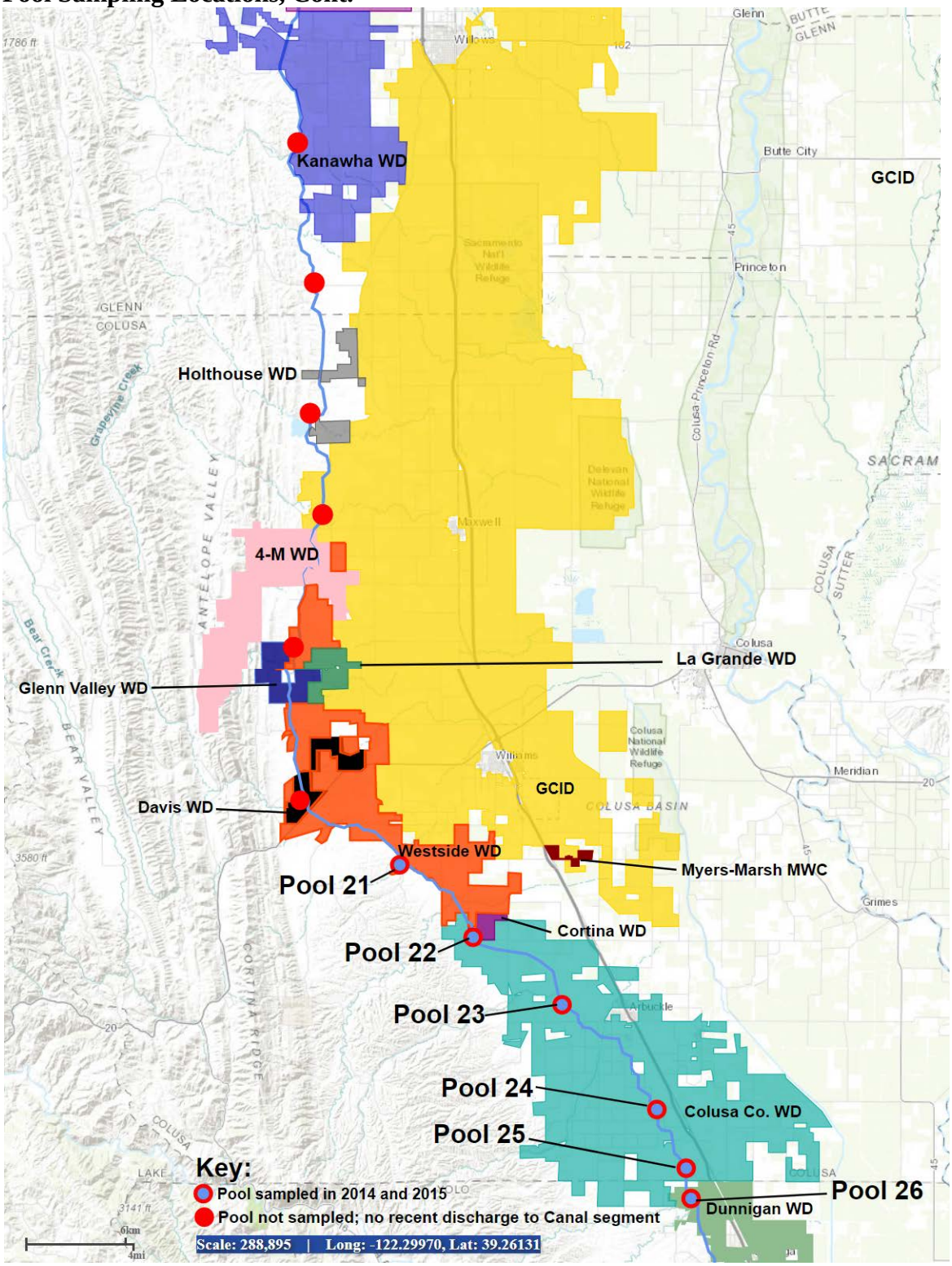
Sample Location	Date	Total salts (dS/m)	Ca (meq/L)	Mg (meq/L)	Na	SAR	SAR (adjusted)	Cl (meq/L)	CO3 + HCO3 (meq/L)*	SO_4 (meq/L)	B (mg/L)	NO_3-N (mg/L)	Fe (mg/L)	Mn (mg/L)	pH	L.I. (calc)
Upper TCC	5/1/17	0.11	0.54	0.37	0.2	0.3	0.2	<0.1	1.0	<0.1	<0.05	0.1	<0.10	<0.02	7.8	-0.7
	8/8/17	0.10	0.46	0.36	0.2	0.3	0.2	<0.1	1.0	<0.1	<0.05	0.2	<0.10	<0.02	7.8	-0.8
Lower TCC	5/1/17	0.11	0.50	0.34	0.2	0.3	0.2	<0.1	1.0	<0.1	<0.05	<0.1	<0.10	<0.02	7.8	-0.8
	8/8/17	0.11	0.53	0.38	0.2	0.3	0.2	<0.1	1.0	<0.1	<0.05	<0.1	<0.10	<0.02	8.2	-0.4
Ag Levels																
Low		<0.50	<4.00												<6.5	< -0.5
Normal		0.60-1.50	5.00-10.00	1.1-5.0	<4.0	0.1-4.0	0.1-4.0	0.1-1.5	0.1-2.5	0.1-5.0	0.01-0.40	0.1-5.0	<0.20	<0.20	6.8-7.9	-0.3 - 0.5
High for Sensitive Crops		1.51-2.20	> 10.00	> 5.0	4.1-7.0	4.1-9.0	4.1-9.0	1.6-3.5	2.5-3.5	-	0.41-0.59	5.1-7.0	0.21-0.40	0.21-0.40	8.0-8.4	0.6-0.7
High for Tolerant Crops		> 2.20	-	-	> 7.0	> 9.0	> 9.0	> 3.5	> 3.5	-	> 0.60	> 7.0	> 0.40*	> 0.40*	> 8.4	> 0.9*

Notes:
When sodium is greater than calcium (or high SAR), the water is considered sodic or alkali".
High & Low levels are based on laboratory interpretation using plant varieties, age, soil type, irrigation system, etc. information provided.
Red = high; Blue = low; Purple = SI high; Green = SI low
* Carbonate and bicarbonates.
** Nitrates as nitrogen.

Attachment B, Cont.
Pool Sampling Locations



Pool Sampling Locations, Cont.



Attachment B, Cont.

2014-2015 Pool Sampling Analytical Results

Specific Conductance

Date	Pool 1	Pool 13	Pool 21	Pool 22	Pool 23	Pool 24	Pool 25	Pool 26	Non-Drought	Drought	Limit
4/17/2014	142	142	162	156	164	161	185	188	700	700	3,000
4/28/2014	142	170	449	266	504	195	182	183			
5/12/2014	138	160	184	303	527	490	485	472			
5/27/2014	131	148	171	257	388	413	547	555			
6/9/2014	121	136	144	191	267	340	498	498			
7/7/2014	127	145	134	214	312	292	366	369			
8/4/2014	121	130	128	153	233	200	332	328			
9/2/2014	137	143	127	207	308	267	351	356			
10/6/2014	137	130	139	274	290	318	390	402			
11/5/2014	142	140	141	432	436	437	328	329			
12/9/2014	140	136	133	177	142	282	381	356			

Aluminum

	Pool 1	Pool 13	Pool 21	Pool 22	Pool 23	Pool 24	Pool 25	Pool 26	Non-Drought	Drought	Limit
4/17/2014	29.6	21.9	**135**	**103**	**158**	**206**	**926**	**778**	87	5,000	20,000
4/28/2014	30.9	6.9	21.3	**214**	**97**	**122**	**215**	**221**			
5/12/2014	51.8	9.1	**103**	62.7	**145**	23.5	**301**	**319**			
5/27/2014	32.5	12.1	73.3	58	43.6	80.9	**206**	**429**			
6/9/2014	26.3	26.3	41.6	29.1	67.8	41.3	**132**	**96.2**			
7/7/2014	23.5	28.6	**123**	48.6	**190**	47.6	**140**	**275**			
8/4/2014	20.6	17.9	**106**	75.8	**107**	**153**	**532**	**438**			
9/2/2014	24	49.2	**87.2**	46.6	86.1	76.3	**211**	**328**			
10/6/2014	13.3	13.9	**149**	46.4	52.3	17.8	45.5	**165**			
11/5/2014	28.6	11.4	**218**	85.2	46.9	42	**295**	**364**			
12/9/2014	27.5	75.2	**78.7**	**196**	**159**	**391**	**740**	**509**			

Boron

	Pool 1	Pool 13	Pool 21	Pool 22	Pool 23	Pool 24	Pool 25	Pool 26	Non-Drought	Drought	Limit
4/17/2014	56.2	41.3	60.6	58.8	62	63.6	77.6	79.4	700	700	2,000
4/28/2014	57.2	42.3	114	63.1	345	97.7	78.4	76.6			
5/12/2014	53.8	56.7	49.7	85.7	256	332	438	427			
5/27/2014	48.4	58.6	62	83.3	188	242	586	548			
6/9/2014	43	53.3	56.5	74.8	141	265	536	536			
7/7/2014	41.6	65.2	58.7	81	162	185	310	318			
8/4/2014	40.9	41.9	47.5	53	119	91.7	271	267			
9/2/2014	50.5	55.6	49.8	63.6	179	144	310	308			
10/6/2014	50.2	50.5	56.6	90.7	158	149	329	337			
11/5/2014	48.3	52.3	62.8	130	199	241	202	199			
12/9/2014	61.4	58.5	57.1	73.1	54.2	126	231	221			

2014-2015 Pool Sampling Analytical Results, Cont.

Specific Conductance

Date	Pool 1	Pool 13	Pool 21	Pool 22	Pool 23	Pool 24	Pool 25	Pool 26	Non-Drought	Drought	Limit
2/10/2015	144	125	126	190	146	199	380	392	700	700	3,000
3/9/2015	146	156	281	238	501	206	329	403			
4/6/2015	140	174	415	441	582	669	440	444			
5/5/2015	126	139	205	572	591	578	648	620			
6/2/2015	129	129	153	285	363	453	580	577			
7/6/2015	120	143	134	191	231	285	350	355			
8/4/2015	119	138	136	245	241	196	271	334			
9/9/2015	116	134	132	142	183	257	342	405			

Aluminum

	Pool 1	Pool 13	Pool 21	Pool 22	Pool 23	Pool 24	Pool 25	Pool 26	Non-Drought	Drought	Limit
2/10/2015	**139**	481	**178**	43.7	116	**202**	**1,130**	**177**	87	5,000	20,000
3/9/2015	**1,290**	43.8	**105**	10.8	59.8	**94.5**	**236**	**249**			
4/6/2015	57.4	**266**	38.5	39.3	43.1	20.1	**1,090**	**712**			
5/5/2015	69	63.3	**137**	60.2	25.4	38.6	**191**	**267**			
6/2/2015	37	23.2	**132**	64	51.7	51.7	**243**	**475**			
7/6/2015	43.1	16.4	**192**	**259**	143	**100**	**136**	**153**			
8/4/2015	33.3	17.3	**115**	72	68	**184**	**254**	**372**			
9/9/2015	22.9	44	**97.7**	**89.3**	**778**	60.4	**122**	**192**			

Boron

	Pool 1	Pool 13	Pool 21	Pool 22	Pool 23	Pool 24	Pool 25	Pool 26	Non-Drought	Drought	Limit
2/10/2015	44.4	46.6	49	66.6	51	70.7	245	204	700	700	2,000
3/9/2015	43.2	31.5	75.1	77.3	348	144	220	220			
4/6/2015	57.5	67.2	121	125	503	***822***	446	348			
5/5/2015	42.8	49.2	68.9	159	182	508	***822***	***748***			
6/2/2015	44.2	44.8	50.8	88	158	329	682	638			
7/6/2015	39.9	44.3	44.2	62.8	93.3	146	272	276			
8/4/2015	39.6	44.4	46.6	72	68	184	254	372			
9/9/2015	44	57.6	58	62.4	111	204	292	271			

Notes:

Specific conductance results and criteria reported in µS/cm. Aluminum and boron concentrations and criteria reported in µg/L.

Bold font indicates concentrations that exceeded the Non-Drought criteria.

Bold, italicized font indicates concentrations that exceeded the Drought criteria, which was used as the acceptance criteria in the referenced years (2014 and 2015).

Attachment C: Cultural Resources Review

CULTURAL RESOURCES COMPLIANCE
Division of Environmental Affairs
Cultural Resources Branch (MP-153)

MP-153 Tracking Number: 18-NCAO-067

Project Name: Five-Year Warren Act Contracts for Conveyance of Groundwater in the Tehama-Colusa Canal – Contract Years 2018 – 2022

NEPA Document: EA-18-01-NCAO

NEPA Contact: Megan Simon, Natural Resource Specialist

MP-153 Cultural Resources Reviewer: Gary Scholze, Archaeologist

Date: February 9, 2018

Reclamation proposes to issue Warren Act Contracts (WACs) to up to 11 Central Valley Project (CVP) water service contractors served by the SCU of the CVP over a five-year period beginning with water contract year 2018. The proposed action would allow for up to 86,200 acre feet (AF) of ground water to be pumped in any one year. Water considered or transport in Federal facilities, would be limited to groundwater pumped from existing wells and discharged to and removed from the Canals through existing facilities or through facilities reviewed and permitted on an individual basis. This proposed action is strictly a water transfer action and will not involve any new construction or ground-disturbing activities.

Reclamation determined that the proposed action is the type of undertaking that does not have the potential to cause effects on historic properties, should such properties be present, pursuant to 36 CFR § 800.3(a)(1). As such, Reclamation has no further obligations under 54 U.S.C. § 306108, commonly known as Section 106 of the National Historic Preservation Act (NHPA).

Reclamation cultural resources staff has reviewed the draft Environmental Assessment for this project and agrees the current language in the EA is sufficient for cultural resources analysis. No additional language will be provided.

This document conveys the completion of the cultural resources review and NHPA Section 106 process for this undertaking. The proposed action would have no impacts on cultural resources. Please retain a copy of this document with the administrative record for the proposed action. Should the proposed action change, additional review under Section 106, possibly including consultation with the State Historic Preservation Officer, may be required.

Attachment D: Indian Trust Asset Review

Simon, Megan <msimon@usbr.gov>

ITA Review - Warren Act Contracts

Simon, Megan <msimon@usbr.gov> Thu, Feb 1, 2018 at 11:57 AM
To: "Zedonis, Paul" <pzedonis@usbr.gov>

I have examined the referenced proposal and have determined that the nearest of the facilities are located approximately 0.16 miles from the closest Indian Trust Asset.

I have determined that there is no likelihood that this action will adversely impact Indian Trust Assets.

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Megan K. Simon
Natural Resources Specialist
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Northern California Area Office
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