CITY OF VISALIA
WATER CONSERVATION PLANT UPGRADES PROJECT

RECIRCULATED DRAFT ENVIRONMENTAL IMPACT REPORT

PREPARED FOR:

City of Visalia
7579 Avenue 288
Visalia, CA 93277
Contact: James Ross
559-713-4466

PREPARED BY:

ICF International
5558 California Avenue, Suite 310
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October 2012

ICF International. 2012. *City of Visalia Water Conservation Plant Upgrades Project.* Recirculated draft environmental impact report. October. (ICF 00663.09.) Bakersfield, CA . Prepared for City of Visalia, Visalia, CA.

Notice of Availability for Public Review

To: ☒ Interested Individuals
See attached mailing list

From: City of Visalia
7579 Avenue 288, Visalia, CA 93277
(Lead Agency and Address)

Contact: James Ross

☒ County Clerk, County of: Tulare

Subject: **Notice of Availability for Public Review**

This is to advise that City of Visalia *(Lead Agency)* has prepared a

☐ Negative Declaration or Mitigated Negative Declaration ☒ Environmental Impact Report

for the project identified below. As mandated by State law, the minimum public review period for this document is:

Negative Declaration	EIR
☐ 21 days (Negative Declaration was not submitted to the State Clearinghouse for review)	☐ 30 days (Draft EIR was not submitted to the State Clearinghouse for review)
☐ 30 days (Negative Declaration was submitted to the State Clearinghouse for review)	☒ 45 days (Draft EIR was submitted to the State Clearinghouse for a normal 45-day review)
☐ 21 days (State Clearinghouse granted a shortened review period for the Negative Declaration)	☐ 30 days (State Clearinghouse granted a shortened review period for the Draft EIR)

This document is available for review at: Visalia City Hall West, 707 West Acequia Avenue, Visalia, CA 93291;City Corporation Yard, 336 N. Cain Street, Visalia, CA 93292; Visalia Transit Center, 425 E. Oak Street, 3rd Floor, Visalia, CA 93291; Visalia Water Conservation Plant, 7579 Avenue 288, Visalia, CA 93277
(Location)

A public hearing has been scheduled with _____ to receive comments on the document.

Date: _____
Time: _____
Place: _____

The comment period for this document closes on: December 13, 2012
(Date)

Testimony at future public hearings may be limited to those issues raised during the public review period either orally or submitted in writing by 5:00 p.m. the day the comment period closes.

Project Title: City of Visalia Water Conservation Plant Upgrades Project

Project Location – Specific: The proposed project would be located in the northwestern portion of Tulare County, about 2 miles west of the Visalia urban area. The plant improvements and recycled water conveyance system encompass about 110 total acres (about 100 acres of ground disturbance for plant upgrades and 10 acres for the recycled water conveyance system).

Project Description – Brief: The project would 1) improve wastewater treatment facilities at the City's existing water conservation plant and 2) develop the initial recycled water pipeline infrastructure for disposal and reuse of treated effluent generated by the plant. Since the circulation of the previous DEIR, the City is now proposing to enter into a water exchange agreement with the Tulare Irrigation District. This significant new information was not disclosed in the previous DEIR and therefore, the City is recirculating the DEIR to solicit public comment about this significant change to the project.

Notice of Availability for Public Review, continued

Significant Environmental Effects: Greenhouse gas emissions (cumulative), hydrology and water quality (project and cumulative), and utilities and service systems (project)

Listed Toxic Site: ☐ Yes ☒ No **Explanation:**

Signature: James K Ross Date: October 29, 2012

Title: Public Works Manager Telephone: 559-713-4466

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Contents

APPENDICES

Tables

Acronyms and Abbreviations

af	acre-feet
AGR	agricultural
Basin Plan	Tulare Lake Basin Plan
bgs	below ground surface
BMPs	best management practices
BO	biological opinion
BOD	biochemical oxygen demand
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
City	City of Visalia
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CVP	Central Valley Project
CWA	Clean Water Act
DEIR	draft environmental impact report
Delta	Sacramento–San Joaquin Delta
DFG	California Department of Fish and Game
DWR	Department of Water Resources
EC	electrical conductivity
EIR	environmental impact report
ESA	Endangered Species Act
FEIR	final environmental impact report
GHG	greenhouse gas
IND	industrial
LSAA	Lake and Streambed Alteration Agreement
MBR	membrane biological reactor
MBTA	Migratory Bird Treaty Act
MUN	municipal
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NPPA	Native Plant Protection Act
Porter-Cologne Act	Porter-Cologne Water Quality Control Act
RWQCB	Regional Water Quality Control Board
SCADA	supervisory control and data acquisition
SR	State Route
SWMP	Stormwater Management Plan
SWPPP	Stormwater Pollution Prevention Plan

SWRCB	State Water Resources Control Board
TDS	total dissolved solids
TID	Tulare Irrigation District
USACE	U.S. Army Corps of Engineers
USBR	U.S. Bureau of Reclamation
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UV	ultraviolet
UWMP	Urban Water Management Plan
WCP or plant	City of Visalia Water Conservation Plant
WDR	waste discharge requirements

Introduction

The City of Visalia (City) has decided to revise and recirculate the previous draft environmental impact report (DEIR) (herein referred to as the September 2011 DEIR) because significant new information regarding the City of Visalia Water Conservation Plant Upgrades Project (proposed project) was presented during the public review process. The City has determined that the information may meet the criteria for recirculation (see criteria 1 and 2, below), as set forth in California Environmental Quality Act (CEQA) Guidelines Section 15088.5.

A DEIR is required to be recirculated if "significant new information" is added to the environmental impact report (EIR) after the close of the public comment period on the DEIR but before certification of the final environmental impact report (FEIR). In accordance with State CEQA Guidelines Section 15088.5, recirculation is required when significant new information identifies:

1. New significant environmental impacts resulting from the project or from a new mitigation measure that has been proposed;
2. A substantial increase in the severity of an environmental impact, resulting in a significant impact unless mitigation measures are adopted to reduce the impact to a level of insignificance;
3. Feasible project alternatives or mitigation measures, which are considerably different from others that were previously analyzed, that clearly lessen the environmental impacts of the project, but the project's proponents decline to adopt; or
4. The DEIR was so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded.

A DEIR may be recirculated in whole or in part, depending on the extent of the revisions that are made to the prior draft. The public review period for the recirculated DEIR will be 45 days. In accordance with State CEQA Guidelines Section 15088.5(f)(2), the City is requesting that comments on this recirculated DEIR be limited to the recirculated DEIR chapters and sections. The City will consider and respond to all of the comments received during both review periods (i.e., during the September 2011 DEIR and recirculated DEIR review periods) in the FEIR. The FEIR will reflect the combined analyses of the original September 2011 DEIR and the recirculated portions of the September 2011 DEIR found in this recirculated DEIR.

The State CEQA Guidelines require this recirculated EIR to include a summary of the revisions made to the previously circulated September 2011 DEIR. In accordance with Section 15088.5(g) of the State CEQA Guidelines, the following list summarizes changes to the September 2011 DEIR that occurred since the previous circulation:

- New analysis regarding downstream effects on riparian habitats and wildlife, including special-status species, resulting from the proposed project ceasing discharges into Mill Creek (see Section 3A, *Biological Resources*);
- New analysis regarding the proposed project's effect on local groundwater quality (see Section 3B, *Hydrology and Water Quality*); and

- Changes to the project description involving a proposed water exchange agreement between the City and the Tulare Irrigation District (TID) (see Chapter 2, *Project Description*, and Section 3C, *Population and Housing*).
- Revisions to Chapter 4, *Cumulative Impact Analysis*, relevant to the above considerations.
- Other revisions necessary to maintain internal consistency among the DEIR's analyses.

The September 2011 DEIR for the proposed project was sent out for a 45-day public review period, from September 26, 2011, to November 10, 2011, as required by CEQA. Following the close of the public review period, the Central Valley Regional Water Quality Control Board (Central Valley RWQCB) provided a comment letter on the proposed project. The Central Valley RWQCB comment letter states that although the DEIR addresses the project's effects on groundwater elevations, it does not include information about the project's effects on groundwater quality. Specifically, the Central Valley RWQCB said that the EIR "must assess compliance of the proposed discharges with SWRCB Resolution No. 68-15, Statement of Policy with Respect to Maintaining High Quality of Waters in California (Antidegradation Policy)." The Central Valley RWQCB comment letter goes on to say that a constituent-by-constituent analysis should be performed to compare the quality of the effluent generated by the plant as it reaches underlying groundwater with the quality of natural groundwater. To address the Central Valley RWQCB's concerns regarding the proposed project and its effect on groundwater quality, the City has prepared an antidegradation analysis for the proposed project (Appendix A). The conclusions of this analysis are detailed in Section 3B, *Hydrology and Water Quality*.

Also during the public review period, the State Water Resources Control Board (SWRCB) stated in a comment letter that the EIR should discuss the direct and indirect effects of decreased discharges of effluent into Mill Creek as a result of the proposed project on biological resources and habitat. In response to this comment, the City had a biologist perform a reconnaissance survey of Mill Creek, from the effluent discharge point to about 3 miles downstream of the City Basin No. 4 turnout. The results of the survey can be found in Section 3A, *Biological Resources*.

Subsequent to the public review period for the September 2011 DEIR, the City proposed entering into a water exchange agreement with TID. A summary outline of the proposed water exchange agreement can be found in Appendix B of this recirculated DEIR. In addition, the agreement is discussed in Chapter 2, *Project Description*. Impacts resulting from the water exchange agreement are discussed throughout this recirculated DEIR.

In the City's view, the antidegradation analysis and reconnaissance biological survey are considered "additional data," and the proposed water exchange is considered a "change in the project," per State CEQA Guidelines Section 15088.5(a). It is also the City's view that the antidegradation analysis, reconnaissance survey, and proposed water exchange are "significant" changes to the EIR analysis and project description. Information regarding the changes was not included in the September 2011 DEIR. Therefore, these changes warrant recirculation of the DEIR to afford the public a meaningful opportunity to comment on these new aspects of the EIR and the proposed project.

Purpose and Use of the Recirculated DEIR

An EIR, including a recirculated DEIR, is a public informational document that facilitates the planning and decision-making process. This recirculated DEIR will analyze the environmental impacts of the significant new information discussed above. The City Council will consider the

information in the September 2011 DEIR and this recirculated DEIR, including public comments and staff responses to those comments, during the public hearing process. The City Council may approve, conditionally approve, or deny the proposed project.

The purpose of an EIR is to identify:

- The significant potential impacts of a project on the environment and indicate the manner in which those significant impacts can be avoided or mitigated.
- Any unavoidable adverse impacts that cannot be mitigated.
- Reasonable and feasible alternatives to a project that eliminate the significant adverse environmental impacts or reduce them to a less-than-significant level.

An EIR also discloses growth-inducing impacts, impacts found not to be significant, and significant cumulative impacts of past, present, and reasonably anticipated future projects. CEQA requires an EIR to reflect the independent judgment of the lead agency regarding the impacts; disclose the level of significance of the impacts, both without and with mitigation; and discuss the mitigation measures proposed to reduce the impacts. The EIR is circulated to responsible agencies, trustee agencies with resources that would be affected by the project, and interested agencies and individuals. Through the EIR review process, both the public and agencies have an opportunity to share expertise, disclose agency analyses, check for accuracy, detect omissions, discover public concerns, and solicit counterproposals. Reviewers of the EIR are requested to focus on the sufficiency of the document with respect to its identification and analysis of possible impacts on the environment and approach to avoiding or mitigating the significant impacts. Comments are most helpful when they suggest additional alternatives or mitigation measures that provide better ways to avoid or mitigate significant environmental impacts.

This recirculated DEIR is being distributed directly to agencies, organizations, and interested groups and persons for comment during a 45-day formal review period, in accordance with Section 15087 of the State CEQA Guidelines. The EIR process, including means by which members of the public can comment on the EIR, is discussed further in Chapter 1, *Introduction*.

Overview of Project Description from the Previous Draft Environmental Impact Report

In recent years, potable water demand in the City of Visalia has slowly and steadily increased, resulting in a sustained overdraft of the local groundwater table. Consequently, recycling and reusing effluent from the City of Visalia Water Conservation Plant (WCP or plant) is part of the City's plan to reduce potable water usage. The need for water recycling and reuse is emphasized in the WCP's current waste discharge requirements (WDRs), Order No. R5-2006-0091:

> Water in the Tulare Lake Basin is in short supply, requiring importation of surface waters from other parts of the state. The Basin Plan encourages reclamation on irrigated crops wherever feasible and indicates that discharges to surface water and evaporation of reclaimable wastewater will not be acceptable permanent disposal methods where the opportunity exists to replace an existing use or proposed use of fresh water with recycled water. Where appropriate, the Basin Plan allows a timetable for implementing reclamation. The City's discharge constitutes a significant source of agricultural supply water and groundwater recharge (Central Valley Regional Water Quality Control Board 2006).

The following summarizes the project, as described in more detail in the September 2011 DEIR. The proposed project would upgrade the WCP to produce recycled water suitable for reuse in conformance with California Code of Regulations (CCR), Title 22, Division 4, Chapter 3 (Title 22 standards). The project would accomplish the following basic objectives:

- Improve wastewater treatment facilities at the WCP, enabling the plant to produce effluent that meets Title 22 standards;
- Develop the initial recycled water conveyance system, consisting of below-grade pipelines and existing canals for disposal and reuse of the WCP's treated effluent, which would be treated to Title 22 standards; and
- Provide effluent treated to Title 22 standards for possible water exchanges of the treated effluent for surface water between the City and TID and/or other entities. The recycled water would be used for agricultural irrigation within the exchange partner's boundaries, and the surface water would be used to recharge the City's groundwater.

The on-site facilities required to complete the WCP upgrade were described in the September 2011 DEIR and are summarized below.

- Replacement of four existing centrifugal pumps, used to pump the primary sludge to the digesters, with progressive cavity pumps;
- Construction of an interstage pump station to lift the primary effluent to the upgraded secondary treatment facilities;
- Conversion of the existing secondary treatment process to a membrane biological reactor (MBR) process (tertiary treatment) to produce the recycled water required to meet the water reuse objective of this project (i.e., to meet Title 22 standards). This would include:
  - Construction of fine screens to capture stringy materials and coarse inorganic solids in the influent prior to delivery to the MBR facilities;
  - Modifications to the existing aeration basins for biological oxygen demand (BOD) and nitrogen removal;
  - Construction of a battery of new MBR tanks to receive the mixed liquid from the aeration basins and house the membrane modules;
  - Replacement of existing aeration blowers by new units with the capacities required for BOD and nitrogen removal in the aeration basins; and
  - Construction of new sludge pumps for returning activated sludge from the MBR tanks to the aeration basins and wasting excess sludge produced by the MBR process to the digesters;
- Construction of new disinfection facilities that use ultraviolet (UV) light for disinfection, which would eliminate the need for chlorine contact disinfection. This would include:
  - Upgrades to the existing anaerobic sludge digestion process, including construction of a new digester to increase the capacity of the digestion process;
  - Construction of a new sludge disintegrator to precondition the discharge from the existing gravity belt thickener prior to digestion;
  - Construction of two presses to dewater the processed sludge from the anaerobic digesters;
  - Lining the sludge drying beds with asphaltic concrete pavement to prevent moisture from the drying sludge from seeping into the ground below the beds;
  - Lining a 3-acre area for stockpiling the dried sludge removed from the drying beds;

- Construction of a digester gas purification system and a renewable power system that uses digester gas produced by the anaerobic sludge digesters to fuel a new energy recovery system, which would generate electrical power for plant use and hot water for digester heating;
- Construction of a 1-megawatt solar photovoltaic system at the plant to supplement on-site energy use;
- Construction of a new on-site administration building, septage receiving station, and collections shop building;
- Replacement of the primary sludge pipeline, plant drain system flow meters, and the plant-wide supervisory control and data acquisition (SCADA) system; and
- Upgrades the existing plant-wide electrical power distribution system to meet the power demand of the upgraded plant.

The project would also include recycled water conveyance facilities for disposal and reuse of treated effluent from the WCP. This system would include (1) Basin No. 4 pipeline, (2) TID pipeline and irrigation pipelines to serve City farmland south of the WCP, and (3) irrigation delivery pipelines for areas east of State Route (SR) 99 (farmland, golf course, and parks). The proposed system would deliver tertiary treated effluent from the WCP to all users and basins.

The September 2011 DEIR also describes the entitlements and approvals that would be necessary from the City and other responsible agencies, such as the SWRCB and Central Valley RWQCB, for the proposed project. Finally, the September 2011 DEIR describes the construction schedule and workforce, materials and equipment, and site preparation required to construct the proposed project.

Changes to the Project Description that Require Recirculation of the Draft Environmental Impact Report

Proposed Water Exchange Agreement

Introduction

The September 2011 DEIR discusses the possibility of water exchanges between the City and TID and/or other entities. However, at time of the September 2011 DEIR's 45-day public review period (September 26, 2011, through November 10, 2011), the City had not formally entered into any water exchange agreements with TID and/or other entities. At that time, analysis of such exchanges was considered premature and speculative and, therefore, proposed water exchanges were not a part of the September 2011 DEIR's analysis. The September 2011 DEIR concluded that future water exchanges between the City and TID and/or other entities would have to undergo separate environmental review in compliance with CEQA and, if necessary, the National Environmental Policy Act (NEPA).

Subsequent to the public review period for the September 2011 DEIR, a proposed water exchange agreement between the City and TID was drafted and proposed for adoption. A summary outline of the proposed water exchange agreement can be found in Appendix B of this recirculated DEIR. This proposed water exchange agreement constitutes a change in the project description that introduces

"significant new information." Therefore, recirculation of the previous DEIR is required, per State CEQA Guidelines Section 15088.5 (see Chapter 1, *Introduction,* for more information). Consequently, this recirculated DEIR is being prepared and distributed for public review.

The recycled water generated by the proposed project would exceed the City's current needs for agricultural and irrigation uses. The proposed water exchange agreement would provide a reliable source of tertiary treated water for TID that would be suitable for irrigating all crops, including food crops, without restriction. The City would be provided with a reliable source of surface water that would be used to recharge the City's groundwater basin, which has historically been and currently is in an overdraft condition.

Recycled Water Deliveries to the Tulare Irrigation District

According to the proposed water exchange agreement, the City would deliver a minimum of 800 acre-feet (af) per month and a minimum of 11,000 af per year of recycled water to TID, except in the event of a catastrophic event or maintenance issue. The proposed agreement assumes that the volume of recycled water would increase over time as the City's population grows and the City finds additional uses for the recycled water in the future. The proposed agreement would require the volume of recycled water delivered to TID to not fall below the minimum monthly and annual volumes outlined in the proposed agreement. The City would provide TID with a schedule of anticipated monthly recycled water deliveries by December 15 of each year for use the upcoming year.

The point of delivery for the City's recycled water to TID would be a pipeline along Evans Ditch near Road 68. This point of delivery was disclosed in the September 2011 DEIR, and impacts related to construction and operations were already analyzed. From the point of delivery, recycled water would flow through existing TID facilities and be used for agricultural irrigation within TID's service area. No additional water conveyance facilities would be required for the delivery of recycled water to TID.

Surface Water Deliveries to the City of Visalia

In exchange for the recycled water delivered to TID, the City would receive surface water equal to 50% of the recycled water delivered (i.e., a 2:1 exchange rate). According the proposed exchange, the City would receive no more than 1,400 af of surface water in any one week or 4,500 af in any one month. In total, the City would receive surface water at an average minimum of 5,500 af per year. Although it is likely that the majority of the surface water received by the City would come from TID's Central Valley Project (CVP) Friant Division Contract Class 2 entitlement, the proposed agreement would allow TID to use other sources of water, with prior approval from the City. Class 2 entitlement water is a firm contract entitlement but may not be available in all years (e.g., when there simply isn't enough water in the CVP). In general, Class 2 entitlement water is a less reliable source than Class 1 entitlement water. The surface water received by the City is intended for groundwater recharge purposes, either in existing City-owned recharge basins or other facilities or as channel losses within or adjacent to City boundaries, which accrue to the benefit provided by the City's groundwater resources.

The City would establish a hierarchy of preferred channels, basins, or other locations for the delivery of the surface water received to optimize the benefit to the City's groundwater resources and wells that serve the City. TID would follow the City's preferred hierarchy to the extent

practicable. The hierarchy may change over time and may be updated annually. Surface water received would be delivered through the existing TID main and be measured at points of introduction, from the TID main to existing channels that traverse the City.

The delivery of surface water to the City may occur at any time. The City may reject a delivery of surface water when there is a declared flood release from the Kaweah River or when existing channels and basins are needed for stormwater or floodwater management.

Proposed Agreement Terms Applicable to Both Parties

The proposed agreement would be in effect for 20 years, beginning with the first delivery of either recycled or surface water. At the end of the 20-year term, either party may provide the other with a written notice of termination not less than 180 days before the end of the then-current term. The proposed agreement would automatically renew for successive terms of 1 year if a notice of termination is not issued. After an initial 10-year period, either party may terminate the proposed agreement, provided that the other party is given 5 years' advance notice in accordance with the terms of the proposed agreement.

A rolling 10-year account balance of water deliveries would be created and monitored with the first issuance of recycled water from the City to TID, generating a balance that would be credited with delivery of surface water to the City from TID (i.e., first in/first out). It is acknowledged in the proposed agreement that the account would be balanced regularly but that prolonged droughts could make CVP Class 2 surface water unavailable for periods of time. Any account balance older than 10 years would be repaid by TID from its next available CVP Class 2 supply, even if it reduces deliveries within TID's service area.

As part of the proposed agreement, the City has the option of purchasing additional TID water supplies. Water sales are a part of the existing or baseline condition for this analysis because such sales are already an established practice of TID, which makes excess water (i.e., not needed to fulfill existing contracts, including with the City) accessible. Therefore, it is not expected that future water sales between the City and TID would result in environmental impacts beyond the baseline condition. Therefore, a discussion of impacts resulting from the terms of future water sales is not warranted for the purposes of CEQA.

The proposed agreement has a number reporting requirements that both TID and the City must meet. For example, such reporting must be accurate, complete, and timely. The reporting requirements of the proposed agreement specify when monthly reports are to be submitted by TID and the City to each other and requirements for joint annual reports.

Proposed Agreement Terms Not Part of the California Environmental Quality Act Documentation for the Proposed Project

The proposed agreement would require U.S. Bureau of Reclamation (USBR) approval because the majority of the surface water that the City would receive from TID would most likely come from TID's CVP Friant Division Contract Class 2 entitlement with USBR. Approval of the proposed water exchange by USBR would be discretionary and, therefore, would trigger the need for NEPA compliance prior to approval. As the lead agency under NEPA, USBR would prepare a separate NEPA document that would disclose the environmental impacts of the proposed exchange, thereby satisfying the requirements of NEPA. Although the recirculated DEIR, as well as the September 2011 DEIR and supporting documentation, would most likely help USBR with its environmental findings

determinations about the proposed water exchange, this document does not satisfy the specific requirements of NEPA. This document's purpose is solely to disclose additional environmental impacts resulting from significant new information (i.e., information pertaining to the proposed water exchange agreement) presented about the proposed project. It is intended to satisfy only the requirements of CEQA.

USBR is currently preparing a NEPA document regarding the installation of a reinforced concrete pipeline that would convey tertiary treated water from the City's WCP to TID. TID has applied for and has been selected as a potential recipient to receive federal funding assistance through a 2011 WaterSMART grant from USBR. The grant would be used for construction of the new TID pipeline.

The September 2011 DEIR and this recirculated DEIR consider indirect impacts that may result from any reasonably foreseeable outcome of USBR's decision (i.e., to allow the proposed water exchange agreement). The environmental documentation for this project has considered all reasonably foreseeable impacts associated with USBR's decision.

The proposed agreement discusses "new delivery facilities" that would facilitate implementation of the proposed agreement. These facilities are described as "new facilities to divert CVP surface water from the TID main into the St. Johns River, the TIC canal, and the Lower Kaweah River (Mill and Packwood Creeks)." Because the size, scope, and location of these new facilities were unknown at the time of public review of this recirculated DEIR, it is premature and speculative to include them in this environmental analysis. Therefore, the potential environmental impacts from developing these new facilities are not a part of the proposed project's CEQA analysis, including the analysis found in this recirculated DEIR. When these new delivery facilities are sited and designed, compliance with CEQA and, if necessary, NEPA would be ascertained prior to development. Future environmental review of the new facilities, if necessary, could tier from this proposed project's CEQA documentation in compliance with CEQA.

Project Objectives

The City has identified the following main objectives for the proposed project. These objectives replace the objectives found in the September 2011 DEIR. The alternatives analysis in Chapter 5 of this recirculated DEIR compares the proposed project and the alternatives against these objectives.

- To continue to meet the wastewater treatment requirements of residences, businesses, and industries within the City's service area, up to an average daily flow of 22 million gallons per day (mgd).
- To improve processes for the removal of wastewater constituents, such as BOD, suspended solids, nitrogen, and waterborne bacteria and viruses, thereby improving subsurface water quality in the receiving groundwater basin relative to current conditions.
- To provide the initial infrastructure for treating influent wastewater to Title 22 standards and conveying the recycled water for irrigation and other purposes.
- To provide a basic level of odor control to reduce the potential for unpleasant odors to be emitted from the plant property.
- To provide treated effluent (treated to Title 22 standards) for possible exchanges with public and/or private entities for surface water.

Environmental Impacts

The City encouraged public participation during the scoping process for this project. The contents of this recirculated DEIR are based on the significant new information not disclosed in the Notice of Preparation/Initial Study (NOP/IS) (see Appendix A of the September 2011 DEIR) and the September 2011 DEIR, which were prepared in accordance with the State CEQA Guidelines, as well as public and agency input received during the scoping process. The NOP/IS comments are found in Appendix B of the September 2011 DEIR. Those specific issues that were found during preparation of the NOP/IS to have no impact or a less-than-significant impact do not need to be addressed further in this EIR.[1]

Impacts Not Further Considered in the Previous Draft Environmental Impact Report

As discussed in Appendix A (Notice of Preparation/Initial Study) of the September 2011 DEIR, the proposed project would have no impact on the following:

- Aesthetics;
- Agriculture and forestry resources;
- Hazards and hazardous materials;
- Land use and planning;
- Mineral resources;
- Public services; and
- Recreation.

The environmental issue areas listed above are not analyzed in the September 2011 DEIR or this recirculated DEIR.

Previous Draft Environmental Impact Report Sections that Are Not Being Recirculated

As allowed by State CEQA Guidelines Section 15088.5, some sections from the September 2011 DEIR are not being recirculated because the new project information does not require changes within these environmental issue areas. Table ES-1 lists the sections and provides a brief explanation regarding why recirculation of these sections is not required.

[1] Section 15128 of the State CEQA Guidelines requires an EIR to contain a brief statement that explains why the various possible significant effects of the project were determined not to be significant and, therefore, were not discussed in detail in the EIR.

Table ES-1. Previous DEIR Environmental Issue Area Sections that Are Not Being Recirculated

Environmental Issue Area Section	Reason for Not Recirculating Section
Air Quality	The changes to the project description (i.e., the proposed water exchange agreement) would not result in the construction of new facilities, an increase in operational energy needs, an increase in construction or operational traffic, an increase in odors, or a cumulative considerable contribution to an air quality impact already disclosed in the September 2011 DEIR. Therefore, additional analysis of air quality impacts is not warranted in this recirculated DEIR.
Cultural Resources	The changes to the project description would not change the "footprint" of the proposed project. Therefore, the possibility of unearthing previously unknown cultural resources as a result of the proposed project has already been disclosed in the September 2011 DEIR. Additional analysis of cultural resources impacts in this recirculated DEIR is not warranted.
Geology and Soils	The changes to the project description would not change the "footprint" of the proposed project. The potential for the proposed project to expose people or structures to seismically related hazards, unstable soils, or landslides or result in soil erosion has already been disclosed in the September 2011 DEIR. Therefore, additional analysis of geology and soils impacts in this recirculated DEIR is not warranted.
Greenhouse Gas Emissions	The changes to the project description would not result in the construction of additional facilities, an increase in operational energy needs, or an increase in construction or operational traffic beyond that already disclosed in the September 2011 DEIR. Therefore, additional analysis of greenhouse gas emissions impacts is not warranted in this recirculated DEIR.
Noise	The changes to the project description would not result in the construction of additional facilities, an increase in operational energy needs, or an increase in construction or operational traffic beyond that already disclosed in the September 2011 DEIR. Therefore, the proposed project would not expose persons to or generate noise levels in excess of standards, generate excessive vibration or ground-bourne noise levels, or result in temporary or periodic increases in ambient noise levels above those already disclosed in the September 2011 DEIR. Therefore, additional analysis of noise impacts in this recirculated DEIR is not warranted.
Transportation and Traffic	The changes to the project description would not result in the construction of additional facilities that would require additional construction-related trips, additional operational personnel, or operational truck trips beyond those already disclosed in the September 2011 DEIR. Therefore, additional analysis of transportation and traffic impacts in this recirculated DEIR is not warranted.
Utilities and Service Systems	The proposed project would result in the construction of improvements at the existing plant. The changes to the project description would not require additional stormwater drainage facilities beyond those already disclosed in the September 2011 DEIR. Therefore, additional analysis of utilities and service systems impacts in this recirculated DEIR is not warranted.

This recirculated DEIR examines the environmental setting, impacts, and mitigation measures associated with the significant new information (i.e., information pertaining to the proposed water exchange agreement). The City determined that the significant new information required further study pertaining to the following environmental issue areas:

- Section 3A, *Biological Resources*;
- Section 3B, *Hydrology and Water Quality*; and
- Section 3C, *Population and Housing*.

As allowed by CEQA Section 15088.5, the environmental issue area sections of the recirculated DEIR are limited to discussions of the environmental setting for the significant new information, impacts associated with the significant new information, and the mitigation measures to reduce significant impacts where required and when feasible. The residual impacts following implementation of any mitigation measure also are discussed.

Impacts of the Significant New Information

Sections 3A through 3C in Chapter 3, *Environmental Analysis*, provide a detailed discussion of the environmental setting, the impacts associated with the significant new information, and mitigation measures, which are designed to reduce significant impacts to less-than-significant levels, when feasible. The impacts, mitigation measures, and residual impacts based on the significant new information are summarized in Table ES-4, *Summary of Impacts and Mitigation Measures and Level of Impacts after Mitigation*, at the end of this summary and discussed below.

Less-than-Significant Impacts

The analysis of the impacts of the significant new information documents that the impacts would be less than significant or less than significant after mitigation is implemented with respect to the following resources:

- Biological resources;
- Hydrology and water quality; and
- Population and housing.

Significant and Unavoidable Impacts

Section 15126.2(b) of the State CEQA Guidelines requires an EIR to describe any significant impacts, including those that can be mitigated but not reduced to less-than-significant levels. Potential environmental effects of the significant new information, as well as the proposed mitigation measures, are discussed in detail in Chapter 3 of this recirculated DEIR.

The analysis is the recirculated DEIR concluded that the significant new information would not result in a new project-level significant and unavoidable impact not already disclosed in the September 2011 DEIR.

Significant Cumulative Impacts

According to Section 15355 of the State CEQA Guidelines, the term *cumulative impacts* "...refers to two or more individual effects that, when considered together, are considerable or compound or increase other environmental impacts." Individual effects that may contribute to a cumulative

impact may be from a single project or a number of separate projects. Individually, the impacts of a project may be relatively minor, but when considered along with impacts of other closely related or nearby projects, including newly proposed projects, the effects could be cumulatively considerable.

This recirculated DEIR has considered the potential cumulative effects of the significant new information along with other current and reasonably foreseeable projects and has determined that the significant new information would not contribute further to a cumulatively considerable impact not already disclosed in the September 2011 DEIR.

Growth Inducement

Section 15126.2(d) of the State CEQA Guidelines provides the following guidance regarding growth-inducing impacts: A project is identified as growth inducing if it could "foster economic or population growth or the construction of additional housing, either directly or indirectly, in the surrounding environment."

The analysis presented below replaces the analysis in the September 2011 DEIR regarding growth-inducing impacts and focuses on the proposed project's potential to stimulate growth in the surrounding area. The following growth-inducement discussion considers both direct and indirect growth-inducement impacts as a result of the project.

Direct Impacts

The proposed project would involve upgrades to the City's WCP, the construction of a recycled water conveyance system, and a proposed water exchange agreement between the City and TID. Operation of the proposed project would not require additional employees, nor would it result in the need for new homes or businesses. Furthermore, the project would not change the capacity of the plant. Therefore, it would not directly induce population growth by allowing more sewage to be treated (i.e., removing a barrier to growth). The project would also not directly induce growth through the development of housing. The direct impacts of the proposed project would be less than significant.

Indirect Impacts

Currently, the WCP's treated effluent is discharged into Mill Creek where it is used by the Kaweah Delta Water Conservation District and farmers with property adjacent to the creek who have agricultural needs or for groundwater recharge. It is not treated to a standard that would make it suitable for urban use. Under the proposed project, discharges of treated effluent into Mill Creek would cease. Instead, treated effluent would be conveyed to the recycled water conveyance system and used for irrigation at Plaza Park and Valley Oaks Golf Course as well as on 250 acres of farmland south of the plant. It would also be delivered to TID for agricultural irrigation purposes under a proposed water exchange agreement. Currently, the regional groundwater basin is in a sustained overdraft condition because of groundwater pumping resulting from urban and agricultural demands in the area. The exchange of recycled water under this project for CVP water for groundwater recharge is intended to help mitigate the overdraft condition. It is important to point out that approximately 95% of pumping from the aquifer is for agricultural and other uses. Even if the City is brought into balance between aquifer replenishment and groundwater extraction, the aquifer would remain in a significant state of overdraft, and the water table would continue to decline.

The water exchange agreement that has been proposed as part of the project would enable an exchange of between 11,000 and 17,600 af per year, on average, of recycled water generated by the plant for an average of 5,500 to 8,800 af per year of surface water provided by TID to the City over a 20-year period.

As discussed in Section 3C, *Population and Housing*, in this recirculated DEIR, surface water received by the City would be conveyed to facilities east of the City to recharge the aquifer beneath the City. The City proposes conveying surface water to the eastside because groundwater flow travels from east to west, and the City wants to retain as much of the recharged water as possible. It is assumed that some of the surface water for groundwater recharge would eventually be pumped back up, treated, and then used as potable water for the benefit of the City and its residents. Therefore, the primary function of the proposed water exchange would be to help alleviate the groundwater overdraft condition that currently exists in the Visalia area.

The Urban Water Management Plan (UWMP) for the City acknowledges that the ultimate reliability of the water supply for the Visalia District, which includes the City, is a function of the long-term balance between aquifer replenishment and groundwater extraction. The UWMP also mentions the possibility of the WCP providing recycled water, which would increase recharge in the Visalia area, thus improving the local water balance. The UWMP goes on to say that a reduction and/or augmentation in pumping of about 11,000 af per year would be needed to bring the Visalia area's groundwater levels back into balance for the long term. It is important to point out that this estimate is based on assumptions with inherently large uncertainties because of certain unknowns (e.g., groundwater losses due to migration within the aquifer). Additionally, this estimate was only for the purpose of estimating the amount of overdraft attributable to municipal pumping. Approximately 95% of pumping from the aquifer is for agricultural and other uses. Even if the City is brought into balance, the aquifer would remain in a significant state of overdraft, and the water table would continue to decline.

The proposed water exchange agreement would provide an average of between 5,500 and 8,800 af of surface water per year for groundwater recharge. The UWMP points to recycled water use as well as other management activities, such as increased conservation, augmented artificial recharge, other exchanges and transfers, and surface water acquisition, to reach the 11,000-acre-feet-per-year reduction and/or augmentation necessary to achieve groundwater balance. But, as discussed above, this estimate is based on assumptions with inherently large uncertainties because of certain unknowns (e.g., groundwater losses due to migration within the aquifer).

The City has determined that the proposed water exchange would not induce growth. Rather, it would help to alleviate the overdraft condition that currently exists in the Visalia area. As discussed in the UWMP, continued pumping without development of new water sources and/or significant reductions in water use would contribute to the ongoing regional overdraft, which is unsustainable in a long-term undefined future (beyond 2040). The proposed water exchange would help to make the long-term groundwater balance more sustainable.

Irreversible Impacts

Section 15126.2(c) of the State CEQA Guidelines defines an irreversible impact as an impact that uses nonrenewable resources during the initial and continued phases of the project. Irreversible impacts can also result from damage caused by environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to ensure that such consumption is justified.

Buildout of the proposed project, including facilities under the proposed water exchange agreement, would commit nonrenewable resources to uses during construction and ongoing operations (i.e., utility services). During project operations, oil, gas, and other nonrenewable resources would

be consumed. Therefore, an irreversible commitment of nonrenewable resources would occur as a result of long-term project operations. However, assuming that such commitments would occur in accordance with the adopted goals, policies, and implementation measures of the *City of Visalia General Plan*, such commitments would be considered acceptable as a matter of public policy. The *City of Visalia General Plan* ensures that any irreversible environmental changes associated with such commitments will be minimized.

Alternatives to the Proposed Project

Section 15126.6 of the State CEQA Guidelines states that an EIR must address "a range of reasonable alternatives to the project that would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project and evaluate the comparative merits of the alternatives." It has been determined by the City that the September 2011 DEIR adequately described the alternatives to the proposed project that were considered, identified alternatives that were eliminated from further consideration and the reasons for their rejection, and compared the potential impacts of several of the alternatives with the potential environmental impacts associated with the proposed project.

This recirculated DEIR was limited to considering the potential impacts of the alternatives that were considered in light of the significant new information. In summary, the significant new information discussed in this recirculated DEIR is as follows:

- New analysis about downstream effects on riparian habitat and wildlife, including special-status species, as a result of the proposed project ceasing discharges into Mill Creek (see Section 3A, *Biological Resources*);
- New analysis regarding the proposed project's effect on local groundwater quality (see Section 3B, *Hydrology and Water Quality*); and
- Changes to the project description involving a proposed water exchange agreement between the City and the TID (see Chapter 2, *Project Description*, and Section 3C, *Population and Housing*).

The significant new information does not necessitate examination of a new alternative because there is no alternative that has not already been considered or analyzed in the September 2011 DEIR or this recirculated DEIR that would reduce impacts related to the significant new information. The City has determined that the alternatives already considered and analyzed in the September 2011 DEIR and this recirculated DEIR represent a reasonable range of alternatives per CEQA.

Alternatives Previously Analyzed

During the preparation of the September 2011 DEIR, the City analyzed two alternatives for the proposed project. This recirculated DEIR will also consider these alternatives. The goal of this alternatives analysis is to identify other means for achieving the project's objectives while lessening or avoiding potentially significant environmental impacts caused by the proposed project in light of the significant new information.

The following alternatives were identified and analyzed by the City in the September 2011 DEIR:

- Alternative 1—No-Project Alternative.
- Alternative 2—No Recycled Water Conveyance System Alternative.

These alternatives are described below and Tables ES-2 and ES-3 summarize the alternatives, including the basis for selection and the relative impacts of each. A complete discussion of each alternative follows.

Table ES-2. Summary of Development Alternatives

Alternative	Description	Basis for Selection and Summary of Analysis
Proposed Project	• Improvements to the existing plant (e.g., the use of MBR technology to treat wastewater to Title 22 standards and development of a photovoltaic renewable energy facility and power generation system). • Development of a recycled water conveyance system. • Possibility of entering into water exchange.	—
Alternative 1: No-Project Alternative	• Improvements at the plant would not occur. • Recycled water conveyance system would not be developed. • No possibility of entering into water exchanges.	• Required by CEQA. • Avoids all significant impacts.
Alternative 2: No Recycled Water Conveyance System Alternative	• Improvements at the plant would occur. • Recycled water conveyance system would not be developed. • Possibility of entering in water exchanges not likely.	• Avoids significant impacts related to hydrology and water quality resulting from lowering the local groundwater table. • Reduction in construction-related impacts (e.g., air quality, noise, traffic).

Table ES-3. Comparison of Alternatives

Environmental Resource	Proposed Project	Alternative 1: No-Project Alternative	Alternative 2: No Recycled Water Conveyance System Alternative
Air Quality	Less than significant with mitigation	Less Impact	Less Impact
Biological Resources	Less than significant with mitigation	Less Impact	Less Impact
Cultural Resources	Less than significant with mitigation	Less Impact	Less Impact
Geology and Soils	Less than significant with mitigation	Less Impact	Similar Impact
Greenhouse Gas Emissions	Significant and unavoidable (cumulative)	Less Impact	Less Impact
Hydrology and Water Quality	Significant and unavoidable (project and cumulative)	Less Impact	Similar Impact
Noise	Less than significant with mitigation	Less Impact	Less Impact
Population and Housing	Less than significant	Similar Impact	Similar Impact

Environmental Resource	Proposed Project	Alternative 1: No-Project Alternative	Alternative 2: No Recycled Water Conveyance System Alternative
Transportation and Traffic	Less than significant with mitigation	Less Impact	Less Impact
Utilities and Service Systems	Significant and unavoidable (project)	Less Impact	Less Impact
Meet Project Objectives?	Yes	No	Some
Reduce Significant and Unavoidable Impacts?	—	Yes	Some

Alternative 1: No-Project Alternative

Section 15126.6(e) of the State CEQA Guidelines requires the analysis of a no-project alternative. This no-project analysis must discuss the existing conditions as well as what would reasonably be expected to occur in the foreseeable future if the proposed project is not approved.

If the proposed project is not approved, baseline conditions at the plant would persist. This means that the plant would continue to operate with its existing technology, at the same capacity, and with the same water quality standards. Treated effluent would continue to be discharged into Mill Creek. The proposed water exchange would not be possible because a conveyance system would not be built, and the influent would not be treated to Title 22 standards. Under Title 22 standards, recycled water pipelines, which would be required to move the recycled water to existing TID facilities, would not be allowed.

The City would still be required to obtain and be in compliance with a NPDES permit, and it would still be subject to WDRs because of discharges into Mill Creek, a water of the United States. Whether the proposed project is approved or not, the City will need to cease discharges into Mill Creek or improve the treatment of effluent as part of future water quality requirements mandated by the Central Valley RWQCB. Therefore, under the No-Project Alternative, the City would most likely end up violating future water quality requirements or have to find an alternative way to discharge effluent that does not include discharging in Mill Creek. The No-Project Alternative does not provide an alternative way to discharge effluent and be compliant with future water quality requirements.

Although the No-Project Alternative is feasible, it would not fulfill any of the project objectives. This alternative would also have a greater odor impact because it would not develop odor control facilities. It is important to note that the City has been ordered by the Central Valley RWQCB to either cease discharges into Mill Creek or upgrade the level of treatment at the plant. The No-Project Alternative does not comply with this order and does not provide an alternative way to discharge effluent that does not include discharging in Mill Creek. Therefore, the No-Project Alternative would not comply with the Central Valley RWQCB's order.

Alternative 2: No Recycled Water Conveyance System Alternative

Alternative 2 includes all of the proposed improvements to the plant (e.g., the installation of MBR technology and construction of a new administration building, odor control facilities, a new entrance, a solar facility), but the proposed recycled water conveyance system would not be built.

Instead, treated effluent would continue to be discharged into Mill Creek but now to Title 22 standards. The proposed water exchange between the City and TID would not occur, and other possible future water exchanges would most likely not occur because a conveyance system would not be available to facilitate the efficient delivery of recycled water in exchange for surface water.

The City would still be required to obtain and be in compliance with a NPDES permit, and it would still be subject to WDRs because of discharges into Mill Creek, a water of the United States. Whether the proposed project is approved or not, the City will need to cease discharges into Mill Creek or improve the treatment of effluent as part of future water quality requirements mandated by the Central Valley RWQCB. Plant improvements related to treating influent to Title 22 standards would most likely satisfy the Central Valley RWQCB's requirement to improve the treatment of effluent. Under Alternative 2, the City would not be expected to violate future water quality requirements.

The No Recycled Water Conveyance System Alternative, although feasible, would not fulfill the following project objectives:

- To provide the initial infrastructure needed to treat influent wastewater to Title 22 standards and convey the recycled water for irrigation and other purposes.
- To provide effluent treated to Title 22 standards for possible water exchanges with public and/or private entities for surface water.

The No Recycled Water Conveyance System Alternative would fulfill the following objectives:

- To continue to meet the wastewater treatment requirements of residences, businesses, and industries within the City's service area, up to an average daily flow of 22 mgd.
- To remove wastewater constituents, such as BOD, suspended solids, nitrogen, and waterborne bacteria and viruses, to a greater extent, thereby improving subsurface water quality in the receiving groundwater basin relative to current conditions.
- To provide a basic level of odor control to reduce the potential for unpleasant odors to be emitted from the plant property.

Environmentally Superior Alternative

An EIR must identify an environmentally superior alternative to the proposed project, if any. The No-Project Alternative would be environmentally superior to the proposed project and the significant new information because it would minimize or avoid physical environmental impacts. However, if a no-project alternative is found to be environmentally superior, the State CEQA Guidelines require that "the EIR shall also identify an environmentally superior alternative among the other alternatives" (State CEQA Guidelines, Section 15126.6[e][3]).

The other alternative considered by the City was the No Recycled Water Conveyance System Alternative (Alternative 2). For most of the environmental issue areas where Alternative 2 has lesser impacts, the September 2011 DEIR and this recirculated DEIR determined that the proposed project could reduce its potentially significant impacts to a level of less than significant with mitigation. In accordance with State CEQA Guidelines Section 15126.6(c), it was determined that Alternative 2 would have a lower level of environmental effect for most of the environmental issue areas. However, both the proposed project and Alternative 2 would not reduce cumulatively considerable GHG emissions impacts to a level of less than significant, even with mitigation. In addition, the proposed project would result in significant and unavoidable project-level and cumulatively

considerable hydrology and water quality impacts because it would lower local groundwater levels downstream of the effluent discharge point into Mill Creek. Alternative 2 avoids these significant and unavoidable impacts and, as a result, is the environmentally superior alternative.

Areas of Controversy

Areas of controversy were identified through agency and public comments received during the scoping periods. In summary, the following issues were identified during scoping and are addressed in the appropriate sections of Chapter 3:

- Effect on downstream riparian habitat from the current effluent discharge point into Mill Creek (Section 3A).
- Effect on groundwater quality as a result of the project (Section 3B).
- Effect on population growth, if any (Section 3C).

Issues to Be Resolved

Section 15123(b)(3) of the State CEQA Guidelines requires an EIR to include issues to be resolved (e.g., the choice among alternatives, how to mitigate significant impacts).

The following list outlines the major issues to be resolved:

- Determine if the EIR adequately describes the environmental impacts of the proposed project.
- Consider the alternatives.
- Determine if the recommended mitigation measures should be adopted or modified.
- Determine if additional mitigation measures need to be applied to the proposed project.

Summary of Environmental Impacts and Mitigation

The following table summarizes the environmental impacts, mitigation measures, and unavoidable significant impacts of the significant new information identified and analyzed in Chapter 3 of this recirculated DEIR. Refer to the appropriate recirculated DEIR section for additional information.

Table ES-4. Summary of Impacts and Mitigation Measures and Level of Impact after Mitigation

Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
BIOLOGICAL RESOURCES			
Impact BIO-1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by DFG or USFWS.	Less than Significant	No mitigation is required.	Less than Significant
Impact BIO-2: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by DFG, USACE, USFWS, or the RWQCB.	Less than Significant	No mitigation is required.	Less than Significant
Cumulative	Less than Significant	No mitigation is required.	Less than Significant
HYDROLOGY AND WATER QUALITY			
Impact HYD-1: Violate any water quality standards or waste discharge requirements.	Less than Significant	No mitigation is required.	Less than Significant
Impact HYD-2: Otherwise substantially degrade water quality.	Less than Significant	No mitigation is required.	Less than Significant
Cumulative	Less than Significant	No mitigation is required.	Less than Significant

Impact	Level of Significance before Mitigation	Mitigation Measures	Level of Significance after Mitigation
POPULATION AND HOUSING			
Impact POP-1: Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through the extension of roads or other infrastructure).	Less than Significant	No mitigation is required.	Less than Significant
Cumulative	Less than Significant	No mitigation is required.	Less than Significant

Chapter 1
Introduction

Purpose of the Recirculated Draft Environmental Impact Report

The City of Visalia (City) has decided to revise and recirculate the previous draft environmental impact report (DEIR) (herein referred to as the September 2011 DEIR) because significant new information regarding the City of Visalia Water Conservation Plant Upgrades Project (proposed project) was presented during the public review process. The City has determined that the information may meet the criteria for recirculation (see criteria 1 and 2, below), as set forth in California Environmental Quality Act (CEQA) Guidelines Section 15088.5.

A DEIR is required to be recirculated if "significant new information" is added to the environmental impact report (EIR) after the close of the public comment period on the DEIR but before certification of the final environmental impact report (FEIR). In accordance with State CEQA Guidelines Section 15088.5, recirculation is required when significant new information identifies:

1. New significant environmental impacts resulting from the project or from a new mitigation measure that has been proposed;
2. A substantial increase in the severity of an environmental impact, resulting in a significant impact unless mitigation measures are adopted to reduce the impact to a level of insignificance;
3. Feasible project alternatives or mitigation measures, which are considerably different from others that were previously analyzed, that clearly lessen the environmental impacts of the project, but the project's proponents decline to adopt; or
4. The DEIR was so fundamentally and basically inadequate and conclusory in nature that meaningful public review and comment were precluded.

A DEIR may be recirculated in whole or in part, depending on the extent of the revisions that are made to the prior draft. The public review period for the recirculated DEIR will be 45 days. In accordance with State CEQA Guidelines Section 15088.5(f)(2), the City is requesting that comments on this recirculated DEIR be limited to the recirculated DEIR chapters and sections. The City will consider and respond to all of the comments received during both review periods (i.e., during the September 2011 DEIR and recirculated DEIR review periods) in the FEIR. The FEIR will reflect the combined analyses of the original September 2011 DEIR and the recirculated portions of the September 2011 DEIR found in this recirculated DEIR.

Summary of Revisions

The State CEQA Guidelines require this recirculated EIR to include a summary of the revisions made to the previously circulated September 2011 DEIR. In accordance with Section 15088.5(g) of the State CEQA Guidelines, the following list summarizes changes to the September 2011 DEIR that occurred since the previous circulation:

- New analysis regarding downstream effects on riparian[1] habitats and wildlife, including special-status species, resulting from the proposed project ceasing discharges into Mill Creek (see Section 3A, *Biological Resources*);
- New analysis regarding the proposed project's effect on local groundwater quality (see Section 3B, *Hydrology and Water Quality*); and
- Changes to the project description involving a proposed water exchange agreement between the City and the Tulare Irrigation District (TID) (see Chapter 2, *Project Description*, and Section 3C, *Population and Housing*).
- Revisions to Chapter 4, *Cumulative Impact Analysis*, relevant to the above considerations.
- Other revisions necessary to maintain internal consistency among the DEIR's analyses.

Additional information regarding the changes is provided in the discussion of the recirculated DEIR's content, below.

Significant New Information

The DEIR (i.e., the September 2011 DEIR) for the proposed project was sent out for a 45-day public review period, from September 26, 2011, to November 10, 2011, as required by CEQA. Following the close of the public review period, the Central Valley Regional Water Quality Control Board (Central Valley RWQCB) provided a comment letter on the proposed project. The Central Valley RWQCB comment letter states that although the DEIR addresses the project's effects on groundwater elevations, it does not include information about the project's effects on groundwater quality. Specifically, the Central Valley RWQCB said that the EIR "must assess compliance of the proposed discharges with SWRCB Resolution No. 68-15, Statement of Policy with Respect to Maintaining High Quality of Waters in California (Antidegradation Policy)." The Central Valley RWQCB comment letter goes on to say that a constituent-by-constituent analysis should be performed to compare the quality of the effluent generated by the plant as it reaches underlying groundwater with the quality of natural groundwater. To address the Central Valley RWQCB's concerns regarding the proposed project and its effect on groundwater quality, the City has prepared an antidegradation analysis for the proposed project (Appendix A). The conclusions of this analysis are detailed in Section 3B, *Hydrology and Water Quality*.

Also during the public review period, the State Water Resources Control Board (SWRCB) stated in a comment letter that the EIR should discuss the direct and indirect effects of decreased discharges of effluent into Mill Creek as a result of the proposed project on biological resources and habitat. In response to this comment, the City had a biologist perform a reconnaissance survey of Mill Creek, from the effluent discharge point to about 3 miles downstream of the City Basin No. 4 turnout. The results of the survey can be found in Section 3A, *Biological Resources*.

Subsequent to the public review period for the September 2011 DEIR, the City proposed entering into a water exchange agreement with TID. A summary outline of the proposed water exchange agreement can be found in Appendix B of this recirculated DEIR. In addition, the agreement is discussed in Chapter 2, *Project Description*. Impacts resulting from the water exchange agreement are discussed throughout this recirculated DEIR.

[1] Of, relating to, or situated on the banks of a river.

In the City's view, the antidegradation analysis and reconnaissance biological survey are considered "additional data," and the proposed water exchange is considered a "change in the project," per State CEQA Guidelines Section 15088.5(a). It is also the City's view that the antidegradation analysis, reconnaissance survey, and proposed water exchange are "significant" changes to the EIR analysis and project description. Information regarding the changes was not included in the September 2011 DEIR. Therefore, these changes warrant recirculation of the DEIR to afford the public a meaningful opportunity to comment on these new aspects of the EIR and the proposed project.

Content of the Recirculated Draft Environmental Impact Report

State CEQA Guidelines Section 15088.5(c) states:

> If the revision [to the draft EIR] is limited to a few chapters or portions of the EIR, the lead agency need only recirculate the chapters or portions that have been modified.

Given this criterion in the State CEQA Guidelines, the City has determined that the new significant information described above and in more detail in Chapter 2, *Project Description*, limits the contents of this recirculated DEIR to the following:

- *Executive Summary* – Presents a summary of the contents of the recirculated DEIR.
- Chapter 1, *Introduction* – Notes that the recirculated DEIR will be limited to:
  - Discussions regarding the purpose of the recirculated EIR, including language from State CEQA Guidelines Section 15088.5;
  - Discussions regarding the content of the recirculated EIR, including a summary of the revisions to the EIR;
  - Discussions regarding EIR sections not being recirculated and why;
  - A statement that comments are to be limited to the recirculated sections, per State CEQA Guidelines Section 15088.5(f)(2);
  - Public review information, including where copies are available, contact information, and where to submit comments; and
  - The next steps in the process after recirculation, including completion of the FEIR (with responses to all comments on the September 2011 DEIR and this recirculated DEIR).
- Chapter 2, *Project Description* – Describes the changes to the project description (i.e., the proposed water exchange agreement between the City and TID).
- Chapter 3, *Environmental Analysis* – Describes existing conditions for each environmental issue area (see below) before project implementation, methods and assumptions used in the impact analysis, the regulatory setting, criteria for determining significance, impacts that would result from the proposed project, and applicable mitigation measures that would eliminate or reduce significant impacts. Key changes are described below:
  - Section 3A, *Biological Resources* – New discussions regarding downstream effects on riverine habitat and possible related impacts on special-status species as a result of the proposed project ceasing discharges into Mill Creek.

  - Section 3B, *Hydrology and Water Quality* – New conclusions in the antidegradation analysis and related impacts.
  - Section 3C, *Population and Housing* – New analysis of the proposed water exchange agreement and the potential for the new source of surface water to induce growth.
- Chapter 4, *Cumulative Impact Analysis* – Evaluates the environmental impacts of combined recent past, present, or reasonably foreseeable future projects in the area that have the potential to contribute to cumulative impacts. This chapter also discusses the proposed project's contribution to cumulative conditions and determines whether that contribution would be cumulatively considerable. This chapter is limited to cumulative impacts on biological resources, hydrology and water quality, and population and housing resulting from the proposed changes and information outlined in Chapter 2, *Project Description,* and the impacts described in Sections 3A, 3B, and 3C.
- Chapter 5, *Alternatives Analysis* – Evaluates the environmental impacts of the project alternatives, including two no-project alternatives. This chapter also identifies the environmentally superior project alternative. The discussion in this chapter is limited to changes in an alternative's impacts relative to the baseline condition previously discussed and disclosed in the September 2011 DEIR and the proposed changes and information outlined in Chapter 2, *Project Description*.
- Chapter 6, *Growth-Inducing Impacts* – Discusses direct and indirect growth-inducing impacts that could be caused by the proposed project. This chapter will replace the previous Chapter 6 in the September 2011 DEIR, which discussed the effects of the proposed water exchange agreement and the potential for the new source of surface water to induce growth.
- Chapter 7, *Significant Irreversible Changes* – Identifies significant, adverse, irreversible commitments of resources caused by the proposed project. This chapter is limited to significant irreversible changes that could occur as a result of the proposed changes and the information outlined in Chapter 2, *Project Description*.
- Chapter 8, *References* – Identifies the additional documents (printed references) and individuals (personal communications) consulted during preparation of this recirculated DEIR.
- Chapter 9, *List of Preparers* – Lists the individuals involved in preparing this recirculated DEIR.
- Chapter 10, *Acronyms and Abbreviations* – Lists all acronyms and abbreviations mentioned throughout the recirculated DEIR, with corresponding definitions.
- Appendix A, *Antidegradation Analysis* – Provides a copy of the analysis that evaluated the proposed project's effect on local groundwater quality.
- Appendix B, *Proposed Water Exchange Agreement Outline* – Provides the most current outline of the proposed water exchange agreement between the City and TID.

Previous Draft Environmental Impact Report Sections that Are Not Being Recirculated

As allowed by State CEQA Guidelines Section 15088.5, some sections from the previous DEIR are not being recirculated because the new project information does not require changes within these environmental issue areas. Table 1-1 lists the sections and provides a brief explanation regarding why recirculation of these sections is not required.

Table 1-1. Previous DEIR Environmental Issue Area Sections that Are Not Being Recirculated

Environmental Issue Area Section	Reason for Not Recirculating Section
Air Quality	The changes to the project description (i.e., the proposed water exchange agreement) would not result in the construction of new facilities, an increase in operational energy needs, an increase in construction or operational traffic, an increase in odors, or a cumulative considerable contribution to an air quality impact already disclosed in the September 2011 DEIR. Therefore, additional analysis of air quality impacts is not warranted in this recirculated DEIR.
Cultural Resources	The changes to the project description would not change the "footprint" of the proposed project. Therefore, the possibility of unearthing previously unknown cultural resources as a result of the proposed project has already been disclosed in the September 2011 DEIR. Additional analysis of cultural resources impacts in this recirculated DEIR is not warranted.
Geology and Soils	The changes to the project description would not change the "footprint" of the proposed project. The potential for the proposed project to expose people or structures to seismically related hazards, unstable soils, or landslides or result in soil erosion has already been disclosed in the September 2011 DEIR. Therefore, additional analysis of geology and soils impacts in this recirculated DEIR is not warranted.
Greenhouse Gas Emissions	The changes to the project description would not result in the construction of additional facilities, an increase in operational energy needs, or an increase in construction or operational traffic beyond that already disclosed in the September 2011 DEIR. Therefore, additional analysis of greenhouse gas emissions impacts is not warranted in this recirculated DEIR.
Noise	The changes to the project description would not result in the construction of additional facilities, an increase in operational energy needs, or an increase in construction or operational traffic beyond that already disclosed in the September 2011 DEIR. Therefore, the proposed project would not expose persons to or generate noise levels in excess of standards, generate excessive vibration or ground-bourne noise levels, or result in temporary or periodic increases in ambient noise levels above those already disclosed in the September 2011 DEIR. Therefore, additional analysis of noise impacts in this recirculated DEIR is not warranted.
Transportation and Traffic	The changes to the project description would not result in the construction of additional facilities that would require additional construction-related trips, additional operational personnel, or operational truck trips beyond those already disclosed in the September 2011 DEIR. Therefore, additional analysis of transportation and traffic impacts in this recirculated DEIR is not warranted.
Utilities and Service Systems	The proposed project would result in the construction of improvements at the existing plant. The changes to the project description would not require additional stormwater drainage facilities beyond those already disclosed in the September 2011 DEIR. Therefore, additional analysis of utilities and service systems impacts in this recirculated DEIR is not warranted.

Availability of the Recirculated Draft Environmental Impact Report

The recirculated DEIR for the proposed project is being circulated to the public and agencies for a 45-day review period (State CEQA Guidelines Section 15087), beginning October 29, 2012, and ending December 13, 2012.

State CEQA Guidelines Section 15088.5(f)(2) states:

> When the EIR is revised only in part and the lead agency is recirculating only the revised chapters or portions of the EIR, the lead agency may request the reviewers limit their comments to the revised chapters or portions of the recirculated EIR. The lead agency need only respond to (i) comments received during the initial circulation period that relate to chapters or portions of the document that were not revised and recirculated and (ii) comments received during the recirculation period that relate to the chapters or portions of the earlier EIR that were revised and recirculated. The lead agency's request that reviewers limit the scope of their comments shall be included either within the text of the revised EIR or by and attachment to the revised EIR.

In accordance with State CEQA Guidelines Section 15088.5(f)(2), the City is requesting that comments on this recirculated DEIR be limited to the recirculated DEIR chapters and sections.

As required by CEQA, the City will respond to all comment letters regarding the September 2011 DEIR received during the previous 45-day public comment period (September 26, 2011 through November 10, 2011) as well as comments received on this recirculated DEIR during its 45-day public comment period (October 29, 2012, through December 13, 2012). In accordance with the State CEQA Guidelines, a FEIR will be developed for this project that responds to comments received during both the September 2011 DEIR and the recirculated DEIR public comment periods.

Public involvement is a primary objective of CEQA, and community members are encouraged to participate in the planning process for the proposed project by reviewing the recirculated DEIR, providing written comments, and attending public meetings.

The recirculated DEIR is available for public review on the City's web site (http://www.ci.visalia.ca.us/depts/public_works/waste_water.asp) or at one of the locations listed below.

City Corporation Yard
336 N. Cain Street
Visalia, CA 93292

Visalia Transit Center
425 E. Oak Street, 3rd Floor
Visalia, CA 93291

Visalia City Hall West
707 West Acequia Avenue
Visalia, CA 93291

Visalia Water Conservation Plant
7579 Avenue 288
Visalia, CA 93277

Supporting documents not included in the recirculated DEIR are available for public review at the Visalia Water Conservation Plant, 7579 Avenue 288, Visalia, CA 93277.

Interested parties may provide written comments on the recirculated DEIR. Comments must be postmarked by December 13, 2012. Please address comments to:

James Ross, Public Works Manager
City of Visalia
7579 Avenue 288
Visalia, CA 93277
559-713-4466 (p)
559-713-4826 (f)
E-mail: jross@ci.visalia.ca.us

Upon completion of the 45-day public review period for this recirculated DEIR, written responses to all comments regarding environmental issues discussed in the recirculated DEIR will be prepared and incorporated into the FEIR (in addition to responses to comments on the September 2011 DEIR). The city council has final authority over certification of the FEIR and project decisions.

Written responses to comments received from state agencies will be made available to the agencies at least 10 days before the city council meeting at which certification of the FEIR will be considered. The state agency comments and responses will be included in the FEIR for consideration by the City as well as any other decision makers.

Project Contacts

The City is the lead agency and responsible for preparation of this recirculated DEIR. ICF International, an independent contractor to the City, prepared the recirculated DEIR. Key project contacts are provided below.

Lead Agency:	City of Visalia 7579 Avenue 288 Visalia, CA 93277 Contact: James Ross, Public Works Manager
EIR Consultant:	ICF International 5558 California Avenue, Suite 310 Bakersfield, CA 93309 Contact: Steve Esselman, Project Manager

Chapter 2
Project Description

Overview of Project Description from the Previous Draft Environmental Impact Report

In recent years, potable water demand in the City of Visalia has slowly and steadily increased, resulting in a sustained overdraft of the local groundwater table. Consequently, recycling and reusing effluent from the City of Visalia Water Conservation Plant (WCP or plant) is part of the City's plan to reduce potable water usage. The need for water recycling and reuse is emphasized in the WCP's current waste discharge requirements (WDRs), Order No. R5-2006-0091:

> Water in the Tulare Lake Basin is in short supply, requiring importation of surface waters from other parts of the state. The Basin Plan encourages reclamation on irrigated crops wherever feasible and indicates that discharges to surface water and evaporation of reclaimable wastewater will not be acceptable permanent disposal methods where the opportunity exists to replace an existing use or proposed use of fresh water with recycled water. Where appropriate, the Basin Plan allows a timetable for implementing reclamation. The City's discharge constitutes a significant source of agricultural supply water and groundwater recharge (Central Valley Regional Water Quality Control Board 2006).

The following summarizes the project, as described in more detail in the previous DEIR (herein referred to as the September 2011 DEIR). The proposed project would upgrade the WCP to produce recycled water suitable for reuse in conformance with California Code of Regulations (CCR), Title 22, Division 4, Chapter 3 (Title 22 standards). The project would accomplish the following basic objectives:

- Improve wastewater treatment facilities at the WCP, enabling the plant to produce effluent that meets Title 22 standards;
- Develop the initial recycled water conveyance system, consisting of below-grade pipelines and existing canals for disposal and reuse of the WCP's treated effluent, which would be treated to Title 22 standards; and
- Provide effluent treated to Title 22 standards for possible water exchanges of the treated effluent for surface water between the City and TID and/or other entities. The recycled water would be used for agricultural irrigation within the exchange partner's boundaries, and the surface water would be used to recharge the City's groundwater.

The on-site facilities required to complete the WCP upgrade were described in the September 2011 DEIR and are summarized below.

- Replacement of four existing centrifugal pumps, used to pump the primary sludge to the digesters, with progressive cavity pumps;
- Construction of an interstage pump station to lift the primary effluent to the upgraded secondary treatment facilities;

- Conversion of the existing secondary treatment process to a membrane biological reactor (MBR) process (tertiary treatment) to produce the recycled water required to meet the water reuse objective of this project (i.e., to meet Title 22 standards). This would include:
  - Construction of fine screens to capture stringy materials and coarse inorganic solids in the influent prior to delivery to the MBR facilities;
  - Modifications to the existing aeration basins for biological oxygen demand (BOD) and nitrogen removal;
  - Construction of a battery of new MBR tanks to receive the mixed liquid from the aeration basins and house the membrane modules;
  - Replacement of existing aeration blowers by new units with the capacities required for BOD and nitrogen removal in the aeration basins; and
  - Construction of new sludge pumps for returning activated sludge from the MBR tanks to the aeration basins and wasting excess sludge produced by the MBR process to the digesters;
- Construction of new disinfection facilities that use ultraviolet (UV) light for disinfection, which would eliminate the need for chlorine contact disinfection. This would include:
  - Upgrades to the existing anaerobic sludge digestion process, including construction of a new digester to increase the capacity of the digestion process;
  - Construction of a new sludge disintegrator to precondition the discharge from the existing gravity belt thickener prior to digestion;
  - Construction of two presses to dewater the processed sludge from the anaerobic digesters;
  - Lining the sludge drying beds with asphaltic concrete pavement to prevent moisture from the drying sludge from seeping into the ground below the beds;
  - Lining a 3-acre area for stockpiling the dried sludge removed from the drying beds;
- Construction of a digester gas purification system and a renewable power system that uses digester gas produced by the anaerobic sludge digesters to fuel a new energy recovery system, which would generate electrical power for plant use and hot water for digester heating;
- Construction of a 1-megawatt solar photovoltaic system at the plant to supplement on-site energy use;
- Construction of a new on-site administration building, septage receiving station, and collections shop building;
- Replacement of the primary sludge pipeline, plant drain system flow meters, and the plant-wide supervisory control and data acquisition (SCADA) system; and
- Upgrades the existing plant-wide electrical power distribution system to meet the power demand of the upgraded plant.

The project would also include recycled water conveyance facilities for disposal and reuse of treated effluent from the WCP. This system would include (1) Basin No. 4 pipeline, (2) TID pipeline and irrigation pipelines to serve City farmland south of the WCP, and (3) irrigation delivery pipelines for areas east of State Route (SR) 99 (farmland, golf course, and parks). The proposed system would deliver tertiary treated effluent from the WCP to all users and basins.

The September 2011 DEIR also describes the entitlements and approvals that would be necessary from the City and other responsible agencies, such as the State Water Resources Control Board and Central Valley Regional Water Quality Control Board, for the proposed project. Finally, the September 2011 DEIR describes the construction schedule and workforce, materials and equipment, and site preparation required to construct the proposed project.

Project Objectives

The City has identified the following main objectives for the proposed project. These objectives replace the objectives found in the September 2011 DEIR. The alternatives analysis in Chapter 5 of this recirculated DEIR compares the proposed project and the alternatives against these objectives.

- To continue to meet the wastewater treatment requirements of residences, businesses, and industries within the City's service area, up to an average daily flow of 22 million gallons per day (mgd).
- To improve processes for the removal of wastewater constituents, such as BOD, suspended solids, nitrogen, and waterborne bacteria and viruses, thereby improving subsurface water quality in the receiving groundwater basin relative to current conditions.
- To provide the initial infrastructure for treating influent wastewater to Title 22 standards and conveying the recycled water for irrigation and other purposes.
- To provide a basic level of odor control to reduce the potential for unpleasant odors to be emitted from the plant property.
- To provide treated effluent (treated to Title 22 standards) for possible exchanges with public and/or private entities for surface water.

Changes to the Project Description that Require Recirculation of the Draft Environmental Impact Report

Proposed Water Exchange Agreement

Introduction

The September 2011 DEIR discusses the possibility of water exchanges between the City and TID and/or other entities. However, at time of the September 2011 DEIR's 45-day public review period (September 26, 2011, through November 10, 2011), the City had not formally entered into any water exchange agreements with TID and/or other entities. At that time, analysis of such exchanges was considered premature and speculative and, therefore, proposed water exchanges were not a part of the September 2011 DEIR's analysis. The September 2011 DEIR concluded that future water exchanges between the City and TID and/or other entities would have to undergo separate environmental review in compliance with CEQA and, if necessary, the National Environmental Policy Act (NEPA).

Subsequent to the public review period for the September 2011 DEIR, a proposed water exchange agreement between the City and TID was drafted and proposed for adoption. A summary outline of the proposed water exchange agreement can be found in Appendix B of this recirculated DEIR. This proposed water exchange agreement constitutes a change in the project description that introduces "significant new information." Therefore, recirculation of the previous DEIR is required, per State CEQA Guidelines Section 15088.5 (see Chapter 1, *Introduction,* for more information). Consequently, this recirculated DEIR is being prepared and distributed for public review.

The recycled water generated by the proposed project would exceed the City's current needs for agricultural and irrigation uses. The proposed water exchange agreement would provide a reliable source of tertiary treated water for TID that would be suitable for irrigating all crops, including food crops, without restriction. The City would be provided with a reliable source of surface water that would be used to recharge the City's groundwater basin, which has historically been and currently is in an overdraft condition.

Recycled Water Deliveries to the Tulare Irrigation District

According to the proposed water exchange agreement, the City would deliver a minimum of 800 acre-feet (af) per month and a minimum of 11,000 af per year of recycled water to TID, except in the event of a catastrophic event or maintenance issue. The proposed agreement assumes that the volume of recycled water would increase over time as the City's population grows and the City finds additional uses for the recycled water in the future. The proposed agreement would require the volume of recycled water delivered to TID to not fall below the minimum monthly and annual volumes outlined in the proposed agreement. The City would provide TID with a schedule of anticipated monthly recycled water deliveries by December 15 of each year for use the upcoming year.

The point of delivery for the City's recycled water to TID would be a pipeline along Evans Ditch near Road 68. This point of delivery was disclosed in the September 2011 DEIR, and impacts related to construction and operations were already analyzed. From the point of delivery, recycled water would flow through existing TID facilities and be used for agricultural irrigation within TID's service area. No additional water conveyance facilities would be required for the delivery of recycled water to TID.

Surface Water Deliveries to the City of Visalia

In exchange for the recycled water delivered to TID, the City would receive surface water equal to 50% of the recycled water delivered (i.e., a 2:1 exchange rate). According the proposed exchange, the City would receive no more than 1,400 af of surface water in any one week or 4,500 af in any one month. In total, the City would receive surface water at an average minimum of 5,500 af per year. Although it is likely that the majority of the surface water received by the City would come from TID's Central Valley Project (CVP) Friant Division Contract Class 2 entitlement, the proposed agreement would allow TID to use other sources of water, with prior approval from the City. Class 2 entitlement water is a firm contract entitlement but may not be available in all years (e.g., when there simply isn't enough water in the CVP). In general, Class 2 entitlement water is a less reliable source than Class 1 entitlement water. The surface water received by the City is intended for groundwater recharge purposes, either in existing City-owned recharge basins or other facilities or as channel losses within or adjacent to City boundaries, which accrue to the benefit provided by the City's groundwater resources.

The City would establish a hierarchy of preferred channels, basins, or other locations for the delivery of the surface water received to optimize the benefit to the City's groundwater resources and wells that serve the City. TID would follow the City's preferred hierarchy to the extent practicable. The hierarchy may change over time and may be updated annually. Surface water received would be delivered through the existing TID main and be measured at points of introduction, from the TID main to existing channels that traverse the City.

The delivery of surface water to the City may occur at any time. The City may reject a delivery of surface water when there is a declared flood release from the Kaweah River or when existing channels and basins are needed for stormwater or floodwater management.

Proposed Agreement Terms Applicable to Both Parties

The proposed agreement would be in effect for 20 years, beginning with the first delivery of either recycled or surface water. At the end of the 20-year term, either party may provide the other with a written notice of termination not less than 180 days before the end of the then-current term. The proposed agreement would automatically renew for successive terms of 1 year if a notice of termination is not issued. After an initial 10-year period, either party may terminate the proposed agreement, provided that the other party is given 5 years' advance notice in accordance with the terms of the proposed agreement.

A rolling 10-year account balance of water deliveries would be created and monitored with the first issuance of recycled water from the City to TID, generating a balance that would be credited with delivery of surface water to the City from TID (i.e., first in/first out). It is acknowledged in the proposed agreement that the account would be balanced regularly but that prolonged droughts could make CVP Class 2 surface water unavailable for periods of time. Any account balance older than 10 years would be repaid by TID from its next available CVP Class 2 supply, even if it reduces deliveries within TID's service area.

As part of the proposed agreement, the City has the option of purchasing additional TID water supplies. Water sales are a part of the existing or baseline condition for this analysis because such sales are already an established practice of TID, which makes excess water (i.e., not needed to fulfill existing contracts, including with the City) accessible. Therefore, it is not expected that future water sales between the City and TID would result in environmental impacts beyond the baseline condition. Therefore, a discussion of impacts resulting from the terms of future water sales is not warranted for the purposes of CEQA.

The proposed agreement has a number reporting requirements that both TID and the City must meet. For example, such reporting must be accurate, complete, and timely. The reporting requirements of the proposed agreement specify when monthly reports are to be submitted by TID and the City to each other and requirements for joint annual reports.

Proposed Agreement Terms Not Part of the California Environmental Quality Act Documentation for the Proposed Project

The proposed agreement would require U.S. Bureau of Reclamation (USBR) approval because the majority of the surface water that the City would receive from TID would most likely come from TID's CVP Friant Division Contract Class 2 entitlement with USBR. Approval of the proposed water exchange by USBR would be discretionary and, therefore, would trigger the need for NEPA compliance prior to approval. As the lead agency under NEPA, USBR would prepare a separate NEPA

document that would disclose the environmental impacts of the proposed exchange, thereby satisfying the requirements of NEPA. Although the recirculated DEIR, as well as the September 2011 DEIR and supporting documentation, would most likely help USBR with its environmental findings determinations about the proposed water exchange, this document does not satisfy the specific requirements of NEPA. This document's purpose is solely to disclose additional environmental impacts resulting from significant new information (i.e., information pertaining to the proposed water exchange agreement) presented about the proposed project. It is intended to satisfy only the requirements of CEQA.

USBR is currently preparing a NEPA document regarding the installation of a reinforced concrete pipeline that would convey tertiary treated water from the City's WCP to TID. TID has applied for and has been selected as a potential recipient to receive federal funding assistance through a 2011 WaterSMART grant from USBR. The grant would be used for construction of the new TID pipeline.

The September 2011 DEIR and this recirculated DEIR consider indirect impacts that may result from any reasonably foreseeable outcome of USBR's decision (i.e., to allow the proposed water exchange agreement). The environmental documentation for this project has considered all reasonably foreseeable impacts associated with USBR's decision.

The proposed agreement discusses "new delivery facilities" that would facilitate implementation of the proposed agreement. These facilities are described as "new facilities to divert CVP surface water from the TID main into the St. Johns River, the TIC canal, and the Lower Kaweah River (Mill and Packwood Creeks)." Because the size, scope, and location of these new facilities were unknown at the time of public review of this recirculated DEIR, it is premature and speculative to include them in this environmental analysis. Therefore, the potential environmental impacts from developing these new facilities are not a part of the proposed project's CEQA analysis, including the analysis found in this recirculated DEIR. When these new delivery facilities are sited and designed, compliance with CEQA and, if necessary, NEPA would be ascertained prior to development. Future environmental review of the new facilities, if necessary, could tier from this proposed project's CEQA documentation in compliance with CEQA.

Chapter 3
Environmental Analysis

Introduction

This chapter examines the environmental setting, impacts, and mitigation measures associated with the significant new information (i.e., information pertaining to the proposed water exchange agreement) presented in this recirculated DEIR. The chapter is divided into sections, with each section representing an environmental issue area that needs further study. The environmental issue areas addressed in this recirculated DEIR and their corresponding sections are listed below.

- Section 3A, *Biological Resources*
- Section 3B, *Hydrology and Water Quality*
- Section 3C, *Population and Housing*

As allowed by CEQA Section 15088.5, Sections 3A through 3C are limited to discussions of the environmental setting for the significant new information outlined in Chapter 1, *Introduction*, impacts associated with the significant new information, and the mitigation measures to reduce significant impacts where required and when feasible. The residual impacts following implementation of any mitigation measure also are discussed.

Organization of Environmental Analysis

To assist the reader in comparing information regarding the environmental issues, each section (Sections 3A–3C) is organized as described below.

- *Environmental Setting* describes the current physical environment in the project area related to the significant new information. According to the State CEQA Guidelines, the environmental setting normally constitutes the baseline physical condition by which the lead agency determines whether an impact is significant.
- *Regulatory Setting* summarizes regulations, plans, and standards that apply to the significant new information.
- *Impact Analysis* discusses the methods and criteria for determining the significance of potential impacts, limited to the significant new information; provides the environmental impact analysis; recommends mitigation measures to reduce the significance of identified environmental impacts; and states the level of significance following implementation of recommended mitigation measures.
    - *Methods* describes the methods used to analyze the environmental effects of the significant new information and states whether a qualitative or a quantitative analysis was used.
    - *Criteria for Determining Significance* identifies the significance criteria used to evaluate the impacts of the significant new information. Where applicable, thresholds of significance are identified. These thresholds, which may be those adopted by the City or another regulatory agency, indicate levels at which an impact is found to be significant. The significance criteria can be quantitative or qualitative.

- *Impacts and Mitigation Measures* provides an evaluation of potential short- and long-term impacts resulting from the significant new information. Mitigation measures for significant impacts are identified. Although criteria for determining significant impacts are unique to each issue area, the environmental analysis applies a uniform standard for defining the levels of significance, as explained below.
  - A designation of *no impact* is given when no adverse changes in the environment would be expected.
  - A *less-than-significant impact* would cause no substantial adverse change in the environment.
  - An impact that is *less than significant with mitigation* would avoid substantial adverse effects on the environment through implementation of mitigation.
  - A *significant and unavoidable impact* would cause a substantial adverse effect on the environment, and no feasible mitigation measure would be available to reduce the impact to a less-than-significant level.

Section 3A
Biological Resources

As mentioned in Chapter 1, *Introduction*, and allowed by State CEQA Guidelines Section 15088.5(c), this section is limited to a discussion of downstream effects on riparian[1] habitat and wildlife, including special-status species, as a result of the proposed project ceasing discharges into Mill Creek.

The previously circulated DEIR for the proposed project (herein referred to as the September 2011 DEIR) provides additional information about the environmental and regulatory setting related to biological resources and an impact analysis that describes the project's effect on special-status species (including riparian and wetland habitat not associated with Mill Creek), federally protected wetlands, wildlife movement, and nursery sites. The September 2011 DEIR also discusses whether the proposed project would conflict with local policies, local ordinances, or adopted habitat conservation plans or natural community conservation plans. It has been determined by the City that the September 2011 DEIR adequately describes the setting and impacts of the proposed project related to these issues and provides reasonable and feasible mitigation, if necessary, to reduce such impacts to the greatest extent practicable. Therefore, these issues are not addressed further in this recirculated DEIR section.

Environmental Setting

This section is limited to the existing conditions related to riparian habitat and wildlife, including special-status species, downstream of the plant's current effluent discharge point into Mill Creek.

Regional

The San Joaquin Valley has a Mediterranean climate, which is characterized by hot, dry summers and cool, moist winters. Summer daytime high temperatures frequently exceed 100°F. The average maximum temperature is about 77°F, and the average minimum temperature is about 49°F. Average annual rainfall for the Visalia area is about 10 inches. Precipitation normally occurs from September to April (Western Regional Climate Center 2010). A dense, persistent ground fog, known as tule fog, can develop in winter, resulting in overcast, damp, cool weather.

Historically, native vegetation in the region consisted of perennial grasses, forbs, shrubs, and oaks on the alluvial fans and floodplains near rivers and streams. Although some native vegetation remains on alluvial fans and fan remnants and in small, unreclaimed areas of saline-sodic soils in the county, the principal regional vegetation consists of irrigated agricultural crops, which are widely represented throughout the project area. Agricultural operations are characterized by frequent ground and vegetation disturbance and high levels of human activity. Over time, these practices dramatically reduce the presence of native plants at or near areas of agricultural production. Animals typically found in agricultural and urban areas are generally adapted to high levels of human activity.

[1] Of, relating to, or situated on the banks of a river.

Local

Riparian Vegetation and Plant Communities at Mill Creek

A reconnaissance-level biological field survey along Mill Creek, from the plant's current effluent discharge point to the nearest riparian vegetated area (approximately 3 miles downstream of the discharge point), was conducted on September 14, 2012, by qualified ICF International (ICF) biologists Russell Sweet and Amanda Parra.

Prior to reaching the nearest vegetated riparian area, the biologists determined that the portion of Mill Creek from the current effluent discharge point to the nearest vegetated riparian area does not contain habitat that could be used by wildlife for foraging, nesting, or other purposes. The bed and bank of this portion of Mill Creek is regularly cleared of emergent vegetation as part of routine maintenance along the creek related to stormwater control and irrigation water conveyance. Therefore, any emergent riparian habitat is removed by the maintenance activities. The only vegetation found during the survey of this portion of Mill Creek was the herbaceous weed species and scattered seedlings that emerged since the last maintenance cycle along the creek's bed and bank. The present vegetation will be removed during the next maintenance cycle. For the most part, it was observed that the bed and bank of Mill Creek is primarily bare ground.

The vegetated riparian area nearest to the current effluent discharge point is located about 3 miles downstream of the current discharge point. The area is approximately 1 mile in length. The nearest riparian area is located between Road 58 and 1st Avenue.

Overall, plant species diversity along Mill Creek was considered low. Riparian habitat was the principal biotic habitat present within the area surveyed, although there were also areas with disked fields, agricultural fields, and orchards adjacent to Mill Creek and the riparian habitat. The plants observed during the survey are listed in Table 3A-1.

Table 3A-1. Plant Species Observed during Biological Survey

Scientific Name	Common Name
Cirsium vulgare	Bull thistle
Conyza canadensis	Horseweed
Cynodon dactylon	Bermuda grass
Datura wrightii	Jimson weed
Erodium cicutarium	Red-stem filaree
Hordeum vulgare	Cultivated barley
Juglans callifornica	Walnut
Lactuca serriola	Prickly lettuce
Malva parviflora	Cheeseweed
Marrubian vulgare	Horehound
Medicago sativa	Alfalfa
Nicotiana glauca	Tree tobacco
Paspalum dilatatum	Dallisgrass
Plantago major	Broadleaf plantain
Quercus lobata	Valley oak
Raphanus raphanistrum	Wild radish
Vitis californica	Wild grape

Disked Fields, Agricultural Fields, and Orchards

Portions of the project area were disked at the time of the field survey. Most of the disked areas were observed north of the nearest riparian area, between Road 56 and Road 68. Essentially, no standing vegetation remained in the disked areas. These areas were most likely planted with alfalfa or a similar crop and are expected to continue to be planted with these crops on a rotational basis. Alfalfa, cornfields, pistachios, and non-native walnut orchards were also observed along the length of the area surveyed.

Riparian Habitat

A survey of the vegetated riparian area nearest to the effluent discharge point was conducted along an approximately 1-mile section of habitat, which was dominated by valley oak (*Quercus labota*). Valley oaks, which are considered an upper floodplain species, do not require their rooting depth to reach the water table. The nearest riparian area lacks indicator species (i.e., sycamore [*Platanus racemosa*], arroyo willow [*Salix lasiolepis*], Fremont cottonwood [*Populus fremontii*]) that normally indicate riparian habitat (Griggs 2009). The nearest riparian area is also non-contiguous to other riparian habitat. Water sources into and from the riparian area are man-made earthen irrigation canals, which are used for adjacent agricultural practices.

Fragmented areas with standing water were present within the nearest riparian area. These areas supported a small area of broadleaf plantain (*Plantago major*), with dallisgrass (*Paspalum dilatatum*) and valley oaks in the margin areas. Approximately one-third of the western portion of the creek, starting at 1st Avenue, showed evidence of disking and weed abatement in and on the banks of the creek. The creek did not show any signs of recent flows through this area. A control gate that limits flows in the western portion of the creek as well as surrounding agricultural operations and general maintenance in Mill Creek have seemingly contributed to unsuitable conditions for most native vegetation, which is unable to thrive and support populations of native wildlife.

Apart from the riparian habitat along Mill Creek, there is a pipe culvert that diverts water to a retaining pond approximately 225 feet south of the creek and in proximity to the nearest riparian area surveyed. Vegetation around the pond is similar to that of Mill Creek.

Riparian Special-Status Plant Species

A list of special-status plant species known to occur within an area covered by nine U.S. Geological Survey (USGS) 7.5-minute quadrangles was generated after a search of the California Native Plant Society's (CNPS's) online *Inventory of Rare and Endangered Plants* (California Native Plant Society 2012). Prior to the field survey, a report specific to the project area was prepared that lists those species with the potential for occurrence in the area surveyed (see Appendix C). The list generated for the proposed project indicates that 12 Category 1B and Category 2 special-status plant species have been observed in Goshen (36119C4) and the surrounding eight quadrangles (California Native Plant Society 2012). List 1B and List 2 plants include species that are rare, threatened, or endangered in California and not elsewhere; most of them are found only in California. However, most of these species are not expected to occur in the area surveyed because the types of habitats they normally occupy do not occur in the area. The one special-status plant species associated specifically with riparian habitat is listed below in Table 3A-2; however this species was not identified during the biological survey.

Table 3A-2. Special-Status Plant Species Reported to Occur in Riparian Habitat Associated with Goshen and the Eight Surrounding USGS 7.5-minute Quadrangles

Scientific Name Common Name	Status			Habitat Requirements	Life Form and Flowering Period	Potential On-Site Occurrence
	Federal	State	CNPS			
Imperata brevifolia (California satintail)	--	--	List 2.1	Mesic, chaparral, coastal scrub, Mojavean desert scrub, meadows and seeps (often alkali), and riparian scrub.	Perrenial rhizomatous herb September–May	*Absent:* This species was not observed during the September 2012 field survey.

Source: California Native Plant Society 2012.
Status Key: List 2 = rare, threatened, or endangered in California but more common elsewhere; 0.1 = seriously endangered in California.

As stated previously, land use practices at and surrounding the area surveyed are associated primarily with active agricultural production, which creates conditions that limit the potential for special-status plant species to occur. In addition, because natural habitats that once existed in the area surveyed have been converted for agricultural uses, including ongoing farming practices such as disking, small-mammal control measures, and other activities, no habitat for special-status plant species exists in the area. No special-status plant species were identified during the field survey.

A complete list of plant species with the potential to occur in the area surveyed can be found in Appendix C.

Riparian Special-Status Plant Communities

The California Department of Fish and Game (DFG), Wildlife and Habitat Data Analysis Branch, developed a list of California terrestrial natural communities. The most recent version, dated September 2003, is derived from the California Natural Diversity Database (CNDDB) and supersedes all other lists developed from the CNDDB. This list of natural communities is based on the detailed classifications put forth in *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995) and structured to be compatible with previous CNDDB lists (e.g., Holland 1986).

No undisturbed native habitat that harbors a sensitive plant community exists within the area surveyed. The area surveyed is flat (< 2% slopes) and underlain by various loams, such as Colpien loam, Nord fine sandy loam, and Tagus loam, which are moderately well-drained to well-drained soils and not subject to ponding.

Riparian Wildlife and Habitat at Mill Creek

Table 3A-3 lists the wildlife species observed along Mill Creek during the biological survey, followed by a discussion of survey observations of wildlife and habitat in the project area.

Table 3A-3. Wildlife Species Observed during Biological Survey

Scientific Name	Common Name
Mammals	
Canis familiaris	Domestic dog
Spermophilus beecheyi	California ground squirrel
Reptiles and Amphibians	
Rana catesbeiana	Bullfrog
Sceloporus occidentalis	Western fence lizard
Birds	
Agelaius phoeniceus	Red-winged blackbird
Aphelocoma californica	Western scrub-jay
Ardea alba	Great egret
Ardea herodias	Great blue heron
Buteo jamaicensis	Red-tailed hawk
Cathartes aura	Turkey vulture
Charadrius vociferus	Killdeer
Corvus brahyrhynchos	American crow
Corvus corax	Common raven
Falco sparverius	American kestrel
Melanerpes formicivorus	Acorn woodpecker
Nycticorax nycticorax	Black-crowned night-heron
Passer domesticus	House sparrow
Sayornis nigricans	Black phoebe
Sturnus vulgaris	European starling
Tyrannus verticalis	Western kingbird
Zenaida macroura	Mourning dove

Disked Fields, Agricultural Fields, and Orchards

No terrestrial wildlife species were observed in disked fields, agricultural fields, or orchards during the survey. In general, these fields offer limited value as wildlife habitat because of intense agricultural land management practices such as disking and other standard farming practices (e.g., the use of herbicides and rodenticides).

Red-tailed hawks (*Buteo jamaicensis*), American kestrels (*Falco sparvarius*), turkey vultures (*Cathartes aura*), and various passerine species were seen perched or flying above the agriculture fields and orchards during the field survey. These species most likely use these adjacent habitats for foraging because small insects, small mammals, and lizards commonly occur in the area. In addition, Swainson's hawk (*Buteo swainsoni*) is known to forage in alfalfa fields, although it was not observed during the survey for this project. Agriculture fields and orchards adjacent to the riparian habitat provide suitable nesting habitat for many passerine species; however, no active nests were detected during the survey period. Raptors (i.e., birds of prey) could also use these areas for nesting. No raptor nests were observed during the survey.

Riparian Habitat

Although site conditions offer little wildlife habitat value, some species were observed along Mill Creek (Table 3A-3) and are discussed herein.

The riparian area nearest to the effluent discharge point provides only marginally suitable foraging and nesting habitat for common bird species. A total of 13 bird species were detected during the survey (i.e., red-winged blackbird [*Agelaius phoeniceus*], western scrub-jay [*Aphelocoma californica*], great egret [*Ardea alba*], great blue heron [*Ardea herodias*], killdeer [*Charadrius vociferous*], American crow [*Corvus brachyrhynchos*], house sparrow [*Passer domesticus*], acorn woodpecker [*Melanerpes formicivorus*], black-crowned night-heron [*Nycticorax nycticorax*], European starling [*Sturnus vulgaris*], western kingbird [*Tyrranus verticalis*], mourning dove [*Zenaida macroura*], black phoebe [*Sayornis nigricans*]). None of these species are dependent solely on riparian habitat. However, many other common bird species are expected to occur as residents, either temporarily during migration periods or as over-wintering visitors. The majority of the identified passerine species were observed foraging in valley oaks or perched on vegetation near areas of standing water.

This small area of riparian habitat contains a vegetation structure that is favorable for many different types of birds; however, it does not appear large enough to support or sustain a substantial number of bird species, and it is not contiguous to surrounding riparian habitat.

The individual mammals observed during the field survey were domestic dog (*Canis familiaris*) and California ground squirrel (*Spermophilus beecheyi*),

Vegetation characteristics are contributing factors to the diversity of reptiles in an area. Most reptiles prefer a variety of habitats in which to forage and live. Small burrows, for example, provide a place to live and use as refuge. The common reptile species detected during the survey was the western fence lizard (*Sceloporus occidentalis*). As for other species, intense agricultural practices and urban uses limit habitat value.

Amphibians require standing or flowing water for part or all of their life cycle. Ponds, seasonal pools, and drainages provide suitable habitat for common amphibian species. Several bullfrogs (*Rana catesbeiana*) were observed using Mill Creek in areas where standing water was detected.

Riparian Special-Status Wildlife Species

A list of special-status wildlife species observed within an area covered by nine USGS 7.5-minute quadrangles was generated prior to conducting the field survey. The list generated for the proposed project indicates that nine special-status wildlife species have been observed in Goshen and the surrounding eight quadrangles (California Natural Diversity Database 2012 [Appendix D]). Special-status wildlife species associated specifically within riparian habitat are listed below in Table 3A-4; however, these species were not identified during the biological survey. As stated previously, land use practices at and surrounding the riparian habitat are associated primarily with active agricultural production, which creates conditions that limit the potential for special-status wildlife species to occur.

Regulatory Setting

This section is limited to a discussion of regulations applicable to the protection of riverine habitat and wildlife, including special-status species.

Table 3A-4. Special-Status Animal Species Reported to Occur in Riparian Habitat Associated with Goshen and the Eight Surrounding USGS 7.5-minute Quadrangles

Common Name	Scientific Name	Status (federal/ state)	Habitat Requirements/ Potential Occurrence
Birds			
California tiger salamander	*Ambystoma californiense*	T/none	Found in vernal pools and some other wet areas. **Not expected to occur** because habitat not suitable and outside known range.
Western spadefoot	*Spea (= Scaphiopus) hammondii*	SSC/SSC	Found in vernal pools and other wet areas within grasslands. **Not expected to occur** because outside known range.

Source: California Natural Diversity Database 2012.
Status Key: SSC = species of special concern; T = threatened.

Federal Regulations

Federal Endangered Species Act of 1973

The federal Endangered Species Act (ESA) (16 United States Code [USC] Sections 1531 through 1543) and subsequent amendments provide guidance for the conservation of endangered and threatened species as well as the ecosystems upon which they depend. The ESA defines species as threatened or endangered and provides regulatory protection for listed species. The federal ESA provides a program for the conservation and recovery of threatened and endangered species as well as the conservation of designated critical habitat that the U.S. Fish and Wildlife Service (USFWS) has determined is required for the survival and recovery of these listed species.

Section 7 requires federal agencies, in consultation with and assistance from the Secretary of the Interior or the Secretary of Commerce, as appropriate, to ensure that the actions they authorize, fund, or carry out will not jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of critical habitat for these species. USFWS and the National Marine Fisheries Service (NMFS) share responsibility for administering the ESA. Regulations governing interagency cooperation under Section 7 are found at 50 Code of Federal Regulations (CFR) Part 402. The biological opinion (BO) issued at the conclusion of consultation includes a statement authorizing a take (i.e., to harass, harm, pursue, hunt, wound, kill, etc.) that may occur incidental to an otherwise legal activity.

Section 9 lists those actions that are prohibited under the ESA. Section 9 prohibits a take of listed species of fish, wildlife, and plants without special exemption. *Harm* is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. *Harass* is further defined as actions that create the likelihood of injury to listed species to an extent that would significantly disrupt normal behavioral patterns.

Section 10 provides a means whereby a non-federal action with the potential to result in a take of a listed species could be allowed under an incidental take permit. Application procedures are found at 50 CFR Parts 13 and 17 for species under the jurisdiction of USFWS and 50 CFR Parts 217, 220, and 222 for species under the jurisdiction of NMFS.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) (16 USC Sections 703 through 711) is the domestic law that affirms, or implements, a commitment by the United States to four international conventions (with Canada, Mexico, Japan, and Russia) for the protection of a shared migratory bird resource. The MBTA makes it unlawful at any time, by any means, or in any manner to pursue, hunt, take, capture, or kill migratory birds. The law also applies to the removal of nests occupied by migratory birds during the breeding season. The MBTA makes it unlawful to take, pursue, molest, or disturb these species, their nests, or their eggs anywhere in the United States.

State Regulations

California Endangered Species Act

The California Endangered Species Act (CESA) (California Fish and Game Code Section 2050 et seq.) establishes the state's policy to conserve, protect, restore, and enhance threatened or endangered species and their habitats. Under the mandate of CESA, state agencies should not approve projects that would jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. There are no state agency consultation procedures under CESA. For projects that would affect a species that is listed under both the state and federal ESA, compliance with the federal ESA will satisfy CESA if DFG determines that the federal incidental take authorization is consistent with CESA under California Fish and Game Code Section 2080.1. For projects that would result in a take of a state-only listed species, the applicant must apply for a take permit under California Fish and Game Code Section 2081(b).

California Fish and Game Code

Sections 1600 through 1616. Under these sections of the California Fish and Game Code, a project proponent is required to notify DFG prior to implementing any project that would divert, obstruct, or change the natural flow, bed, channel, or bank of any river, stream, or lake. Pursuant to the California Fish and Game Code, a stream is defined as a body of water that flows at least periodically, or intermittently, through a bed or channel having banks and supporting fish or other aquatic life. Given this definition, a watercourse with surface or subsurface flows that supports or has supported riparian vegetation is a stream and therefore under DFG jurisdiction. Altered or artificial habitat that is valuable to fish and wildlife is also under DFG jurisdiction. DFG also has jurisdiction over dry washes that carry water ephemerally during storm events.

Preliminary notification and project review generally occur during the environmental process. When an existing fish or wildlife resource may be adversely affected, DFG is required to propose reasonable project changes to protect the resource. These modifications are formalized in a Lake and Streambed Alteration Agreement, which becomes part of the plans, specifications, and bid documents for the project.

Sections 1900 through 1913. These sections of the California Fish and Game Code, also known as the Native Plant Protection Act (NPPA), require all state agencies to use their authority to carry out programs to conserve endangered and rare native plants. Provisions of the NPPA prohibit the taking of

listed plants from the wild and require notification of DFG at least 10 days in advance of any change in land use. This allows DFG to salvage listed plant species that would otherwise be destroyed. The applicant is required to conduct botanical inventories and consult with DFG during project planning to comply with the provisions of this act and sections of CEQA that apply to rare or endangered plants.

Sections 2080 and 2081. Section 2080 of the California Fish and Game Code states that "No person shall import into this state [California], export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the Commission [State Fish and Game Commission] determines to be an endangered species or threatened species or attempt any of those acts, except as otherwise provided in this chapter or the Native Plant Protection Act or the California Desert Native Plants Act." Pursuant to Section 2081 of the California Fish and Game Code, DFG may authorize individuals or public agencies to import, export, take, or possess state-listed endangered, threatened, or candidate species. These otherwise prohibited acts may be authorized through permits or memoranda of understanding if the take is incidental to an otherwise lawful activity, impacts of the authorized take are minimized and fully mitigated, the permit is consistent with any regulations adopted pursuant to any recovery plan for the species, and the project proponent ensures adequate funding to implement the measures required by DFG. The DFG determination, which considers the ability of the species to survive and reproduce, is based on available scientific information.

Sections 3503 and 3503.5. Under these sections of the California Fish and Game Code, the project proponent is not allowed to conduct activities that would result in taking, possessing, or destroying birds of prey; taking or possessing migratory non-game birds, as designated in the MBTA; taking, possessing, or needlessly destroying of the nest or eggs of any raptors or non-game birds protected under the MBTA; or taking any non-game bird, pursuant to California Fish and Game Code Section 3800.

Impact Analysis

This section describes the impact analysis pertaining to effects resulting from the proposed project, including the cessation of discharges of the plant's effluent into Mill Creek, on riparian habitat and wildlife, including special-status species. It discusses the methods that were used to determine the riparian impacts of the proposed project and lists the thresholds that were used to conclude if a riparian impact would be significant. Mitigation measures are recommended to address (i.e., avoid, minimize, rectify, reduce, eliminate, compensate for) significant impacts. Please note that the impact discussions below are limited to riparian habitat and wildlife, including special-status species. The lead agency determined that the September 2011 DEIR adequately disclosed impacts on non-riparian habitat and wildlife as well as riparian and wetland habitat not associated with Mill Creek within the study area. Therefore, in compliance with State CEQA Guidelines Section 15088.5, the following impact analysis is limited to an analysis of the proposed project's effects on riparian habitat and wildlife associated with Mill Creek.

Methods

Impacts were assessed by comparing the potential presence of riparian biological resources under current conditions with their likely presence under the existing or baseline condition, their likely presence under the proposed project condition, and the likely effects caused by construction or operation of the proposed project. Information regarding current presence is based on a reconnaissance-level biological survey performed by qualified ICF biologists on September 14, 2012, and available literature. Potential riparian impacts were assessed with respect to functional use of the site by biological resources of concern, as listed below.

- Each potentially affected riparian special-status species, considered individually.
- Each potentially affected riparian plant community.
- Non-special-status lizards.
- Non-special-status birds.
- Non-special-status mammals.

The assessment used one quantitative metric, the area (acres) of the affected resource. The assessment of functional impairment was qualitative, emphasizing potential relative changes that can be attributed to project effects, with reference to the thresholds of significance. Given the current site conditions and vegetation present within the riparian habitat along Mill Creek, it is likely that the cessation of discharges of the plant's effluent into Mill Creek would result in less-than-significant impacts. Dominant vegetation throughout this area is not dependent on the presence of water in the creek. The lack of water during the survey indicates that vegetation along the creek is ultimately sustained by agricultural runoff and naturally occurring weather conditions. Short-term impacts due to the cessation of effluent would affect some water-dependent vegetation found around standing ponds; however, all of these species are common to this area, and none of them are special-status plants. The overall vegetation structure is not likely to change or significantly shift because of flow cessation.

Given the marginal amount of suitable habitat present during the survey, fauna that use this area for foraging or nesting would experience a less-than-significant impact if discharges of the plant's effluent into Mill Creek cease. The cessation of discharges is not expected to have a substantial adverse effect on common wildlife species occurring or potentially occurring on the site because of their ability to move freely throughout the area. The relative abundance of suitable habitat and nesting habitat in the region ensures that the survival of migratory birds and common species will be sustained.

Criteria for Determining Significance

The criteria used to determine the significance of an impact related to biological resources are based on Appendix G of the State CEQA Guidelines. The proposed project would result in a significant impact if it would result in one or more of the following:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by DFG or USFWS.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by DFG, the U.S. Army Corps of Engineers (USACE), USFWS, or the RWQCB.
- Have a substantial adverse effect on wetlands through direct removal, filling, trenching, hydrological interruption, or other means.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

The lead agency (City) has determined that the September 2011 DEIR (including analysis found in the proposed project's notice of preparation/initial study [NOP/IS], which was appended to the September 2011 DEIR), adequately discloses the impacts of the proposed project for the environmental issue areas listed below. Therefore, these issue areas are not discussed in this recirculated DEIR section:

- Have a substantial adverse effect on wetlands through direct removal, filling, trenching, hydrological interruption, or other means.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

The lead agency has determined that, based on significant new information, as defined by State CEQA Guidelines Section 15088.5, further analysis of these environmental issue areas is warranted in this recirculated DEIR section:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by DFG or USFWS.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by DFG, USACE, USFWS, or the RWQCB.

Impacts and Mitigation Measures

Impact BIO-1: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by DFG or USFWS (less than significant)

Special-Status Plant Species at Mill Creek

Twelve special-status plant species are known to occur in the project area (see Appendix C); however, of the 12, only one special-status plant species (California satintail) is associated with riparian habitat. The survey of the riparian area nearest to the effluent discharge point determined that the cessation of discharges into Mill Creek resulting from the project would not affect a special-status plant species because California satintail does not occur in the area surveyed. Therefore, the cessation of discharges into Mill Creek would have no effect on special-status plants or their regional populations. There would be no impacts, and mitigation is not required.

Special-Status Wildlife Species at Mill Creek

According to the CNDDB, two special-status wildlife species have the potential to occur in the area surveyed, California tiger salamander and western spadefoot.

California Tiger Salamander (Federally Threatened). California tiger salamanders are known to occur within vernal pools. Specifically, just after enough winter rain has fallen for the ground to be moist and for temporary pools to begin to form, salamanders begin their nocturnal breeding migration. On rainy nights, the adults emerge from their underground burrows and roam, often more than a mile, to lay their eggs in newly replenished vernal pools. Given the disturbed agricultural nature of the areas adjacent to the area surveyed, it is unlikely that suitable vernal pools would be available for salamanders. Also, the area surveyed is outside the known range for California tiger salamander. Therefore, the cessation of discharges into Mill Creek resulting from the project would have no impact on salamanders, and mitigation is not required.

Western Spadefoot (Federal and California Species of Special Concern). Populations of western spadefoot are localized but widespread. The species is found throughout the Central Valley of California as well as along the coast south of San Jose and in some parts of the desert. Western spadefoot prefers grassland, scrub, and chaparral but can occur in oak woodlands. The species is nocturnal, and activity is limited to the wet season, periods with summer storms, or evenings with elevated substrate moisture levels. The area surveyed is outside the known range for western spadefoot. Therefore, the cessation of discharges into Mill Creek resulting from the project would have no impact to western spadefoot, and mitigation is not required.

Common Wildlife Species and Migratory Birds at Mill Creek

The plant communities in the area surveyed along Mill Creek provide limited foraging and breeding habitat for small mammals; reptiles, which represent prey for a variety of common and special-status birds (including passerines and both local and wintering raptors); and mammal species.

Because of the relative abundance of common wildlife species that could be displaced, as well as the extensive areas of open space that surround the project site and provide escape for these species, project implementation is not expected to reduce populations to a point below a self-sustaining level or otherwise substantially affect common mammal or reptile species within the project area. Consequently, impacts on common mammal and reptile species would be less than significant.

Impact BIO-2: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by DFG, USACE, USFWS, or the RWQCB (less than significant)

DFG does not designate any of the plant communities found within the area surveyed as sensitive. The riparian area nearest to the effluent discharge point is dominated primarily by valley oaks. It is important to note that this nearest riparian area lacks the typical riparian indicator species that normally indicate riparian habitat. The nearest riparian area is also non-contiguous to other riparian habitat. Water sources into and from the riparian area are man-made irrigation canals, which are used for adjacent farming practices.

The cessation of discharges into Mill Creek would reduce the amount of water available to the grove of valley oaks. However, valley oaks, which are considered to be an upper floodplain species, do not require their rooting depth to reach the water table. Given the amount of irrigation occurring adjacent to this grove of valley oaks, it is unlikely that the cessation of discharges into Mill Creek would adversely affect the grove. The grove has a number of different existing water sources as a result of nearby ongoing irrigation beyond the current effluent flow. Nearby irrigation would sustain the grove, even with the cessation of effluent discharges into Mill Creek. Therefore, the cessation of discharges into Mill Creek would not have a substantial adverse effect on any riparian habitat or other sensitive natural community. Impacts would be less than significant. No mitigation is required.

Section 3B
Hydrology and Water Quality

As discussed in Chapter 1, *Introduction*, and allowed by State CEQA Guidelines Section 15088.5(c), this section is limited to a discussion of the conclusions found in the antidegradation analysis prepared by Provost & Pritchard Consulting Group (Appendix A). The analysis examines the effect of the proposed project on local groundwater quality.

The previously circulated DEIR for the proposed project (herein referred to as the September 2011 DEIR) provides additional information about the environmental and regulatory setting pertaining to hydrology and water quality and an impact analysis that describes the proposed project's effects related to groundwater supplies; drainage patterns that could cause erosion, siltation, and/or flooding; stormwater drainage capacity; and 100-year flood hazard concerns. It has been determined by the City that the September 2011 DEIR adequately describes the setting and impacts of the proposed project related to these issues and provides reasonable and feasible mitigation, if necessary, to reduce such impacts to the greatest extent practicable. Therefore, these issues are not addressed further in this recirculated DEIR section.

Environmental Setting

This section is limited to existing conditions related to local groundwater quality in the study area.

Regional Groundwater Resources

The following description of regional groundwater resources is based on *Bulletin 118 – California's Groundwater* from the California Department of Water Resources (DWR) (California Department of Water Resources 2006). The DWR bulletin describes the groundwater basin and provides information regarding water supply, quality, and use.

The project site is located in the Tulare Lake Hydrologic Region, San Joaquin Valley Groundwater Basin (Groundwater Basin No. 5-22), Kaweah Subbasin (Groundwater Subbasin No. 5-22.11). This groundwater basin is located within both Tulare and Kings Counties and has a surface area of 446,000 acres (696 square miles).

The San Joaquin Valley is surrounded on the west by the Coast Ranges, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada, and on the north by the Delta and Sacramento Valley. The northern portion of the San Joaquin Valley drains toward the Delta via the San Joaquin River and its tributaries, the Fresno, Merced, Tuolumne, and Stanislaus Rivers. The southern portion of the valley is drained internally by the Kings, Kaweah, Tule, and Kern Rivers, which flow into the Tulare drainage basin, including the beds of the former Tulare, Buena Vista, and Kern Lakes. The San Joaquin Valley is a structural trough, nearly 200 miles long and 70 miles wide, that has been filled with up to 32,000 feet of marine and continental sediments, which were deposited during periodic inundation by the Pacific Ocean and as the surrounding mountains eroded.

The Kaweah Subbasin, which is within the San Joaquin Valley, generally comprises lands within Kaweah Delta Water Conservation District boundaries. It is bounded on the north by the Kings Subbasin (Groundwater Basin No. 5-22.08), on the east by granitic bedrock of the Sierra Nevada foothills, on the south by the Tule Subbasin (Groundwater Basin No. 5-22.13), and on the west by

the Tulare Lake Subbasin (Groundwater Basin No. 5-22.12). Groundwater in the subbasin generally flows to the southwest. Small groundwater depressions occur north and south of Visalia and at the subbasin's northwest corner, with a groundwater mound in the central western portion of the subbasin. No horizontal groundwater barriers have been found within this subbasin. The Kaweah Subbasin is one of 11 basins that have been identified by DWR as being in a critical overdraft condition.

In general, groundwater quality throughout the San Joaquin Valley Groundwater Basin is suitable for most urban and agricultural uses. However, some local impairment does exist. The primary constituents of concern are total dissolved solids (TDS), or salts; nitrates; arsenic; and organic compounds. Areas with high TDS concentrations are primarily located along the west side of the San Joaquin Valley and outside of the project area. These areas result from streamflow that originates in marine sediments of the Coast Ranges or the trough of the valley where salts are concentrated because of evaporation and poor drainage. Nitrates occur naturally but can also result from the use of fertilizer and the disposal of human and animal waste products. High levels of arsenic occur locally and appear to be associated with lakebed areas. The project area is not located near a lakebed.

Local Groundwater Resources

The following local setting for groundwater resources is based on information found in the antidegradation analysis (Appendix A).

Local Groundwater Aquifer Depth and Thickness

Existing groundwater quality near the plant and the proposed recycled water use areas[1] is highly variable. The stratigraphy beneath the WCP can be divided into four predominant zones to depths of 465 feet below ground surface (bgs), the maximum depth explored. These stratigraphic units appear to dip gently to the southwest at approximately 20 feet per mile. The uppermost stratigraphic zone is composed of interbedded, predominantly coarse-grained sediments to approximately 100 feet bgs. The next zone consists of relatively thin beds of sand interbedded with clay, clayey silt, and silt. This interbedded zone is approximately 160 to 170 feet thick and occurs to about 270 feet bgs. The uppermost coarse-grained zone and the underlying thin-bed sand and silt zone comprise the upper aquifer.

The third stratigraphic zone is a very stiff, highly plastic clay layer that measures approximately 20 feet thick. This clay layer acts as an aquitard (confining layer) between the upper unconfined aquifer and the deeper confined aquifer. A sequence of sand and silty sand interbedded with clay and clayey silt occurs stratigraphically below the confining layer. This interbedded zone comprises the "deep aquifer" underneath the site.

Groundwater depth in the upper aquifer, according to City monitoring well data, has typically ranged from about 55 feet bgs directly below the WCP ponds to approximately 106 feet bgs in areas away from the plant. Regional groundwater beneath the site is encountered at a depth of approximately 80 to 95 feet bgs. Upper aquifer groundwater elevations appear to show some seasonal variances. Historical groundwater elevation measurements in the upper aquifer consistently depict groundwater mounding near the on-site recycled water ponds.

[1] Including Plaza Park, Valley Oaks Golf Course, City farmland, Ponds 2 and 3 at the WCP, City-owned Basin No. 4, and the TID use area.

Generalized Local Groundwater Flow Direction and Rate

The direction of the groundwater flow beneath the plant is predominantly to the southwest. However, local mounding beneath the on-site disposal ponds causes intermittent deflections of the groundwater flow lines in the vicinity of the WCP. The mounding also creates a substantial downward vertical hydraulic gradient in the upper aquifer, which dissipates with distance from the WCP.

Local Groundwater Beneficial Uses and Objectives

Designated beneficial groundwater uses for the Kaweah River Subbasin (where the WCP is found) are contained in the Tulare Lake Basin Plan (Basin Plan) and include municipal (MUN), agricultural (AGR), and industrial uses (IND).

Groundwater quality objectives, which are designed to protect the designated beneficial uses, are also contained in the Basin Plan and identified in Table 3B-1, below.

Table 3B-1. Basin Plan Groundwater Quality Objectives

Constituent	Criteria/Objective
Bacteria (as total coliform)	2.2 MPN/100 mL (7-day average)
General Chemicals	Not present in concentrations that affect beneficial uses
Inorganics Chemicals	Shall not exceed MCLs in California Title 22
Fluoride	Shall not exceed MCLs in California Title 22
Organic Chemicals	Shall not exceed MCLs in California Title 22
Pesticides	Shall not exceed MCLs in California Title 22
Radioactivity	Shall not exceed MCLs in California Title 22
Salinity (measured as EC)	Annual increase less than 3 µmhos/cm
Tastes/Odor	Shall not contain concentrations that create a nuisance or adversely affect beneficial uses
Toxicity	Maintain free of toxic substances

Source: Appendix A.
Key
cm = centimeter
EC = electrical conductivity
MCLs = maximum contaminant levels
mL = milliliters
MPN = most probable number
µmhos = micromhos

Current agricultural crops in the proposed use areas include alfalfa, cherries, cotton, field corn, grain sorghum, pistachios, walnuts, wheat, and wine grapes. Native pasture areas are also found here. In addition to the groundwater quality objectives summarized above, which are dictated by the Basin Plan, the aforementioned crops are also subject to various agricultural water quality guidelines. Additional groundwater quality objectives for agricultural use are presented in Table 3B-2. The information in this table is based on the agricultural guidelines pertaining to water quality for irrigation, with unrestricted use based on Ayers and Westcot (1985). These objectives were also used in the antidegradation analysis because agriculture is the primary beneficial use that could be affected by the proposed project.

Table 3B-2. Agricultural Guidelines for Groundwater Quality

Constituent	Criteria/Objective (maximum)
Boron	700 µg/L
Chloride	106 mg/L
Electrical Conductivity	700 µmhos/cm
Selenium	20 µg/L
Sodium	69 mg/L
Total Dissolved Solids	450 mg/L

Source: Ayers and Westcot 1985, as cited in Appendix A.

Key

cm = centimeter
L = liter
mg = milligram
µg = microgram
µmhos = micromhos

Current Local Groundwater Quality

The federal Clean Water Act (CWA) includes an antidegradation policy that requires the City to compare the proposed project's effect on groundwater quality against the "natural groundwater quality," which is the quality of the groundwater assumed to exist prior to the influence of human activity. The natural groundwater quality is more specifically defined to be the groundwater quality at the time the antidegradation policy was approved in 1968. Groundwater quality data are not available from as far back as 1968; therefore, the antidegradation analysis uses the earliest known groundwater data available for locations near the recycled water use areas.

More than 26 constituents that occur in groundwater and could be found in the proposed project's effluent were examined in the analysis. Of the 26, four were identified as "constituents of concern" because the analysis concluded that they could cause groundwater degradation and affect beneficial uses. The four constituents of concern are chloride, electrical conductivity (EC), sodium, and TDS. Therefore, the focus of this recirculated DEIR is on those four constituents. An analysis of the remaining 22 constituents can be found in Table 7-3 of the antidegradation analysis (Appendix A). The remaining constituents are not being analyzed in this recirculated DEIR because the antidegradation analysis concluded that their concentrations in the plant's effluent would not be high enough to affect beneficial uses. It is important to note that nitrate was one of the 22 constituents that the analysis determined would not affect beneficial uses because the proposed project's treatment processes would reduce concentrations in the recycled water to a level below state and federal maximum contaminant level concentrations.

The current local groundwater concentrations of the four remaining constituents of concern, as determined by the analysis, are shown in Table 3B-3.

Table 3B-3. Current Concentration of Groundwater Constituents of Concern

Constituent	Current Concentration	Water Quality Objective	Beneficial Use[1]
Chloride	22 mg/L	106 mg/L	AGR
Electrical Conductivity	510 µmhos/cm	Average annual increase less than 3 µmhos/cm averaged over a 5-year period or 700 µmhos/cm	AGR
Sodium	NS	69 mg/L	AGR
Total Dissolved Solids	NS	450 mg/L	AGR

Source: Appendix A.

[1] Beneficial use, as designated in the Basin Plan, that could be affected by the relevant constituent.

Key

AGR = agriculture
cm = centimeter
L = liter
mg = milligram
NS = not sampled
µmhos = micromhos

Regulatory Setting

This section is limited to a discussion of regulations applicable to local groundwater quality.

Federal Regulations

Clean Water Act

The federal CWA (33 USC Section 1251 et seq.), formerly the Federal Water Pollution Control Act of 1972, was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point-source and certain nonpoint-source discharges to surface water.

Antidegradation Policy

The CWA requires state water quality standards to include an antidegradation policy to protect beneficial uses and prevent further degradation of high-quality waters, including groundwater. A further discussion of California's specific antidegradation policy can be found below under *State Water Resources Control Board Resolution No. 68-16*.

State Regulations

Porter Cologne Water Quality Control Act

Passed in 1969, the Porter-Cologne Water Quality Control Act (Porter-Cologne Act) acts in concert with the federal CWA. It established the SWRCB and divided the state into nine regions, each overseen by a RWQCB. The SWRCB is the primary state agency with responsibility for protecting the quality of the state's surface and groundwater supplies. However, much of its daily implementation authority is delegated to the nine RWQCBs.

The Porter-Cologne Act provides for the development and periodic review of water quality control plans, which designate beneficial uses for California's major rivers and groundwater basins and establish narrative and numerical water quality objectives for those waters. The proposed project falls within the Tulare Lake Basin Plan. Basin plans are implemented primarily by using the National Pollutant Discharge Elimination System (NPDES) permitting system to regulate waste discharges so that water quality objectives are met. Basin plans, which are updated every 3 years, provide the technical basis for determining waste discharge requirements, taking enforcement actions, and evaluating clean water grant proposals.

State Water Resources Control Board Resolution No. 68-16

As stated above, the federal CWA requires state water quality standards to include an antidegradation policy to protect beneficial uses and prevent further degradation of high-quality waters. In California, water quality standards include the beneficial use and water quality objectives established within basin plans and the state's antidegradation policy. The antidegradation directives of SWRCB Resolution No. 68-16 require high-quality waters of the state to be maintained "consistent with the maximum benefit to the people of the state."

In accordance with federal regulations requiring states to adopt antidegradation policies, the state's *Statement of Policy with Respect to Maintaining High-Quality Waters in California* (Resolution No. 68-16) is interpreted so as to incorporate the federal antidegradation policy. Resolution No. 68-16 states, in part:

1. Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the state that any change will be consistent with maximum benefit to the people of the state, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less than that prescribed in the policies.

2. Any activity that produces or may produce a waste or increased volume or concentration of waste and discharges or proposes to discharge to existing high-quality waters will be required to meet waste discharge requirements that will result in the best practicable treatment or control of the discharge necessary to ensure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the state will be maintained.

State Water Resources Control Board Resolution No. 2009-0011

In February 2009, the SWRCB adopted Resolution No. 2009-0011, *Adoption of a Policy for Water Quality Control for Recycled Water, a Recycled Water Policy*. The purpose of the policy is "to increase the use of recycled water from municipal wastewater sources…" The policy also says, "When used in compliance with this Policy, Title 22, and all applicable state and federal water quality laws, the State Water Board finds that recycled water is safe for approved uses and strongly supports recycled water as a safe alternative to potable water for such approved uses."

Impact Analysis

This section describes the proposed project's impact analysis pertaining to local groundwater quality. It discusses the methods that were used to determine the groundwater quality impacts of the proposed project and lists the thresholds that were used to conclude whether a groundwater quality impact would be significant. Mitigation measures are recommended to address (i.e., avoid, minimize, rectify, reduce, eliminate, compensate for) significant impacts.

Methods

The analysis of the proposed project's impact on local groundwater quality found in the recirculated DEIR sections is based on the antidegradation analysis (Appendix A) prepared for the proposed project.

Criteria for Determining Significance

The criteria used to determine the significance of an impact related to hydrology and water quality are based on Appendix G of the State CEQA Guidelines. The proposed project would result in a significant impact if it would:

- Violate any water quality standards or waste discharge requirements.
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted).
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site.
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
- Otherwise substantially degrade water quality.
- Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows.
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.
- Contribute to inundation by seiche, tsunami, or mudflow.

The lead agency (City) has determined that the September 2011 DEIR (including the analysis found in the proposed project's NOP/IS, which was appended to the September 2011 DEIR) adequately discloses the impacts of the proposed project for the environmental issue areas listed below. Therefore, those issue areas are not discussed in this recirculated DEIR section.

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted).
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site.
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
- Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows.
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.
- Contribute to inundation by seiche, tsunami, or mudflow.

The lead agency has determined that, based on the significant new information, as defined by State CEQA Guidelines Section 15088.5, further analysis of the following environmental issue areas is warranted in this recirculated DEIR section:

- Violate any water quality standards or waste discharge requirements.
- Otherwise substantially degrade water quality.

Impacts and Mitigation Measures

Impact HYD-1: Violate any water quality standards or waste discharge requirements (less than significant)

With the cessation of discharges into Mill Creek as part of the proposed project, the WCP would no longer require a NPDES permit from the Central Valley RWQCB to be issued. The WCP would continue to operate under a WDR permit. Because of the proposed treatment processes, the project is not expected to violate any WDR. This issue is not addressed further in this recirculated DEIR.

As discussed in the *Environmental Setting*, above, of the 26 constituents that occur in groundwater and could be found in the proposed project's effluent, four are considered constituents of concern: chloride, EC, sodium, and TDS. The antidegradation analysis modeled the proposed project's effect on the concentration of these constituents in the groundwater that underlies the recycled water use area. The modeling assumed that, at the current effluent production rate of 13 mgd at the WCP,

there would be an increase in effluent production of 2.5% per year over the next 20 years, for a maximum permitted effluent production rate of almost 21 mgd by 2025. The rate of increase in effluent production, 2.5% per year, is based on the projected rate of increase found in the *Visalia Water Conservation Plant 2008 Master Plan* (Carollo Engineers 2008). A 20-year timeframe was used because it matches the proposed length of the water exchange agreement. The modeling also assumed that within the recycled water use area, recycled water would be applied to basins and use areas totaling approximately 10,100 acres. Table 3B-4 provides the results of this modeling.

Table 3B-4. Modeled Concentration of Groundwater Constituents of Concern as a Result of the Proposed Project

Constituent	Current Concentration	Modeled Concentration[1,2,3]	Groundwater Quality Objective/Guideline	Could Degradation Occur?/Will Beneficial Use Be Affected?
Chloride	22 mg/L	76 mg/L	106 mg/L	No/No
Electrical Conductivity	510 µmhos/cm	553 µmhos/cm	Average annual increase less than 3 µmhos/cm averaged over a 5-year period or 700 µmhos/cm	**Yes**/No
Sodium	NS	67 mg/L	69 mg/L	No/No
Total Dissolved Solids	NS	420 mg/L	450 mg/L	No/No

Source: Appendix A.

[1] As an average throughout the recycled water use area.

[2] Concentrations in the recycled water may decrease when the process changes to ultraviolet disinfection, but credit was not taken for these reductions in the analysis.

[3] The values are the maximum amount at the end of the 20-year modeling period.

Key

cm = centimeter

L = liter

mg = milligram

NS = not sampled

µmhos = micromhos

It was determined that the proposed project would not contribute to constituent concentrations of chloride, sodium, or TDS that would be in excess of the groundwater quality objectives outlined in the Basin Plan or the agricultural guidelines over the 20-year modeling period. The proposed project would not cause groundwater degradation or affect beneficial uses. Therefore, no further discussion is required for these constituents. However, preliminary analysis could not eliminate from further consideration the possibility that increased EC levels as a result of the proposed project could degrade groundwater quality beneath the recycled water use area. The Porter-Cologne Act recognizes that "it may be possible for the quality of water to be changed to some degree without unreasonably affecting beneficial uses." Additionally, the Basin Plan acknowledges that "no proven means exist at present time that will allow ongoing human activity in the basin and maintain groundwater salinity at current levels throughout the basin. Accordingly, the water quality objectives for groundwater salinity control the rate of increase."

The antidegradation analysis went on to model in greater detail the effects of the proposed project on groundwater EC levels within the recycled water use area over a 20-year period. Table 3B-5 provides the results of this modeling.

Table 3B-5. 20-Year Modeled Concentration of Electrical Conductivity as a Result of the Proposed Project

Year	Projected Volume of Recycled Water Produced (mgd)	Modeled Groundwater Concentration (µmhos/cm)	Annual Increase (µmhos/cm)
1	13.0	513.3	3.3
2	13.3	516.6	3.1
3	13.7	519.3	2.9
4	14.0	522.1	2.8
5	14.3	524.7	2.6
		5-year Average	**2.9**
6	14.7	527.2	2.5
7	15.1	529.5	2.3
8	15.5	531.8	2.3
9	15.8	534.0	2.2
10	16.2	536.0	2.0
		5-year Average	**2.3**
11	16.6	538.0	2.0
12	17.1	539.9	1.9
13	17.5	541.7	1.8
14	17.9	543.5	1.8
15	18.4	545.2	1.7
		5-year Average	**1.8**
16	18.8	546.8	1.6
17	19.3	548.4	1.6
18	19.8	549.9	1.5
19	20.3	551.4	1.5
20	20.8	552.9	1.5
		5-year Average	**1.5**
		20-year Average	**2.1**

Source: Appendix A.
Key
mgd = million gallons per day
µmhos = micromhos

As shown in Table 3B-5, over the 20-year modeling period, the proposed project would result in an annual increase in EC levels of less than 3 µmhos/cm when averaged over a 5-year period. This averaged annual increase in EC levels would be less than that of the groundwater quality objective found in the Basin Plan (i.e., a maximum annual increase of 3 µmhos/cm averaged over a 5-year period). Additionally, the modeled EC levels for groundwater that would underlie the recycled water use area after 20 years would be about 553 µmhos/cm, which is less than the 700 µmhos/cm value found in the agricultural guidelines. Therefore, the proposed project would not violate the groundwater quality standards for EC found in the Basin Plan or the agricultural guidelines.

SWRCB's Recycled Water Policy says that "the Regional Water Boards shall, absent unusual circumstances…permit recycled water projects that meet the criteria set forth in this policy…" The Recycled Water Policy also says that "When used in compliance with this policy, Title 22, and all applicable state and federal water quality laws, the State Water Board finds that recycled water is safe for approved uses and strongly supports recycled water as a safe alternative to potable water for such approved uses."

Because the proposed project would not significantly affect existing or potential future beneficial uses of the receiving groundwater over the long term, the proposed project would be in compliance with SWRCB Resolution No. 68-16 as well as the Recycled Water Policy. Also, the proposed project would treat influent received at the plant to Title 22 standards.

In light of the aforementioned policies, it can be concluded that the proposed project would not violate federal or state antidegradation policies or any groundwater quality standards. As a result, the proposed project's impact on groundwater quality is considered less than significant.

Impact HYD-2: Otherwise substantially degrade water quality (less than significant)

As discussed in Impact HYD-1, it can be concluded that the proposed project would not violate federal or state antidegradation policies or any groundwater quality standards. As a result, the proposed project's potential to degrade groundwater quality substantially is considered less than significant.

Section 3C
Population and Housing

As discussed in Chapter 1, *Introduction*, and allowed by State CEQA Guidelines Section 15088.5(c), this section is limited to a new analysis of the proposed water exchange agreement (Appendix B) and the potential for the new source of surface water as a result of the agreement to induce growth.

The previously circulated DEIR for the proposed project (herein referred to as the September 2011 DEIR) provides additional information about the environmental and regulatory setting for the proposed project related to population and housing. It also provides an impact analysis for the proposed project, describing whether the proposed project would displace existing housing or a substantial number of people, necessitating the construction of replacement housing elsewhere, as well as construction-related impacts and direct impacts (e.g., construction of housing) that could foster growth. It has been determined by the City that the September 2011 DEIR adequately describes the setting and impacts of the proposed project related to these issues and provides reasonable and feasible mitigation, as necessary, to reduce such impacts to the greatest extent practicable. Therefore, these issues are not addressed further in this recirculated DEIR section.

Environmental Setting

This section is limited to the existing conditions related to population growth in the study area. Although portions of the proposed project would be located in an unincorporated area of Tulare County, the upgraded WCP would serve primarily the current and future population within the city limits of Visalia. As such, the following discussion pertains to existing population and housing conditions in Visalia.

Visalia's most recent population estimates are included in the *Visalia General Plan Update: Existing Conditions Report,* which was prepared by Dyett & Bhatia in 2010 as a component of the City's general plan update, the preparation of which is currently in progress. According to the report, the City had an annual population-growth rate of 2% between 2000 and 2009. Table 3C-1 provides additional information about annual population growth in Tulare County and elsewhere during the timeframe.

Table 3C-1. Annual Population Growth (2000–2009)

Location	2000 Population	2009 Population	Annual Growth (%)
Tulare County	369,873	441,481	2.0
Fresno County	804,508	942,298	1.8
Kern County	665,519	827,173	2.4
Kings County	130,202	154,743	1.9
California	34,105,437	38,292,687	1.3

Source: Dyett & Bhatia 2010.

The City of Visalia's 2010 population of 124,440 represents a 36% increase over its 2000 population of 91,565—an annual growth rate of 3.1% (City of Visalia 2012). The latest City general plan update states that the future approved City general plan expects to accommodate a population of

approximately 209,600 in the City by 2030 (the proposed planning horizon for the upcoming general plan), which represents an annual population growth rate of 2.6% for the City through 2030 (City of Visalia 2012).

Regulatory Setting

This section is limited to discussing regulations applicable to local population growth.

Local Regulations

City of Visalia General Plan

As noted above, the City is currently updating its general plan. Relevant portions of the existing City general plan related to population growth (e.g., the Land Use Element [adopted in 1996]) are provided below. The City's Housing Element was adopted in March 2010, and its relevant goals and policies are also listed below.

Land Use Element (1996)

GOAL 4: Provide a Viable Range of Housing Alternatives in the Visalia Planning Area

4.1 Residential Land Development and Land Use

Objective A – Ensure adequate land area is available for future housing needs.

Objective D – Provide new residential areas that offer a variety of housing densities, types, sizes, costs, and locations to meet projected demand throughout the community.

GOAL 6: Manage Planning Area Growth to Be Contiguous and Concentric from the City's Core Area

6.1 Urban Boundaries

Objective A – Implement and periodically update a growth management system that will:

1. Guide the timing, type, and location of growth.
2. Preserve resource lands.
3. Protect natural features and open space.
4. Encourage techniques that encourage energy conservation.

Impact Analysis

This section describes the impact analysis related to the proposed project's potential to induce population growth. It discusses the methods that were used to determine the population-growth impacts of the proposed project and lists the thresholds that were used to conclude if a population-growth impact would be significant. Mitigation measures are recommended to address (i.e., avoid, minimize, rectify, reduce, eliminate, compensate for) significant impacts.

Methods

To conduct this analysis, the City's general plan (City of Visalia 1996) and the *Visalia General Plan Update: Existing Conditions Report* (Dyett & Bhatia 2010) were consulted. The proposed project was then assessed qualitatively to determine if it would contribute to growth inducement and related significant physical environmental impacts.

Criteria for Determining Significance

The criteria used to determine the significance of an impact related to population and housing are based on Appendix G of the State CEQA Guidelines. The proposed project would result in a significant impact if it would result in one or more of the following:

- Induce substantial growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure).
- Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere.
- Displace a substantial number of people, necessitating the construction of replacement housing elsewhere.

The lead agency (City) has determined that the September 2011 DEIR (including analysis found in the proposed project's NOP/IS, which was appended to the September 2011 DEIR) adequately discloses the impacts for the proposed project for the following environmental issue areas; therefore, these issue areas are not discussed in this recirculated DEIR section:

- Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere.
- Displace a substantial number of people, necessitating the construction of replacement housing elsewhere.

The lead agency has determined that, based on significant new information as defined by State CEQA Guidelines Section 15088.5, further analysis of this environmental issue area is warranted in this recirculated DEIR section:

- Induce substantial growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure).

Impacts and Mitigation Measures

Impact POP-1: Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through the extension of roads or other infrastructure) (less than significant)

The following analysis is limited to whether the proposed water exchange agreement (Appendix B) would indirectly induce population growth during operations. The City has determined that the September 2011 DEIR adequately discloses the proposed project's potential to result in construction-related growth impacts or directly induce growth. Therefore, these growth-related issues are not further discussed in this recirculated DEIR.

The proposed water exchange agreement between the City and TID, if formally adopted, would provide the City with an average minimum of 5,500 af per year of surface water for groundwater recharge purposes and an average minimum 11,000 af per year of recycled water to TID for agricultural irrigation activities (Appendix B). It is important to note that the City could receive no water for a year or a number of years and then receive a large amount of water during a year, most likely associated with a wet year. This is because the City is proposing to exchange recycled water for Class 2 entitlement water, which is not available every year. It is likely that the City would receive large volumes of water during wet years that average out to the minimum 5,500 af per year of surface water over the duration of the proposed water exchange agreement. At the end of the 20-year period starting after the construction of the proposed WCP, it is anticipated that the City would receive an average maximum of 8,800 af per year[1] of surface water, and TID would receive an average maximum of 17,600 af per year[2] of recycled water. These maximums assume a 2.5% annual increase in recycled water production at the WCP over a 20-year period. The 20-year period was chosen because it is the proposed length of the water exchange agreement. The 2.5% annual increase in recycled water production at the WCP is also from this analysis and was chosen because it is the projected rate of increase found in the *Visalia Water Conservation Plant 2008 Master Plan* (Carollo Engineers 2008).

Because TID would receive recycled water that is sufficient for agricultural irrigation, but not for potable use, the recycled water provided through the proposed water exchange to TID would not induce population growth by providing a new source of potable water.

The 5,500 to 8,800 af average per year of surface water provided to the City through the proposed water exchange over the 20-year period would be predominantly conveyed to facilities east of Visalia for groundwater recharge purposes. The purpose of the additional surface water supply is to recharge groundwater in the aquifer under the City. Potable water demand for the City has steadily increased, as has agricultural water usage, resulting in a slow and sustained overdraft of the regional aquifer.

The surface water received by the City is proposed to be conveyed to facilities east of the City to recharge the aquifer beneath the City. The City proposes to convey the surface water to the eastside because groundwater flow goes from east to west under the City, and the City wants to retain as much of the recharged water as possible underneath the City. It is assumed that some of the surface water used for groundwater recharge would eventually be pumped back up, treated, and then used as potable water for the benefit of the City and its residents. The proposed water exchange's primary function is to help alleviate the groundwater overdraft condition that currently exists in the Visalia area. According to the *California Water Service Company, 2010 Urban Water Management Plan, Visalia District* (California Water Company 2011), groundwater is currently the sole source of available potable water for the City, and it is projected that groundwater supplies would be adequate to meet all projected demands beyond 2040, based on the adopted general plan, although groundwater levels would continue to decline.

[1] A total of 5,500 af per year surface water/13.0 million gallons per day (mgd) recycled water at year 1 = *X* af per year surface water/20.8 mgd recycled water at year 20. Solved for *X*.

[2] A total of 11,000 af per year recycled water/13.0 mgd recycled water at year 1 = *X* af per year recycled water/ 20.8 mgd recycled water at year 20. Solved for *X.*

The Urban Water Management Plan (UWMP) goes on to acknowledge that the ultimate reliability of the water supply for the Visalia District, which includes the City, is a function of the long-term balance between aquifer replenishment and groundwater extraction. The UWMP also mentions the possibility of the WCP providing recycled water, which would increase recharge in the Visalia area thus improving local water balance. The UWMP goes on to state that in order to achieve a long-term balanced groundwater condition, the UWMP modeled that a reduction and/or augmentation of about 11,000 af per year of water pumping would be needed to bring the Visalia area's groundwater levels back into balance. It is important to point out that this estimate is based on assumptions with inherently large uncertainties due to unknowns like groundwater losses due to migration within the aquifer, etc. Additionally, this estimate was only for the purpose of estimating the amount of overdraft attributable to municipal pumping. Approximately 95% of pumping from the aquifer is for agricultural and other uses, and, even if the City is brought into balance, the aquifer would remain in a significant state of overdraft and the water table would continue to decline.

As discussed above, the proposed water exchange agreement would provide an average of between 5,500 and 8,800 af per year of surface water for groundwater recharge activities. The UWMP has pointed to recycled water use as well as other management activities, such as increased conservation, augmented artificial recharge, other exchanges and transfers, and surface water acquisition, to aid in the 11,000 af per year reduction and/or augmentation necessary to achieve groundwater balance. But, as discussed above, this estimate is based on assumptions with inherently large uncertainties due to unknowns like groundwater losses due to migration within the aquifer, etc.

The City has determined that the proposed water exchange would not induce growth. Rather, it would help to alleviate the overdraft condition that currently exists within the Visalia area. As discussed in the UWMP, continued pumping without development of new water sources and/or significant reductions in water use would contribute to the ongoing regional overdraft, which is unsustainable in a long-term undefined future (beyond 2040). The proposed water exchange helps to make the long-term groundwater balance more sustainable.

The City has determined that the proposed water exchange agreement would not remove a barrier to growth (i.e., provide additional potable water supplies). Therefore, the proposed water exchange agreement would not indirectly induce substantial population growth in the Visalia area. Impacts would be less than significant.

Chapter 4
Cumulative Impacts

Introduction and Overview

The State CEQA Guidelines (Section 15130) require cumulative impacts to be analyzed in an EIR when the resulting impacts are cumulatively considerable and, therefore, potentially significant. The term *cumulative impacts* refers to the combined effect of project impacts with the impacts of other past, present, and reasonably foreseeable future projects. The discussion of cumulative impacts must reflect the severity of the impacts as well as the likelihood of their occurrence. However, the discussion does not need to be as detailed as the discussion of environmental impacts attributable to the proposed project alone. Furthermore, the discussion should remain practical and reasonable in considering other projects and related cumulatively considerable impacts.

According to Section 15355 of the State CEQA Guidelines:

> "Cumulative impacts" refers to two or more individual effects that, when considered together, are considerable or compound or increase other environmental impacts.
>
> (a) The individual effects may be changes resulting from a single project or a number of separate projects.
>
> (b) The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

Furthermore, according to State CEQA Guidelines Section 15130 (a)(1):

> As defined in Section 15355, a "cumulative impact" consists of an impact that is created as a result of the combination of the project evaluated in the EIR together with other projects, causing related impacts. An EIR should not discuss impacts that do not result in part from the project evaluated in the EIR.

In addition, as stated in the State CEQA Guidelines, Section 15064(i)(5), it should be noted that:

> The mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable.

Therefore, the cumulative impacts discussion in an EIR focuses on whether the impacts of the proposed project are cumulatively considerable within the context of combined impacts caused by other past, present, or future projects. The cumulative impact scenario considers other projects proposed within the area that have the potential to contribute to cumulatively considerable impacts.

As previously stated and as set forth in the State CEQA Guidelines, "related projects" consist of closely related past, present, and reasonable foreseeable probable future projects that will contribute to the same impact and be located in the same geographic area (CCR, Title 14, Division 6, Chapter 3, Section 15355).

This chapter discusses cumulative impacts associated with the proposed project and the "significant new information" described in Chapter 1, *Introduction*. The significant new information discussed in this recirculated DEIR is summarized as follows:

- New analysis regarding downstream effects on riparian habitat and wildlife, including special-status species, resulting from the proposed project ceasing discharges into Mill Creek (see Section 3A, *Biological Resources*);
- New analysis regarding the proposed project's effect on local groundwater quality (see Section 3B, *Hydrology and Water Quality*); and
- Changes to the project description involving a proposed water exchange agreement between the City and TID (see Chapter 2, *Project Description*, and Section 3C, *Population and Housing*).

It is important to note that the proposed water exchange agreement discusses "new delivery facilities" that would facilitate implementation of the proposed agreement. These are described as "new facilities to divert CVP surface water from the TID main into the St. Johns River, the TIC canal, and the Lower Kaweah River (Mill and Packwood Creeks)." Because the size, scope, and location of these required new facilities were unknown at the time of the public review of this recirculated DEIR, it is premature and speculative to include them in this analysis. When these new delivery facilities are sited and designed, compliance with CEQA and, if necessary, NEPA will be ascertained prior to the development.

Cumulative Impact Assessment Methodology

The significance of a cumulative impact, as well as a project's incremental contribution to a cumulative impact, can be analyzed by using either the project-list or projection approach. This recirculated DEIR uses the projection approach to analyze cumulative impacts, per CCR, Title 14, Division 6, Chapter 3, Section 15130(b)(1)(B). The cumulative impact analysis is based on growth and housing projections for the City, which the City relies on to evaluate regional conditions that contribute to cumulative impacts.

According to the State CEQA Guidelines, the cumulative analysis should provide the following:

> …define the geographic scope of the area affected by the cumulative effect and provide a reasonable explanation for the geographic limitation used [CCR, Title 14, Division 6, Chapter 3, Section 15130(b)(3)].
>
> A summary of expected environmental effects to be produced by [related] projects with specific reference to additional information and where that information is available [CCR, Title 14, Division 6, Chapter 3, Section 15130(b)(4)].
>
> A reasonable analysis of cumulative impacts of the relevant projects. An EIR shall examine reasonable and feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects [CCR, Title 14, Division 6, Chapter 3, Section 15130(b)(5)].

This chapter provides these required components using the projection approach for the cumulative impacts analysis.

Cumulative Baseline and Projected Growth

Unless otherwise stated in the following cumulative impact analysis, the geographic area for this analysis shall be the City and adjacent unincorporated areas outside the City, such as the town of Goshen. According to the *Visalia General Plan Update, Existing Conditions Report* (Dyett & Bhatia 2010), the Visalia area is expected to experience an annual population growth rate of 1.9% and an annual household growth rate of 2.0% between 2010 and 2030. Table 4-1 shows the area's population and household growth projections through 2030 in 5-year increments.

Table 4-1. City of Visalia Area Population and Household Projections (2010–2030)

						2010–2030 Growth		
Item	2010	2015	2020	2025	2030	Total	Percent	Annual Percent
Population	142,079	155,119	174,259	190,900	207,582	65,503	46%	1.9%
Households	50,261	55,111	62,506	68,662	74,855	24,594	49%	2.0%

Note:
Includes adjacent unincorporated areas outside the City (such as Goshen).
Source: Dyett & Bhatia 2010.

The table shows that the Visalia area is growing rapidly, and population and household numbers will increase by 65,503 and 24,594, respectively, between 2010 and 2030. The current general plan shows an annual project growth rate for the City of 2.5% between 2011 and 2020 (City of Visalia 1996).

Although the Visalia area is currently experiencing the same economic downturn as the rest of the nation, it is clear from the projections that the Visalia area will most likely experience robust growth through 2030.

Cumulative Impact Analysis

The following analysis of cumulative impacts is related to the environmental issue areas discussed in the previous DEIR (herein referred to as the September 2011 DEIR). It is assumed that the environmental issue areas that were eliminated from further consideration in the NOP/IS (Appendix A of the September 2011 DEIR) will not contribute to cumulatively considerable impacts. The issue areas eliminated from further consideration in the NOP/IS and, therefore, not discussed in this cumulative analysis are:

- Aesthetics;
- Agriculture and forestry resources;
- Hazards and hazardous materials;
- Land use and planning;
- Mineral resources;
- Public services; and
- Recreation.

The City has determined that the significant new information presented in this recirculated DEIR does not change the cumulative analysis for the environmental issue areas listed below because the proposed water exchange facilities were included in the September 2011 DEIR's analysis. Therefore, the following environmental issue areas will not be discussed further in this cumulative impacts analysis:

- Air quality – The September 2011 DEIR concluded that the proposed project would not contribute to a cumulatively considerable impact.
- Cultural resources – The September 2011 DEIR concluded that the proposed project would not contribute to a cumulatively considerable impact.
- Geology and soils – The September 2011 DEIR concluded that the proposed project would not contribute to a cumulatively considerable impact.
- Greenhouse gas emissions – The September 2011 DEIR concluded that the proposed project would contribute to a cumulatively considerable impact. This significant cumulative impact has already been adequately disclosed in the September 2011 DEIR.
- Noise – The September 2011 DEIR concluded that the proposed project would not contribute to a cumulatively considerable impact.
- Transportation and traffic – The September 2011 DEIR concluded that the proposed project would not contribute to a cumulatively considerable impact.
- Utilities and service systems – The September 2011 DEIR concluded that the proposed project would not contribute to a cumulatively considerable impact.

The City has determined that the significant new information could contribute to a cumulatively considerable impact for the following environmental issue areas: biological resources, hydrology and water quality, and population and housing. This was not disclosed in the September 2011 DEIR.

Biological Resources

The current *City of Visalia General Plan* (City of Visalia 1996) provides data regarding the level of development desired by the City and its citizens within the general plan area. Much like the projections in the proposed general plan update (see above), the current general plan projects an annual growth rate in the City of about 2.5% between 2011 and 2020. With regard to biological resources, the *City of Visalia General Plan* emphasizes the preservation and enhancement of natural features such as waterways and valley oak trees. The general plan discourages development in areas that contain natural features, such as Mill Creek. Therefore, development pressures outlined in the *City of Visalia General Plan* would not be likely to occur within riparian areas.

Special-status wildlife species are present in the project area. The proposed project would not reduce the amount of habitat or cause a loss of habitat because proposed improvements within the WCP fence line would occur in an area that has already been developed for a wastewater treatment plant. Therefore, the on-site baseline condition pertains to an area that is already without suitable habitat for special-status species.

The proposed recycled water conveyance system would be located underground. Any ground disturbed during construction of the system would be returned to its baseline contours and allowed to revegetate. Furthermore, after disturbing the bed and bank of Mill Creek during construction of the system, the bed and bank at the crossings would be restored and revegetated with native

wetland plant species (see Figure 3B-1 in the September 2011 DEIR). In areas downstream of the plant where effluent is currently discharged into Mill Creek, the bed and bank are routinely mowed and dredged for maintenance purposes. The cessation of effluent discharges would not affect wetland or riparian habitats because, as a result of ongoing maintenance activities in this channelized intermittent stream, such habitats are not present.

There is a grove of valley oak trees along the banks of Mill Creek that could be affected by ceasing discharges into Mill Creek. Because valley oak is an upland species and because of the amount of existing irrigation runoff near this grove, it has been concluded that the grove has a sufficient amount of water available without the continuance of flows into Mill Creek. Therefore, the proposed project would not significantly affect this oak grove near Mill Creek (see Section 3A, *Biological Resources*, for more information).

The proposed project and the significant new information would not permanently affect habitats on the ground, and no permanent habitat loss would occur. The project area is small relative to the scale of habitat resources in the Visalia area. It would not affect the cumulative loss of habitat in the area that will occur as a result of future development projects. Therefore, the project and the significant new information would not contribute to a cumulatively considerable impact on biological resources.

Cumulative Impact

The project and the significant new information would not result in a cumulatively considerable contribution to the cumulative biological resources impact.

Hydrology and Water Quality

With regard to groundwater, the *City of Visalia General Plan* states that groundwater supply and quality are adequate throughout the planning area, even with the development pressures outlined in the general plan. However, the current *City of Visalia General Plan* is from 1996. It is now known that the aquifer that underlies the City is in an overdraft condition. According to the *California Water Service Company, 2010 Urban Water Management Plan, Visalia District* (California Water Service Company 2011), groundwater is currently the sole source of potable water available to the City. It is projected that groundwater supplies will be adequate and able to meet all projected demands beyond 2040, based on data from the adopted general plan, although groundwater levels will continue to decline.

Development patterns associated with other projects in the Visalia area, as illustrated by the Visalia and Tulare County general plans, could alter drainage patterns in the region. The majority of the future projects would occur on existing vacant land or agricultural land. Such land allows stormwater and irrigation water to percolate into the ground or run off into drainage sumps and nearby canals. Implementation of other projects may not necessarily affect surface waters because few exist in the area, but the possibility still exists that other projects could affect surface waters, similar to the proposed project's effect on Mill Creek downstream of the plant. In addition, future projects could include hardscape areas (e.g., parking lots, building pads, concrete walkways) that could increase runoff and decrease percolation. However, similar to the proposed project, the other future projects would be required to implement a Stormwater Pollution Prevention Plan (SWPPP), thereby ensuring that they would not affect the quality of surface water or groundwater or cause erosion on- or off-site during their respective construction periods. Furthermore, during the operational period for the other

projects, the City and other municipalities would require and approve drainage designs for the capture and discharge of stormwater from the various project sites. Such designs would inhibit flooding and erosion on- and off-site. Other future projects in the area would be required to convey stormwater to retention facilities or other facilities, either developed as part of a project or already existing. The stormwater would most likely percolate back into the aquifer.

Future projects may also increase the amount of urban pollutants, which could ultimately affect surface water and groundwater. Urban uses are associated with a number of stormwater pollutants, such as grease, oil, rubber, silt, pesticides, fertilizers, and general debris. As part of the new development projects, these types of uses would be subject to the stringent requirements of the CWA, which are implemented by the City through its Stormwater Management Plan, Water Conservation Ordinance, and Engineering Division. Other municipalities in the area would have similar requirements. Water quality standards are achieved through the implementation of best management practices (BMPs) during design, construction, and post-construction operations. The proposed project as well as other projects would be subject to these requirements, which would reduce stormwater and water quality impacts to levels that would be less than cumulatively considerable during both construction and operation.

An antidegradation analysis (Appendix A) was prepared to determine if the proposed project would have a significant adverse effect on groundwater quality below the recycled water use area.[1] The analysis modeled 26 constituents that could be present in the plant's effluent as a result of the proposed project. It was determined that the proposed project and the significant new information would not significantly affect groundwater quality for any of the constituents over a 20-year period. In particular, EC levels in the groundwater as a result of the proposed project would not significantly affect beneficial uses for groundwater (i.e., agricultural uses). EC was the only constituent of concern in the analysis with the potential to degrade groundwater quality significantly. However, the overall EC impact would not result in an exceedance of any water quality objective. Therefore, the proposed project would not contribute to a cumulatively considerable groundwater quality impact.

Because the project would allow treated effluent to percolate into the ground from two basins, a park, existing farmland, and a golf course and because the Kaweah River watershed in the Visalia area is a contained basin, the proposed project would not result in a net deficit in aquifer volume within the regional Kaweah River Hydrologic Unit (No. 558.10). However, the proposed project would alter local groundwater levels within the basin because current effluent discharges into Mill Creek downstream of the plant would cease. This effluent would instead be conveyed through the proposed recycled water conveyance system to other areas within the basin (i.e., the two basins, park, farmland, golf course). The result would be a lowering of the local groundwater table downstream of the plant, with the level rising in other areas of the basin. Therefore, the project would contribute to a cumulatively considerable impact on local groundwater levels.

Cumulative Impact

The project and the significant new information would result in a cumulatively considerable contribution to a localized cumulative hydrology impact.

[1] Includes Plaza Park, Valley Oaks Golf Course, City farmland, Ponds 2 and 3 at the WCP, City-owned Basin No. 4, and the TID use area.

Population and Housing

The current *City of Visalia General Plan* (City of Visalia 1996) provides data regarding the level of development desired by the City and its citizens within the general plan area. Much like the projections in the proposed general plan update (see above), the current general plan projects an annual growth rate in the City of about 2.5% between 2011 and 2020.

It is not expected that a substantial number of construction workers would relocate permanently to the area surrounding the project site. However, given the vacancy rate in the county, if temporary housing is needed, it is expected that the cities of Visalia, Corcoran, Tulare, and Hanford would be able to provide adequate accommodations. Therefore, construction of the proposed project would not directly induce population growth. During the operational period, the project would not require additional employees, and the current capacity of the plant would not increase. Therefore, operation of the proposed project would not directly induce population growth.

Surface water received by the City would be conveyed to facilities to the east to recharge the aquifer beneath the City. The City proposes conveying surface water to the eastside because groundwater flow travels from east to west, and the City wants to retain as much of the recharged water as possible. It is assumed that some of the surface water for groundwater recharge would eventually be pumped back up, treated, and then used as potable water for the benefit of the City and its residents. Therefore, the primary function of the proposed water exchange would be to help alleviate the groundwater overdraft condition that currently exists in the Visalia area. According to the UWMP, groundwater is currently the sole source of potable water available to the City. It is projected that groundwater supplies will be adequate and able to meet all projected demands beyond 2040, based on data from the adopted general plan, although groundwater levels will continue to decline.

The UWMP goes on to acknowledge that the ultimate reliability of the water supply for the Visalia District, which includes the City, is a function of the long-term balance between aquifer replenishment and groundwater extraction. The UWMP also mentions the possibility of the WCP providing recycled water, which would increase recharge in the Visalia area, thus improving the local water balance. The UWMP goes on to say that a reduction and/or augmentation in pumping of about 11,000 af per year would be needed to bring the Visalia area's groundwater levels back into balance for the long term. It is important to point out that this estimate is based on assumptions with inherently large uncertainties because of certain unknowns (e.g., groundwater losses due to migration within the aquifer). Additionally, this estimate was only for the purpose of estimating the amount of overdraft attributable to municipal pumping. Approximately 95% of pumping from the aquifer is for agricultural and other uses. Even if the City is brought into balance, the aquifer would remain in a significant state of overdraft, and the water table would continue to decline.

The proposed water exchange agreement would provide an average of between 5,500 and 8,800 af of surface water per year for groundwater recharge. The UWMP points to recycled water use as well as other management activities, such as increased conservation, augmented artificial recharge, other exchanges and transfers, and surface water acquisition, to reach the 11,000-acre-feet-per-year reduction and/or augmentation necessary to achieve groundwater balance. But, as discussed above, this estimate is based on assumptions with inherently large uncertainties because of certain unknowns (e.g., groundwater losses due to migration within the aquifer).

The City has determined that the proposed water exchange would not induce growth. Rather, it would help to alleviate the overdraft condition that currently exists in the Visalia area. As discussed in the UWMP, continued pumping without development of new water sources and/or significant reductions in water use would contribute to the ongoing regional overdraft, which is unsustainable in a long-term undefined future (beyond 2040).

The proposed water exchange would help to make the long-term groundwater balance more sustainable. Similarly, because the proposed project, with the inclusion of the proposed water exchange agreement, would not result in a significant and unavoidable project-level growth impact, it is concluded that the proposed project, with the agreement, would not contribute to a cumulatively considerable growth-inducing impact.

Cumulative Impact

The project and the significant new information would not result in a cumulatively considerable contribution to a cumulative population and housing impact.

Chapter 5
Alternatives Analysis

Introduction

CEQA requires an EIR to identify and evaluate a reasonable range of alternatives to a project that could feasibly avoid or lessen any significant environmental impacts while substantially achieving the basic objectives of the project. An EIR should also evaluate the comparative merits of the alternatives. It has been determined by the City that the previous DEIR (herein referred to as the September 2011 DEIR) adequately described the alternatives to the proposed project that were considered, identified alternatives that were eliminated from further consideration and the reasons for their rejection, and compared the potential impacts of several of the alternatives with the potential environmental impacts associated with the proposed project.

This chapter is limited to considering the potential impacts of the alternatives that were considered in light of the "significant new information" described in Chapter 1, *Introduction*. In summary, the significant new information discussed in this recirculated DEIR is as follows:

- New analysis about downstream effects on riparian habitat and wildlife, including special-status species, as a result of the proposed project ceasing discharges into Mill Creek (see Section 3A, *Biological Resources*);
- New analysis regarding the proposed project's effect on local groundwater quality (see Section 3B, *Hydrology and Water Quality*); and
- Changes to the project description involving a proposed water exchange agreement between the City and the TID (see Chapter 2, *Project Description*, and Section 3C, *Population and Housing*).

The significant new information does not necessitate examination of a new alternative because there is no alternative that has not already been considered or analyzed in the September 2011 DEIR or this recirculated DEIR that would reduce impacts related to the significant new information. The City has determined that the alternatives already considered and analyzed in the September 2011 DEIR and this recirculated DEIR represent a reasonable range of alternatives per CEQA.

It is important to note that the proposed water exchange agreement discusses "new delivery facilities" that would facilitate implementation of the proposed agreement. These are described as "new facilities to divert CVP surface water from the TID main into the St. Johns River, the TIC canal, and the Lower Kaweah River (Mill Creek)." Because the size, scope, and location of these required new facilities were unknown at the time of public review of this recirculated DEIR, it is premature and speculative to include them in this alternatives analysis. When these new delivery facilities are sited and designed, compliance with CEQA and, if necessary, NEPA will be ascertained prior to development.

Relationship to Project Objectives

The objectives of the proposed project are as follows:

- To continue to provide for the wastewater treatment requirements of residences, businesses, and industries within the City's service area up to an average daily flow of 22 mgd.

- To remove wastewater constituents, such as BOD, suspended solids, nitrogen, and waterborne bacteria and viruses, to a greater extent, thereby improving subsurface water quality in the receiving groundwater basin relative to current conditions.
- To provide the initial infrastructure to treat influent wastewater to Title 22 standards and convey the recycled water for irrigation and other purposes.
- To provide a basic level of odor control to reduce the potential for unpleasant odors to be emitted from the plant property.
- To provide treated effluent to Title 22 standards for possible water exchanges with public and/or private entities for surface water.

Alternatives Previously Analyzed

During the preparation of the September 2011 DEIR, the City analyzed two alternatives for the proposed project. This recirculated DEIR will also consider these alternatives. The goal of this alternatives analysis is to identify other means for achieving the project's objectives while lessening or avoiding potentially significant environmental impacts caused by the proposed project in light of the significant new information.

The following alternatives were identified and analyzed by the City in the September 2011 DEIR:

- Alternative 1—No-Project Alternative.
- Alternative 2—No Recycled Water Conveyance System Alternative.

These alternatives are described below.

Alternative 1—No-Project Alternative

Section 15126.6(e) of the State CEQA Guidelines requires the analysis of a no-project alternative. This no-project analysis must discuss the existing conditions as well as what would reasonably be expected to occur in the foreseeable future if the proposed project is not approved.

If the proposed project is not approved, baseline conditions at the plant would persist. This means that the plant would continue to operate with its existing technology, at the same capacity, and with the same water quality standards. Treated effluent would continue to be discharged into Mill Creek. The proposed water exchange would not be possible because a conveyance system would not be built, and the influent would not be treated to Title 22 standards. Under Title 22 standards, recycled water pipelines, which would be required to move the recycled water to existing TID facilities, would not be allowed.

The City would still be required to obtain and be in compliance with a NPDES permit, and it would still be subject to WDRs because of discharges into Mill Creek, a water of the United States. Whether the proposed project is approved or not, the City will need to cease discharges into Mill Creek or improve the treatment of effluent as part of future water quality requirements mandated by the Central Valley RWQCB. Therefore, under the No-Project Alternative, the City would most likely end up violating future water quality requirements or have to find an alternative way to discharge effluent that does not include discharging in Mill Creek. The No-Project Alternative does not provide an alternative way to discharge effluent and be compliant with future water quality requirements.

The *Analysis of Alternatives Considered* section, below, provides a discussion of this alternative's potential environmental impacts in comparison with the proposed project.

Alternative 2—No Recycled Water Conveyance System Alternative

Alternative 2 includes all of the proposed improvements to the plant (e.g., the installation of MBR technology and construction of a new administration building, odor control facilities, a new entrance, a solar facility), but the proposed recycled water conveyance system would not be built. Instead, treated effluent would continue to be discharged into Mill Creek but now to Title 22 standards. The proposed water exchange between the City and TID would not occur, and other possible future water exchanges would most likely not occur because a conveyance system would not be available to facilitate the efficient delivery of recycled water in exchange for surface water.

The City would still be required to obtain and be in compliance with a NPDES permit, and it would still be subject to WDRs because of discharges into Mill Creek, a water of the United States. Whether the proposed project is approved or not, the City will need to cease discharges into Mill Creek or improve the treatment of effluent as part of future water quality requirements mandated by the Central Valley RWQCB. Plant improvements related to treating influent to Title 22 standards would most likely satisfy the Central Valley RWQCB's requirement to improve the treatment of effluent. Under Alternative 2, the City would not be expected to violate future water quality requirements.

Initial screening of this alternative in the September 2011 DEIR failed to eliminate it from further consideration because it meets most the of the project objectives and, when compared with the proposed project, may reduce impacts. Therefore, this alternative is being analyzed further in this recirculated DEIR.

The *Analysis of Alternatives Considered* section, below, provides a discussion of this alternative's potential environmental impacts in comparison with the proposed project.

Analysis of Alternatives Considered

In accordance with the State CEQA Guidelines (Section 15126.6[d]), the discussion of the environmental impacts of the alternatives may be less detailed than the discussion of the impacts of the proposed project and the significant new information. The analysis provided below and summarized in Table 5-1 (at the end of the chapter) compares the impacts of the alternatives with those of the proposed project and the significant new information. Impacts related to aesthetics, agriculture and forestry, hazards and hazardous materials, land use and planning, mineral resources, public services, and recreation were not considered because these environmental issue areas were scoped out in the NOP/IS (see Appendix A of the September 2011 DEIR). Therefore, they will not be discussed in the following alternatives analysis.

The issue areas to be discussed in the alternatives analysis for Alternative 1 (No-Project Alternative) and Alternative 2 (No Recycled Water Conveyance System Alternative) are air quality, biological resources, cultural resources, geology and soils, greenhouse gas emissions, hydrology and water quality, noise, population and housing, transportation and traffic, and utilities and service systems.

Alternative 1—No-Project Alternative

The following is an analysis of Alternative 1's environmental impacts compared with those of the proposed project and the significant new information.

Air Quality

Under the No-Project Alternative, construction would not occur. Therefore, there would be no construction-related air quality impacts (i.e., emissions from the transport of material or the use of equipment during construction of plant improvements and the placement of the underground recycled water conveyance system). Under the proposed project, there would be a modest increase in operational emissions related to energy needs (i.e., energy to pump the recycled water and move it through the conveyance system) compared with the baseline, but there would also be an air emissions offset from the proposed solar facility at the plant. Nonetheless, Alternative 1 would most likely result in fewer operational air quality emissions than the proposed project.

As discussed in the September 2011 DEIR, the project would be required to be in compliance with San Joaquin Valley Air Pollution Control District guidance and the applicable air quality plan. Therefore, neither the project nor this alternative would conflict with, or obstruct implementation of, the air quality plan, and both would have a similar impact. However, Alternative 1 does not include the proposed odor control facilities. Therefore, this alternative has a greater odor impact than that of the proposed project.

The proposed water exchange agreement would require energy to convey recycled water to the City's golf course and park, but recycled water conveyed to TID under the proposed water exchange agreement would move under gravity flow and, therefore, would not require additional energy. Likewise, surface water conveyed as part of the proposed exchange would also move under gravity flow, though it is possible that future recharge facilities would require additional energy. Overall, it is assumed that water conveyance under the proposed exchange would cause additional emissions. However, the September 2011 DEIR analysis included construction-related emissions from building the recycled water conveyance facilities needed for the proposed water exchange as well as operational emissions from moving the water. Therefore, the significant new information would not change the proposed project's impact level.

Air quality impacts under this alternative would have less of an impact overall than those of the proposed project and the significant new information. It is important to note that, with mitigation, air quality impacts would be less than significant under the proposed project and the significant new information.

Biological Resources

Under this alternative, construction would not occur. Therefore, there would be no construction-related impacts on San Joaquin kit fox, burrowing owl, Swainson's hawk, migratory birds, or valley oak. This is because no construction-related disturbances would occur that could result in a take of special-status species or valley oaks, which are protected by City ordinance.

During operations, the proposed project would have no impact on special-status wildlife because the proposed improvements would be within the plant's existing fence line, an area where special-status wildlife species are already precluded. Furthermore, operation of the underground recycled water conveyance system would not affect wildlife because the ground surface would still be available to

special-status species. Alternative 1 would have less of an impact on riparian habitat because it would not require the bed and bank of Mill Creek to be disturbed at the two crossings proposed by the project. This alternative would also not reduce effluent discharges into Mill Creek and thus would not affect downstream riparian habitat. However, it is important to note that this recirculated DEIR concluded that, with mitigation, impacts under the proposed project and the significant new information on downstream riparian habitat and wildlife, including special-status species, would be reduced to a level of less than significant (see Section 3A, *Biological Resources*).

Biological resources impacts under this alternative would have less of an impact overall than those of the proposed project and the significant new information. It is important to note that construction-related and operational biological resources impacts would be less than significant under the proposed project and the significant new information.

Cultural Resources

Under Alternative 1, construction would not occur. Therefore, there would be no cultural resources impacts related to the possibility of unearthing previously unknown archaeological or paleontological resources or human remains during ground disturbance. The September 2011 DEIR concluded that the project would have no operational impacts on cultural resources, and the cultural resources survey determined that the project would have no impact on historic resources. Furthermore, the proposed water exchange would not contribute to an impact on cultural resources that was already disclosed in the September 2011 DEIR because the required facilities for the proposed water exchange were included in the September 2011 DEIR analysis.

Cultural resources impacts under this alternative would have less of an impact overall than those of the proposed project and the significant new information. It is important to note that construction-related cultural resources impacts would be less than significant under the proposed project and the significant new information, and operational cultural resources impacts, with mitigation, would be the same as the baseline under the proposed project and the significant new information.

Geology and Soils

Under the No-Project Alternative, construction would not occur, and the amount of impervious surfaces would not increase. Therefore, there would be no geology and soils impacts from seismically related ground failure, soils erosion, soil instability, or expansive soils during construction or operation of the proposed project. Under this alternative, existing conditions at the site (i.e., very low liquefaction potential, relative stability, lack of expansive soils) would not change. Furthermore, unlike the proposed project, water quality and geologic engineering considerations, such as the preparation of a SWPPP or drainage plan, would not be required. Also, the proposed water exchange would not contribute to an impact on geology and soils that was already disclosed in the September 2011 DEIR because the required facilities for the proposed water exchange were included in the September 2011 DEIR analysis.

Geology and soils impacts under this alternative would have less of an impact overall than those of the proposed project and the significant new information. It is important to note that geology and soils impacts would be less than significant under the proposed project and the significant new information.

Greenhouse Gas Emissions

Under this alternative, construction would not occur. Therefore, there would be no construction-related greenhouse gas (GHG) emissions impacts (i.e., emissions from the transport of material or the use of equipment during the construction of plant improvements and the placement of the underground recycled water conveyance system). Under the proposed project, there would be a modest increase in operational GHG emissions related to energy needs (i.e., energy to pump the recycled water and move it through the conveyance system) compared with the baseline, but there would also be a GHG emissions offset from the proposed solar facility at the plant. Nonetheless, Alternative 1 would most likely result in fewer operational GHG emissions than the proposed project. Furthermore, as discussed in the September 2011 DEIR, the project would be required to be in compliance with applicable plans, policies, or regulations adopted for the purpose of reducing GHG emissions.

Recycled water conveyed to TID under the proposed water exchange agreement would move under gravity flow and, therefore, would not require additional energy. Likewise, surface water conveyed as part of the proposed exchange would also move under gravity flow, though it is possible that future recharge facilities would require additional energy. Overall, it is assumed that water conveyance as part of the proposed exchange would cause additional GHG emissions. However, the September 2011 DEIR analysis included construction-related GHG emissions from building the recycled water conveyance facilities needed for the proposed water exchange as well as operational emissions from moving the water. Therefore, the significant new information would not change the proposed project's level of impact.

GHG emissions impacts under this alternative would have less of an impact overall than those of the proposed project and the significant new information. It is important to note that, with migration, construction-related GHG emissions impacts would be less than significant under the proposed project and the significant new information, and the operational GHG emissions impacts would be the same as the baseline under the proposed project and the significant new information.

Hydrology and Water Quality

Under Alternative 1, construction would not occur, the amount of impervious surfaces would not increase, and treated effluent would continue to be discharged into Mill Creek. As discussed in Section 3F, *Hydrology and Water Quality*, of the September 2011 DEIR, because the project would allow treated effluent to percolate into the ground at the two basins, the park, and the golf course, as well as on existing farmland, and because the Kaweah River watershed is a contained basin, the proposed project would not result in a net deficit in aquifer volume within the Kaweah River Hydrologic Unit (No. 558.10). However, the proposed project would alter local groundwater levels within the basin because effluent would no longer be discharged into Mill Creek downstream of the plant but instead be conveyed through the proposed recycled water conveyance system to other areas within the basin (i.e., the two basins, park, golf course, existing farmland). As a result of the project, the local groundwater table would be lower downstream of the plant and higher in other areas of the basin. Therefore, the project would have a greater impact on local groundwater levels than this alternative but a similar impact on the overall basin.

This alternative would not result in potential hydrology or water quality impacts related to erosion or flooding potential because it would not cause ground disturbance, alter existing drainage patterns, or create additional runoff that would exceed the capacity of an existing or planned

stormwater drainage system. Furthermore, the risk of flooding as a result of dam failure is the same under the existing condition (No-Project Alternative) as it is under the proposed project because, with or without the project, there is a 0.4% annual chance of Fusegate failure at Terminus Dam, which would result in flooding at the existing plant site. Therefore, this alternative and the project would have a similar impact with respect to the exposure of people and structures to dam failure.

The proposed water exchange would result in increased EC levels throughout the local groundwater basin (see Section 3B, *Hydrology and Water Quality*, of this recirculated DEIR). However, the increase in EC would be below the thresholds set by the applicable basin plan and agricultural guidelines, and impacts would be considered less than significant. Other constituent levels, such as nitrates, would decrease in local groundwater basins because of improvements to the plant that would allow influent to be treated to Title 22 standards.

This alternative would have an impact on the regional groundwater table similar to that of the proposed project and the significant new information because, regardless of whether recycled water is conveyed through the proposed water conveyance system and TID's exchanged surface water is conveyed to the eastside of the City (proposed project) or the plant's effluent continues to be discharged into Mill Creek and TID continues to use surface water for existing irrigation purposes (Alternative 1), the same overall amount of effluent and surface water would reach the regional aquifer under both the proposed project and Alternative 1 scenarios.

Hydrology and water quality impacts under this alternative would have an impact similar to that of the proposed project and the significant new information. Project-level and cumulative impacts would be significant and unavoidable under the project scenario as a result of lowering the local groundwater table.

Noise

Under the No-Project Alternative, construction would not occur. Therefore, there would be no construction-related noise or vibration impacts (e.g., noise and vibration from heavy construction equipment). There would be no noise impacts resulting from operation of the proposed project. Furthermore, the proposed water exchange would not contribute to an impact related to noise that was already disclosed in the September 2011 DEIR because the required facilities for the proposed water exchange were included in the September 2011 DEIR analysis.

Noise impacts under this alternative would have less of an impact overall than those of the proposed project and the significant new information. It is important to note that noise impacts would occur under the proposed project and the significant new information, but they would be considered less than significant.

Population and Housing

Similar to the proposed project, this alternative would not directly induce growth by developing housing or businesses, which could foster population growth, or by increasing the capacity of the plant.

Surface water received by the City would be conveyed to facilities to the east to recharge the aquifer beneath the City. The City proposes conveying surface water to the eastside because groundwater flow travels from east to west, and the City wants to retain as much of the recharged water as possible. It is assumed that some of the surface water for groundwater recharge would eventually be

pumped back up, treated, and then used as potable water for the benefit of the City and its residents. Therefore, the primary function of the proposed water exchange would be to help alleviate the groundwater overdraft condition that currently exists in the Visalia area.

The proposed water exchange agreement would provide an average of between 5,500 and 8,800 af of surface water per year for groundwater recharge. The UWMP points to recycled water use as well as other management activities, such as increased conservation, augmented artificial recharge, other exchanges and transfers, and surface water acquisition, to reach the 11,000-acre-feet-per-year reduction and/or augmentation necessary to offset groundwater pumping in the City. However, the vast majority of pumping occurs outside of the City. It is anticipated that the aquifer will remain in a condition of overdraft, and groundwater levels will continue to decline.

The City has determined that the proposed water exchange would not induce growth. Rather, it would help to alleviate the overdraft condition that currently exists in the Visalia area. As discussed in the UWMP, continued pumping without development of new water sources and/or significant reductions in water use would contribute to the ongoing regional overdraft, which is unsustainable in a long-term undefined future (beyond 2040). The proposed water exchange would help to make the long-term groundwater balance more sustainable.

Population and housing impacts under this alternative would have an impact similar to that of the proposed project and the significant new information. It is important to note that population and housing impacts would occur under the proposed project and the significant new information, but they would be considered less than significant.

Transportation and Traffic

Under the No-Project Alternative, construction would not occur. Therefore, there would be no transportation and traffic impacts resulting from commuting workers or the transport of materials to and from the site during construction. As discussed in the September 2011 DEIR, the project would not conflict with an applicable plan, ordinance, or policy that establishes measures of effectiveness related to the performance of the circulation system or an applicable congestion management program. The proposed project would not result in operational transportation and traffic impacts beyond the existing condition because the project would not require additional workers at the plant or additional truck trips. Furthermore, the proposed water exchange would not contribute to an impact on transportation and traffic that was already disclosed in the September 2011 DEIR because the required facilities for the proposed water exchange were included in the September 2011 DEIR analysis.

Transportation and traffic impacts under this alternative would have less of an impact overall than those of the proposed project and the significant new information. It is important to note that transportation and traffic impacts would be less than significant under the project and the significant new information.

Utilities and Service Systems

Unlike the project, significant and unavoidable utilities and service systems impacts would not occur because this alternative would not require or result in the construction of new wastewater treatment facilities, the construction of which could cause significant environmental effects related to hydrology and water quality (project level and cumulative), GHG emissions (cumulative only), and population and housing (project level and cumulative). This alternative would have less

need for the construction and maintenance of stormwater drainage facilities. Therefore, this alternative would result in fewer impacts related to stormwater drainage facilities than the project.

The proposed water exchange would not contribute to an impact on utilities and service systems that was already disclosed in the September 2011 DEIR because the required facilities for the proposed water exchange were included in the September 2011 DEIR analysis. Impacts resulting from construction and operation of these facilities, as well as their contribution to hydrology and water quality, GHG emissions, and population and housing impacts, have already been fully analyzed in the September 2011 DEIR.

Utilities and service system impacts under this alternative would have less of an impact overall than those of the proposed project and the significant new information. It is important to note that utilities and service systems impacts related to the development of wastewater treatment facilities would be significant and unavoidable under the project scenario and in light of the significant new information, but impacts related to the need for new stormwater facilities would be less than significant with mitigation.

Relationship to Project Objectives and Feasibility

Although the No-Project Alternative is feasible, it would not fulfill any of the project objectives. This alternative would also have a greater odor impact because it would not develop odor control facilities. It is important to note that the City has been ordered by the Central Valley RWQCB to either cease discharges into Mill Creek or upgrade the level of treatment at the plant. The No-Project Alternative does not comply with this order and does not provide an alternative way to discharge effluent that does not include discharging in Mill Creek. Therefore, the No-Project Alternative would not comply with the Central Valley RWQCB's order.

Alternative 2—No Recycled Water Conveyance System Alternative

The following is an analysis of Alternative 2's environmental impacts compared with the proposed project and the significant new information.

Air Quality

Under the No Recycled Water Conveyance System Alternative, construction of the proposed improvements within the fence line of the existing plant would occur, but construction of the underground recycled water conveyance system would not occur. Therefore, there would be fewer construction-period air quality impacts from emissions related to material transport and equipment usage under Alternative 2 compared with the proposed project. There would also be fewer operational emissions under this alternative compared with the proposed project because the amount of energy required to discharge recycled water into Mill Creek (Alternative 2) would be less than the amount required to move it through the conveyance system (proposed project).

As discussed in the September 2011 DEIR, the project would be required to be in compliance with San Joaquin Valley Air Pollution Control District guidance and the applicable air quality plan. Therefore, neither the project nor this alternative would conflict with or obstruct implementation of the air quality plan, and each would have a similar impact.

Without construction of the recycled water conveyance system, the proposed water exchange agreement would most likely not be executed because a conveyance system would not be available to facilitate the efficient delivery of recycled water in exchange for surface water.

Air quality impacts under this alternative would have less of an impact overall than those of the proposed project and the significant new information. It is important to note that, with migration, air quality impacts would be less than significant under the proposed project and the significant new information.

Biological Resources

Under this alternative, construction of the improvements within the plant's existing fence line would occur, but construction of the underground recycled water conveyance system would not occur. As a result, fewer construction-related biological resources impacts on San Joaquin kit fox, burrowing owl, Swainson's hawk, migratory birds, and valley oak would occur under this alternative compared with the project. This is because most of the project's potential construction-related biological resources impacts would occur in areas surrounding the recycled water conveyance system. The open fields and orchards, which are suitable for movement, foraging, nesting, and denning, are located in areas adjacent to the proposed conveyance system. There may be some potential to affect nesting birds in the grove of trees south of the plant, but the improvements within the plant's fence line, for the most part, would not affect special-status wildlife. Oak trees would not be affected under this alternative.

During operations, the proposed project would have no impact on special-status wildlife because the improvements would be within the plant's existing fence line, an area where special-status wildlife species are already precluded. Furthermore, operation of the underground recycled water conveyance system would not affect wildlife because the ground surface would still be available to special-status species. Alternative 2 would have less of an impact on riparian habitat because it would not require the bed and bank of Mill Creek to be disturbed at the two crossings proposed by the project. This alternative would also not reduce effluent discharges into Mill Creek and thus would not affect downstream riparian habitat. However, it is important to note that this recirculated DEIR concluded that, with mitigation, impacts on downstream riparian habitat and wildlife, including special-status species, would be reduced to a level of less than significant (see Section, 3A, *Biological Resources*).

Biological resources impacts under this alternative would have less of an impact overall than those of the proposed project and the significant new information. It is important to note that construction-related biological resources impacts would be less than significant under the proposed project and the significant new information, and operational biological resources impacts would be the same as the baseline under the proposed project and the significant new information.

Cultural Resources

Under Alternative 2, construction of the improvements within the plant's existing fence line would occur, but construction of the underground recycled water conveyance system would not occur. As discussed in the September 2011 DEIR, all possible cultural resources impacts under the proposed project would result from unearthing previously unknown cultural resources or human remains during ground disturbance related to construction of the recycled water conveyance system. Because the conveyance system would not be built under this alternative, there would be no

construction-related cultural resources impacts. Therefore, construction-related cultural resources impacts under this alternative would be less than those of the project. The September 2011 DEIR concluded that the project would have no cultural resources impacts during operations, and the cultural resources survey determined that the project would not result in any historic resources impacts. Impacts under this alternative would be similar. Furthermore, the proposed water exchange would not contribute to an impact on cultural resources that was already disclosed in the September 2011 DEIR because the required facilities for the proposed water exchange were included in the September 2011 DEIR analysis.

Cultural resources impacts under this alternative would have less of an impact overall than those of the proposed project and the significant new information. It is important to note that construction-related cultural resources impacts, with mitigation, would be less than significant under the proposed project and the significant new information, and operational cultural resources impacts would be the same as the baseline under the proposed project and the significant new information.

Geology and Soils

Under the No Recycled Water Conveyance System Alternative, construction of improvements within the plant's fence line would occur, and the amount of impervious surfaces would increase. However, geology and soils impacts from seismically related ground failure, soil erosion, soil instability, or expansive soils would be similar to those of the proposed project. This is because Alternative 2 would be subject to the same site conditions (i.e., very low liquefaction potential, relative stability, lack of expansive soils) as the proposed project. Under Alternative 2, the recycled water conveyance system would not be constructed. Under the proposed project, the system would not be affected by the aforementioned geologic considerations because the pipe, which would be placed underground, would be designed to City standards to withstand geologic hazards. Similar to the proposed project, under Alternative 2, water quality and geologic engineering considerations, including the preparation of a SWPPP or drainage plan, would be required.

The proposed water exchange would not contribute to an impact on geology and soils that was already disclosed in the September 2011 DEIR because the required facilities for the proposed water exchange were included in the September 2011 DEIR analysis. Geology and soils impacts under this alternative would have an impact similar to that of the proposed project and the significant new information. It is important to note that geology and soils impacts would be less than significant under the proposed project and the significant new information.

Greenhouse Gas Emissions

Under this alternative, construction of the proposed improvements within the fence line of the existing plant would occur, but construction of the underground recycled water conveyance system would not occur. Therefore, there would be fewer construction-related GHG emissions impacts (i.e., emissions from the transport of material or the use of equipment) compared with the proposed project. Under the proposed project, there would be a modest increase in operational GHG emissions related to energy needs (i.e., energy to pump the recycled water and move it through the conveyance system) compared with the baseline. Because Alternative 2 would not include the recycled water conveyance system, fewer operational GHG emissions would result under this alternative.

As discussed in the September 2011 DEIR, the project would be required to be in compliance with applicable plans, policies, or regulations adopted for the purpose of reducing GHG emissions.

Recycled water conveyed to TID under the proposed water exchange agreement would move under gravity flow and, therefore, would not require additional energy. Likewise, surface water conveyed as part of the proposed exchange would also move under gravity flow, though it is possible that future recharge facilities would require additional energy. Overall, it is assumed that water conveyance as part of the proposed exchange would cause additional GHG emissions. However, the September 2011 DEIR analysis included construction-related GHG emissions from building the recycled water conveyance facilities needed for the proposed water exchange and operational emissions from moving the water. Therefore, the significant new information would not change the proposed project's level of impact.

GHG emissions impacts under this alternative would have less of an impact overall than those of the proposed project and the significant new information. It is important to note that, with migration, construction-related GHG emissions impacts would be less than significant under the proposed project and the significant new information, and operational GHG emissions impacts would be the same as the baseline under the proposed project and the significant new information.

Hydrology and Water Quality

Under this alternative, construction of the proposed improvements within the fence line of the existing plant would occur, but construction of the underground recycled water conveyance system would not occur. Because improvements within the fence line of the plant would occur, the amount of impervious surfaces created under this scenario would be similar to the amount created under the project. Under this scenario, groundwater levels would be significantly affected locally, but regional recharge would be similar to that of the project. Therefore, the project would have a greater impact on local groundwater levels than this alternative but a similar impact on the overall basin.

This alternative would result in fewer potential construction-related hydrology or water quality impacts related to erosion and flooding than the project because it would not require ground disturbance for development of the recycled water conveyance system. Furthermore, the risk of flooding as a result of dam failure is the same under this alternative as it is under the proposed project because, with or without the project, there is a 0.4% annual chance of Fusegate failure at Terminus Dam, which would result in flooding at the existing plant site. Therefore, this alternative and the project would have a similar impact with respect to the exposure of people and structures to dam failure.

The proposed water exchange would result in increased EC levels throughout the local groundwater basin (see Section 3B, *Hydrology and Water Quality*, of this recirculated DEIR). However, the increase in EC would be below the thresholds set by the applicable basin plan and agricultural guidelines. Therefore, the impacts would be considered less than significant. Other constituent levels, such as nitrates, would decrease in local groundwater basins because of improvements to the plant that would allow influent to be treated to Title 22 standards.

This alternative would have an impact on the regional groundwater table similar to that of the proposed project and the significant new information because, regardless of whether recycled water is conveyed through the proposed water conveyance system and TID's exchanged surface water is conveyed to the eastside of the City (proposed project) or the plant's effluent continues to be discharged into Mill Creek and TID continues to use surface water for existing irrigation purposes (Alternative 1), the same overall amount of effluent and surface water would reach the regional aquifer under both the proposed project and Alternative 2 scenarios.

Hydrology and water quality impacts under this alternative would have an impact similar to that of the proposed project and the significant new information. It is important to note that project-level and cumulative impacts would be significant and unavoidable under the project scenario as a result of lowering the local groundwater table.

Noise

Under the No Recycled Water Conveyance System Alternative, construction of the proposed improvements within the fence line of the existing plant would occur, but construction of the underground recycled water conveyance system would not occur. Therefore, under this alternative, there would be fewer construction-related noise or vibration impacts (e.g., noise and vibration from heavy construction equipment). Furthermore, there would be no operational noise impacts beyond the existing condition resulting from the project.

The proposed water exchange would not contribute to an impact related to noise that was already disclosed in the September 2011 DEIR because the required facilities for the proposed water exchange were included in the September 2011 DEIR analysis.

Noise impacts under this alternative would have less of an impact overall than those of the proposed project and the significant new information. It is important to note that noise impacts would occur under the proposed project and the significant new information, but they would be considered less than significant.

Population and Housing

Similar to the proposed project, this alternative would not directly induce growth by developing housing or businesses, which could foster population growth, or by increasing the capacity of the plant.

Surface water received by the City would be conveyed to facilities to the east to recharge the aquifer beneath the City. The City proposes conveying surface water to the eastside because groundwater flow travels from east to west, and the City wants to retain as much of the recharged water as possible. It is assumed that some of the surface water for groundwater recharge would eventually be pumped back up, treated, and then used as potable water for the benefit of the City and its residents. Therefore, the primary function of the proposed water exchange would be to help alleviate the groundwater overdraft condition that currently exists in the Visalia area.

The proposed water exchange agreement would provide an average of between 5,500 and 8,800 af of surface water per year for groundwater recharge. The UWMP points to recycled water use as well as other management activities, such as increased conservation, augmented artificial recharge, other exchanges and transfers, and surface water acquisition, to reach the 11,000-acre-feet-per-year reduction and/or augmentation necessary to achieve groundwater balance.

The City has determined that the proposed water exchange would not induce growth. Rather, it would help to alleviate the overdraft condition that currently exists in the Visalia area. As discussed in the UWMP, continued pumping without development of new water sources and/or significant reductions in water use would contribute to the ongoing regional overdraft, which is unsustainable in a long-term undefined future (beyond 2040). The proposed water exchange would help to make the long-term groundwater balance more sustainable.

Population and housing impacts under this alternative would have an impact similar to that of the proposed project and the significant new information. It is important to note that population and housing impacts would occur under the proposed project and the significant new information, but they would be considered less than significant.

Transportation and Traffic

Under the No Recycled Water Conveyance System Alternative, construction of the proposed improvements within the fence line of the existing plant would occur, but construction of the underground recycled water conveyance system would not occur. Therefore, there would be no transportation and traffic impacts resulting from commuting workers or the transport of materials to and from the recycled water conveyance system site during construction. Similar to the project, this alternative would not conflict with an applicable plan, ordinance, or policy that establishes measures of effectiveness related to the performance of the circulation system or an applicable congestion management program. Neither this alternative nor the proposed project would result in operational transportation and traffic impacts beyond the existing condition because neither would require additional workers at the plant or additional truck trips. Therefore, operational impacts under this alternative would be similar to those of the proposed project.

The proposed water exchange would not contribute to an impact on transportation and traffic that was already disclosed in the September 2011 DEIR because the required facilities for the proposed water exchange were included in the September 2011 DEIR analysis.

Transportation and traffic impacts under this alternative would have less of an impact overall than those of the proposed project and the significant new information. It is important to note that transportation and traffic impacts would be less than significant under the project and the significant new information.

Utilities and Service Systems

Unlike the proposed project, there would be no significant and unavoidable project-level and cumulatively considerable utilities and service systems impacts under this alternative. Under the project scenario, significant groundwater table impacts would result from discontinuing discharges into Mill Creek and thereby lowering the local groundwater table. This would not occur under Alternative 2. In addition, cumulatively considerable GHG emissions impacts would still occur. These would be similar to those of the proposed project because operational GHG emissions would contribute to global climate change. Significant and unavoidable population and housing impacts would not occur because the alternative would not remove a barrier to growth (i.e., increase the availability of a potable water source).

Utilities and service systems impacts under this alternative would have less of an impact overall than those of the proposed project and the significant new information. It is important to note that utilities and service systems impacts related to the development of wastewater treatment facilities would be significant and unavoidable under the project scenario and in light of the significant new information, but impacts related to the need for new stormwater facilities would be less than significant with mitigation.

Relationship to Project Objectives and Feasibility

The No Recycled Water Conveyance System Alternative, although feasible, would not fulfill the following project objectives:

- To provide the initial infrastructure needed to treat influent wastewater to Title 22 standards and convey the recycled water for irrigation and other purposes.
- To provide effluent treated to Title 22 standards for possible water exchanges with public and/or private entities for surface water.

The No Recycled Water Conveyance System Alternative would fulfill the following objectives:

- To continue to meet the wastewater treatment requirements of residences, businesses, and industries within the City's service area, up to an average daily flow of 22 mgd.
- To remove wastewater constituents, such as BOD, suspended solids, nitrogen, and waterborne bacteria and viruses, to a greater extent, thereby improving subsurface water quality in the receiving groundwater basin relative to current conditions.
- To provide a basic level of odor control to reduce the potential for unpleasant odors to be emitted from the plant property.

Environmentally Superior Alternative

An EIR must identify an environmentally superior alternative to the proposed project, if any. The No-Project Alternative would be environmentally superior to the proposed project and the significant new information because it would minimize or avoid physical environmental impacts. However, if a no-project alternative is found to be environmentally superior, the State CEQA Guidelines require that "the EIR shall also identify an environmentally superior alternative among the other alternatives" (State CEQA Guidelines, Section 15126.6[e][3]).

The other alternative considered by the City was the No Recycled Water Conveyance System Alternative (Alternative 2). As shown in Table 5-1, many of the impacts of the proposed project and Alternative 2 would be similar. For most of the environmental issue areas where Alternative 2 has lesser impacts, the September 2011 DEIR and this recirculated DEIR determined that the proposed project could reduce its potentially significant impacts to a level of less than significant with mitigation. In accordance with State CEQA Guidelines Section 15126.6(c), it was determined that Alternative 2 would have a lower level of environmental effect for most of the environmental issue areas. However, both the proposed project and Alternative 2 would not reduce cumulatively considerable GHG emissions impacts to a level of less than significant, even with mitigation. In addition, the proposed project would result in significant and unavoidable project-level and cumulatively considerable hydrology and water quality impacts because it would lower local groundwater levels downstream of the effluent discharge point into Mill Creek. Alternative 2 avoids these significant and unavoidable impacts and, as a result, is the environmentally superior alternative.

Table 5-1. Comparison of Alternatives with the Proposed Project and the Significant New Information

Environmental Issue Area[1]	Proposed Project Impact	Alternative 1 Impact	Alternative 2 Impact
AIR QUALITY			
Impact AQ-1. Conflict with or obstruct implementation of the applicable air quality plan.	Less than Significant with Mitigation	Similar Impact	Similar Impact
Impact AQ-2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation.	Less than Significant	Less Impact	Less Impact
Impact AQ-3. Result in a cumulatively considerable net increase in any criteria pollutant for which the project vicinity is in nonattainment status under an applicable federal or state ambient air quality standard.	Less than Significant	Less Impact	Less Impact
Impact AQ-4. Expose sensitive receptors to substantial pollutant concentrations.	Less than Significant	Less Impact	Less Impact
Impact AQ-5. Create objectionable odors that would affect a substantial number of people.	Less than Significant	Greater Impact	Similar Impact
BIOLOGICAL RESOURCES			
Impact BIO-1. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species.	Less than Significant with Mitigation	Less Impact	Less Impact
Impact BIO-2. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game, U.S. Army Corps of Engineers, Regional Water Quality Control Board, or U.S. Fish and Wildlife Service.	Less than Significant with Mitigation	Less Impact	Less Impact
Impact BIO-3. Have a substantial adverse effect on wetlands through direct removal, filling, trenching, hydrological interruption, or other means.	Less than Significant with Mitigation	Less Impact	Less Impact
Impact BIO-4. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites.	Less than Significant with Mitigation	Less Impact	Less Impact
Impact BIO-5. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	Less than Significant with Mitigation	Less Impact	Less Impact

Environmental Issue Area[1]	Proposed Project Impact	Alternative 1 Impact	Alternative 2 Impact
CULTURAL RESOURCES			
Impact CUL-1: Cause a substantial adverse change in the significance of a historical resource, as defined in Section 15064.5.	No Impact	Similar Impact	Similar Impact
Impact CUL-2: Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5.	Less than Significant with Mitigation	Less Impact	Less Impact
Impact CUL-3: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	Less than Significant with Mitigation	Less Impact	Less Impact
Impact CUL-4: Disturb any human remains, including those interred outside of formal cemeteries.	Less than Significant	Less Impact	Less Impact
GEOLOGY AND SOILS			
Impact GEO-1: Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death, involving seismically related ground failure, including liquefaction.	Less than Significant with Mitigation	Less Impact	Similar Impact
Impact GEO-2. Result in substantial soil erosion or the loss of topsoil.	Less than Significant with Mitigation	Less Impact	Similar Impact
Impact GEO-3: Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.	Less than Significant with Mitigation	Less Impact	Similar Impact
Impact GEO-4. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.	Less than Significant with Mitigation	Less Impact	Similar Impact
GREENHOUSE GAS EMISSIONS			
Impact GHG-1. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.	Less than Significant with Mitigation	Less Impact	Less Impact
Impact GHG-2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	Less than Significant	Similar Impact	Similar Impact

Environmental Issue Area[1]	Proposed Project Impact	Alternative 1 Impact	Alternative 2 Impact
HYDROLOGY AND WATER QUALITY			
Impact HYD-1: Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table.	Significant and Unavoidable (project-level and cumulative impacts)	Similar Impact	Similar Impact
Impact HYD-2: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or off-site.	Less than Significant with Mitigation	Less Impact	Less Impact
Impact HYD-3: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site.	Less than Significant with Mitigation	Less Impact	Similar Impact
Impact HYD-4: Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.	Less than Significant with Mitigation	Less Impact	Similar Impact
Impact HYD-5: Place within a 100-year flood hazard area structures that would impede or redirect flood flows.	Less than Significant with Mitigation	Less Impact	Similar Impact
Impact HYD-6: Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.	Less than Significant	Similar Impact	Similar Impact
NOISE			
Impact NOI-1: Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies.	Less than Significant with Mitigation	Less Impact	Less Impact
Impact NOI-2: Expose persons to or generate excessive groundborne vibration or groundborne noise levels.	Less than Significant	Less Impact	Less Impact
Impact NOI-3: Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.	Less than Significant with Mitigation	Less Impact	Less Impact
POPULATION AND HOUSING			
Impact POP-1: Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through the extension of roads or other infrastructure).	Less than Significant	Similar Impact	Similar Impact

Environmental Issue Area[1]	Proposed Project Impact	Alternative 1 Impact	Alternative 2 Impact
TRANSPORTATION AND TRAFFIC			
Impact TR-1: Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and nonmotorized travel, and relevant components of the circulation system, including intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.	Less than Significant	Less Impact	Less Impact
Impact TR-2: Conflict with an applicable congestion management program, including, level-of-service standards and travel demand measures or other standards established by the county congestion management agency for designated roads or highways.	Less than Significant	Less Impact	Less Impact
UTILITIES AND SERVICE SYSTEMS			
Impact UTL-1: Require or result in the construction of new water or wastewater treatment facilities or the expansion of existing facilities, the construction of which could cause significant environmental effects.	Significant and Unavoidable (project-level impact)	Less Impact	Less Impact
Impact UTL-2: Require or result in the construction of new stormwater drainage facilities or the expansion of existing facilities, the construction of which could cause significant environmental effects.	Less than Significant with Mitigation	Less Impact	Less Impact

[1] Impact numbering based on the September 2011 DEIR.

Chapter 6
Growth-Inducing Impacts

The State CEQA Guidelines require an EIR to discuss how a proposed project could directly or indirectly foster economic or population growth—or the construction of additional housing—in the surrounding environment. The EIR must also discuss ways in which the proposed project would remove obstacles to population growth or trigger the construction of new community service facilities that could cause significant impacts (State CEQA Guidelines, Section 15126.2).

The analysis presented below replaces the analysis in the previous DEIR (herein referred to as the September 2011 DEIR) regarding growth-inducing impacts and focuses on the proposed project's potential to stimulate growth in the surrounding area. The following growth-inducement discussion considers both direct and indirect growth-inducement impacts as a result of the project.

Direct Impacts

The proposed project would involve upgrades to the City's WCP, the construction of a recycled water conveyance system, and a proposed water exchange agreement between the City and TID. Operation of the proposed project would not require additional employees, nor would it result in the need for new homes or businesses. Furthermore, the project would not change the capacity of the plant. Therefore, it would not directly induce population growth by allowing more sewage to be treated (i.e., removing a barrier to growth). The project would also not directly induce growth through the development of housing. The direct impacts of the proposed project would be less than significant.

Indirect Impacts

Currently, the WCP's treated effluent is discharged into Mill Creek where it is used by the Kaweah Delta Water Conservation District and farmers with property adjacent to the creek who have agricultural needs or for groundwater recharge. It is not treated to a standard that would make it suitable for urban use. Under the proposed project, discharges of treated effluent into Mill Creek would cease. Instead, treated effluent would be conveyed to the recycled water conveyance system and used for irrigation at Plaza Park and Valley Oaks Golf Course as well as on 250 acres of farmland south of the plant. It would also be delivered to TID for agricultural irrigation purposes under a proposed water exchange agreement. Currently, the regional groundwater basin is in a sustained overdraft condition because of groundwater pumping resulting from urban and agricultural demands in the area. The exchange of recycled water under this project for CVP water for groundwater recharge is intended to help mitigate the overdraft condition. It is important to point out that approximately 95% of pumping from the aquifer is for agricultural and other uses. Even if the City is brought into balance between aquifer replenishment and groundwater extraction, the aquifer would remain in a significant state of overdraft, and the water table would continue to decline.

The water exchange agreement that has been proposed as part of the project would enable an exchange of between 11,000 and 17,600 af per year, on average, of recycled water generated by the plant for an average of 5,500 to 8,800 af per year of surface water provided by TID to the City over a 20-year period.

As discussed in Section 3C, *Population and Housing*, in this recirculated DEIR, surface water received by the City would be conveyed to facilities east of the City to recharge the aquifer beneath the City. The City proposes conveying surface water to the eastside because groundwater flow travels from east to west, and the City wants to retain as much of the recharged water as possible. It is assumed that some of the surface water for groundwater recharge would eventually be pumped back up, treated, and then used as potable water for the benefit of the City and its residents. Therefore, the primary function of the proposed water exchange would be to help alleviate the groundwater overdraft condition that currently exists in the Visalia area.

The UWMP (California Water Service Company 2011) acknowledges that the ultimate reliability of the water supply for the Visalia District, which includes the City, is a function of the long-term balance between aquifer replenishment and groundwater extraction. The UWMP also mentions the possibility of the WCP providing recycled water, which would increase recharge in the Visalia area, thus improving the local water balance. The UWMP goes on to say that a reduction and/or augmentation in pumping of about 11,000 af per year would be needed to bring the Visalia area's groundwater levels back into balance for the long term. It is important to point out that this estimate is based on assumptions with inherently large uncertainties because of certain unknowns (e.g., groundwater losses due to migration within the aquifer). Additionally, this estimate was only for the purpose of estimating the amount of overdraft attributable to municipal pumping. Approximately 95% of pumping from the aquifer is for agricultural and other uses. Even if the City is brought into balance, the aquifer would remain in a significant state of overdraft, and the water table would continue to decline.

The proposed water exchange agreement would provide an average of between 5,500 and 8,800 af of surface water per year for groundwater recharge. The UWMP points to recycled water use as well as other management activities, such as increased conservation, augmented artificial recharge, other exchanges and transfers, and surface water acquisition, to reach the 11,000-acre-feet-per-year reduction and/or augmentation necessary to achieve groundwater balance. But, as discussed above, this estimate is based on assumptions with inherently large uncertainties because of certain unknowns (e.g., groundwater losses due to migration within the aquifer).

The City has determined that the proposed water exchange would not induce growth. Rather, it would help to alleviate the overdraft condition that currently exists in the Visalia area. As discussed in the UWMP, continued pumping without development of new water sources and/or significant reductions in water use would contribute to the ongoing regional overdraft, which is unsustainable in a long-term undefined future (beyond 2040). The proposed water exchange would help to make the long-term groundwater balance more sustainable.

Chapter 7
Significant Irreversible Changes

Pursuant to Section 15126.2(c) of the State CEQA Guidelines, an EIR must consider any significant irreversible environmental changes that would be caused by the proposed project should it be implemented. Section 15126.2(c) reads as follows:

> Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible because a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvements that provide access to a previously inaccessible area) generally commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to ensure that such current consumption is justified.

Section 15126.2(c) of the State CEQA Guidelines defines an irreversible impact as one that uses nonrenewable resources during the initial and continued phases of the project. Irreversible impacts can also result from damage caused by environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to ensure that such consumption is justified.

Buildout of the proposed project, including facilities under the proposed water exchange agreement, would commit nonrenewable resources to uses during construction and ongoing operations (i.e., utility services). During project operations, oil, gas, and other nonrenewable resources would be consumed. Therefore, an irreversible commitment of nonrenewable resources would occur as a result of long-term project operations. However, assuming that such commitments would occur in accordance with the adopted goals, policies, and implementation measures of the *City of Visalia General Plan*, such commitments would be considered acceptable as a matter of public policy. The *City of Visalia General Plan* ensures that any irreversible environmental changes associated with such commitments will be minimized.

Chapter 8
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APPENDICES

Appendix A

ANTIDEGRADATION ANALYSIS
CITY OF VISALIA WATER CONSERVATION PLANT

VISALIA, CA

DRAFT

JUNE 21, 2012

Prepared for:

City of Visalia

Prepared by:

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Visalia, California

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ABBREVIATIONS

AF.....Acre Feet
bgs ..... Below Ground Surface
BOD .....Biological Oxygen Demand
CDPH ..... California Department of Public Health
CDWR .....California Department of Water Resources
CPUC ..... California Public Utilities Commission
CWA.....Clean Water Act
EPA ..... Environmental Protection Agency
EC ..... Electrical Conductivity
gpd ..... Gallons per Day
gpm ..... Gallons per Minute
IPP ..... Industrial Pretreatment Program
MCL.....Maximum Contaminant Level
MBR ..... Membrane Biological Reactor
mgd ..... Million Gallons per Day
MPN ..... Most Probable Number
NTU..... Nephelometric Turbidity Units
PHG .....Public Health Goal
RWQCB ..... Regional Water Quality Control Board
SWRCB.....State Water Recourses Control Board
TDS.....Total Dissolved Solids
TID ..... Tulare Irrigation District
UV .....Ultra Violet
WCP..... Water Conservation Plan
WDR.....Waste Discharge Requirements

EXECUTIVE SUMMARY

This Antidegradation Analysis (Report) provides an analysis of impacts that the City of Visalia (City) Water Conservation Plant (WCP) upgrades and associated recycled water use may have on the underlying groundwater. The WCP is located about one mile southwest of the intersection of State Highway 99 and Highway 198. The WCP currently discharges approximately 13 million gallons per day (mgd) of effluent under Waste Discharge Requirements (WDRs) from the California Regional Water Quality Control Board, Central Valley Region (RWQCB) to City owned ponds and Mill Creek. The proposed project, and subject of this Report, will upgrade the existing WCP from secondary level treatment to advanced tertiary treatment, discontinue discharge to Mill Creek, and provide recycled water use for nearly 10,000 acres of farmland within the City and Tulare Irrigation District (TID). The design capacity and proposed permit capacity of the proposed WCP is 22 mgd.

Water Quality Standards

Water quality objectives for the proposed recycled water were developed based on the Water Quality Control Plan for the Tulare Lake Basin (Basin Plan), agricultural objectives, and water quality thresholds for various uses, as provided on the State Water Resources Control Board (SWRCB) website. The Basin Plan objectives generally require that constituents in the discharge not be present in concentrations that affect beneficial uses of the receiving groundwater. For this project, that includes Title 22 standards for drinking water (municipal use) and agricultural water quality thresholds. The Basin Plan also acknowledges that "No proven means exist at present that will allow ongoing human activity in the Basin and maintain ground water salinity at current levels throughout the Basin. Accordingly, the water quality objectives for ground water salinity control the rate of increase." For the Kaweah River hydrographic unit, under which the City of Visalia falls, the maximum average annual increase in salinity measured as electrical conductivity shall not exceed 3 μmhos/cm as averaged over a 5-year period (15 μmhos/cm increase over 5 years).

Groundwater Characterization

Groundwater flow beneath the site is predominantly to the southwest, although local mounding beneath the onsite disposal ponds causes intermittent deflections of the groundwater flow direction in the vicinity of the WCP. Groundwater quality within the recycled water use areas is highly variable. Groundwater quality data was solicited from various sources. While data was obtained from several sources, well construction data is not available for most of the well data obtained, and well location information is limited. Since some of the well data utilized in the analysis was likely from a deeper aquifer, the characterization of existing groundwater is considered to be of higher quality than actual first encountered groundwater, and will result in a greater perceived impact from the proposed recycled water usage. This is a conservative approach.

'Natural" groundwater quality is the quality of groundwater assumed to exist prior to the influence of human activity. The natural groundwater quality is more specifically defined

to be the groundwater quality at the time the antidegradation policy was approved in 1968. Data was solicited, but is not available as far back as 1968. It is not reasonably possible to extrapolate back to 1968 to characterize groundwater quality prior to these impacts. It can, however, be reasonably assumed that existing land uses in the area are stable, and impact to groundwater from these land uses (primarily dairies and agriculture) have also stabilized. The current existing groundwater quality is therefore a reasonable baseline quality with which the impacts associated with the proposed discharge can be assessed.

Groundwater quality data was obtained from the SWRCB GeoTracker GAMA database, City monitoring wells, dairies, and other sources providing data within the TID recycled water use area. Generalized groundwater quality was developed based on an area-by-area weighted average for background conditions. The generalized background quality was calculated to be about 510 μmhos/cm for EC and 10 mg/L for nitrates as nitrogen.

Recycled Water Quantity and Quality

The upgraded treatment plant will eventually produce disinfected tertiary treated effluent at a design capacity of 22 mgd, average annual flow. The existing secondary treatment process will be converted to a membrane biological reactor (MBR) process, designed to produce recycled water to meet Title 22 standards for disinfected, tertiary water. The MBR treatment process is among the most advanced wastewater treatment processes available. The upgraded treatment plant will also eliminate the use of chlorine disinfection in favor of UV disinfection.

The projected effluent quality will meet or exceed recycled water criteria, including BOD of 30 mg/L, TSS of 30 mg/L, Total Nitrogen less than 10 mg/L, Turbidity of 0.2 NTU, and Total Coliform Bacteria of 2.2 MPN/100 mL, 7-day median. Other constituents in the proposed recycled water are anticipated to be similar to existing effluent conditions. EC, TDS, chloride, and sodium concentrations in the recycled water may be reduced due to the change in disinfection technology from chlorine to UV disinfection, but credit has not been taken for those reductions in this Report.

Based on the water quality standards, background groundwater quality, and recycled water quality, the constituents of concern have been identified to be EC, Nitrate, Chloride, and Sodium.

Impact of Operations on Groundwater

Beneficial uses of the receiving water will not be impacted by any of the constituents considered, based on the water quality objectives. Chloride, EC, and sodium will, however, cause degradation of the groundwater. Nitrates in the recycled water are not anticipated to impact groundwater quality, and are within the water quality objectives. Existing effluent concentrations of chloride and sodium are below all water quality objectives.

For EC, the Basin Plan allows for an annual increase in EC of 3 μmhos/cm as averaged over a 5-year period. That objective was analyzed by developing a constituent balance calculation, using a control volume within the groundwater aquifer below the recycled

water use areas at background concentrations, and the volume of recycled water applied at the recycled water concentration. The calculated annual increase in EC is shown to be within the Basin Plan requirements, and decreasing each year. The following set of conservative assumptions were made, which make the calculated impact greater than the actual anticipated impact:

- 100% of recycled water reaches groundwater.
- No horizontal movement of recycled water through the vadose zone.
- Background groundwater quality was developed from a compilation of data from wells at unknown depths, which are likely of higher quality than first encountered groundwater.

Conclusions

Based on the water quality assessment, the project is not expected to contribute to water quality impairments for any constituent. The impacts to existing groundwater quality are considered to be consistent with the maximum benefit to the people of the State since any higher level of treatment would be unreasonably expensive, the project provides environmental benefits related to improved effluent quality, and the project reduces dependence on groundwater supply. The MBR treatment process selected is among the most advanced wastewater treatment processes available, and will produce an effluent of much higher quality than the existing facility as well as most municipal wastewater treatment facilities in California.

The project will maintain the highest quality water consistent with the maximum benefit to the people of the State. It is therefore concluded that construction and operation of the proposed WCP upgrades and recycled water facilities is compliant with the Federal and State Antidegradation Policies.

1 INTRODUCTION

1.1 Background

The City of Visalia (City), located in Tulare County California, provides wastewater collection, treatment, and disposal service for domestic and industrial wastewater generated within the service area. The service area includes the area within the City limits and some County areas adjacent to the City, including the community of Goshen. Wastewater treatment is provided by the City's Water Conservation Plant (WCP). A vicinity map is included as **Figure 1-1**.

Currently, the treated effluent from the WCP is discharged to onsite ponds or Mill Creek under Waste Discharge Requirements (WDR) Order No. R5-2006-0091 issued by the California Regional Water Quality Control Board (RWQCB), Central Valley Region. The City is nearly complete with design upgrades to the WCP. The project will include upgrading the existing WCP to provide advanced tertiary treatment, enabling the City to produce recycled water in conformance with Title 22 disinfected tertiary treatment standards. The proposed project will cease discharges of treated water into Mill Creek and instead convey recycled water through a recycled water conveyance system for irrigation of Plaza Park, Valley Oaks Golf Course, farmland to the south and east of the WCP, City owned Basin 4, and use areas within Tulare Irrigation District. The WCP will initially be constructed to provide a treatment capacity of 22 million gallons per day (mgd), with provisions to expand to 26 mgd. Currently the WCP produces approximately 13 mgd.

The purpose of this Antidegradation Analysis (Report) is to analyze the impacts which the WCP upgrades and associated recycled water use will have on the underlying groundwater. The study presented herein is based on the conditions that will exist once the project is complete.

1.2 Regulations and Policies

1.2.1 Porter-Cologne Act

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (together "Water Boards") have primary responsibility for the coordination and control of water quality in California. In the Porter-Cologne Water Quality Control Act (Porter-Cologne), the Legislature declared that the "state must be prepared to exercise its full power and jurisdiction to protect the quality of the waters in the state from degradation…" (Wat. Code, §13000). Porter-Cologne grants the Water Boards the authority to implement and enforce the water quality laws, regulations, policies, and plans to protect the groundwater and surface waters of the State. "Waters of the State" as defined in Porter-Cologne, means any surface water or groundwater, including saline waters, within the boundaries of the State. Waters of the United States include only navigable surface waters or tributaries thereto, and are regulated by the US

Environmental Protection Agency. This project does not include or impact waters of the US.

Porter-Cologne Chapter 7, §13510 states, "… the people of the state have a primary interest in the development of facilities to recycle water containing waste to supplement existing surface and underground water supplies and to assist in meeting the future water requirements of the state." §13511 goes on to say, "The Legislature further finds and declares that the utilization of recycled water by local communities for domestic, agricultural, industrial, recreational, and fish and wildlife purposes will contribute to the peace, health, safety and welfare of the people of the state. Use of recycled water constitutes the development of 'new basic water supplies'…"

Porter-Cologne Chapter 4, Article 3, § 13241 states:

Each regional board shall establish such water quality objectives in water quality control plans as in its judgment will ensure the reasonable protection of beneficial uses and the prevention of nuisance; however, it is recognized that it may be possible for the quality of water to be changed to some degree without unreasonably affecting beneficial uses. Factors to be considered by a regional board in establishing water quality objectives shall include, but not necessarily be limited to, all of the following:

(a) Past, present, and probable future beneficial uses of water.

(b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.

(c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area.

(d) Economic considerations.

(e) The need for developing housing within the region.

(f) The need to develop and use recycled water.

1.2.2 Antidegradation Policy

The federal Clean Water Act (CWA) requires state water quality standards to include an antidegradation policy to protect beneficial uses and prevent further degradation of high quality waters. In California, water quality standards include the beneficial uses and water quality objectives established within Water Quality Control Plans (Basin Plans) and the State's antidegradation policy. The antidegradation directives of State Water Board Resolution No. 68-16 require that high quality waters of the State be maintained "consistent with the maximum benefit to the people of the State."

In accordance with the federal regulations requiring states to adopt antidegradation policies, the State's *Statement of Policy with Respect to Maintaining High Quality Waters in California* ("Resolution No. 68-16") is interpreted to incorporate the federal antidegradation policy. Resolution No. 68-16 states, in part:

1. *Whenever the existing quality of water is better than the quality established*

in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.

2. *Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.*

1.2.3 Recycled Water Policy

The SWRCB adopted Resolution No. 2009-001, Adoption of a Policy for Water Quality Control for Recycled Water, a Recycled Water Policy (Policy) in February 2009. The purpose of the Policy is "to increase the use of recycled water from municipal wastewater sources…" The Policy additionally says, "When used in compliance with this Policy, Title 22 and all applicable state and federal water quality laws, the State Water Board finds that recycled water is safe for approved uses, and strongly supports recycled water as a safe alternative to potable water for such approved uses."

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2 STAKEHOLDERS

The City is the sole entity involved in the production and distribution of the proposed recycled water from the WCP. Users of the recycled water include Tulare Irrigation District (TID or District) and the City.

2.1 Tulare Irrigation District (TID)

TID, a political subdivision of the State of California, is an independent agency operating under the California Water Code. The District delivers surface water to approximately 230 farms. The exterior boundary of TID encompasses an area of about 77,000 acres, including the City of Tulare, which is not a part of the District. District acreage is approximately 70,000 acres. TID will use recycled water from the City for irrigation of farms within approximately 8,000 acres in the northwest portion of the District.

A planned agreement between the City and TID allows delivery of a minimum of 800 acre-feet (AF) per month and 11,000 AF per year of recycled water to TID. Peak recycled water flows to TID will be about 35 million gallons per day (mgd). Recycled water will be delivered to TID through a 60-inch diameter recycled water pipeline originating at the WCP.

2.2 City of Visalia

The City of Visalia also intends to use the recycled water for irrigation of City owned land including the Valley Oaks Golf Course, Plaza Park, City landscaping, and crop land located generally to the south and east of the WCP.

3 RECYCLED WATER FACILITIES

Proposed recycled water use areas involved in the project include Plaza Park, Valley Oaks Golf Course, City Farmland, City onsite Ponds 2 and 3, City owned Basin 4, and TID use area. The recycled water conveyance facilities include a Basin 4 pipeline, TID pipeline, irrigation pipelines serving City farmland to the south of the WCP, and irrigation delivery pipelines for areas east of Highway 99, including the golf course, park, and additional farmland. The proposed system would deliver recycled water from the WCP to each of the recycled water users and basins.

The Basin 4 and TID pipelines are both designed as gravity pipelines, and include two regulating basins at the upstream end, within the WCP's fence line. The irrigation pipelines to the east of Highway 99 and those serving the farmland to the south of the WCP will operate at low water pressures. The eastern pipeline is designed to accommodate expanded capacity for the addition of a future regulating basin east of Highway 99.

The WCP's proposed UV disinfection system would discharge into the two regulating basins (onsite Ponds 2 and 3). The pump station for the initial phase would deliver irrigation water at low pressure to farmland south of the WCP and to Plaza Park, Valley Oaks Golf Course, and farmland east of Highway 99. In the future, this pump station may be upgraded to a higher pressure system to deliver flows to a future regulating basin to the east.

Figure 3-1 shows the overall recycled water use system, including City and TID use areas. All areas are served without conveyance to waters of the United States.

3.1 Soils

The geology of the Visalia area generally consists of deep underlying metamorphic and granitic rock overlain by hundreds of feet of alluvium. More specifically, the first 100 feet below ground surface (bgs) contains interbedded sand zones that are periodically saturated depending on the lateral proximity to surface water. The interbedded sand zone is underlain by relatively thin saturated beds of sand mixed with clay, clayey silt, and silt that extend to depths of 240 to 275 feet bgs. The WDR designates groundwater within the interbedded sand zone as the upper aquifer and indicates that the majority of the water supply wells in the area are within this zone. The regionally extensive E-clay layer, which lies beneath these soils, is approximately 20 feet thick under the WCP but much thicker to the west. Stratigraphic and water quality data indicate the E-clay to be the first effective aquitard in the upper portion of the regional aquifer; however, its effectiveness as an aquitard has been reduced by numerous wells that penetrate the E-clay layer. The WDR identifies the lower aquifer as the groundwater lying beneath the E-clay (Central Valley Regional Water Quality Control Board 2006).

The topography of the WCP site, the proposed recycled water conveyance system area, and the surrounding area is flat, with a generally southwest slope of 1.2 feet per 1,000 horizontal feet. The general soil types under the WCP and proposed recycled water conveyance system are loams, such as Colpien loam, Nord fine sandy loam, and Tagus

loam. The loams in the project area consist of alluvium derived from granitic or mixed rock sources. These moderately well-drained to well drained soils experience flooding infrequently and have moderate to high water capacity. Regional groundwater flows west-southwest and occurs at about 80 to 90 feet bgs (Central Valley Regional Water Quality Control Board 2006).

3.2 Vegetation

Historically, native vegetation in the region consisted of perennial grasses, forbs, shrubs, and oaks on the alluvial fans and floodplains near rivers and streams. Although some native vegetation remains on alluvial fans and fan remnants and in small, unreclaimed areas of saline-sodic soils in the County, the principal regional vegetation consists of irrigated agricultural crops, which are widely represented throughout the project area (Draft EIR 2011).

Agricultural crops within the use areas include alfalfa, cherries, cotton, field corn, grain sorghum, native pasture, pistachios, walnuts, wheat, and wine grapes.

3.3 Location and Acreage

3.3.1 City Spaces

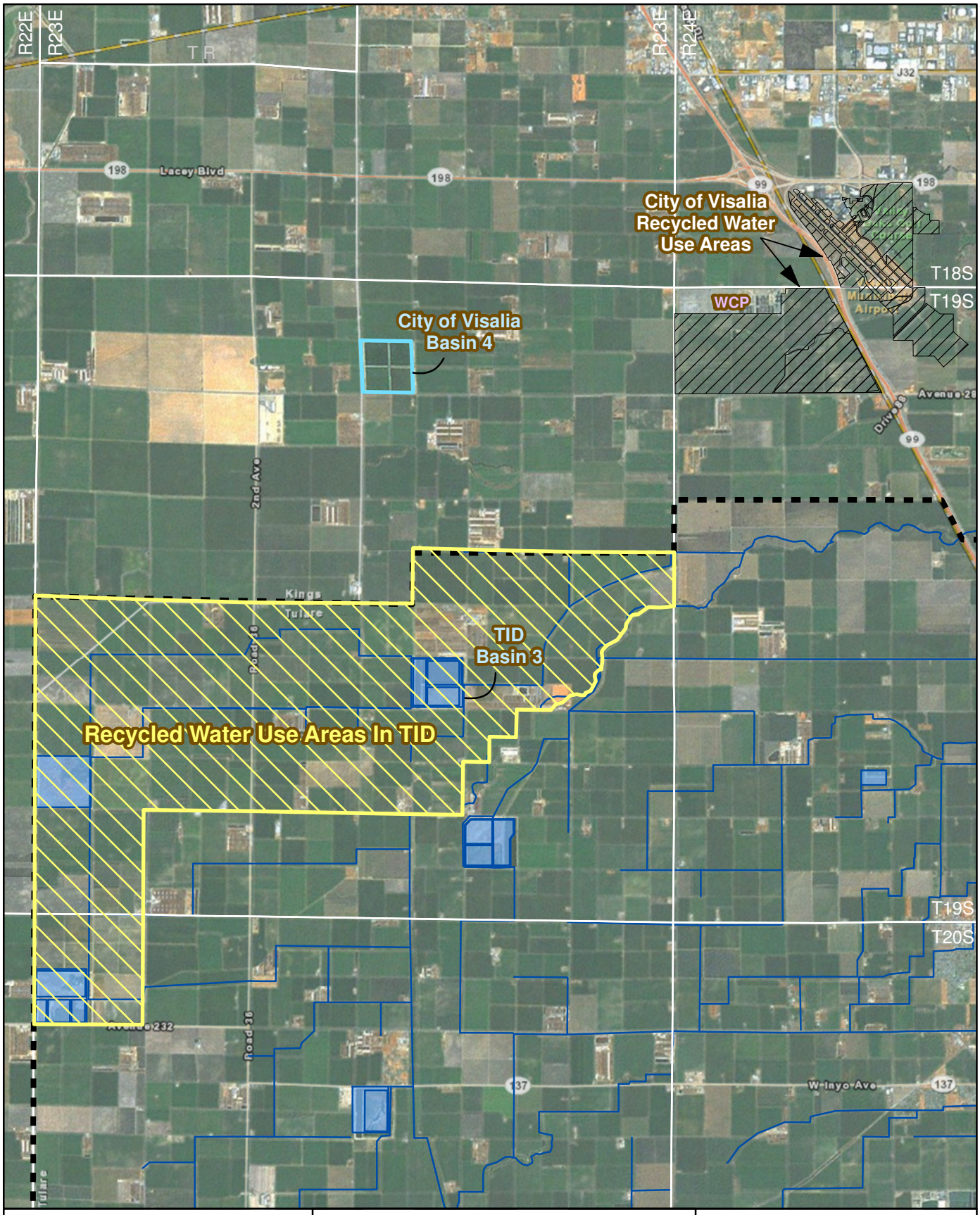
Recycled water will be delivered to approximately 890 acres of City farmland to the south and east of the WCP, and land east of Highway 99 including approximately 223 acres of Valley Oaks Golf Course, 30 acres within Plaza Park, 260 acres of airport farmland, and 284 acres of City farmland to the south of the airport.

3.3.2 TID Facilities

TID facilities within the use area include TID owned Basin 3, which has a storage volume of approximately 500 AF, and approximately 8,000 acres of farmland.

3.3.3 Basin 4

When recycled water volume exceeds demands within the use areas, recycled water will be transferred to City owned Basin 4 located approximately 3 miles west of the WCP. Basin 4 has an overall footprint of about 160 acres and a storage volume of approximately 1,028 AF.



0 0.5 1 Miles

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(559) 636-1166

Legend

- City of Visalia Recycled Water Use Areas
- Recycled Water Use Areas in TID
- TID Boundary
- TID Ditch/Canal
- TID Basin

CITY OF VISALIA

Figure 3-1
Recycled Water Use Areas

6/20/2012 \\goose\vsl_clients\Clients\Visalia City of - 1391\139112V5-WWTP AntiDeg\GIS\Map\ReuseAreaTIDrev14jun2012v10.mxd

4 RECYCLED WATER FACILITY OPERATIONS

Recycled water facilities and operations were evaluated for the “normal” year and “wet” year rainfall scenarios. “Normal” (average) year and “wet” (100-year rainfall recurrence) year rainfall data was obtained from the Western Regional Climate Center website (http://www.wrcc.dri.edu/) for the Visalia station. The normal and wet year scenarios are discussed below.

The disposal facility operations aim to maximize the use of recycled water from the WCP, as promoted by Porter-Cologne (see Section 1.2).

4.1 Normal Year

During normal year operations, the City will use recycled water as needed to irrigate Plaza Park (175 AF) and Valley Oaks Golf Course (1,100 AF). The remaining recycled water will be sent to TID for use to the extent feasible. The WCP currently produces approximately 13 mgd (14,560 AF/year). At current flows, TID is anticipated to accept nearly all of the flows not used at the City park or golf course. As recycled water flows increase, TID will accept larger recycled water flows, and City farmland and Basin 4 will be utilized as necessary. A small portion of the recycled water will be lost to percolation and evaporation in the onsite regulation basins.

The agreement between the City and TID includes a guaranteed minimum volume of recycled water that the City will convey to TID, but TID plans to use more than the minimum volumes (800 AF per month and 11,000 AF per year) if available. While typical operation of the recycled water facilities will be to deliver the majority of the water to TID, water balance calculations were completed to verify that the City can dispose of the permitted maximum annual average flow of 22 mgd at the minimum delivery volumes provided to TID.

4.2 Wet Year

Operations during a 100-year rainfall occurrence will be the same as during the normal year. The first priority for recycled water delivery will be to the park and golf course, and the remainder of the flow will be delivered to TID. As recycled water flows exceed the needs of TID, recycled water will be delivered to City farmland and, if needed, City owned Basin 4.

5 WATER QUALITY STANDARDS

Water quality standards are the beneficial uses and water quality objectives established within the applicable Basin Plan. The Water Quality Control Plan for the Tulare Lake Basin establishes water quality standards for the groundwater underlying this project.

5.1 Groundwater Beneficial Uses and Objectives

Groundwater beneficial uses designated for this portion of the Kaweah River Hydrologic Unit are contained in the Tulare Lake Basin Plan, and include municipal, agricultural, and industrial uses.

Groundwater quality objectives to protect the designated beneficial uses are also contained in the Tulare Lake Basin Plan and are identified in **Table 5-1** below.

Table 5-1. Groundwater Quality Objectives - Narrative

Parameter	**Criteria/Objective**
Bacteria (as Total Coliform)	2.2 MPN/100mL (7 day average)
Chemicals:	
General	Not present in concentrations that affect beneficial uses
Inorganics	Shall not Exceed MCLs in Cal Title 22
Fluoride	Shall not Exceed MCLs in Cal Title 22
Organics	Shall not Exceed MCLs in Cal Title 22
Pesticides	Shall not Exceed MCLs in Cal Title 22
Radioactivity	Shall not Exceed MCLs in Cal Title 22
Salinity (measured as EC)	Annual increase less than 3 µmhos/ cm
Tastes/ odors	Shall not contain concentrations that create nuisance or adversely affect beneficial uses
Toxicity	Maintain free of toxic substances

Current agricultural uses in the proposed use areas include alfalfa, cherries, cotton, field corn, grain sorghum, native pasture, pistachios, walnuts, wheat, and wine grapes. In addition to the groundwater quality objectives summarized above, as dictated by the Basin Plan, these crops have various agricultural water quality limitations. Additional groundwater quality objectives for agricultural use are presented in **Table 5-2**. This table is based on agricultural guidelines of water quality for irrigation with unrestricted use,

based on Ayers and Westcot (1985). Some relaxed objectives are also available with certain levels of restricted use, with some crops being more tolerant than others.

Table 5-2. Agricultural Groundwater Quality Objectives

Parameter	Criteria/Objective[1]
Boron	700 µg/L
Chloride	106 mg/L
Electrical Conductivity (EC)	700 µmhos/cm
Selenium	20 µg/L
Sodium	69 mg/L
Total Dissolved Solids (TDS)	450 mg/L
1. Water quality for agriculture from Ayers & Westcot.	

The major constituents of concern in assessing the quality of water for agriculture are salinity, boron, chloride, and sodium. In general, human and animal uses are less sensitive than crops for these constituents. Salinity (expressed as EC or TDS) reduces crop growth by reducing the ability of plant roots to absorb water. The salt tolerance of crops also depends on the frequency and type of irrigation. Sprinkler irrigation is most restricting due to foliar absorption of salt. Absorption and foliar injury are further influenced by high temperature, low humidity, drying winds, type of sprinkler, and timing of irrigation. Boron is an essential element but can become toxic to some plants when concentrations in water even slightly exceed the amount required for optimal growth. Like salt tolerance, boron tolerance varies with the climate, the soil, and the crop. While boron sensitivity appears to affect a wide variety of crops, sodium and chloride toxicities are mostly limited to tree crops and woody perennials (e.g., citrus, stone-fruit, and vineyard). A predominance of sodium relative to other ions in irrigation water may disperse soil aggregates, which in turn, affects virtually all crops by decreasing the permeability of the soil by water and air.

In determining the concentrations of salinity, boron, chloride, and sodium in groundwater associated with no adverse affects on agricultural beneficial use in the area, multiple criteria apply. The most stringent concentrations become the constraining criterion, and therefore the water quality objectives.

Utilizing an extensive constituent list and water quality based assessment thresholds based on the Basin Plan, California primary and secondary maximum contaminant levels (MCL), California public health goals (PHG), and water quality standards for agriculture, numeric objectives for the narrative objectives shown in **Table 5-1** were

determined. A summary of numeric water quality based assessment thresholds, including both municipal and agricultural objectives, is attached as **Appendix A**.

6 GROUNDWATER CHARACTERIZATION

Existing groundwater quality near the WCP and the use areas is highly variable. Groundwater quality data solicited from various sources was summarized and illustrated on **Figure 6-1**, **Figure 6-2**, and **Figure 6-3**. Well locations shown are approximate and are often representative of a set of wells, as discussed in this section.

Well construction and location data are not available for most of the well data obtained. Trying to make an assumption of well depth for each well based on water quality proved to be difficult, and so all of the known domestic and monitoring well data was summarized either by section or by dairy address, depending on the source. This is a conservative approach, as the water quality of concern (first encountered groundwater) is generally of lesser quality than the quality of deeper groundwater. Our characterization of existing groundwater is therefore considered to be of higher quality than the actual first encountered groundwater, and will result in a greater perceived impact from the proposed discharge.

6.1 Aquifer Depth and Thickness

Based on a report entitled “Groundwater Investigation Report”, prepared by Boyajian & Ross, Inc., and dated January 30, 1998 (B&R, 1998), the stratigraphy beneath the WCP can be divided into four predominant zones to depths of 465 feet bgs, the maximum depth explored. These stratigraphic units appear to dip gently to the southwest at approximately 20 feet per mile. The uppermost stratigraphic zone is comprised of interbedded, predominantly coarse-grained sediments to approximately 100 feet bgs. The next zone consists of relatively thin beds of sand interbedded with clay, clayey silt, and silt. This interbedded zone is approximately 160 to 170 feet thick and occurs to about 270 feet bgs. The uppermost coarse-grained zone and the underlying thin bedded sand and silt zone comprise the “upper aquifer” (B&R 1998).

The third stratigraphic zone is a very stiff, highly plastic clay layer that is approximately 20 feet thick. This clay layer acts as an aquitard (confining layer) between the upper unconfined aquifer and the deeper confined aquifer. A sequence of sand and silty sand interbedded with clay and clayey silt lays stratigraphically below the confining layer. This interbedded zone comprises the “deep aquifer” underneath the site.

Groundwater depth in the upper aquifer, according to City monitoring well data, has typically ranged from about 55 feet bgs directly below the WCP ponds to approximately 106 feet bgs away from the plant. According to B&R 1998, regional groundwater beneath the site is encountered at a depth of approximately 80 to 95 feet bgs. According to the First Quarter 2012 Groundwater Monitoring Report, prepared by Moore Twining Associates, Inc., (Twining, 2012) upper aquifer groundwater elevations appear to show some seasonal variances. Historical groundwater elevation measurements in the upper aquifer consistently depict groundwater mounding in the area of the onsite recycled water ponds. The Twining 2012 report documents a range in depth to first encountered groundwater from 55 feet to 87 feet bgs due to the groundwater mound.

6.2 Generalized Groundwater Flow Direction and Rate

Based on the Twining 2012 report and Department of Water Resources historical groundwater level data for the Tulare Lake Region, Kaweah Groundwater Basin, groundwater flow direction beneath the site is predominantly to the southwest. However, local mounding beneath the disposal ponds causes intermittent deflections of the groundwater flow lines in the vicinity of the WCP. The mounding also creates a substantial downward vertical hydraulic gradient in the upper aquifer, which dissipates with distance from the WCP (B&R 1998).

B&R estimated hydraulic conductivity values from grain-size distribution analyses of 16 selected core sample intervals. Of the 16 intervals tested, 9 intervals represented sand layers within the saturated portion of the upper aquifer. Values of hydraulic conductivity within the 9 saturated upper aquifer intervals ranged from 40 to 130 feet per day, with an average of 80 feet per day. Porosity of the sand layers was estimated from grain-size distribution results. A range for effective porosity of 35 to 40 percent was used for velocity calculations. Using these aquifer parameters and the range of hydraulic gradients observed in the vicinity of the plant, the average pore-water velocity was determined to be approximately 0.48 feet per day or 170 feet per year (B&R 1998).

6.3 Groundwater Quality Conditions

6.3.1 Natural Groundwater Quality

'Natural' groundwater quality is the quality of groundwater prior to the influence of human activity. The natural groundwater quality is more specifically defined to be the groundwater quality at the time the antidegradation policy was approved in 1968.

Data was solicited from within the offsite use area. It was reported that sparse data was available from the early 1990's, but no data is available prior to that. Well construction information for the well data obtained from within the use area was not available, although it is likely that many of the wells were agricultural wells drilled to the deeper aquifer, and not representative of first encountered groundwater.

It is known that previous effluent discharges from the WCP as well as discharges from various animal confinement facilities (mostly dairies) in the area have impacted background groundwater quality in the upper aquifer. Due to the significant amount of activity in the area since 1968, it is not reasonably possible to extrapolate back to 1968 to characterize the groundwater quality before these impacts. It can, however, be reasonably assumed that existing land uses in the area are stable, and impacts to groundwater from these land uses (primarily dairies and agriculture) have also stabilized. The current existing groundwater quality is therefore a reasonable baseline quality with which the impacts associated with the proposed discharge can be assessed.

6.3.2 Current Groundwater Quality

6.3.2.1 Online Databases

Background groundwater quality data research was initiated through online database searches. The US EPA STORET database (http://www.epa.gov/storet/) was consulted with no results available for groundwater in the area. The SWRCB GeoTracker GAMA database (http://geotracker.waterboards.ca.gov/gama/) was also consulted. Several stations were located near the WCP and use areas, as shown on **Figure 6-2**. Water quality data from this source was limited to nitrates. GAMA station locations are approximated based on the maps provided on the GeoTracker website.

6.3.2.2 City of Visalia Monitoring Well Data

The City of Visalia provided groundwater monitoring well data. The City monitoring wells are installed in three different zones: the Upper Aquifer, the Base of Upper Aquifer, and the Lower Aquifer. Since this report is intended to discuss impacts to first encountered water, the monitoring wells installed in the Lower Aquifer are not included in this analysis. **Figure 6-3** includes groundwater quality data for the Upper Aquifer and Base of Upper Aquifer monitoring wells. Monitoring well locations are approximated based on well location maps provided by the City.

Only EC and nitrate data has been summarized in the figure in order to characterize the overall groundwater quality in the area of concern.

6.3.2.3 Dairy Data

The RWQCB provided groundwater quality data for various dairies in the vicinity of the WCP and use areas. Since the location of the wells on each dairy site is unknown, the groundwater quality for all wells on a given dairy were averaged and the location was approximated by the dairy address. Groundwater quality data for the dairies was limited to EC and nitrates, and includes annual 2009 through 2011 data. Generalized groundwater quality by dairy site is shown on **Figure 6-1** and **Figure 6-2**. **Figure 6-1** shows the EC by site, and is characterized by a trimmed mean. The trimmed mean ignores the top and bottom 15 percent of the data points, and averages the remaining values. **Figure 6-2** shows the nitrate as nitrogen (NO_3-N), and includes the minimum concentration, maximum concentration, and the trimmed mean. Minimum and maximum values were shown in addition to the average because the nitrate concentrations were highly variable, even within a given dairy site.

6.3.2.4 Offsite Use Area

Groundwater quality data for EC and nitrates was also provided from wells within the offsite use area. This data was provided by section, and is shown on **Figure 6-1** and **Figure 6-2**. The data provided includes a limited number of data points between 1990 and 2008, which have been averaged as shown on the figures.

6.4 Generalized Quality

While groundwater quality data is not available from as far back as 1968, it is reasonable to assume that current background groundwater is of lower quality than in 1968. Since the degradation that has occurred since that time has been the result of legally conducted operations, and the Basin Plan acknowledges that some amount of degradation will occur as the result of ongoing human activity, the current background groundwater quality will be considered as the ambient water quality whose beneficial uses shall continue to be protected.

Since groundwater quality within the project area is highly variable, a weighted average has been developed for the background quality with respect to EC and nitrates. The background groundwater quality below the City use areas to the east of Highway 99 has been considered to be the quality in upgradient monitoring well MW-A. MW-A is located east of Highway 99, in the proposed City use area. While monitoring well MW-A is no longer used, it represents the only upgradient monitoring data available, and provides closer to historical characterization of groundwater. Well MW-F appears to be upgradient of the WCP and use areas; however, according to the WDRs, "The Discharger's 'upgradient' groundwater data is from MW-F adjacent to an irrigation supply canal. Monitoring data from MW-F show that groundwater passing through the well reflects the high quality of surface water conveyed in the canal. Hence, data from MW-F is not [considered] representative of regional groundwater upgradient from the [WCP] and to treat it as such could be punitive."

The data available from MW-A is from years 1987 through 1989. It therefore represents an upgradient condition more than 20 years ago, which is assumed to be more nearly representative of 1968 groundwater quality. This is the earliest known groundwater quality data available near the recycled water use areas. Water quality data from MW-A indicates a background EC level of 574 μmhos/cm and chloride of about 22 mg/L. Nitrate data is not available from MW-A.

The background groundwater quality assumed for the use areas near the WCP and Basin 4 is an average of monitoring well data from the upper aquifer monitoring wells in that area, as shown on **Figure 6-3**. Average water quality data for monitoring wells MW-B, MW-G, MW-H1, MW-J1, MW-K1, MW-L, and MW-M, from May 2004 to present, indicates background EC and nitrate as nitrogen of 900 μmhos/cm and 20 mg/L, respectively.

Groundwater quality data obtained from the TID use area includes various dairy and agricultural sources, and no associated well construction data was available. In order to estimate first encountered groundwater, all data from agricultural wells were removed from consideration, as it is likely that those wells represent a deeper aquifer. We attempted to isolate domestic well data, which are more likely to be constructed in the upper aquifer. While the domestic wells may not represent the first encountered groundwater, they are the best representation of upper aquifer groundwater quality for the TID use area. If these wells are in fact deeper, the water quality data used may be

of better quality than actual first encountered groundwater, and therefore this approach is conservative. Domestic well data obtained throughout the TID use area, as shown on **Figure 6-1** and **Figure 6-2**, were averaged to obtain a background groundwater quality for this area. Background quality for EC and nitrate as nitrogen is 450 µmhos/cm and 8.5 mg/L, respectively.

The generalized background groundwater quality for the combined use areas is based on a weighted average of the values presented above. Based on the overall acreage of each use area and its corresponding background groundwater quality, an overall generalized background quality was calculated for EC and nitrate as nitrogen at 510 µmhos/cm and 10 mg/L, respectively.

Background groundwater quality for constituents other than EC and nitrate is assumed to be similar to MW-A.

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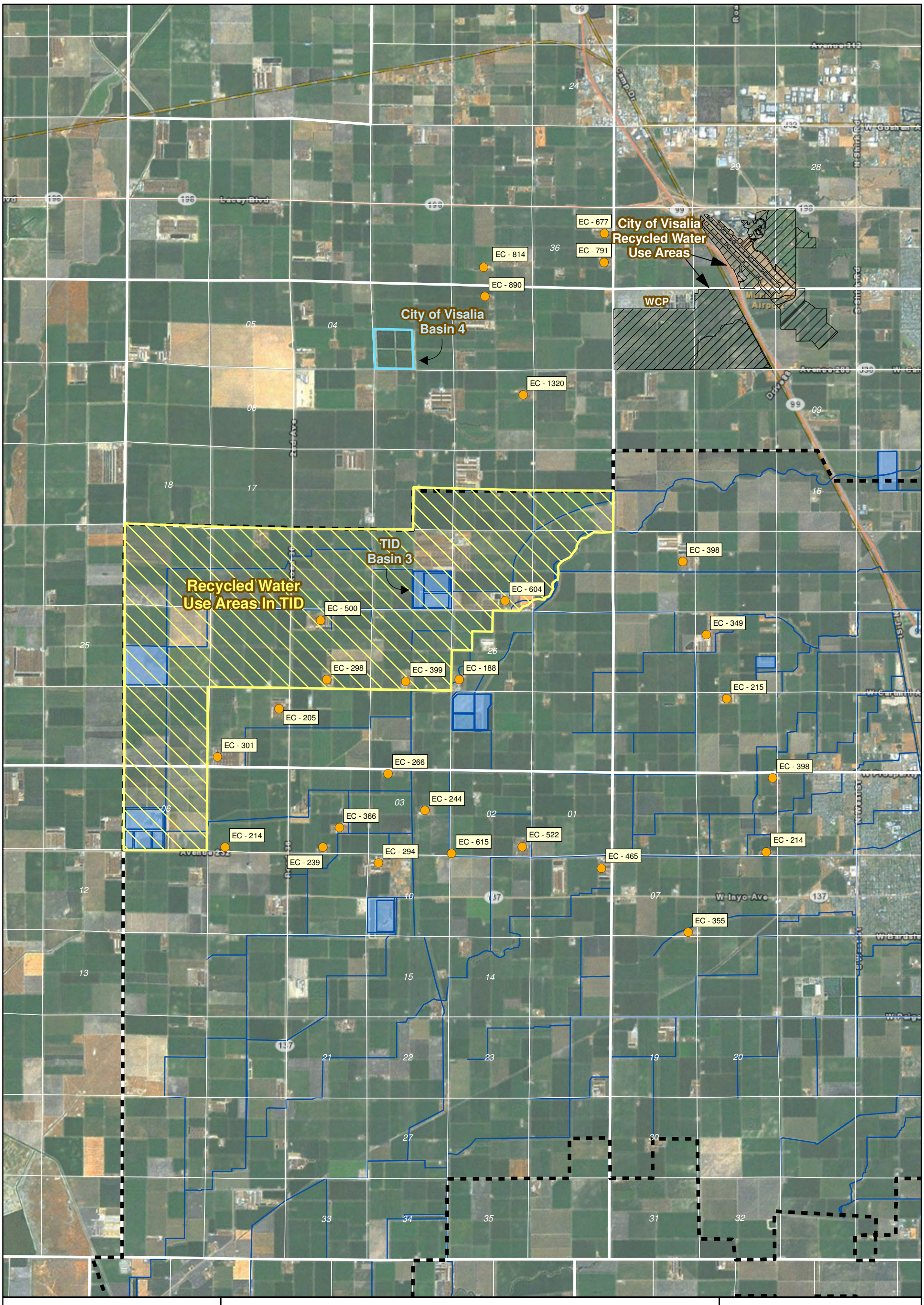


0 0.5 1 Miles

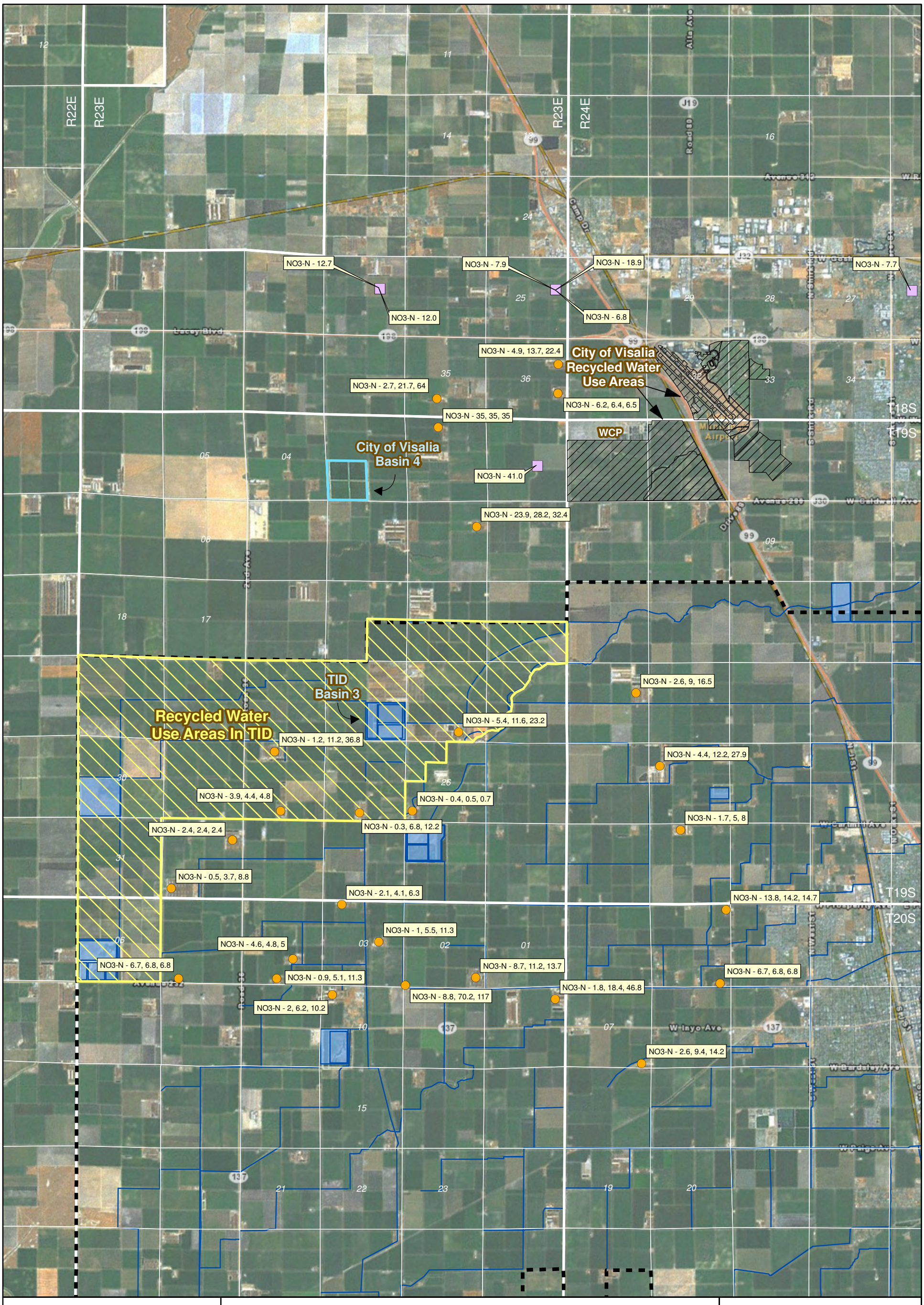
EST. 1968
PROVOST & PRITCHARD CONSULTING GROUP
An Employee Owned Company
286 W. Cromwell Ave.
Fresno, CA 93711-6162
(559) 449-2700

Legend

- City of Visalia Recycled Water Use Areas
- Recycled Water Use Areas in TID
- TID Boundary
- TID Ditch/Canal
- TID Basin
- Well - Dairy (Approx. Loc. by Address)

CITY OF VISALIA

Figure 6-1
Groundwater
Constituent Map - EC



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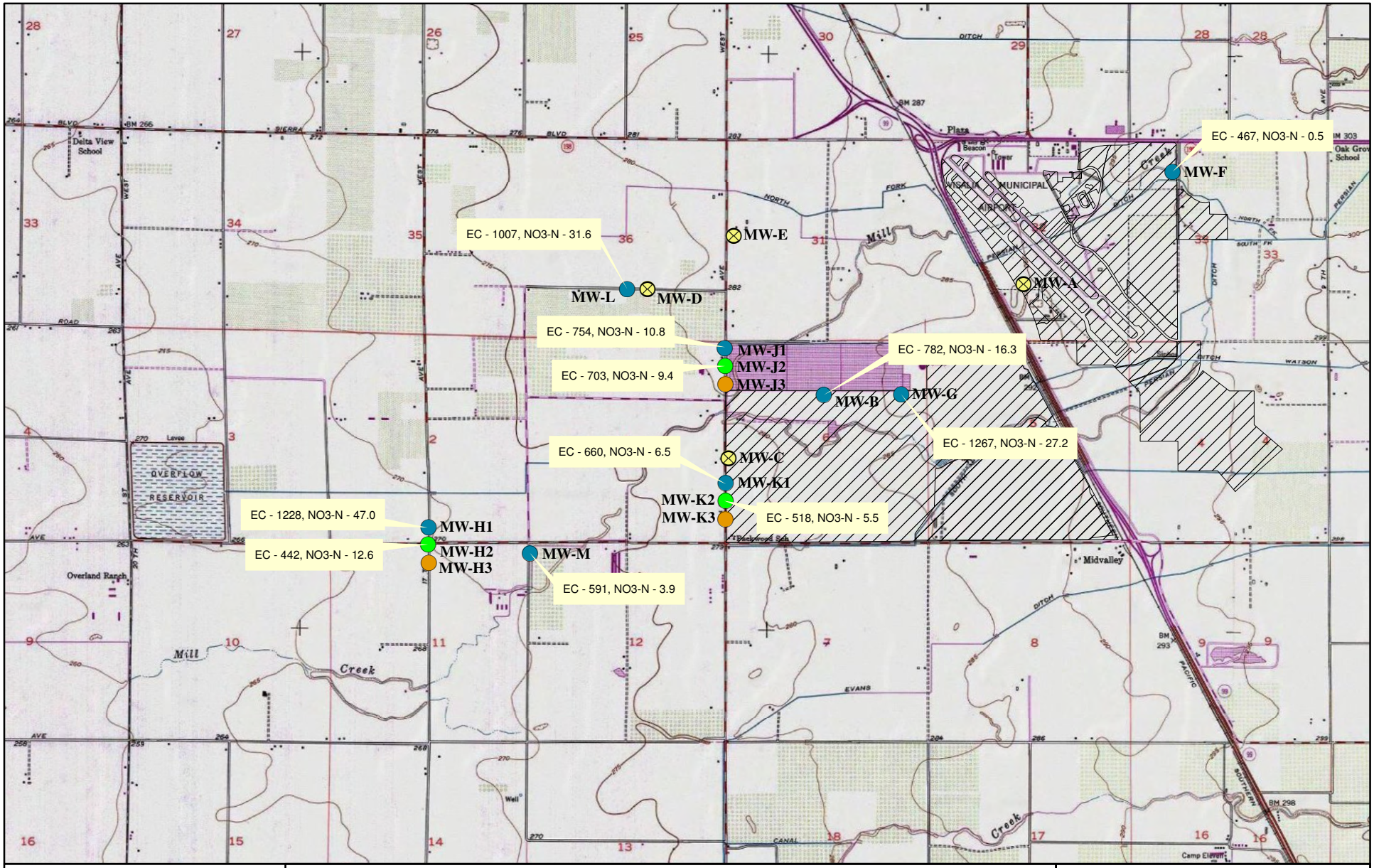
- City of Visalia Recycled Water Use Areas
- Recycled Water Use Areas in TID
- TID Boundary
- TID Ditch/Canal
- TID Basin
- Well - Dairy (Approx. Loc. by Address)
- Well - GAMA (Approx. Loc.)

Note: Where three NO3-N values are shown, they represent minimum, mean, and maximum values respectively.

CITY OF VISALIA

Figure 6-2
Groundwater
Constituent Map - NO3-N



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Legend

City of Visalia Water Reuse Areas
City of Visalia Monitoring Wells
- Upper Aquifer
- Base of Upper Aquifer
- Top of Lower Aquifer
- Dry (no longer sampled)

Note: EC and NO3-N values shown are average concentrations reported from May 2004 through January 2012.

CITY Of VISALIA

Figure 6-3
Monitoring Well Constituent Map

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7 RECYCLED WATER QUANTITY AND QUALITY

7.1 Treatment

The upgraded treatment plant will produce disinfected recycled water at a design capacity of 22 mgd, average annual flow, with peak flows up to 44 mgd. The treatment plant will include preliminary treatment, primary treatment, secondary and advanced tertiary treatment, and disinfection. The existing secondary treatment process will be converted to a membrane biological reactor (MBR) process, designed to produce recycled water to meet Title 22 standards. The MRB treatment process is among the most advanced wastewater treatment processes available.

7.1.1 Preliminary Treatment

Raw wastewater from the City service area is conveyed to the existing headworks, which includes two (2) Parshall flumes, two (2) bar screens, an influent pump station, and four (4) grit tanks. The screenings are processed by a washer/compactor unit. The influent pump station will include a total of six (6) influent pumps (five existing and one new), with a firm capacity of 47 mgd.

The influent pumps convey the flow to existing vortex-type grit tanks. Each tank is provided with a grit pump to transfer the grit slurry to the classifiers. Two existing classifiers are each equipped with a grit concentrating cyclone and dewatering trough.

Septage delivered by trucks is processed by a packaged unit that removes trash and grit. The septage is then mixed with incoming raw wastewater from the sewer conveyance system, prior to the headworks.

7.1.2 Primary Treatment

Flow from the grit tanks is transferred to the existing primary clarifiers. Each of the five (5) rectangular clarifiers is equipped with a chain and flight mechanism to remove scum and sludge. The scum and sludge collected from the primary clarifiers are pumped to the digesters by four (4) new sludge pumps.

7.1.3 Secondary and Advanced Tertiary Treatment

A new pump station with three (3) pumps having a firm capacity of 44 mgd will lift primary effluent to the secondary treatment facilities. The primary effluent will be pumped to four (4) fine screens. The compacted dewatered screenings will be collected into plastic bags and disposed off-site.

The screened flow will be conveyed to four (4) existing rectangular aerations basins, working in parallel. Each basin will be equipped with baffles to allow for anoxic and oxic zones to enable BOD and nitrogen removal, and to achieve more efficient treatment. Mixing in the anoxic zone will be provided by submersible mechanical mixers. Fine

bubble diffusers will provide air for mixing and biological needs in the oxic zone. Five (5) turbo blowers will supply the air to the aeration basins.

Effluent from the aeration basins will flow to one of ten (10) membrane tanks. The membranes are hollow-fiber type with nominal pore size of 0.04 μm. There will be one (1) pump per tank to permeate the flow through the membranes, leaving suspended solids behind, and transferring the clear effluent to the disinfection facility.

7.1.4 Disinfection

The membrane permeate will be disinfected through a new UV system. Two parallel channels housing six (6) UV banks each will be provided. The UV system will be low-pressure high-intensity, designed to supply the required dosage to achieve the required coliform bacteria concentration (2.2 MPN/100 mL).

7.2 Expected Recycled Water Quality

The upgraded WCP will produce recycled water meeting the limits specified in **Table 7-1**.

Table 7-1. Recycled Water Criteria

Parameter	Units	Value
Biochemical Oxygen Demand (BOD)	mg/L	30
Total Suspended Solids (TSS)	mg/L	30
Total Nitrogen (TN)	mg/L	<10
Turbidity	NTU	0.2[1]
Total Coliform Bacteria	MPN/100 mL	2.2[3]

1. 95% of the time; not to exceed 0.5 NTU.

2. 7-day median; not to exceed 23 MPN/100 mL in more than one sample during any 30-day period; not to exceed 200 MPN/100 mL at any time.

Other constituents in the proposed recycled water are anticipated to be similar to existing effluent conditions, as shown in **Table 7-2**. EC, TDS, chloride, and sodium concentrations in the recycled water may be reduced due to the change in disinfection technology from chlorine disinfection to UV disinfection, but credit is not taken for those reductions in **Table 7-2**. Also, production of disinfection byproducts will be avoided with the use of UV disinfection as opposed to chlorine disinfection.

Table 7-2. Existing Effluent Quality

Constituent	Units	Existing Effluent Conc.*
Aluminum	µg/L	110
Arsenic	µg/L	1.4
Barium	µg/L	24
Boron	µg/L	170
Bromodichloromethane	µg/L	0.76
Cadmium	µg/L	<0.2
Chloride	mg/L	76
Chloroform	µg/L	6.5
Chromium VI (as Cr)	µg/L	12
Copper	µg/L	8.1
Cyanide	µg/L	5.7
Electrical Conductivity @ 25 °C	µmhos/cm	667
Iron	µg/L	170
Lead	µg/L	0.62
Manganese	µg/L	12
Mercury	µg/L	0.95
Nickel	µg/L	4.8
Nitrate as N	mg/L	5.7
pH	pH units	6.5-8.5
Selenium	µg/L	2.1
Silver	µg/L	1.1
Sodium	mg/L	67
Sulfate	mg/L	38
Total Dissolved Solids (TDS)	mg/L	420
Zinc	µg/L	36
Total Coliform Organisms	MPN/100 mL	2.2
*Data obtained from WCP self monitoring reports from 2009-2011.		

7.3 Source Control

The City has adopted a state-approved Industrial Pretreatment Program (IPP) for the residents, businesses, and industries within the service area of the WCP. The City has built an effective pretreatment program and has succeeded in complying with all elements of the IPP, which include:

- Implementing the necessary legal authority (sewer ordinance) to establish industrial requirements and carry out the program.
- Enforcing IPP requirements on industrial discharges.
- Implementing program functions, such as permitting and monitoring industries.
- Providing adequate funding and personnel to carry out the IPP functions.

- Publishing a list of industrial users that are in significant noncompliance.
- Inspecting industries.

The City's current sewer ordinance limits industrial discharges to an EC limit of background plus 500 μmhos/cm. This limit is included in the industrial wastewater discharge permits and enforced by the IPP. Industrial waste streams with high EC are captured and disposed of outside the Basin.

7.4 Constituents of Concern

The constituents of concern are those constituents in groundwater that can reasonably be expected to be derived from the WCP, and that have the potential to affect beneficial uses or adversely increase salinity in the area.

Table 7-3 summarizes constituents of concern based on the beneficial uses of the groundwater within the use area, and including only those constituents with detectable concentrations in the effluent as analyzed in the City of Visalia annual reports from 2009 through 2011. Constituents with consistently non detected concentrations were determined to pose no threat to the groundwater or beneficial uses thereof. **Table 7-3** includes the background groundwater quality, the projected recycled water quality, and the water quality objectives on a constituent by constituent basis.

Table 7-3. Water Quality Objectives – Constituents of Concern

Constituent	Units	Background GW Conc.[a]	Projected Recycled Water Conc.[c]	Water Quality Objective (GW)	Benefical Use	Will Degradation Occur?	Will Beneficial Use be Impacted?
Aluminum	µg/L	NS	110	200	MUN-Secondary MCL	No	No
Arsenic	µg/L	NS	1.4	10	MUN-Primary MCL	No	No
Barium	µg/L	NS	24	1000	MUN-Primary MCL	No	No
Boron	µg/L	NS	170	700	AGR	No	No
Bromodichloromethane	µg/L	NS	0.76	80	MUN-Primary MCL	No	No
Cadmium	µg/L	NS	<0.2	5.0	MUN-Primary MCL	No	No
Chloride	mg/L	22	76*	106	AGR	Yes	No
Chloroform	µg/L	NS	6.5	80	MUN-Primary MCL	No	No
Chromium VI (as Cr)	µg/L	NS	12	50	MUN-Primary MCL	No	No
Copper	µg/L	NS	8.1	200	AGR	No	No
Cyanide	µg/L	NS	5.7	150	MUN-Primary MCL	No	No
Electrical Conductivity @ 25 °C	µmhos/cm	510 [b]	667*	Source + 500		Yes	No
				700	AGR		No
Iron	µg/L	NS	170	300	MUN-Secondary MCL	No	No
Lead	µg/L	NS	0.62	15	MUN-Primary MCL	No	No
Manganese	µg/L	NS	12	50	MUN-Secondary MCL	No	No
Mercury	µg/L	NS	0.95	1.2	MUN-Toxicity (PHG)	No	No
Nickel	µg/L	NS	4.8	12	MUN-Toxicity (PHG)	No	No
Nitrate as N	mg/L	10	5.7	10	MUN-Primary MCL	No	No
pH	pH units	7.1-7.7	6.5-8.5	6.5-8.4	AGR	No	No
Selenium	µg/L	NS	2.1	20	AGR	No	No
Silver	µg/L	NS	1.1	35	MUN-Toxicity (IRIS)	No	No
Sodium	mg/L	NS	67*	69	AGR	Yes	No
Sulfate	mg/L	NS	38	250	MUN-Secondary MCL	No	No
Total Dissolved Solids (TDS)	mg/L	NS	420*	450	AGR	Yes	No
Zinc	µg/L	NS	36	2000	AGR	No	No
Total Coliform Organisms	MPN/100 mL	NS	2.2	2.2	Basin Plan		No

a. Existing groundwater concentrations are approximated based on City of Visalia upgradient MW-A and dairy data near the recycled water use areas.
b. Background EC based on a weighted average of EC values for the various recycled water use areas.
c. Projected recycled water concentrations are based on existing effluent concentrations as reported in the City of Visalia's 2009-2011 self-monitoring reports
* Concentrations in the recycled water may decrease when process changes to UV disinfection, but credit has not been taken for those reductions in this table.
NS: Not Sampled

8 IMPACT OF OPERATIONS ON GROUNDWATER

Groundwater shall be maintained as close to its natural quality as is reasonable considering careful use and management of water resources. As shown in **Table 7-3**, beneficial uses of the receiving water will not be impacted by any of the constituents considered, based on the water quality objectives listed. Four (4) of the constituents listed will cause degradation of the groundwater: chloride, EC, sodium, and TDS. Existing effluent concentrations of chloride, sodium, and TDS are below all water quality objectives, and therefore no further analysis is required for those constituents. EC will be considered further in this section. The remaining constituents are deemed to have no impact on the existing groundwater conditions or the beneficial uses thereof, and will therefore not be discussed further in this report.

It is also noted that BOD concentrations in the recycled water will be typically less than 10 mg/L. There has been concern from other locations that higher levels of BOD cause soil bacteria to develop into an anaerobic environment; the resulting oxygen-depleted environment causes soil pH to decline, which has the potential to cause metals to leach from the soils. The low levels of BOD in the City effluent should allow dissolved oxygen to persist throughout the vadose zone, and thereby avoid the depressed pH levels and associated leaching concerns

Porter-Cologne recognizes that “it may be possible for the quality of water to be changed to some degree without unreasonably affecting beneficial uses.” Additionally, the Water Quality Control Plan for the Tulare Lake Basin (Basin Plan) acknowledges, “No proven means exist at present that will allow ongoing human activity in the Basin and maintain ground water salinity at current levels throughout the Basin. Accordingly, the water quality objectives for ground water salinity control the rate of increase.” For the Kaweah River hydrographic unit, under which the City of Visalia falls, the maximum average annual increase in salinity measured as electrical conductivity shall not exceed 3 μmhos/cm as averaged over a 5-year period (15 μmhos/cm increase over 5 years). This objective will be discussed further in this section.

8.1 Groundwater Impact Analysis

Impacts to groundwater quality are dependent on the volume and quality of the recycled water discharge, the volume and quality of groundwater below the project area, and the horizontal movement of water within the receiving aquifer.

Effluent is currently produced at an annual average rate of 13 mgd, and is anticipated to increase by about 2.5 percent per year over the next 20 years. The proposed permitted maximum annual average rate at which recycled water will be produced is 22 mgd, which is expected to be reached around year 2025. Recycled water will be applied to ponds and use areas totaling approximately 10,100 acres. Groundwater conditions for the WCP area were discussed in the Groundwater Investigation Report prepared by Boyajian & Ross, Inc. in January 1998.

8.1.1 Control Volume

The control volume could be approximated various ways. The control volume can either be assumed based on a combination of horizontal and vertical hydraulic conductivities, yielding a wider control area at depth than the surface disposal area, or the boundaries of the control volume can be assumed to be the same as the disposal area at ground surface. The latter method is more conservative because it generates a smaller control volume within which mixing is calculated. That is the method that will be used herein. It has been assumed that all of the recycled water produced will reach the groundwater aquifer, which is also a very conservative approach. In actuality, a large portion of the recycled water will be consumed by crop uptake or evapotranspiration, and only a percentage will reach groundwater.

The control volume surface area is assumed to be the same as the total disposal area of 10,100 acres. Depth can be assumed to be equal to the thickness of the upper aquifer, as suggested by Boyajian & Ross (1998) that vertical mixing occurs throughout the upper aquifer. This thickness varies depending on the depth to water and depth to the top of the E-Clay under each use area, but is generally about 175 feet thick (depth to E-Clay about 260 feet to 275 feet bgs, and depth to first encountered groundwater about 80 feet to 100 feet bgs).

An effective aquifer porosity was also used to calculate the groundwater volume below the project areas. An effective porosity of 37 percent was used for the site, which is midway between the 35 to 40 percent range reported by Boyajian & Ross (1998). This yields an effective volume for mixing in the upper aquifer of 654,000 AF.

8.1.2 Mass Balance Calculations

Assuming that any recycled water reaching the aquifer would mix within the thickness of the upper aquifer, as described by Boyajian & Ross (1998), a mass balance type model can be used to calculate concentrations of key constituents in the mixed volume below the site.

Given that the mass of any constituent within the mixed groundwater control volume must equal the mass in the control volume prior to mixing plus the mass of that constituent within the recycled water discharged into the control volume, mixed concentrations in the aquifer can be estimated mathematically. It is assumed that some of the groundwater within the control volume flows away from the project site, and is replenished with additional groundwater flowing into the control volume, which has not yet been impacted.

The total constituent mass mixed in the aquifer can be given by:

Year 1:

$$Vol_{rw} * C_{rw} + Vol_{GW} * C_{GW} + Vol_{Flow} * C_{GW} = Vol_{mix1} * C_{mix1} \quad \textbf{(Eq. 1)}$$

Subsequent Years:

$$Vol_{rw} * C_{rw} + (Vol_{GW} + \Sigma\, Vol_{rw(1,x-1)}) * C_{mix(x-1)} + Vol_{Flow} * C_{GW} = Vol_{mix\_x} * C_{mix\_x} \quad \textbf{(Eq. 2)}$$

Where,

Vol_{rw} = Volume of recycled water discharged over 1-year,

C_{rw} = constituent concentration in recycled water,

Vol_{GW} = Volume of groundwater below use areas (Control Volume),

C_{GW} = constituent concentration in existing groundwater,

Vol_{Flow} = Volume of groundwater inflow below site over 1 year,

Vol_{mix1} = Volume of groundwater plus recycled water (after year 1),

C_{mix1} = constituent concentration after mixing (after year 1),

Vol_{mix_x} = Volume of groundwater plus recycled water (after year x),

C_{mix_x} = constituent concentration after mixing (after year x).

Groundwater flow through the site can be calculated by a groundwater velocity, the width of the control volume perpendicular to the direction of groundwater flow, and the thickness of the upper aquifer. The average pore-water velocity as reported by Boyajian & Ross (1998) was 0.48 feet per day. The groundwater flow direction below the site is predominantly toward the southwest. The width of the control volume perpendicular to the flow direction has been approximated to be 40,000 ft, and the thickness of the upper aquifer, as described above, is about 175 feet. The flow into the control volume is assumed to equal the flow out of the control volume, although the flow out may increase due to the proposed discharge. The flow through the control volume is therefore calculated to be about 28,000 AF per year, by the following equation:

$$Q_{Flow} = V_{Flow} * w_{CV} * t_{mixing} * \text{(365 days/yr) *(1 AF/43,560 cu.ft.)} \quad \textbf{(Eq. 3)}$$

$$Vol_{Flow} = Q_{Flow} * 1 \text{ year} \quad \textbf{(Eq. 4)}$$

Where,

Q_{Flow} = Volumetric flow of groundwater into and out of the control volume (AF/year)

V_{Flow} = average pore water velocity (ft/day)

w_{CV} = control volume width (ft)

t_{mixing} = mixing zone thickness (thickness of upper aquifer) (ft)

Vol_{Flow} = Volume of groundwater inflow below site over 1 year (AF)

8.1.3 Groundwater Model Analysis

The groundwater model estimates EC impacts to the aquifer beneath the site from the recycled water use. EC is a measure of the ability of a solution to conduct electric current based on the ions present. While not measured in mass, EC concentration is related to the salt concentration so using a mass balance as an approximation is appropriate. The groundwater model calculations are attached as **Appendix B**, and

results are summarized in **Table 8-1** below for EC. Background EC concentration is based on a weighted average EC concentration by area.

Table 8-1. Groundwater Model Summary

Constituent	Year	Projected Volume of Recycled Water Produced (mgd)	Mixed Groundwater Concentration (µmhos/cm)	Annual Increase (µmhos/cm)
Electrical Conductivity	1	13.0	513.3	3.3
	2	13.3	516.4	3.1
	3	13.7	519.3	2.9
	4	14.0	522.1	2.8
	5	14.3	524.7	2.6 **(14.7 – 5yr)**
	6	14.7	527.2	2.5
	7	15.1	529.5	2.3
	8	15.5	531.8	2.3
	9	15.8	534.0	2.2
	10	16.2	536.0	2.0 **(11.3 – 5yr)**
	11	16.6	538.0	2.0
	12	17.1	539.9	1.9
	13	17.5	541.7	1.8
	14	17.9	543.5	1.8
	15	18.4	545.2	1.7 **(9.2 – 5yr)**
	16	18.8	546.8	1.6
	17	19.3	548.4	1.6
	18	19.8	549.9	1.5
	19	20.3	551.4	1.5
	20	20.8	552.9	1.5 **(7.7 – 5yr)**

As shown in **Table 8-1**, impact of EC on the groundwater will occur, but it will be within the Basin Plan allowable incremental increase of 3 µmhos/cm per year, averaged over 5 years (15 µmhos/cm over the 5-year period shown). Calculations clearly show a convergence of annual EC increase, even as the recycled water flow volume increases each year. The change in EC for the first 5-year period, as shown above, is projected to be about 14.7 µmhos/cm. The change in EC for the second five year period, with recycled water flows increasing from 14.7 mgd to 16.2 mgd, is projected to be only 11.3 µmhos/cm, with the annual increase becoming less each year. EC in the recycled water is also below the Secondary MCL of 900 µmhos/cm, the agricultural objective of 700

μmhos/cm, and the objective that the EC concentration shall not exceed the source water concentration (230 μmhos/cm) plus 500 μmhos/cm.

The calculated annual increase in EC is within the Basin Plan requirements, based on a conservative set of assumptions. The following assumptions were made, which make the calculated impact greater than the actual anticipated impact.

- 100% of recycled water reaches groundwater.
- No uptake of salts by crops or other plants.
- No horizontal movement of recycled water through the vadose zone.
- Background groundwater quality developed from a compilation of data from wells at unknown depths, which are likely of higher quality than first encountered groundwater.

8.2 Predicted Changes in Quality

As discussed, EC in the groundwater will be impacted by the discharge. However, the beneficial uses are not projected to be impacted. The projected recycled water concentration of EC is 667 μmhos/cm, which is below the agricultural objective of 700 μmhos/cm, and well below the Secondary MCL of 900 μmhos/cm.

It should also be noted that the existing plume beneath the WCP of higher salinity groundwater would actually be diluted and improved by discharge and reuse within the recycled water use area.

9 BENEFIT TO PEOPLE OF THE STATE

SWRCB Resolution No. 2009-0011, Adoption of a Policy for Water Quality Control for Recycled Water, states that "The Recycled Water Policy (Policy) is intended to support the Strategic Plan priority to Promote Sustainable Local Water Supplies. Increasing the acceptance and promoting the use of recycled water is a means towards achieving sustainable local water supplies… The Policy is also intended to encourage beneficial use of, rather than solely disposal of, recycled water."

9.1 Impact to Beneficial Use

As discussed in Section 8, the proposed discharge will not impact the present or anticipated future beneficial uses of the receiving groundwater.

9.2 Alternatives Analysis

The impacts of the proposed discharge on the existing groundwater quality could potentially be mitigated by one of two alternatives considered, including higher level of treatment and no project.

9.2.1 Higher Level of Treatment

Since salinity is the primary concern with the recycled water quality, implementation of a reverse osmosis (RO) treatment system could further improve the recycled water quality from the WCP. The addition of RO treatment would minimize degradation of the groundwater, but it would result in an unreasonably high capital cost and would require disposal of the waste brine stream.

It is estimated that a 22 mgd RO treatment system would have a capital cost of approximately $15 to $20 million ($0.7 to $1.0 per gpd processed), in addition to other treatment and disinfection that will still be required to limit bacterial growth on the membranes. Additionally, the ongoing cost of disposing of the waste brine stream makes this alternative infeasible. Ocean disposal of the waste stream is not practical since the WCP is not located near the ocean and land application would cause an impact to groundwater, thus defeating the original intent of the RO system, and so the only reasonable alternative would be to truck the concentrate to another disposal facility that could accept the concentrated waste. This would be prohibitively expensive to implement at the volumes produced from this WCP, and would likely transfer the groundwater impact to another area, not remove it.

Implementation of this alternative is therefore determined to be infeasible, and the associated costs are not consistent with the maximum benefit to the people of the State.

9.2.2 No-Project Alternative

The no project alternative would maintain the existing WCP and disposal facilities as they are, and would not include the proposed tertiary treatment upgrades and effluent

recycling facilities. This would include continued discharge of a lower quality effluent and associated higher impacts to groundwater, and would not provide the advantages of recycled water use for irrigation purposes. This alternative is therefore not consistent with the maximum benefit to the people of the State.

9.3 Environmental Benefits

The proposed project will provide several environmental benefits, further demonstrating that changes in existing groundwater quality are consistent with the maximum benefit to the people of the State. The proposed project will reduce the environmental impacts from the WCP by producing a higher quality effluent treated to Title 22 standards that will be recycled and used for irrigation purposes, thus reducing groundwater and surface water demands and minimizing groundwater overdraft conditions.

As the population continues to grow, water demands and the corresponding concerns related to water supply increase. The proposed recycled water project will help to ease the burden on the groundwater aquifer by reducing groundwater pumping for irrigation purposes. As considered in Porter-Cologne, “Use of recycled water constitutes the development of ‘new basic water supplies’…”

The proposed project will also help to improve the groundwater quality below the WCP, caused by past degradation. Additionally, with the proposed recycled water facilities, the project will eliminate the discharge to Mill Creek, as surface water of the US. The project will improve the effluent quality to tertiary treatment standards, including nitrate reduction, allowing for use as and maximizing used of recycled water, as promoted in Porter-Cologned. This will also minimize the impacts to groundwater, as required in Resolution No. 68-16.

9.4 Socioeconomic Considerations

As discussed above, it has been found that improving the recycled water quality beyond the advanced tertiary treated level proposed is infeasible due to the high capital costs. The proposed project will provide the maximum benefit of the people of the region and the State. Minor changes to the groundwater quality will not pollute or impact the beneficial uses thereof.

The project has significant socioeconomic benefits through its reclamation of wastewater to the highest tertiary treatment, use of the recycled water in lieu of potable water, and the resulting reduced impact to the groundwater overdraft condition in the regional aquifer.

9.5 Alternative Treatment or Control

The project includes the highest reasonable level of treatment and control to reduce, eliminate, or compensate for negative impacts from the discharge. These treatment and control measures include UV disinfection to minimize salinity and chloride impacts, MBR

treatment as one of the highest quality tertiary treatment methods, and implementation of an Industrial Pretreatment Program.

10 CONCLUSIONS

The SWRCB Recycled Water Policy says that "The Regional Water Boards shall, absent unusual circumstances…, permit recycled water projects that meet the criteria set forth in this Policy…" This project does not impact the existing or potential future beneficial uses of the receiving water and is consistent with the maximum benefit to the people of the State, and is therefore in compliance with Resolution No. 68-16 as well as the Recycled Water Policy.

Based on the water quality assessment, the project is not expected to contribute to water quality impairments for any constituent, and the review of socioeconomic impacts indicates that the proposed project is to the maximum benefit of the people of the State. The membrane bioreactor treatment process selected by the City is among the most advanced wastewater treatment processes available, and will produce a recycled water of much higher quality than the existing facility as well as most municipal wastewater treatment facilities in California. Additionally, the project will provide a beneficial use of a water resource, as promoted in both Porter-Cologne and the Recycled Water Policy.

As defined in Resolution No. 68-16, the concept of "best practical treatment or control" is not defined in terms of specific technology, but as a technology that will prevent the impairment of designated beneficial uses and maintain the highest quality water considering socioeconomic costs and benefits. As discussed in previous sections, this project will not cause impairment of designated uses. The project will maintain the highest quality water consistent with the maximum benefit to the people of the State, as discussed in Section 9. For these reasons, it is concluded that construction and operation of the City of Visalia WCP upgrades is compliant with the Federal and State Antidegradation Policies.

11 REFERENCES

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APPENDICES

Appendix A Water Quality-Based Assessment Thresholds

Appendix B Groundwater Model Calculations

Water Quality-Based Assessment Thresholds

Derived using the Assessment Threshold Algorithms in the Water Quality Goals Staff Report, on the web at http://www.waterboards.ca.gov/water_issues/programs/water_quality_goals/docs/wq_goals_text.pdf

Constituent / Parameter (Synonym)	Water Quality Objective or Promulgated Criterion	Numeric Thresholds Recommended to Implement Objective or Criterion			G=Groundwater IS=Inland SW E=EB/Estuary O=Ocean	Assessment Thresholds Recommended to Protect Designated Beneficial Uses in the Groundwater			CAS Number
		Source of Numeric Threshold *(footnotes in parentheses are at bottom of table)*	Numeric Threshold	Units		MUN-MCL	MUN-Toxicity	AGR	
Aluminum	Chemical Constituents	California Primary MCL	1,000	ug/L	G & IS				7429-90-5
		California Secondary MCL	**200**	**ug/L**	G & IS	X	X		
		Water Quality for Agriculture (Ayers & Westcot)	5,000	ug/L	G & IS			X	
	Tastes and Odors	California Secondary MCL	200	ug/L	G & IS				
	Toxicity - humans	California Public Health Goal for Drinking Water	600	ug/L	G & IS				
Arsenic	Chemical Constituents	California Primary MCL	10	ug/L	G & IS	X			7440-38-2
		Water Quality for Agriculture (Ayers & Westcot)	100	ug/L	G & IS			X	
	Toxicity - humans	California Public Health Goal for Drinking Water	0.004	ug/L	G & IS		X		
Barium	Chemical Constituents	California Primary MCL	**1,000**	**ug/L**	G & IS	X	X		7440-39-3
	Toxicity - humans	California Public Health Goal for Drinking Water	2,000	ug/L	G & IS				
Boron	Chemical Constituents	Water Quality for Agriculture (Ayers & Westcot)	**700**	**ug/L**	G & IS			X	7440-42-8
	Toxicity - humans	California DPH Notification Level for drinking water	1,000	ug/L	G & IS	X	X		
Bromodichloromethane (Dichlorobromomethane)	Chemical Constituents	California Primary MCL (for total trihalomethanes)	80	ug/L	G & IS	X			75-27-4
	Toxicity - humans	Cal/EPA Cancer Potency Factor as a drinking water level (b)	0.27	ug/L	G		X		
Chloride	Chemical Constituents	California Secondary MCL, recommended level	250,000	ug/L	G & IS	X	X		16887-00-6
		California Secondary MCL, upper level	500,000	ug/L	G & IS				
		Water Quality for Agriculture (Ayers & Westcot)	**106,000**	**ug/L**	G & IS			X	
	Tastes and Odors	California Secondary MCL	250,000	ug/L	G & IS				
Chloroform	Chemical Constituents	California Primary MCL (total trihalomethanes)	80	ug/L	G & IS	X			67-66-3
	Tastes and Odors	Odor threshold (Amoore and Hautala)	2,400	ug/L	G & IS				
	Toxicity - humans	Cal/EPA Cancer Potency Factor as a drinking water level (b)	1.1	ug/L	G & IS		X		
Chromium (VI)	Chemical Constituents	California Primary MCL (total chromium)	**50**	**ug/L**	G & IS	X	X		18540-29-9
		Water Quality for Agriculture (Ayers & Westcot)	100	ug/L	G & IS			X	
Copper	Chemical Constituents	California Primary MCL	1,300	ug/L	G & IS				7440-50-8
		California Secondary MCL	1,000	ug/L	G & IS	X			
		Water Quality for Agriculture (Ayers & Westcot)	**200**	**ug/L**	G & IS			X	
	Tastes and Odors	California Secondary MCL & USEPA Nat. Rec. WQ Criteria	1,000	ug/L	G & IS				
	Toxicity - humans	California Public Health Goal for Drinking Water	300	ug/L	G		X		
Cyanide	Chemical Constituents	California Primary MCL	**150**	**ug/L**	G & IS	X	X		57-12-5
	Tastes and Odors	Odor threshold (Amoore and Hautala)	170	ug/L	G & IS				
	Toxicity - humans	California Public Health Goal for Drinking Water	150	ug/L	G				
Iron	Chemical Constituents	California Secondary MCL	**300**	**ug/L**	G & IS	X	X		7439-89-6
		Water Quality for Agriculture (Ayers & Westcot)	5,000	ug/L	G & IS			X	
	Tastes and Odors	California Secondary MCL	300	ug/L	G & IS				
Lead	Chemical Constituents	California Primary MCL	15	ug/L	G & IS	X			7439-92-1
		Water Quality for Agriculture (Ayers & Westcot)	5,000	ug/L	G & IS			X	
	Toxicity - humans	California Public Health Goal for Drinking Water	0.2	ug/L	G & IS		X		
Manganese	Chemical Constituents	California Secondary MCL	**50**	**ug/L**	G & IS	X	X		7439-96-5
		Water Quality for Agriculture (Ayers & Westcot)	200	ug/L	G & IS			X	
	Tastes and Odors	California Secondary MCL	50	ug/L	G & IS				
	Toxicity - humans	California DPH Notification Level for drinking water	500	ug/L	G & IS				

Water Quality-Based Assessment Thresholds

Derived using the Assessment Threshold Algorithms in the Water Quality Goals Staff Report, on the web at http://www.waterboards.ca.gov/water_issues/programs/water_quality_goals/docs/wq_goals_text.pdf

Constituent / Parameter (Synonym)	Water Quality Objective or Promulgated Criterion	Numeric Thresholds Recommended to Implement Objective or Criterion: Source of Numeric Threshold *(footnotes in parentheses are at bottom of table)*	Numeric Threshold	Units	G=Groundwater IS=Inland SW E=EB/Estuary O=Ocean	Assessment Thresholds Recommended to Protect Designated Beneficial Uses in the Groundwater: MUN-MCL	MUN-Toxicity	AGR	CAS Number
Mercury (see also Methylmercury)	Chemical Constituents	California Primary MCL	2	ug/L	G & IS	X			7439-97-6
	Toxicity - humans	California Public Health Goal for Drinking Water	**1.2**	**ug/L**	G		X		
Nickel	Chemical Constituents	California Primary MCL	100	ug/L	G & IS	X			7440-02-0
		Water Quality for Agriculture (Ayers & Westcot)	200	ug/L	G & IS			X	
	Toxicity - humans	California Public Health Goal for Drinking Water	**12**	**ug/L**	G		X		
Nitrate (expressed as nitrogen)	Chemical Constituents	California Primary MCL	**10,000**	**ug/L**	G & IS	X	X		14797-55-8
	Toxicity - humans	California Public Health Goal for Drinking Water	10,000	ug/L	G & IS				
pH - minimum	Chemical Constituents	USEPA Secondary MCL	**6.5**	**units**	G & IS	X	X		--
		Water Quality for Agriculture (Ayers & Westcot)	6.5	units	G & IS			X	
	Tastes and Odors	USEPA National Recomm. WQ Criteria, taste & odor	5	units	G & IS				
pH - maximum	Chemical Constituents	USEPA Secondary MCL	8.5	units	G & IS	X	X		--
		Water Quality for Agriculture (Ayers & Westcot)	**8.4**	**units**	G & IS			X	
	Tastes and Odors	USEPA National Recomm. WQ Criteria, taste & odor	9	units	G & IS				
Selenium	Chemical Constituents	California Primary MCL	50	ug/L	G & IS	X			7782-49-2
		Water Quality for Agriculture (Ayers & Westcot)	**20**	**ug/L**	G & IS			X	
	Toxicity - humans	California Public Health Goal for Drinking Water	30	ug/L	G & IS		X		
Silver	Chemical Constituents	California Secondary MCL	100	ug/L	G & IS	X			7440-22-4
	Tastes and Odors	California Secondary MCL	100	ug/L	G & IS				
	Toxicity - humans	USEPA IRIS Reference Dose (c)	**35**	**ug/L**	G & IS		X		
Sodium	Chemical Constituents	Water Quality for Agriculture (Ayers & Westcot)	**69,000**	**ug/L**	G & IS			X	7440-23-5
	Tastes and Odors	Taste and odor threshold (USEPA Drinking Water Advisory)	30,000	ug/L	G & IS				
	Toxicity - humans	USEPA Drinking Water Advisory for persons on restricted	20,000	ug/L	G & IS	X	X		
Specific conductance (Electrical conductivity) (EC)	Chemical Constituents	California Secondary MCL, recommended level	900	umhos/cm	G & IS	X	X		--
		California Secondary MCL, upper level	1,600	umhos/cm	G & IS				
		Water Quality for Agriculture (Ayers & Westcot)	**700**	**umhos/cm**	G & IS			X	
	Tastes and Odors	Basin Plan (annual increase in EC)	**3**	**umhos/cm per year**	G	X			
		California Secondary MCL, recommended level	900	umhos/cm	G & IS				
Sulfate	Chemical Constituents	California Secondary MCL, recommended level	**250,000**	**ug/L**	G & IS	X	X		14808-79-8
		California Secondary MCL, upper level	500,000	ug/L	G & IS				
	Tastes and Odors	California Secondary MCL, recommended level	250,000	ug/L	G & IS				
	Toxicity - humans	USEPA Drinking Water Advisory	500,000	ug/L	G & IS				
Total Dissolved Solids (TDS)	Chemical Constituents	California Secondary MCL, recommended level	500,000	ug/L	G & IS	X	X		--
		California Secondary MCL, upper level	1,000,000	ug/L	G & IS				
		Water Quality for Agriculture (Ayers & Westcot)	**450,000**	**ug/L**	G & IS			X	
	Tastes and Odors	California Secondary MCL	500,000	ug/L	G & IS				
Zinc	Chemical Constituents	California Secondary MCL	5,000	ug/L	G & IS	X			7440-66-6
		Water Quality for Agriculture (Ayers & Westcot)	**2,000**	**ug/L**	G & IS				
	Tastes and Odors	California Secondary MCL	5,000	ug/L	G & IS				
	Toxicity - humans	USEPA IRIS Reference Dose (c)	2,100	ug/L	G & IS		X		
Total Coliform Organisms (7-Day)		Basin Plan	**2.2**	**MPN per 100mL**	G	X			

Water Quality-Based Assessment Thresholds

Derived using the Assessment Threshold Algorithms in the Water Quality Goals Staff Report, on the web at http://www.waterboards.ca.gov/water_issues/programs/water_quality_goals/docs/wq_goals_text.pdf

Constituent / Parameter (Synonym)	Water Quality Objective or Promulgated Criterion	Numeric Thresholds Recommended to Implement Objective or Criterion			G=Groundwater IS=Inland SW E=EB/Estuary O=Ocean	Assessment Thresholds Recommended to Protect Designated Beneficial Uses in the Groundwater			CAS Number
		Source of Numeric Threshold *(footnotes in parentheses are at bottom of table)*	Numeric Threshold	Units		MUN-MCL	MUN-Toxicity	AGR	

Notes:

(a) For surface waters, toxicity limits may be preempted by Calfornia Toxics Rule or National Toxics Rule criteria or by California Ocean Plan objectives.
(b) Assumes 70 kg body weight and 2 liters per day drinking water consumption.
(c) Assumes 70 kg body weight, 2 liters per day drinking water consumption, and 20 percent relative source contrubution. An additional undertainty factor of 10 is used for Class C carcinogens.
(d) Applies to "TCDD Equivalents" calculated from the concentrations of 2,3,7,8-chlorinated dibenzodioxins and 2,3,7,8-chlorinated dibenzofurans and their corresponding toxic equivalency factors (TEFs).
(e) Applies separately to Aroclors 1242, 1254, 1221, 1232, 1248, 1260, and 1016.
(f) USEPA, Region 9 has allowed acid soluble analysis in surface water samples to account for suspended clay partices, which pose little aluminum toxicity.
(g) Potency Equivalency Factors, published by the Cal/EPA Office of Enviornmental Health Hazard Assessment, relate the relative cancer potencies of various polynuclear aromatic hydrocarbons to that of benzo(a)pyrene.
(h) In addition, the Average Primary Producer Steinhaus Similarity deviation for a site is less than 5% (as determined using Comprehensive Aquatic Systems Model (CASM) or other appropriate model and index) and is not exceeded more tha once every three years (or other appropriate return frequency sufficient to allow system recovery). The 5% index for the protection of aquatic plant community should also be protective of most freshwater animals (chronic criterion).
(i) Assumes pH 8.5, 27°C, and fish earlly life stages present.
(j) Assumes pH 8.5 and salmonids present.
(k) For estuarine waters, assumes maximum temperature of 25°C, maximum pH of 9.0 and minimum salinity of 20 g/kg. For ocean waters, assumes maximum temperature of 25°C, maximum pH of 8.5 and minimum salinity of 30 g/kg.
(l) Assumes 40 mg/L hardness as CaCO3.
(m) For sum of DDD, DDE and DDT.
(n) For sum of carcinogenic PAHs.
(o) Cancer risk at action level is 5 in 1,000,000.
(p) For chlorinated phenolics.
(q) Applies to total PCBs (e.g., sum of all congener or all isomer or homolog or Arochlor analyses).
(r) Criterion appears in an older reference, but not in the current list of recommended criteria.
(s) Value adjusted by rounding intermediate calculations per USEPA procedures.
(t) Value adjusted by removing *Gammarus fasciatus* study results per recommendation of Finlayson, California Dept. of Fish and Game.

CTR California Toxics Rule
MFL Million fibers per liter; limited to fibers longer than 10 um.
NTR National Toxics Rule

Beneficial Uses:

MUN-MCL = Municipal or Domestic Supply with default selection of drinking water Maximum Contaminant Level (MCL) when available
MUN-Toxicity = Municipal or Domestic Supply with consideration of human toxicity thresholds that are more stringent than drinking water MCLs
AGR = Agricultural Water Uses, including irrigation supply and stock watering
Aquatic Life & Consump = Supporting protection of aquatic life and consumption of aquatic organisms

APPENDIX C
GROUNDWATER MODEL CALCULATIONS
CITY OF VISALIA WATER CONSERVATION PLANT

Groundwater Model - Year 1

Project Area	Acres	10,100	
Average Thickness of Upper Aquifer	Feet	175	[Use Entire Upper Aquifer]
Effective Porosity		37%	B&R
Effective Volume of Upper Aquifer	AF	654,000	
Background EC	µmhos/cm	510	
Annual Volume of Effluent Discharge	mgd	13	[conservative - only a portion of irrigation water will reach gw]
Annual Volume of Effluent Discharge	AF	14,562	
EC of Discharge	µmhos/cm	667	
V_gw	ft/day	0.48	[B&R]
W_cv	ft	40,000	
t_mixing	ft	175	
Q_gw	AF/year	28,154	

Assuming complete mixing:

EC of Groundwater after 1-year of Discharge	**µmhos/cm**	**513.3**
ΔEC	**µmhos/cm**	**3.28**

APPENDIX C
GROUNDWATER MODEL CALCULATIONS
CITY OF VISALIA WATER CONSERVATION PLANT

Groundwater Model - Year 2

Project Area	*Acres*	*10,100*	
Average Thickness of Upper Aquifer	*Feet*	*175*	
Effective Porosity		*37%*	
Effective Volume of Upper Aquifer	*AF*	*654,000*	
Background EC	*µmhos/cm*	*510*	
Annual Volume of Effluent Discharge	mgd	13.3	
Annual Volume of Effluent Discharge	AF	14,926	
EC of Discharge	µmhos/cm	667	
EC of Groundwater after 1-year of Discharge	µmhos/cm	513.3	
V_gw	ft/day	0.48	[B&R]
W_cv	ft	40,000	
t_mixing	ft	175	
Q_gw	AF/year	28,154	

Assuming complete mixing:

EC of Groundwater after 2-years of Discharge	**µmhos/cm**	**516.4**	
ΔEC	**µmhos/cm**	**3.09**	

APPENDIX C
GROUNDWATER MODEL CALCULATIONS
CITY OF VISALIA WATER CONSERVATION PLANT

Groundwater Model - Year 3

Project Area	*Acres*	*10,100*
Average Thickness of Upper Aquifer	*Feet*	*175*
Effective Porosity		*37%*
Effective Volume of Upper Aquifer	*AF*	*654,000*
Background EC	*µmhos/cm*	*510*
Annual Volume of Effluent Discharge	mgd	13.7
Annual Volume of Effluent Discharge	AF	15,299
EC of Discharge	µmhos/cm	667
EC of Groundwater after 2 years of Discharge	µmhos/cm	516.4
V_gw	*ft/day*	*0.48*
W_cv	*ft*	*40,000*
t_mixing	*ft*	*175*
Q_gw	*AF/year*	*28,154*

Assuming complete mixing:

EC of Groundwater after 3-years of Discharge	**µmhos/cm**	**519.3**
ΔEC	**µmhos/cm**	**2.92**

Groundwater Model - Year 4

Project Area	*Acres*	*10,100*
Average Thickness of Upper Aquifer	*Feet*	*175*
Effective Porosity		*37%*
Effective Volume of Upper Aquifer	*AF*	*654,000*
Background EC	*µmhos/cm*	*510*
Annual Volume of Effluent Discharge	mgd	14.0
Annual Volume of Effluent Discharge	AF	15,682
EC of Discharge	µmhos/cm	667
EC of Groundwater after 3 years of Discharge	µmhos/cm	519.3
V_gw	*ft/day*	*0.48*
W_cv	*ft*	*40,000*
t_mixing	*ft*	*175*
Q_gw	*AF/year*	*28,154*

Assuming complete mixing:

EC of Groundwater after 4-years of Discharge	**µmhos/cm**	**522.1**
ΔEC	**µmhos/cm**	**2.77**

APPENDIX C
GROUNDWATER MODEL CALCULATIONS
CITY OF VISALIA WATER CONSERVATION PLANT

Groundwater Model - Year 5

Project Area	*Acres*	*10,100*
Average Thickness of Upper Aquifer	*Feet*	*175*
Effective Porosity		*37%*
Effective Volume of Upper Aquifer	*AF*	*654,000*
Background EC	*µmhos/cm*	*510*
Annual Volume of Effluent Discharge	mgd	14.3
Annual Volume of Effluent Discharge	AF	16,074
EC of Discharge	µmhos/cm	667
EC of Groundwater after 4 years of Discharge	µmhos/cm	522.1
V_gw	*ft/day*	*0.48*
W_cv	*ft*	*40,000*
t_mixing	*ft*	*175*
Q_gw	*AF/year*	*28,154*

Assuming complete mixing:

EC of Groundwater after 5-years of Discharge	**µmhos/cm**	**524.7**
ΔEC	**µmhos/cm**	**2.62**
ΔEC_Total 5 YR	**µmhos/cm**	**14.69**

APPENDIX C
GROUNDWATER MODEL CALCULATIONS
CITY OF VISALIA WATER CONSERVATION PLANT

Groundwater Model - Year 6

Project Area	*Acres*	*10,100*
Average Thickness of Upper Aquifer	*Feet*	*175*
Effective Porosity		*37%*
Effective Volume of Upper Aquifer	*AF*	*654,000*
Background EC	*µmhos/cm*	*510*
Annual Volume of Effluent Discharge	mgd	14.7
Annual Volume of Effluent Discharge	AF	16,475
EC of Discharge	µmhos/cm	667
EC of Groundwater after 5 years of Discharge	µmhos/cm	524.7
V_gw	*ft/day*	*0.48*
W_cv	*ft*	*40,000*
t_mixing	*ft*	*175*
Q_gw	*AF/year*	*28,154*

Assuming complete mixing:

EC of Groundwater after 6-years of Discharge	**µmhos/cm**	**527.2**
ΔEC	**µmhos/cm**	**2.49**

Groundwater Model - Year 7

Project Area	*Acres*	*10,100*
Average Thickness of Upper Aquifer	*Feet*	*175*
Effective Porosity		*37%*
Effective Volume of Upper Aquifer	*AF*	*654,000*
Background EC	*µmhos/cm*	*510*
Annual Volume of Effluent Discharge	mgd	15.1
Annual Volume of Effluent Discharge	AF	16,887
EC of Discharge	µmhos/cm	667
EC of Groundwater after 6 years of Discharge	µmhos/cm	527.2
V_gw	*ft/day*	*0.48*
W_cv	*ft*	*40,000*
t_mixing	*ft*	*175*
Q_gw	*AF/year*	*28,154*

Assuming complete mixing:

EC of Groundwater after 7-years of Discharge	**µmhos/cm**	**529.5**
ΔEC	**µmhos/cm**	**2.37**

APPENDIX C
GROUNDWATER MODEL CALCULATIONS
CITY OF VISALIA WATER CONSERVATION PLANT

Groundwater Model - Year 8

Project Area	*Acres*	*10,100*
Average Thickness of Upper Aquifer	*Feet*	*175*
Effective Porosity		*37%*
Effective Volume of Upper Aquifer	*AF*	*654,000*
Background EC	*µmhos/cm*	*510*
Annual Volume of Effluent Discharge	mgd	15.5
Annual Volume of Effluent Discharge	AF	17,309
EC of Discharge	µmhos/cm	667
EC of Groundwater after 7 years of Discharge	µmhos/cm	529.5
V_gw	*ft/day*	*0.48*
W_cv	*ft*	*40,000*
t_mixing	*ft*	*175*
Q_gw	*AF/year*	*28,154*

Assuming complete mixing:

EC of Groundwater after 8-years of Discharge	**µmhos/cm**	**531.8**
ΔEC	**µmhos/cm**	**2.26**

APPENDIX C
GROUNDWATER MODEL CALCULATIONS
CITY OF VISALIA WATER CONSERVATION PLANT

Groundwater Model - Year 9

Project Area	*Acres*	*10,100*
Average Thickness of Upper Aquifer	*Feet*	*175*
Effective Porosity		*37%*
Effective Volume of Upper Aquifer	*AF*	*654,000*
Background EC	*µmhos/cm*	*510*
Annual Volume of Effluent Discharge	mgd	15.8
Annual Volume of Effluent Discharge	AF	17,742
EC of Discharge	µmhos/cm	667
EC of Groundwater after 8 years of Discharge	µmhos/cm	531.8
V_gw	*ft/day*	*0.48*
W_cv	*ft*	*40,000*
t_mixing	*ft*	*175*
Q_gw	*AF/year*	*28,154*

Assuming complete mixing:

EC of Groundwater after 9-years of Discharge	**µmhos/cm**	**534.0**
ΔEC	**µmhos/cm**	**2.16**

APPENDIX C
GROUNDWATER MODEL CALCULATIONS
CITY OF VISALIA WATER CONSERVATION PLANT

Groundwater Model - Year 10

Project Area	*Acres*	*10,100*
Average Thickness of Upper Aquifer	*Feet*	*175*
Effective Porosity		*37%*
Effective Volume of Upper Aquifer	*AF*	*654,000*
Background EC	*µmhos/cm*	*510*
Annual Volume of Effluent Discharge	mgd	16.2
Annual Volume of Effluent Discharge	AF	18,186
EC of Discharge	µmhos/cm	667
EC of Groundwater after 9 years of Discharge	µmhos/cm	534.0
V_gw	*ft/day*	*0.48*
W_cv	*ft*	*40,000*
t_mixing	*ft*	*175*
Q_gw	*AF/year*	*28,154*

Assuming complete mixing:

EC of Groundwater after 10-years of Discharge	**µmhos/cm**	**536.0**
ΔEC	**µmhos/cm**	**2.06**
ΔEC_Total	**µmhos/cm**	**26.03**
ΔEC_YR 6-10	**µmhos/cm**	**11.34**

APPENDIX C
GROUNDWATER MODEL CALCULATIONS
CITY OF VISALIA WATER CONSERVATION PLANT

Groundwater Model - Year 11

Project Area	*Acres*	*10,100*
Average Thickness of Upper Aquifer	*Feet*	*175*
Effective Porosity		*37%*
Effective Volume of Upper Aquifer	*AF*	*654,000*
Background EC	*µmhos/cm*	*510*
Annual Volume of Effluent Discharge	mgd	16.6
Annual Volume of Effluent Discharge	AF	18,640
EC of Discharge	µmhos/cm	667
EC of Groundwater after 10 years of Discharge	µmhos/cm	536.0
V_gw	*ft/day*	*0.48*
W_cv	*ft*	*40,000*
t_mixing	*ft*	*175*
Q_gw	*AF/year*	*28,154*

Assuming complete mixing:

EC of Groundwater after 11-years of Discharge	**µmhos/cm**	**538.0**
ΔEC	**µmhos/cm**	**1.98**

APPENDIX C
GROUNDWATER MODEL CALCULATIONS
CITY OF VISALIA WATER CONSERVATION PLANT

Groundwater Model - Year 12

Project Area	*Acres*	*10,100*
Average Thickness of Upper Aquifer	*Feet*	*175*
Effective Porosity		*37%*
Effective Volume of Upper Aquifer	*AF*	*654,000*
Background EC	*µmhos/cm*	*510*
Annual Volume of Effluent Discharge	mgd	17.1
Annual Volume of Effluent Discharge	AF	19,106
EC of Discharge	µmhos/cm	667
EC of Groundwater after 11 years of Discharge	µmhos/cm	538.0
V_gw	*ft/day*	*0.48*
W_cv	*ft*	*40,000*
t_mixing	*ft*	*175*
Q_gw	*AF/year*	*28,154*

Assuming complete mixing:

EC of Groundwater after 12-years of Discharge	**µmhos/cm**	**539.9**
ΔEC	**µmhos/cm**	**1.90**

Groundwater Model - Year 13

Project Area	*Acres*	*10,100*
Average Thickness of Upper Aquifer	*Feet*	*175*
Effective Porosity		*37%*
Effective Volume of Upper Aquifer	*AF*	*654,000*
Background EC	*µmhos/cm*	*510*
Annual Volume of Effluent Discharge	mgd	17.5
Annual Volume of Effluent Discharge	AF	19,584
EC of Discharge	µmhos/cm	667
EC of Groundwater after 12 years of Discharge	µmhos/cm	539.9
V_gw	*ft/day*	*0.48*
W_cv	*ft*	*40,000*
t_mixing	*ft*	*175*
Q_gw	*AF/year*	*28,154*

Assuming complete mixing:

EC of Groundwater after 13-years of Discharge	**µmhos/cm**	**541.7**
ΔEC	**µmhos/cm**	**1.82**

APPENDIX C
GROUNDWATER MODEL CALCULATIONS
CITY OF VISALIA WATER CONSERVATION PLANT

Groundwater Model - Year 14

Project Area	*Acres*	*10,100*
Average Thickness of Upper Aquifer	*Feet*	*175*
Effective Porosity		*37%*
Effective Volume of Upper Aquifer	*AF*	*654,000*
Background EC	*µmhos/cm*	*510*
Annual Volume of Effluent Discharge	mgd	17.9
Annual Volume of Effluent Discharge	AF	20,074
EC of Discharge	µmhos/cm	667
EC of Groundwater after 13 years of Discharge	µmhos/cm	541.7
V_gw	*ft/day*	*0.48*
W_cv	*ft*	*40,000*
t_mixing	*ft*	*175*
Q_gw	*AF/year*	*28,154*

Assuming complete mixing:

EC of Groundwater after 14-years of Discharge	**µmhos/cm**	**543.5**
ΔEC	**µmhos/cm**	**1.76**

APPENDIX C
GROUNDWATER MODEL CALCULATIONS
CITY OF VISALIA WATER CONSERVATION PLANT

Groundwater Model - Year 15

Project Area	*Acres*	*10,100*
Average Thickness of Upper Aquifer	*Feet*	*175*
Effective Porosity		*37%*
Effective Volume of Upper Aquifer	*AF*	*654,000*
Background EC	*µmhos/cm*	*510*
Annual Volume of Effluent Discharge	mgd	18.4
Annual Volume of Effluent Discharge	AF	20,576
EC of Discharge	µmhos/cm	667
EC of Groundwater after 14 years of Discharge	µmhos/cm	543.5
V_gw	*ft/day*	*0.48*
W_cv	*ft*	*40,000*
t_mixing	*ft*	*175*
Q_gw	*AF/year*	*28,154*

Assuming complete mixing:

EC of Groundwater after 15-years of Discharge	**µmhos/cm**	**545.2**
ΔEC	**µmhos/cm**	**1.69**
ΔEC_Total	**µmhos/cm**	**35.18**
ΔEC_YR 11-15	**µmhos/cm**	**9.15**

APPENDIX C
GROUNDWATER MODEL CALCULATIONS
CITY OF VISALIA WATER CONSERVATION PLANT

Groundwater Model - Year 16

Project Area	*Acres*	*10,100*
Average Thickness of Upper Aquifer	*Feet*	*175*
Effective Porosity		*37%*
Effective Volume of Upper Aquifer	*AF*	*654,000*
Background EC	*µmhos/cm*	*510*
Annual Volume of Effluent Discharge	mgd	18.8
Annual Volume of Effluent Discharge	AF	21,090
EC of Discharge	µmhos/cm	667
EC of Groundwater after 15 years of Discharge	µmhos/cm	545.2
V_gw	*ft/day*	*0.48*
W_cv	*ft*	*40,000*
t_mixing	*ft*	*175*
Q_gw	*AF/year*	*28,154*

Assuming complete mixing:

EC of Groundwater after 16-years of Discharge	**µmhos/cm**	**546.8**
ΔEC	**µmhos/cm**	**1.64**

Groundwater Model - Year 17

Project Area	*Acres*	*10,100*
Average Thickness of Upper Aquifer	*Feet*	*175*
Effective Porosity		*37%*
Effective Volume of Upper Aquifer	*AF*	*654,000*
Background EC	*µmhos/cm*	*510*
Annual Volume of Effluent Discharge	mgd	19.3
Annual Volume of Effluent Discharge	AF	21,617
EC of Discharge	µmhos/cm	667
EC of Groundwater after 16 years of Discharge	µmhos/cm	546.8
V_gw	*ft/day*	*0.48*
W_cv	*ft*	*40,000*
t_mixing	*ft*	*175*
Q_gw	*AF/year*	*28,154*

Assuming complete mixing:

EC of Groundwater after 17-years of Discharge	**µmhos/cm**	**548.4**
ΔEC	**µmhos/cm**	**1.58**

Groundwater Model - Year 18

Project Area	*Acres*	*10,100*
Average Thickness of Upper Aquifer	*Feet*	*175*
Effective Porosity		*37%*
Effective Volume of Upper Aquifer	*AF*	*654,000*
Background EC	*µmhos/cm*	*510*
Annual Volume of Effluent Discharge	mgd	19.8
Annual Volume of Effluent Discharge	AF	22,158
EC of Discharge	µmhos/cm	667
EC of Groundwater after 17 years of Discharge	µmhos/cm	548.4
V_gw	*ft/day*	*0.48*
W_cv	*ft*	*40,000*
t_mixing	*ft*	*175*
Q_gw	*AF/year*	*28,154*

Assuming complete mixing:

EC of Groundwater after 18-years of Discharge	**µmhos/cm**	**549.9**
ΔEC	**µmhos/cm**	**1.53**

Groundwater Model - Year 19

Project Area	*Acres*	*10,100*
Average Thickness of Upper Aquifer	*Feet*	*175*
Effective Porosity		*37%*
Effective Volume of Upper Aquifer	*AF*	*654,000*
Background EC	*µmhos/cm*	*510*
Annual Volume of Effluent Discharge	mgd	20.3
Annual Volume of Effluent Discharge	AF	22,712
EC of Discharge	µmhos/cm	667
EC of Groundwater after 18 years of Discharge	µmhos/cm	549.9
V_gw	*ft/day*	*0.48*
W_cv	*ft*	*40,000*
t_mixing	*ft*	*175*
Q_gw	*AF/year*	*28,154*

Assuming complete mixing:

EC of Groundwater after 19-years of Discharge	**µmhos/cm**	**551.4**
ΔEC	**µmhos/cm**	**1.49**

APPENDIX C
GROUNDWATER MODEL CALCULATIONS
CITY OF VISALIA WATER CONSERVATION PLANT

Groundwater Model - Year 20

Project Area	*Acres*	*10,100*
Average Thickness of Upper Aquifer	*Feet*	*175*
Effective Porosity		*37%*
Effective Volume of Upper Aquifer	*AF*	*654,000*
Background EC	*µmhos/cm*	*510*
Annual Volume of Effluent Discharge	mgd	20.8
Annual Volume of Effluent Discharge	AF	23,279
EC of Discharge	µmhos/cm	667
EC of Groundwater after 19 years of Discharge	µmhos/cm	551.4
V_gw	*ft/day*	*0.48*
W_cv	*ft*	*40,000*
t_mixing	*ft*	*175*
Q_gw	*AF/year*	*28,154*

Assuming complete mixing:

EC of Groundwater after 20-years of Discharge	**µmhos/cm**	**552.9**
ΔEC	**µmhos/cm**	**1.45**
ΔEC_Total	**µmhos/cm**	**42.87**
ΔEC_YR 16-20	**µmhos/cm**	**7.69**

Appendix B

City of Visalia/Tulare Irrigation District
Proposed Water Exchange Agreement Outline

1. Purpose of Agreement

a. City of Visalia (City) will produce a reliable source of tertiary treated Recycled Water suitable for irrigation of all crops including food crops without restriction. City desires to exchange its Recycled Water for water that can be utilized to recharge City's groundwater for the benefit of its citizens.

b. Tulare Irrigation District (TID) desires to take delivery of Recycled Water in exchange for wet-season water, when available, for the benefit of its water users.

c. The general purpose of this agreement is to establish the terms, conditions, and obligations of City and TID regarding water exchanges for the mutual benefit of both parties.

2. Delivery of City Recycled Water

a. Volume and rate of Recycled Water to be delivered by City:

   i. City will deliver a minimum of 800 acre-feet per month and a minimum of 11,000 acre-feet per year of Recycled Water to TID, except in the event that City is unable to provide such delivery due to catastrophic event or maintenance issue.

b. Points of delivery:

   i. Recycled Water will be delivered by pipeline to TID via Evans Ditch near Road 68.

c. Miscellaneous:

   i. It is anticipated that the volume of Recycled Water produced will increase as Visalia's population grows. It is also anticipated that City will have additional uses for its Recycled Water over time. Future in-City reuse of Recycled Water will not decrease the volume of Recycled Water delivered to TID below the amounts in Section 2.a. above.

   ii. City will provide a monthly schedule of anticipated Recycled Water deliveries each year by December 15 for the upcoming year.

3. Delivery of Return Water by TID

a. Volume, rate and source water delivered by TID:

   i. TID will return surface water equal to 50 percent of the volume of Recycled Water delivered (2:1 exchange rate). All such return water is intended to be delivered for groundwater recharge purposes either in recharge basins or other facilities, or as channel losses within or adjacent to City boundaries which accrue to the benefit of City's groundwater resources.

ii. TID will return water at a rate not exceeding 1,400 acre-feet in any one week or 4,500 acre-feet in any one month without written approval from City, subject to Section 3.c. below.

iii. The primary source of return water will be TID's CVP Friant Division Contract Class 2 entitlement including Uncontrolled Season water.

iv. TID may use other sources of water for return to City with the prior approval of City. CVP Friant Division water other than Uncontrolled Season water, RWA water or section 215 water will be deemed pre-approved.

b. Points of delivery and measurement:

i. City will establish a hierarchy of preferred channels, basins, or other locations for such delivery in an effort to optimize the benefit to City's groundwater and wells serving the community. TID will follow City's preferred hierarchy to the extent practicable. The preferred hierarchy may change over time and may be updated annually.

ii. Water returned to City will be delivered through the TID Main and will be measured at points of introduction from the TID Main into channels traversing the City including the St. Johns River (with service to St. Johns Ditch and Modoc Ditch), the TIC Canal, The Lower Kaweah River (with service to Mill Creek, Evans Ditch, Persian and Watson Ditches and Packwood Creek), and Cameron Creek.

iii. Any water that passes through and leaves City in Packwood Creek, Cameron Creek, or other TID controlled channel will not be counted as return water.

iv. City may also take delivery of water at other locations, including but not limited to, water banking facilities that may be available to City at other locations within the Friant Division authorized place-of-use.

c. Delivery timing:

i. TID may return water to City from its CVP supply at any time with the following exceptions.

1. City may reject the return of water by TID at any time there is a declared flood release on the Kaweah River. Such rejection will only be limited to water that would displace water that otherwise would be in City's channels as losses supporting delivery to interests outside of City including TID.

2. City may reject the return of water by TID at any time channels or basins are needed for stormwater or floodwater management.

4. Exchange Account Balance

a. A rolling 10-year account balance of water deliveries will be created and monitored. The first water generating a balance will be the first water credited with return water (first in-first out).

b. It is the intention of the parties that the account be balanced regularly over time. The parties also understand that prolonged droughts can occur making CVP Class 2 water unavailable. Any account balance that is older than 10 years will be repaid by TID with it's the next available Class 2 supply even if it reduces deliveries to lands within TID.

5. Use of Recycled Water

a. TID intends to use all Recycled Water provided by City for purposes of irrigating edible and non-edible crops and for groundwater recharge without limitation on use and will have no obligation to take water from City that cannot be legally used for these purposes without prior regulatory approvals not yet in place.

b. City is responsible for all costs associated with treatment and regulatory compliance in providing Recycled Water to TID.

c. TID will work with City (at no out-of-pocket cost to TID) in assisting City in managing any such regulatory compliance issues (such as insuring isolation from Waters of the U.S.).

6. Water Sales Option

Note: The terms of the water sales option are still being developed.

7. Reporting Requirements

a. City and TID recognize the importance of accurate, complete, and timely reporting of water deliveries conducted in accordance with this agreement.

b. Monthly reports of Recycled Water deliveries to TID shall be submitted by City to TID no later than the 15th of the following month.

c. Monthly reports of surface water deliveries to City shall be submitted by TID to City no later than the 15th of the following month.

d. An annual report shall be jointly prepared by TID and City that summarizes all water deliveries and discusses any suggested changes in planned operations. The annual report shall be finalized and adopted no later than March 31.

8. Term of the Agreement

a. The Agreement will be in effect for 20 years, beginning when City first delivers water to TID, subject to Section 8.c. below.

b. Unless either Party has provided the other with written notice of termination not less than 180 days before the end of the then-current term, after the initial term the Agreement shall be automatically renewed for successive terms of one year each without further action by the Parties.

c. After an initial period of ten years, either party may terminate the Agreement by providing written notice at least five years in advance of termination subject to the following:

i. The party desiring to terminate will include in its notice of termination to the other party the reasons while they feel it is in their best interest to seek termination.

ii. The parties will meet and confer in good faith during the five-year period to discuss whether the reasons for termination can be addressed to the satisfaction of the parties to allow the Agreement to persist.

d. Any account balance existing at the time of termination will be returned within five years following termination, but only including years in which Class 2 CVP entitlement is available to TID. Any negative balance (water owed to TID by City) will be repaid to TID with the next available Recycled Water subject to the conditions of availability described in Section 1. above. At City's option, City may buy out any remaining account balance at a rate not to exceed the then current cost of water charged by TID to TID growers.

9. Miscellaneous

a. USBR approval – Both parties recognize that a long term program of exchange will need to be approved for the use of CVP to benefit City by the USBR and will assist in obtaining such approvals. NEPA and federal ESA compliance will also be needed.

b. Reclamation law – Both parties will assist each other in minimizing any cost or compliance issues that may be associated with the receipt of CVP water.

c. No assignment of this Agreement will be permitted without the approval of the non-assigning party, which may be withheld in the non-assigning party's sole discretion.

d. New delivery facilities – To facilitate the implementation of this Agreement, new facilities to divert CVP water from the TID Main Canal into the St. Johns River, the TIC Canal and the Lower Kaweah River (Mill Creek) are needed. City will pay for the costs of constructing the new turnouts off of the TID Main Canal. TID will provide any needed right-of-way for construction within their current land ownership. City and TID will cooperate in obtain grant funding to offset the costs of any new recharge or turnout facilities that aid in the delivery of the TID return water.

e. Regulatory compliance – City will be the lead agency in CEQA documentation preparation and TID will be a responsible agency. The documentation will be a supplemental report to the WCP upgrade Environmental Impact Report (EIR). City and TID will share costs of the supplemental EIR.

f. California Water Institute study – City and TID agree to share in cost and scope development of an assessment of the potential change in water supplies and their impacts to agricultural soils and groundwater in the Tulare Irrigation District to be conducted by the California Water Institute at CSU Fresno.

Appendix C

Appendix C. Special-Status Plant Species Reported to Occur in Goshen and Eight Surrounding 7.5-minute Quadrangles

Scientific Name Common Name	Status Federal	 State	 CNPS	Habitat Requirements	Life Form and Flowering Period	Potential On-Site Occurrence
Atriplex cordulata heartscale	--	--	List 1B.2	Alkaline or saline. Chenopod scrub, valley and foothill grassland (sandy), meadows, and seeps.	Annual herb April–October	*Absent:* this species was not observed during the September 2012 field survey.
Atriplex cordulata var. erecticaulis Earlimart orache	--	--	List 1B.2	Valley and foothill grassland.	Annual herb August-November	*Absent:* this species was not observed during the September 2012 field survey.
Atriplex depressa brittlescale	--	--	List 1B.2	Alkaline, clay. Chenopod scrub, meadows and seeps, playas, valley and foothill grassland, and vernal pools.	Annual herb April-October	*Absent:* this species was not observed during the September 2012 field survey.
Atriplex miuscula lesser saltscale	--	--	List 1B.1	Alkaline, sandy. Chenopod scrub, playas, valley and foothill grassland.	Annual herb May–October	*Absent:* this species was not observed during the September 2012 field survey.
Atriplex subtilis subtle orache	--	--	List 1B.2	Valley and foothill grassland.	Annual herb June–October	*Absent:* this species was not observed during the September 2012 field survey.
Caulanthus californicus California jewel-flower	FE	CE	List 1B.1	Chenopod scrub, Pinyon and juniper woodland, and valley and foothill grassland.	Annual herb February-May	*Absent:* this species was not observed during the September 2012 field survey.
Chamaesyce hooveri Hoover's spurge	FT	--	List 1B.2	Vernal pools.	Annual herd July-October	*Absent:* this species was not observed during the September 2012 field survey.
Delphinium recurvatum recurved larkspur	--	--	List 1B.2	Chenopod scrub, Cismontane woodland, and valley and foothill grassland.	Perrenial herb March-June	*Absent:* this species was not observed during the September 2012 field survey.

Scientific Name Common Name	Status Federal	 State	 CNPS	Habitat Requirements	Life Form and Flowering Period	Potential On-Site Occurrence
Eryngium spinosepalum spiny-sepaled button-celery	--	--	List 1B.2	Valley and foothill grassland and vernal pools.	Annual/ Perrenial herb April-May	*Absent:* this species was not observed during the September 2012 field survey.
Imperata brevifolia California satintail	--	--	List 2.1	Mesic. Chaparral, coastal scrub, Mojavean desert scrub, meadows and seeps (often alkali), and riparian scrub.	Perrenial rhizomatous herb September-May	*Absent:* this species was not observed during the September 2012 field survey.
Orcuttia inaequalis San Joaquin Valley orcutt grass	FT	CE	List 1B.1	Vernal pools.	Annual herb April-September	*Absent:* this species was not observed during the September 2012 field survey.
Pseudobahia peirsonii San Joaquin adobe sunburst	FT	CE	List 1B.1	Adobe clay. Cismontane woodland and valley and foothill grassland.	Annual herb March-April	*Absent:* this species was not observed during the September 2012 field survey.

Source: California Native Plant Society 2012.

Status Key:
Federal: FE = Federally Endangered
FT = Federally Threatened
State: CE = California Endangered
CNPS List 1B = Plants Rare and Endangered in California and elsewhere
0.1 = Seriously Endangered in California
0.2 = Fairly Endangered in California
List 2 = Rare, threatened, or endangered in California, but more common elsewhere
0.1= Seriously endangered in California

Appendix D

Appendix D. Special-Status Wildlife Species Reported to Occur in Goshen and Eight Surrounding 7.5-minute Quadrangles

Common Name	Scientific Name	Status (federal/ state)	Habitat Requirements/Potential Occurrence
Mammals			
San Joaquin kit fox	*Vulpes macrotis muticai*	E/T	Found in chenopod scrub and grasslands; occasionally forages in agricultural areas. CNDDB review indicates project area is within known range for kit fox. **Low potential** for occurrence because agricultural setting provides limited suitable foraging habitat.
Western mastiff bat	*Eumops perotis californicus*	None/SSC	Uncommon resident in southeastern San Joaquin Valley. Occurs in many open semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, palm oases, chaparral, desert scrub, and urban areas. Not expected to occur because habitat is not suitable.
Reptiles and Amphibians			
Blunt-nosed leopard lizard	*Gambelia sila*	E/E	Inhabits sparsely vegetated alkali and desert scrub habitats in areas of low topographic relief. Preferred habitats are semi-arid grasslands, alkali flats, and washes. Not expected to occur because habitat is not suitable.
California tiger salamander	*Ambystoma californiense*	T/none	Found in vernal pools and some other wet areas. Not expected to occur because habitat is not suitable.
Western spadefoot	*Spea (=Scaphiopus) hammondii*	None/SSC	Found in vernal pools and other wet areas within grasslands. Not expected to occur because habitat is not suitable.
Birds			
Burrowing owl	*Athene cunicularia*	None/SSC	Found in open, dry grasslands; deserts; and ruderal areas along ditch levees. Requires burrows, principally those made by California ground squirrels. **Low potential** for occurrence. Grasslands provide suitable foraging habitat, but limited burrow habitat present given the scarcity of ground squirrel and suitable small mammal burrows.
Swainson's hawk	*Buteo swainsoni*	None/T	Breeds in stands with few trees, juniper-sage flats, riparian areas, and oak savannah. Requires adjacent suitable foraging areas, such as grasslands or alfalfa or grain fields that support rodent populations. **Low potential** for occurrence. Grasslands provide suitable foraging habitat, but there is limited burrow habitat present given the scarcity of ground squirrel and suitable small mammal burrows.

Common Name	Scientific Name	Status (federal/ state)	Habitat Requirements/Potential Occurrence
Invertebrates			
Vernal pool fairy shrimp	*Branchinecta lynchi*	T/none	Found in vernal pools. Not expected to occur because habitat is not suitable.
Vernal pool tadpole shrimp	*Lepidurus packardi*	E/none	Found in vernal pools. Not expected to occur because habitat is not suitable.

Source: California Natural Diversity Database 2012.
Status Key: SSC = species of special concern; T = threatened; E= endangered