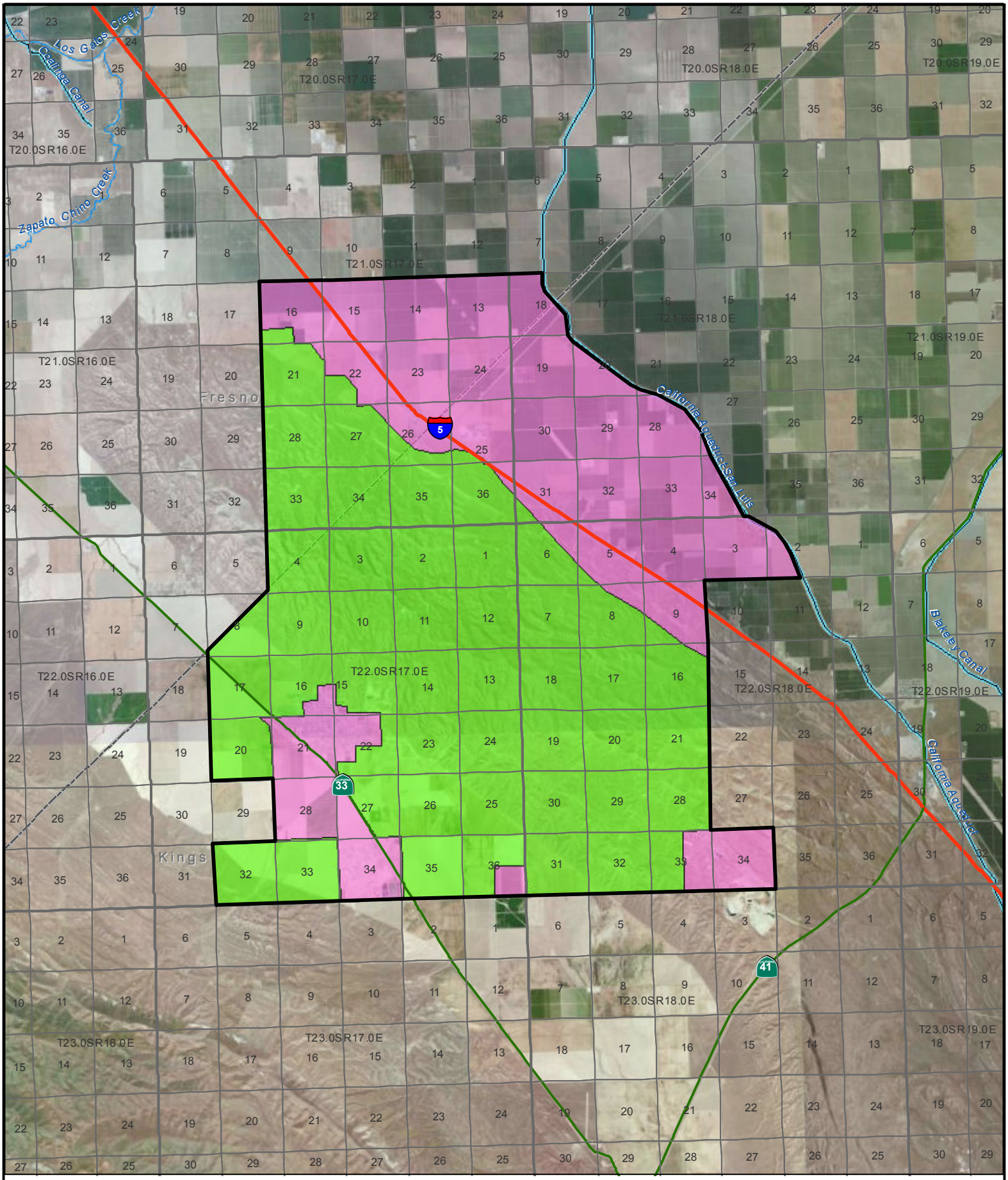
Appendix A: Cities Contractor Service Area Maps



City Boundary
Lands Eligible to Receive CVP Water
Lands Ineligible to Receive CVP Water

City of Avenal

N

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Date: June 27, 2012
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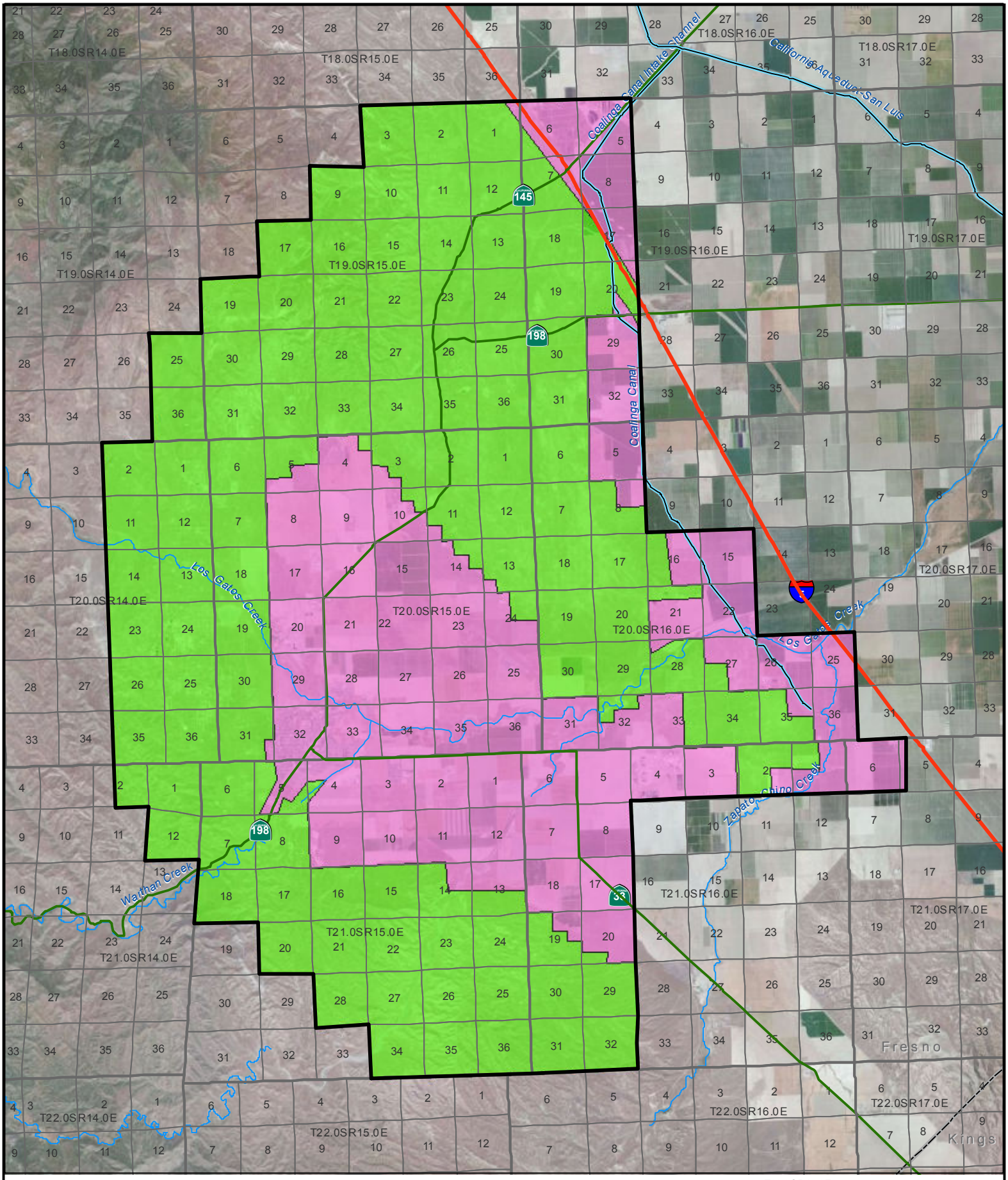
805-202-71



City of Coalinga

City Boundary
Lands Eligible to Receive CVP Water
Lands Ineligible to Receive CVP Water

N

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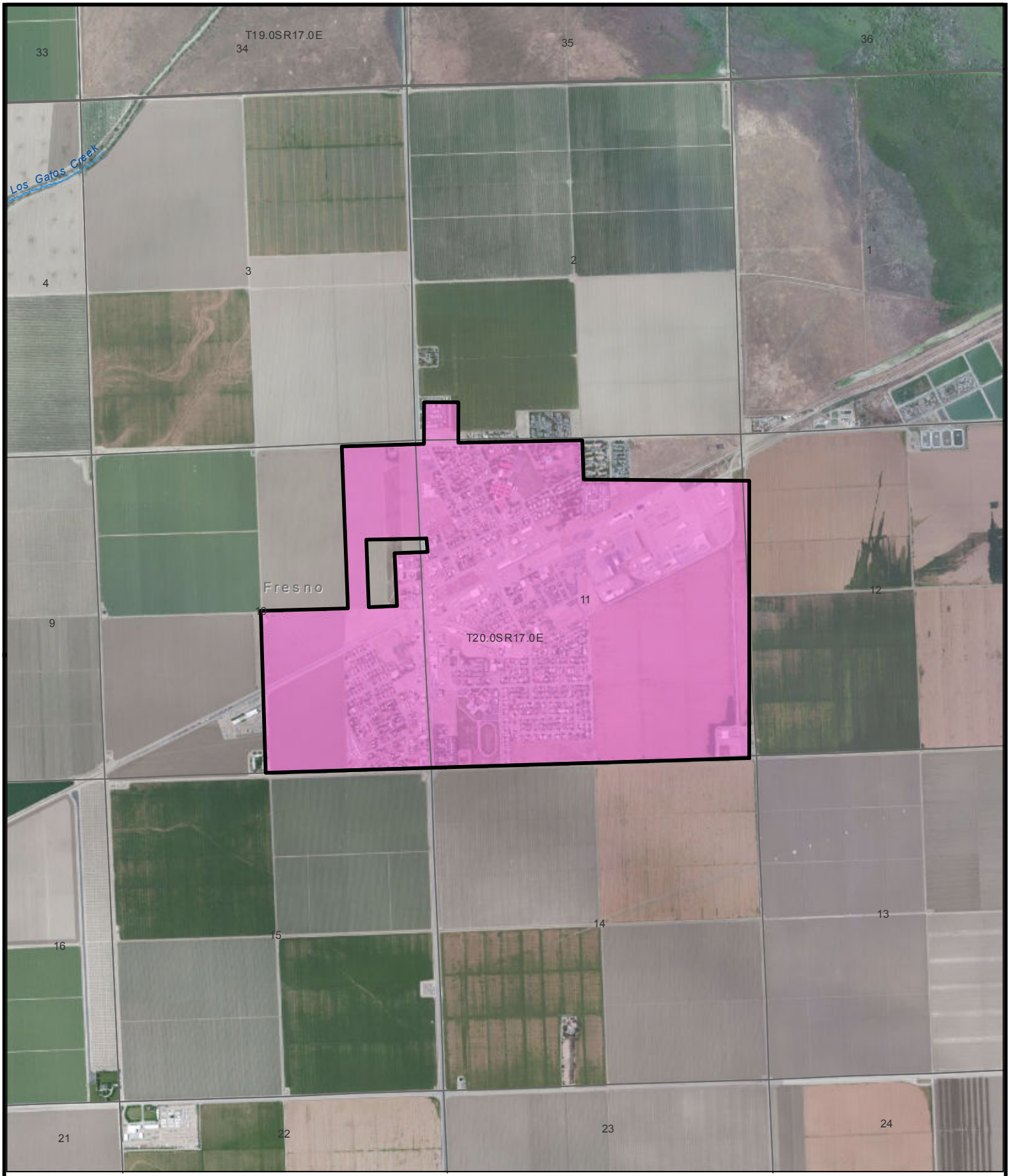
805-202-72



City of Huron

City Boundary

Lands Eligible to Receive CVP Water

N

0 0.5 1 Miles

Date: June 27, 2012
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805-202-73

Appendix B: Purpose and Methodology for Water Needs Assessments

ATTACHMENT 1

CENTRAL VALLEY PROJECT (CVP) WATER NEEDS ASSESSMENTS:
PURPOSE AND METHODOLOGY

Purpose:

Water needs assessments have been performed for each CVP water contractor eligible to participate in the CVP long-term contract renewal process. These water needs assessments serve three purposes:

1. Confirm past beneficial use of CVP water;

2. Provide water demand and supply information under current and future conditions for the environmental documents; and

3. Provide an estimate of contractor-specific needs for CVP water by the year 2025 to serve as a starting point for discussions regarding contract quantities in the negotiation process.

Small Contractors exempt from Detailed Water Needs Assessments:

In order to minimize the informational burdens on CVP water contractors with small amounts of CVP supply under contract, an exemption from the requirement for detailed water needs assessments has been provided to these contractors. The exemption applies to contractors who provide agricultural water to a service area of 2000 irrigable acres, or less, and/or provide urban water now, or in the future, in the amount of 2000 acre-feet annually, or less. A contractor may be exempt from the water needs assessment requirement for its urban water service, but not for its agricultural water service, or vice-a-versa. These contractors are assumed to demonstrate future need if they have beneficially used their CVP supplies in the past.

Approach to Confirm Past Beneficial Use and Depict Current Conditions:

Originally, Reclamation requested water demand and supply information for the 1979 through 1997 timeframe. Reclamation believes that evaluations of beneficial use, current and future CVP needs based on information for a 19-year period of record, including both wet and dry periods, is a scientifically defendable way of conducting water needs assessments. However, the concerns of the CVP water contractors with respect to the magnitude of the information request persuaded Reclamation to perform the assessments using a representative snapshot year approach, instead. Although less scientifically rigorous, the snapshot year approach appears adequate for cursory evaluations of water needs.

The year 1989 is the snapshot year chosen to confirm past beneficial use of CVP water for the American, Delta, Contra Costa, Sacramento, and San Felipe regions (refer to the definitions below). This year was chosen because the majority of CVP water contractors received full delivery of their requested water supplies and the total annual precipitation for most CVP regions was in the normal range. Since 1989 was a drought year in the Friant region, 1996 is the snapshot

year selected to calculate past beneficial use for this region. Water Need Assessments for the Stanislaus Region have been deferred pending the resolution of operational issues in the Stanislaus River basin. Some contractors have elected to deviate from the selected snapshot year because of the unavailability of information for that year. Following is a description of the regions:

American: American River Division

Delta: Delta Division combined with West San Joaquin Division, but not the Contra Costa Unit

Contra Costa: Contra Costa Unit

Stanislaus: East Side Division

Friant: Friant Division combined with Hidden Unit, Buchanan Unit, and Cross Valley Canal

Sacramento: Sacramento River Division combined with Trinity River and Shasta Divisions

San Felipe: San Felipe Division

Following is a description of the process to evaluate past beneficial use of CVP water supplies:

For contractors who supply water to meet agricultural demands, Reclamation estimated the district irrigation efficiency associated with the crop water information provided for the snapshot year. Both the district irrigation efficiency and the amount of intra-district conveyance losses are evaluated for reasonableness. Past beneficial use of CVP supplies is confirmed if the district irrigation efficiency is close to the current statewide average of 75 percent, or if a trend towards increasing district irrigation efficiencies over time is apparent; **and** if intra-district conveyance losses total 10 percent, or less, of the district's total water supply. In situations where some, or all, of these conveyance losses contribute to groundwater recharge for later use by the contractor, these "conveyance losses" are shown as groundwater recharge rather than conveyance losses.

For contractors who supply municipal and industrial water, the primary test of past beneficial use of CVP supplies is whether the calculated per capita demand in column 36 is reasonably close to the reference per capita demand value in column 35. Acceptable explanations for calculated per capita demands that significantly exceed the reference number might include a large industrial water demand, or a significant percentage of residences on larger than average-size city lot parcels.

The environmental documentation associated with the CVP long-term contract renewals specifies 1995 as the base year. Therefore, water supply and demand information is indicated on the water needs assessments for the 1995 level of development, if available. In many cases, the

information provided to demonstrate past beneficial use is also reasonably representative of 1995 level water supplies and demands.

Definition of Need for CVP Water Supplies:

An important function of these assessments is the estimation of year 2025 CVP water needs. The assessments compare all demands and all supplies (including CVP supplies) estimated for the 2025 level of development for a normal hydrologic year. The results are displayed in Column 39 as Unmet Demand. If the number in this column is positive or only slightly negative[1] then the CVP water contractor is deemed to have full future need of the maximum annual CVP supply currently under contract for all year types.

Demands include agricultural, urban and, on occasion, environmental water demands.
CVP supplies in the assessments are set at the maximum annual contractual amount for each water contractor, except in the Friant Division. The Friant Division's Class II contract amounts are based on a wet hydrologic year. To reflect a normal hydrologic year, CVP supplies for the Friant Division are set at the maximum annual Class I contract amount plus 40% of the maximum annual Class II contract amount.

Dry year and critically dry year analyses were only performed for urban contractors who did not demonstrate full future need of their CVP contract supply in a normal hydrologic year.

The methodology used to estimate agricultural and urban water demands as well as to estimate the availability of non-CVP supplies is described in the following sections.

Agricultural Water Demand:

Agricultural water demand is defined as the sum of the district's irrigation water demand and the intra-district conveyance losses, where irrigation water demand is the product of the irrigated acreage in a district and the average farm delivery requirement. The farm delivery requirement is defined as the unit amount of water necessary to supply crop water needs in excess of effective precipitation and varies based on crop type, climate, irrigation water quality, soil salinity and irrigation method. The district's irrigation water demand is not necessarily the sum of all the on-farm irrigation water demands because such measures as recycling of intra-district return flows are effective in reducing the overall district irrigation water demand. The assumption for this analysis is that the continued implementation of water use efficiency measures between now and the year 2025 will further reduce the unit amount of water needed to grow crops in the future. Often, it is also assumed that district conveyance losses will decrease in the future. Specifically, district irrigation efficiencies are assumed to increase from an average of 75 percent currently to 85 percent by the year 2025, where district irrigation efficiency is defined as follows:

[1] If the negative amount is within 10% for contracts in excess of 15,000 acre-feet, or within 25% for contracts equal to, or less than, 15,000 acre-feet; the test of full future need of CVP supplies under contract is deemed to be met.

District Irrigation Efficiency= Supply - Non Recoverable Losses to the District[2]
Supply

Or, approximately =

Sum of On-farm Crop Water Requirements of Applied Water (ETAW) + Intra-District Reuse
District's Irrigation Water Demand

Certain districts, such as those with large elevation differences within their boundaries, have target district irrigation efficiencies of 80 percent based on the unavailability of certain water management options to increase overall district irrigation efficiency.

Estimating Crop Water Requirements:

Generally, the CVP water contractors' Water Management Plans provide historical information on crop water requirements. This information was used in the snapshot year analyses to confirm past beneficial use of CVP supplies and to reflect the base condition in the environmental documents.

Reclamation estimated crop water requirements for the year 2025 level of development based on the CVP water contractors' estimates of future crops and acreage planted multiplied by estimates of the farm delivery requirements for each crop. Reclamation staff initially estimated crop water requirements for all regions using evapotranspiration (ET) and effective precipitation (EP) data from several sources: 1) California Department of Water Resources (DWR) Bulletin 160-98, 2) DWR Bulletin 113-3, and 3) Reclamation knowledge and experience. The ET and EP information was tabulated on a Detailed Analysis Unit (DAU) basis and then proportioned to each district based on the district's area in a DAU. The data was then used in combination with other traditional methodologies for determining crop water requirements to estimate each district's total irrigation water demand in the year 2025.

In February 2000, representatives of the Friant and Delta Region CVP water contractors expressed the following concerns with using this methodology:

• The crop water requirements estimated are too low;

• The effective precipitation component to meeting crop water requirements is too high for some areas.

In order to address these concerns a number of evaluations were performed.

[2] The general equation for district efficiency includes conveyances losses; however, for these assessments intra-district conveyance losses are not included in the district efficiency equation because these are treated as a separate parameter for the purposes of evaluating beneficial use of CVP supplies.

One analysis compared the agricultural water demand calculations performed by a private consultant to CVP contractors and those performed by Reclamation staff for the water districts in the Delta Region. This analysis indicated that Reclamation's and the consultant's estimation of these water demands on a regional basis is close (within 8%). However, the results of the agricultural water demand determinations diverge as the regional area is broken into sub-regions and especially when the comparison is made at the district level.

A comparison of calculations of ET and EP for alfalfa in the Friant Region using the methodologies of Bulletin 160-98, Reclamation and the Natural Resources Conservation Service (NRCS) indicates that Bulletin 160-98 consistently estimates EP higher than the other two methods at the district level. One reason for this difference appears to be that the Bulletin 160-98 methodology estimates the contribution of rainfall to the soil moisture profile in the non-irrigation season in a different way than the other two methodologies. Similarly, a comparison of ET values shows that the Bulletin 160-98 values are consistently lower than the NRCS values at the district level. This difference is most likely the result of Bulletin 160-98's use of "actual" ET values. "Actual" ET is potential ET modified to reflect regional agricultural practices by farmers. The NRCS method uses potential ET values without modification.

Based on discussions with DWR, the affected CVP water contractors and their consultants; Reclamation concluded that the regional agricultural practices taken into account by Bulletin 160-98 may not be reflective of current and/or future practices by the CVP water contractors. For this reason, Reclamation determined that it was more prudent to use potential ET values than the "actual" ET values from Bulletin 160-98 in evaluating 2025 crop water requirements for water districts located in the Friant and Delta Regions.

In addition, Reclamation and representatives of the Friant and Delta Region water contractors agreed on a different methodology to estimate EP than the one used in Bulletin 160-98 because of the lack of dependable rainfall. The bulletin assumes rainfall is effective if it can be stored in the soil moisture profile, or directly meet crop water needs during any month. However, in actual practice to effectively manage farm operations, a farmer may need to pre-irrigate one or more fields earlier in the month only to have a major precipitation event occur later in the month, thus reducing the effectiveness of the rainfall during that month.

Revised Agricultural Water Demand Methodology for the Friant and Delta Regions:

Following is a description of the revised methodology for estimating ET and EP:

• EP is estimated to be 50 percent of long-term average annual rainfall with the exception of citrus EP. For citrus groves, it is estimated that one inch of the initial rainfall is stored before the soil seals over and the runoff begins; then about 10% of the additional rainfall for the season is estimated to be effective.

• ET is determined using California Irrigation Management Information System (CIMIS) potential ET data and crop coefficients supplied by the University of California Cooperative Extension.

No change was made to the ET and EP determinations for the CVP water contractors in the other regions because these regions are located in areas of higher precipitation not as sensitive to the issues raised in the comparative analyses.

Urban Water Demand:

Urban water demand is defined as the sum of residential, nonresidential and distribution system demands. The components of residential demand include indoor and outdoor demand. Originally, information on residential and a portion of nonresidential demand was requested in terms of these two components; however, most CVP water contractors were unable to provide the information in that format. Therefore, the information request was revised to a combined figure for indoor and outdoor use. Nonresidential demand includes commercial, institutional and industrial demands. Distribution system demands consist of unaccounted beneficial use and distribution system losses where:

• Unaccounted beneficial use includes water for such uses as firefighting, mainline flushing, storm drain flushing, sewer and street cleaning, construction site use, water quality testing and other testing.

• Distribution system losses accounts for water lost because of leaks in storage and distribution systems, evaporation, illegal connections, and water theft.

Projected M&I water demand will be influenced over time by many factors, including future land use changes, population shifts, and improvements in residential and distribution system efficiencies over time. As is the case for agricultural water demands, the methodology assumes that the implementation of water conservation measures in the next 25 years will increase the efficiency of urban water use and reduce unit M&I water demands. Specifically, the reference average per capita usage upon which the urban beneficial use evaluation is based decreases from 5% to 14% by the year 2025, depending on the location in the state.

Non-CVP Water Supplies:

Non-CVP water supplies can include groundwater including the conjunctive use of surface and groundwater, State Water Project (SWP} supplies, local surface water supplies, recycled water, inter-district return flows and water transfers. The methodology considers water transfers a beneficial use of water. Water transfers are, therefore, included in the 2025 level assessments if there is evidence of a commitment by both parties to engage in the transfer in this timeframe.

Average values for SWP and local surface supplies are used in the 2025 level assessments unless the analysis is for dry or critically dry year conditions. Often the source of information is the 10-year average surface water supply from the contractor's Water Management Plan. If there is an indication that surface water supplies will decrease in the future because of increased upstream diversions or increased environmental requirements, the surface water supply is reduced to reflect these considerations in the 2025 level assessment.

Where available, groundwater safe yields are used to estimate future groundwater pumping. Safe yield is defined as the amount of groundwater a district can pump on a long-term average and not cause the long-term decline of groundwater levels leading to excessive depths for pumping or leading to degradation of groundwater quality. A safe yield value is the result of a complex interaction between many factors; a change in any one of the factors can have an impact on the value obtained from safe yield computations. The main factors involved in safe yield computations can include, but are not limited to, water supply, consumptive use, losses to the system, and water quality. Adding to the complexity of the analysis is that many, if not most, of the factors involved in a safe yield computation are time dependent, and have both short-term and long-term trends--which may be quite different. If a safe yield analysis is not available for the contractors' groundwater resources, groundwater pumping and recharge, if applicable, is estimated from historical information for the 2025 level assessments.

Originally, groundwater pumping for the Friant Region was estimated based on historical estimates of groundwater pumping for 1996 from the water contractors' Water Management Plans. During the February 2000 discussions with representatives of the Friant Region water contractors, the issue of groundwater was raised. Specifically, Reclamation was requested to evaluate the possibility of using the original safe yields estimated by Reclamation as the supply available from groundwater in the 2025 level assessments. Reclamation agreed to investigate the use of these original safe yields because the original safe yields were developed for ultimate build-out and included CVP groundwater recharge. Following is a summary of the analysis performed to estimate groundwater pumping for the Friant Region in the 2025 level assessments.

Analysis of Groundwater Pumping in the Friant Region:

Groundwater technical studies were conducted by Reclamation in the 1940's and 1950's to characterize the geohydrology, groundwater occurrence and groundwater conditions in each district, and to determine each district's safe yield. Prior to the delivery of CVP water supplies, farmers irrigated mainly with groundwater, although some local surface water sources were also used. Because recharge of groundwater could not keep pace with the use of water primarily for agricultural purposes, groundwater levels had declined in many areas, and groundwater overdraft was common throughout the region.

A review of Reclamation's original safe yields for the Friant Region shows that these safe yield estimates are generally less than the estimated amounts of groundwater pumping for 1996. Reclamation's original safe yield estimates are also generally less than the updated safe yield estimates performed by Reclamation for some of the districts in the early 1990's. However, the 1990's safe yield estimates are considered preliminary numbers and were never adopted by Reclamation nor accepted by the Friant water contractors. Historical estimates of groundwater pumping indicate that these water contractors are pumping groundwater in excess of the original safe yields.

The groundwater pumping in excess of safe yield has resulted in the continued decline in the groundwater tables underlying most of the districts. A review of hundreds of individual well hydrographs shows that this increase in pumping has not been supported by the aquifer. Most districts are still experiencing declining groundwater levels since the inception of CVP

deliveries. With the exception of five districts (Delano Earlimart, Exeter, Lindmore, Lindsay-Strathmore and Orange Cove), cumulative groundwater storage has decreased in the remaining 19 Friant districts since the CVP began importing water into those districts. The five districts that show overall rises in groundwater storage change have unique geohydrologic conditions and were evaluated individually to determine appropriate levels of groundwater pumping for the 2025 level assessments.

From the analysis performed, it can be concluded that CVP deliveries since 1986, as evidenced by a continuous decline in storage from 1986 to 1992, have not been sufficient to maintain reasonably stable groundwater levels, nor have CVP deliveries supported an increase in groundwater levels in wet years under the conjunctive use operations practiced by most districts. Safe yield pumping in combination with surface water supplies should have sustained or raised groundwater levels to some stable level. However, historical groundwater pumping has been higher than the safe yield values. In addition, unforeseen factors in the original safe yield analysis such as the magnitude of groundwater use by non-district entities primarily for urban needs within the boundaries of the district, the magnitude of groundwater and surface water use by adjacent districts, changes in the type of crops, droughts and reductions in CVP water deliveries may render even the original safe yield values as too high. However, the unavailability of critical information and the lack of time to perform an analysis make the determination of new safe yields for the Friant Region infeasible at this time. Therefore, Reclamation concurs that the original safe yields are appropriate to depict groundwater pumping for 19 contractors in the Friant Region for the 2025 level assessments unless recharge is significantly higher than under the pre-project condition. In that case, groundwater pumping is assumed to be the safe yield plus a certain percentage of recharge. It is assumed that up to 10% of a district's supply may be lost in conveyance or recharge losses; the remainder of the recharge is assumed to be available for groundwater pumping.

Sources of Information

The Water Management Plans that most water districts have prepared in response to the mandates of the Central Valley Project Improvement Act and the Reclamation Reform Act provide information on agricultural, urban and environmental water demands as well as on water supplies available to meet these demands. In most cases, these plans depict information for a representative year, although some plans provide a number of years of historical information as well as projections for the future. Fortunately, the representative year for many of these plans is either 1989, or 1996. The water contractors were asked to verify that information contained in these plans may be used to calculate past beneficial use and/or to depict current conditions for the purposes of the environmental documentation. In addition, the agricultural water contractors were requested to provide projections of types of crops planted, irrigated acres and amounts and types of non-CVP water supplies for the year 2025. Similarly, the urban water contractors were asked to provide population projections, projections of nonresidential water demand and amounts and types of non-CVP water supplies for the year 2025. Department of Finance population projections were used to assess whether the contractors' population projections appear reasonable.

Other sources of information included DWR Bulletin 160-98, DWR Bulletin 113-3, CIMIS information, crop coefficients from various sources, Reclamation's annual crop reports, the January 2000 Water Forum Agreements for the American River, Reclamation's groundwater safe yield studies and miscellaneous planning and environmental documents.

WATER NEEDS ASSESSMENTS FOR CENTRAL VALLEY PROJECT LONG TERM RENEWAL

Purpose

Section 3406 (c) of the Central Valley Project Improvement Act states that upon request, the Secretary shall renew any existing long-term repayment or water service contract for the delivery of water from the Central Valley Project for a period of twenty-five years and may renew such contract for successive periods of up the 25 years each. In response to this provision, the Region submitted a Basis of Negotiation (BON) to the Commissioner on January 26, 1999 which required the Region to conduct water needs demand assessments for as many as 113 Long Term Renewal Contacts. As stated in the BON, the water demands in conjunction with information on available water supplies will be used to demonstrate historic beneficial use of both CVP and non-CVP water for each contractor. Also, a determination of future need for CVP will be made water based on comparisons of future water demands and the determination of non-CVP water supplies for each contractor.

Background

On October 23, 1998, Reclamation's Mid-Pacific Region announced its intent to undertake a water needs assessment for each contactor as part of the CVP long term contract renewal process. The letter requested written comments on the draft water needs assessment methodologies be submitted to Reclamation by December 11, 1998. As part of the scoping process, four public workshops were held in early November 1998 to address the development of water demand methodologies for both irrigation and M&I purposes. The various proposed steps to assess potential water needs for irrigation and M&I purposes and subsequent total potential demands for CVP water are detailed in the document entitled "Proposed Water Need Methodologies, LTRC, Central Valley Project."

On December 30, 1998, Reclamation requested information for water needs assessment for Long Term Contract Renewal from All CVP Interim Renewal Irrigation and M&I Contractors, and All CVP Irrigation and M&I Contractors Subject to Binding Agreement. The request stated that although Reclamation recognized the water demand methodologies where still in draft form and the comment period had been extended to January 8, 1999. Reclamation believed the required information would likely be needed irrespective of any changes in methodologies. The information was to be provided by February 19, 1999.

On January 29, 1999, Reclamation held technical discussions on the proposed irrigation contractor methodology for the needs assessment. As an outcome of this meeting, Reclamation committed to perform comparisons in order to streamline the irrigation water demand analysis. 1) Evaluate crop water needs plus distribution system water requirement for the years 1979 through 1997 for six representative districts to arrive at an "average" beneficial use of water for that time frame to establish a correlation between scientifically calculated beneficial use and actual deliveries. 2) Compare the result to determine if a close correlation between scientifically calculated beneficial use and actual deliveries can be made. 3) Using the districts' Water Management Plans, calculate the crop water needs and distribution system water

requirements for the "representative" year (either 1989 or 1996) and compare that with the actual water deliveries in that year. 4) Determine whether the "representative year" method appears to be a scientifically credible substitute for the "average year" method.

Based on Reclamation's analysis, a letter was sent out February 22, 1999, to update Reclamation's December 30 1998, request for information from the irrigation contractors. The letter extended the deadline for the submittal of information and provided contractors with the findings of the comparative analysis described in the previous paragraph. The conclusion in the comparative analyses was that the information provided in the water management plans was sufficient to meet the current water demand and supply information and the determination whether the historical water deliveries were beneficially used. Therefore, contractors were provided the opportunity to have the information presented in their water management plans as the basis for the analysis of historic and current use. If that information was not available, contractors where requested to submit information for 1995.

A similar letter was also sent to M&I contractors on February 22, 1999. This letter extended the deadline for submittal of water needs assessment information to March 19, 1999, and provided the contractors with the option of using information provided in their water management plan or current Integrated Resource Plan if that plan contained information corresponding to that information in Reclamation's December 30, 1998 information request.

A follow up letter dated June 3, 1999 was sent to those contractors which had not yet submitted the water assessment information requesting. The letter requested that the information be submitted by close of business June 25, 1999.

In the fall of 1999, Reclamation staff completed development of an Access© Data Base Program which was used to analyze the data submitted by the contractors. An output file was developed which provided information on the contractors' water supply, and agricultural and/or urban water demands. A summary column on the output provided information on the amount of water by which the contractors' water demands exceeded or were less than its supplies. Information was input for each contractor for a historic year to demonstrate beneficial use and for a future year (2025) to demonstrate future need. Between November 1999 and March 2000 this information was sent to most of contractors in draft form with results of the assessment. The contractors were asked to review the assessment to determine if all the information and assumptions were accurate.

Future demand was projected in most cases for year 2025. The data requested from the districts in December 1998, was for the future year 2025 because it was believed at that time the contracts would be finalized by 2000 and the irrigation contracts would be for 25 years. Although M&I water service contracts are for 40 years, it was assumed build out would occur by 2025. In the few instances in which an M&I contractor could demonstrate that build out would not occur by 2025, those contractors were allowed to provide projection to the year 2040.

Although all of the contracts were executed after 2000, it was assumed that the cropping patterns initially projected for 2025 would still be valid after that date since additional information to

discern annual out year cropping pattern changes was not available. Therefore, any estimated changes in cropping patterns after 2025 would be highly speculative.

The assessments were performed by technical staff in the Mid-Pacific Region's Resources Division and Reclamation's Technical Service Center. Reclamation used expertise from the California Department of Water Resource and the TSC to perform the urban water assessments. The Reclamation technical staff used to perform the agricultural needs analysis included agricultural engineering staff from the Region and the TSC and water conservation staff from the Region. These staff interacted with contractors and other stakeholders to develop the assessment tools based on a combination of technical literature and personal knowledge. When background information such as crop evapotranspiration information was in dispute, Reclamation funded consultants with technical expertise in the field to service as an independent source of information.

Resources that Reclamation staff used to substantiate estimates provided by the contractors included, the State Water Plan Bulletin 160-98 for (urban and agricultural water use trends and water use efficiency estimates), California Department of Finance (population trends), County Master Plans and Land Use Planning Reports (population trends, water supplies, and land use trends), Agricultural Commissioners Annual County Crop Reports (agricultural crop acreages) and Bulletin 113-3 (crop evapotranspiration).

The methodology for the water needs assessments was finalized in May of 200 I with the inclusion of provisions for the Friant Unit (attachment). M&I contractors with a contracted water supply of 2,000 acre feet or less, and Irrigation contractors with an irrigable acreage of 2,000 acre feet or less were exempted from the needs assessment. Along with general assumptions for all of the needs assessments, the methodology contained specific assumptions on evapotranspiration and effective precipitation for the Friant and Delta Regions and an assessment of groundwater conditions in the Friant Region resulting in the assumptions used to determine the safe yield of groundwater.

Reclamation began sending final water needs assessments to CVP contractors starting in September 2000. The majority of the assessments were sent under cover letter for each of the major divisions in the CVP. The divisions included the Sacramento Division, Tehama-Colusa Canal; Friant Division, Buchanan Unit, Hidden Unit, and Cross Valley Canal; Delta Division; Delta Mendota Canal, Delta Mendota and San Luis Unit. These assessments were analyzed as groups since data and methodology developed for the analysis were unique to each of these divisions. Contractors with a majority of their supplies used for M&I purposes each went out under an individual cover letter. The last final needs assessment was completed in December 2004.

Transmittal letters sent with each water needs assessment included a determination of whether the contractor had been beneficially using its past water supplies and if it was anticipated that the contractor needed its current allocation of CVP water to meet future demands.

Revisions to final needs assessments were made in a few cases. These revisions were required when new information was either presented by the contractors or identified by Reclamation that

would impact either the contractor's water demand or water supply. New information could include an anticipated change in water use such as agricultural or urban, or a change in the future amount of local water supply that will be available to the contractors. In each case, a letter identify the revised information was sent to the specific contractor.

Sacramento River Settlement Contractors Water Needs Assessments

Water needs assessments were performed for 11 settlement contractors participating in the Basin-wide Water Management Plan and 8 other settlement contractors on the Sacramento River.

For other areas of the CVP, Reclamation requested actual historic water demand and supply information to determine a contractor's past beneficial use and the contractor's estimated cropping pattern to determine future beneficial use. In the case of the Sacramento River Settlement Contractors Reclamation was able to use information developed as part of the BWMP which used a representative "normal" year approach based on normalized data for 1995 and 2020. The normal year approach allowed for a consistent and fair WNA for the SRSCs.

WNA's for water service contracts included non-contract water supplies such as groundwater including the conjunctive use of surface and groundwater, State Water Project (SWP) supplies, local surface water supplies, recycled water, inter-district return flows and water transfers. Due to the nature of the settlement contracts, Reclamation used the full contract quantities the year 2020 analysis as the contractors' only water supply because the settlement contracts were negotiated in lieu of the contractors exercising their water rights on the Sacramento River and its tributaries. Furthermore, The Settlement Contracts are different than water service contracts. These contracts were negotiated to settle disputes over the respective rights of the contractors and the United States. The contractors' use of water during the contract period is not to be used as a reference to how the contractors would have used the water under their water right(s). The contractors would have exercised due diligence to fully protect or prove their water rights. Existing language in the Settlement Contracts provides that the contractors' water use during the term of the contract cannot be construed as an admission that such water use was not water it would have been entitled to under their water rights.

Two SRSC's, Anderson-Cottonwood Irrigation District and Sutter Mutual Water Company, did not meet the criteria for renewing their contracts for the full amount. Long term historic cropping patterns and water diversions were analyzed to determine the highest reasonable annual diversions. The calculated annual diversion was used to negotiate the contract quantities for these two SRSC's.

Appendix C: 2017 Water Needs Assessments

Division: **West San Joaquin**

Water Needs Assessment

District: 203181 Date: 1/6/2017

M&I Water Supply

AVENAL, CITY OF

Contractor's Water Supply Sources and Quantities (acre-feet)

	Surface Water Supply							Groundwater Supply				
Timeframe 1	Reference Delivery 2	USBR Total Deliv/Max 3	SWP 4	Local 5	Local Source 6	Trsfr/Rtrn /Recycle In 7	Trsfr/ Out 8	District 9	Private 10	Safe Yield 11	Recharge 12	Total Supply 13
1995	3,500 *	2,432	0	0		0	0	0	0		0	2,432
1997 representative	3,500 *	2,432	0	0		0	0	0	0		0	2,432
2015	3,500 *	2,436	0	0		0	0	0	0		0	2,436
2025	3,500 *	3,500	0	0		0	0	0	0		0	3,500
2050	3,500 *	3,500	0	0		0	0	0	0		0	3,500

Contractor's Agricultural Water Demands

Maximum ProductiveAcres= 0

Timeframe 1	Crop Water Requirement (acre-feet) 15	District Irrig. Efficiency (%) 16	Effective Precip (acre-feet) 17	Reference Effective Precip (acre-ft) 18	Calculated Net Crop Water Req (acre-feet) 19	USBR Net Crop Water Req (acre-feet) 20	Average Irrigated Acres (acres) 21	Reference Irrigated Acres (acres) 22	Calculated FDR (AF/acre) 23	USBR FDR (AF/acre) 24	Conveyance Loss (acre-feet) 25	Total Ag Demand (acre-feet) 26
1995												
1997												
2015												
2025												
2050												

Contractor's M&I Water Demands

	Residential Water Demand			Nonresidential Water Demand			Loss					
Timeframe 1	Population 28	Per Capita Demand (gpcd) 29	Total Demand (acre-feet) 30	Industrial (acre-feet) 31	Comm/ Instit (acre-feet) 32	Total Demand (acre-feet) 33	Unacc /Distr (acre-feet) 34	Ref Urban Per Capita Dmd (gpcd) 35	Calc Urban Per Capita Dmd (gpcd) 36	Total M&I Demand (acre-feet) 37	Total Ag+ M&I Dmd (acre-feet) 38	Unmet Demand (acre-feet) 39
1995	6,495	106.1	772	33	1,300	1,333	328	311.0	334.4	2,433	2,433	1
1997	6,495	106.1	772	33	1,300	1,333	328	311.0	334.4	2,433	2,433	1
2015	16,367	56.7	1,039	33	1,397	1,430	328	198.0	152.6	2,797	2,797	361
2025	12,000	97.2	1,306	57	2,143	2,200	385	274.0	289.5	3,891	3,891	391
2050	20,210	166.0	3,758	33	1,586	1,619	471	166.0	258.3	5,848	5,848	2,348

* Represents Maximum Contract Amount

Notes: Unaccounted beneficial use is added to distribution system loss; the total is shown under Distribution system loss.

Division: **West San Joaquin**

Water Needs Assessment

District: 203182 Date: 1/13/2017

M&I Water Supply

COALINGA, CITY OF

Contractor's Water Supply Sources and Quantities (acre-feet)

Timeframe 1	Surface Water Supply: Reference Delivery 2		USBR Total Deliv/Max 3	SWP 4	Local 5	Local Source 6	Trsfr/Rtrn /Recycle In 7	Trsfr/ Out 8	Groundwater Supply: District 9	Private 10	Safe Yield 11	Recharge 12	Total Supply 13
1998	10,000	*	3,995	0	0		0	0	0	0		0	3,995
2011	10,000	*	5,859	0	0		0	0	0	0		0	5,859
2050	10,000	*	10,000	0	0		0	0	0	0		0	10,000

Contractor's Agricultural Water Demands

Maximum ProductiveAcres=

Timeframe 1	Crop Water Requirement (acre-feet) 15	District Irrig. Efficiency (%) 16	Effective Precip (acre-feet) 17	Reference Effective Precip (acre-ft) 18	Calculated Net Crop Water Req (acre-feet) 19	USBR Net Crop Water Req (acre-feet) 20	Average Irrigated Acres (acres) 21	Reference Irrigated Acres (acres) 22	Calculated FDR (AF/acre) 23	USBR FDR (AF/acre) 24	Conveyance Loss (acre-feet) 25	Total Ag Demand (acre-feet) 26
1998												
2011												
2050												

Contractor's M&I Water Demands

Timeframe 1	Residential Water Demand: Population 28	Per Capita Demand (gpcd) 29	Total Demand (acre-feet) 30	Nonresidential Water Demand: Industrial (acre-feet) 31	Comm/ Instit (acre-feet) 32	Total Demand (acre-feet) 33	Loss: Unacc /Distr (acre-feet) 34	Ref Urban Per Capita Dmd (gpcd) 35	Calc Urban Per Capita Dmd (gpcd) 36	Total M&I Demand (acre-feet) 37	Total Ag+ M&I Dmd (acre-feet) 38	Unmet Demand (acre-feet) 39
1998	15,400	108.7	1,875	600	1,295	1,895	225	311.0	231.6	3,995	3,995	0
2011	19,362	88.5	1,919	1,226	881	2,107	475	198.0	207.5	4,501	4,501	-1,358
2050	29,665	166.0	5,517	3,104	881	3,985	1,225	166.0	322.8	10,727	10,727	727

* Represents Maximum Contract Amount

Notes: Unaccounted beneficial uses are added to distribution system losses and shown under Distribution system loss.

Division: **West San Joaquin**

Water Needs Assessment

District: 203186

Date: 1/20/2017

M&I Water Supply

HURON, CITY OF

Contractor's Water Supply Sources and Quantities (acre-feet)

Timeframe 1	Surface Water Supply: Reference Delivery 2		USBR Total Deliv/Max 3	SWP 4	Local 5	Local Source 6	Trsfr/Rtrn /Recycle In 7	Trsfr/ Out 8	Groundwater Supply: District 9	Private 10	Safe Yield 11	Recharge 12	Total Supply 13
1996	3,000	*	982	0	0		0	0	0	0		0	982
2015	3,000	*	726	0	0		0	0	0	0		0	726
2050	3,000	*	3,000	0	0		0	0	0	0		0	3,000

Contractor's Agricultural Water Demands

Maximum ProductiveAcres=

Timeframe 1	Crop Water Requirement (acre-feet) 15	District Irrig. Efficiency (%) 16	Effective Precip (acre-feet) 17	Reference Effective Precip (acre-ft) 18	Calculated Net Crop Water Req (acre-feet) 19	USBR Net Crop Water Req (acre-feet) 20	Average Irrigated Acres (acres) 21	Reference Irrigated Acres (acres) 22	Calculated FDR (AF/acre) 23	USBR FDR (AF/acre) 24	Conveyance Loss (acre-feet) 25	Total Ag Demand (acre-feet) 26
1996		0									0	
2015												
2050												

Contractor's M&I Water Demands

Timeframe 1	Residential Water Demand: Population 28	Per Capita Demand (gpcd) 29	Total Demand (acre-feet) 30	Nonresidential Water Demand: Industrial (acre-feet) 31	Comm/ Institt (acre-feet) 32	Total Demand (acre-feet) 33	Loss: Unacc /Distr (acre-feet) 34	Ref Urban Per Capita Dmd (gpcd) 35	Calc Urban Per Capita Dmd (gpcd) 36	Total M&I Demand (acre-feet) 37	Total Ag+ M&I Dmd (acre-feet) 38	Unmet Demand (acre-feet) 39
1996	5,608	75.9	477	311	114	425	80	311.0	156.3	982	982	0
2015	8,082	28.6	259	86	348	434	58	198.0	83.0	751	751	25
2050	14,086	166.0	2,619	150	607	757	240	166.0	229.2	3,616	3,616	616

* Represents Maximum Contract Amount

Notes: Unaccounted beneficial use it totaled with the distribution system loss. The total for both is shown under Distribution system loss.

Division: **West San Joaquin**

Water Needs Assessment

District: 204750 Date: 1/17/2017

M&I Water Supply

CA DEPT OF FISH & WILDLIFE

Contractor's Water Supply Sources and Quantities (acre-feet)

	Surface Water Supply							Groundwater Supply				
Timeframe 1	Reference Delivery 2	USBR Total Deliv/Max 3	SWP 4	Local 5	Local Source 6	Trsfr/Rtrn /Recycle In 7	Trsfr/ Out 8	District 9	Private 10	Safe Yield 11	Recharge 12	Total Supply 13
2015	10	10	0	0		0	0	0	0		0	10
2050	10 *	10	0	0		0	0	0	0		0	10

Contractor's Agricultural Water Demands

Maximum ProductiveAcres=

Timeframe 1	Crop Water Requirement (acre-feet) 15	District Irrig. Efficiency (%) 16	Effective Precip (acre-feet) 17	Reference Effective Precip (acre-ft) 18	Calculated Net Crop Water Req (acre-feet) 19	USBR Net Crop Water Req (acre-feet) 20	Average Irrigated Acres (acres) 21	Reference Irrigated Acres (acres) 22	Calculated FDR (AF/acre) 23	USBR FDR (AF/acre) 24	Conveyance Loss (acre-feet) 25	Total Ag Demand (acre-feet) 26
2015												
2050												

Contractor's M&I Water Demands

	Residential Water Demand			Nonresidential Water Demand			Loss					
Timeframe 1	Population 28	Per Capita Demand (gpcd) 29	Total Demand (acre-feet) 30	Industrial (acre-feet) 31	Comm/ Institt (acre-feet) 32	Total Demand (acre-feet) 33	Unacc /Distr (acre-feet) 34	Ref Urban Per Capita Dmd (gpcd) 35	Calc Urban Per Capita Dmd (gpcd) 36	Total M&I Demand (acre-feet) 37	Total Ag+ M&I Dmd (acre-feet) 38	Unmet Demand (acre-feet) 39
2015	15	59.5	1	0	9	9	0	77.0	595.2	10	10	0
2050	15	165.5	3	0	9	9	0	166.0	701.1	12	12	2

* Represents Maximum Contract Amount

Notes:

Appendix D: Reclamation’s Cultural Resources Determination

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

MP-153 Tracking Number: 18-SCAO-144

Project Name: Central Valley Project Interim Renewal Contracts for Cities of Avenal, Coalinga, Huron, and Calif. Dept. Fish & Wildlife for Contract Years 2019-2021

NEPA Document: EA-18-017

NEPA Contact: Mary (Kate) Connor, Natural Resource Specialist

MP 153 Cultural Resources Reviewer: Scott Williams, Archaeologist SW

Date: July 23, 2018

Reclamation would execute interim renewal contracts for the contracts for California Department of Fish and Wildlife, the City of Avenal, the City of Coalinga, and the City of Huron for a two-year period (March 1, 2019 through February 28, 2021). This is the type of undertaking that does not have the potential to cause effects to historic properties, should such properties be present, pursuant to the NHPA Section 106 regulations codified at 36 CFR § 800.3(a)(1). Reclamation has no further obligations under NHPA Section 106, pursuant to 36 CFR § 800.3(a)(1).

Under the Proposed Action, Reclamation would execute interim renewal contracts for the contracts listed in Table 1 for a two-year period (March 1, 2019 through February 28, 2021). The California Department of Fish and Wildlife would continue to receive up to 10 AF per year, City of Avenal would continue to receive up to 3,500 AF per year, City of Coalinga would continue to receive up to 10,000 AF, and the City of Huron would continue to receive up to 3,000 AF of CVP water pursuant to the new two-year interim renewal contracts. No changes to the contractor service areas or water deliveries are part of the Proposed Action. CVP water deliveries under the four proposed interim renewal contracts can only be used within each designated contract service area. The contract service area for the proposed interim renewal contracts have not changed from the existing interim renewal contracts. If the contractor proposes to change the designated contract service area separate environmental documentation and approval will be required.

This document is intended to convey the completion of the NHPA Section 106 process for this undertaking. This action would not have significant impacts on properties listed, or eligible for listing, on the National Register of Historic Places as determined by Reclamation (LND 02-01) (43 CFR 46.215 (g). Please retain a copy in the administrative record for this action. Should changes be made to this project, additional NHPA Section 106 review, possibly including consultation with the State Historic Preservation Officer, may be necessary. Thank you for providing the opportunity to comment.