Central Amador Water Project (CAWP)

Water Right Application

Environmental Impact Report

DRAFT

SCH #2016092008

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Abbreviations

AF	acre-feet
AFY	acre-feet per year
AWA	Amador Water Agency
AWS	Amador Water System
CAWP	Central Amador Water Project
CCR	California Code of Regulations
CCWD	Calaveras County Water District
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
cfs	cubic feet per second
CPUD	Calaveras Public Utility District
DWR	Department of Water Resources
EBMUD	East Bay Municipal Utility District
EIR	Environmental Impact Report
FERC	Federal Energy Regulatory Commission
GPCD	Gallons per capita per day
IRWMP	Integrated Regional Water Management Plan
JVID	Jackson Valley Irrigation District
LOS	Level of Service
MAC	Mokelumne-Amador-Calaveras
MOCASIM	Mokelumne Calaveras Amador Simulation (Model)
MRW&PA	Mokelumne River Water and Power Authority
NOC	Notice of Completion
NOP	Notice of Preparation
NSJWCD	North San Joaquin Water Conservation District
PG&E	Pacific Gas & Electric
RMC	RMC Water and Environment
RPC	Regional Participants Committee
RPU	Reduced Place of Use
RWS	Reduced Water Supply
SR	State Route
SWRCB	State Water Resources Control Board
UMWRA	Upper Mokelumne River Watershed Authority
WID	Woodbridge Irrigation District
WTP	Water Treatment Plant

Executive Summary

ES-1 Introduction

The Amador Water Agency (AWA) has filed water right Application 5647X03 (Project) with the State Water Resources Control Board, Division of Water Rights (SWRCB), requesting approval to directly divert up to 1,050 acre-feet per year (AFY) of water from Bear River and North Fork Mokelumne River and store up to 1,400 AFY in Lower Bear River Reservoir in connection with AWA's Central Amador Water Project (CAWP). The amount taken by direct diversion and rediversion from storage for consumptive uses within the CAWP service area would not exceed 1,050 AFY.

The water rights process involves water right Permit 12167 (Application 5648B) of Jackson Valley Irrigation District (JVID). Currently, JVID is authorized to directly divert 3,850 acre-feet of water from March through October of each year for irrigation purposes, and throughout the year for incidental domestic and stock watering purposes. JVID's point of diversion is at Pardee Reservoir. JVID's permit includes provisions for the reversion of up to 2,200 acre-feet to upstream diverters within Amador County. In 1978, AWA obtained a reversion of 1,150 acre-feet for CAWP, leaving an additional potential reversion of 1,050 acre-feet. The reversion causes a subtraction from what JVID may divert and an addition to what AWA may divert so that there is no net increase in direct diversions from the Mokelumne River. Concurrent with the filing of Application 5647X03, AWA submitted a petition requesting the reversion of the remaining 1,050 acre-feet. AWA's proposed direct diversion and storage may reduce water flow along the Mokelumne River between the AWA's points of diversion and Pardee Reservoir. However, there would be no net change in water flow downstream of Pardee Dam. The proposed diversions and storage would be accomplished using existing infrastructure, and no construction of new water facility infrastructure would be required.

JVID and AWA have agreed that the reversion would occur incrementally year-by-year based on projected annual increases in demand in the CAWP service area. AWA would thus not have access to the full additional 1,050 AFY upon approval of the water right, but would have to apply to the SWRCB for an appropriate quantity every year, based on expected demand.

AWA prepared an Initial Study (IS) to provide the public and Responsible and Trustee Agencies reviewing the proposed Project with information about the Project's potential impacts on the environment. The IS evaluated the Project relative to various environmental resource areas and identified potentially significant impacts to several resource areas that require further study to determine whether such impacts are significant, and if so, whether they can be mitigated to less than significant levels. These include the Project's potential direct impacts on aquatic biological resources and hydrology, and potential indirect impacts associated with land development and population growth that could be accommodated by the Project. These environmental topics will be addressed in detail in this Draft Environmental Impact Report (Draft EIR).

AWA is the Lead Agency for compliance with the California Environmental Quality Act (CEQA) environmental review process for the Project.

The Draft EIR considers the proposed Project, as described above. In addition, the Draft EIR considers the following alternatives:

- Reduced Growth Alternative: This alternative would reduce either size of the service area or the quantity of the water that could be beneficially used under Application 5647X03, whether by direct diversion or rediversion of water released from storage, so as to reduce to some uncertain extent the Project's potential to contribute to secondary growth inducing impacts.

- No Project Alternative: This alternative assumes that the water supply sought pursuant to Application 5647X03 is not obtained, which could require AWA to obtain other sources of water to ensure adequate water supply capacity and reliability for the CAWP service area.

ES-2 Project Location

The proposed Project would serve an area in the Sierra foothills of Amador County as shown in **Figure ES-1** (Project Vicinity), which is generally located along the California State Route 88 (SR 88) corridor, encompassing the communities of Pine Grove, Pine Acres, Pioneer, Ranch House Estates, Mace Meadows, and surrounding areas. Project facilities already exist and are generally located in open space and agricultural areas, with some portions of the existing water conveyance system extending through residential suburban areas.

ES-3 Purpose and Need

AWA expects water use in the CAWP service area to increase in the future beyond the amount allowed in its existing water right Permit 17579 (Application 5647B), and for that reason, filed Application 5647X03, along with the above-referenced reversion request. AWA's existing Permit 17579 allows the direct diversion of 1,150 AFY and the storage of 1,600 AFY at Lower Bear River Reservoir, with the total taken for consumptive use by direct diversion and rediversion from storage not to exceed 1,150 AFY. In 2006, AWA's annual diversion for the CAWP service area was 1,149.7 AF, which was very close to the amount of water allowed under the permit. Although water use declined during the recession and was further reduced due to conservation during the multi-year drought that extended through 2015, AWA has projected that the need for water has not decreased and will likely increase in the future. Water would be diverted only as needed, and pursuant to an agreement with JVID, the reversion of the 1,050 acre-feet would occur over time commensurate with AWA's increase in demand. JVID would retain the right to divert the non-reverted portion of the 1,050 AFY until such time as it is needed by AWA.

ES-4 CEQA Objectives

The specific objectives of the proposed Project are as follows:

- Augment existing water supply to meet the needs of existing customers and accommodate future planned growth; and
- Increase supply resiliency for current and future customers in central Amador County.

ES-5 Summary of Impacts

Table ES-1 below provides a summary of potential Project impacts by environmental resource topic area.

Figure ES-1: Project Vicinity

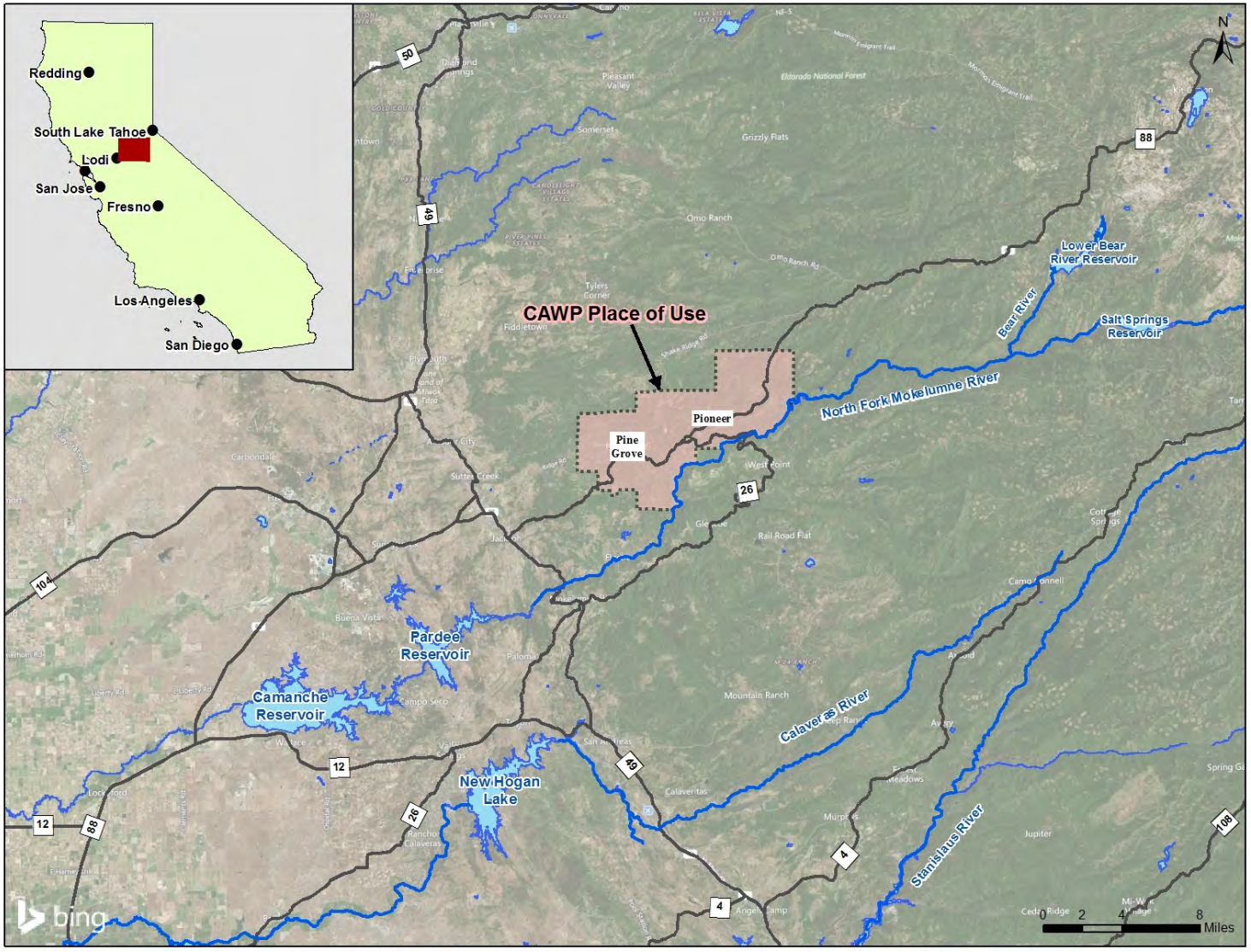


Table ES-1: Summary of Potential Project Impacts

Impact Statement	Level of Significance			Mitigation Measure
	Proposed Project	Reduced Growth Alternative	No Project	
Hydrology				
HYD-1: Potential to substantially alter existing drainage pattern of Project site or area	LTS	PS	PS	No mitigation is necessary.
Substantially deplete groundwater supplies	NI	PS	PS	No mitigation is necessary.
Biological Resources				
BIO-1: Potential to affect species identified as candidate, sensitive, or special-status	LTS	LTS	NI	No mitigation is necessary.
BIO-2: Potential to affect riparian habitat or other sensitive natural community	LTS	LTS	NI	No mitigation is necessary.
BIO-3: Potential to interfere substantially with movement of any native resident or migratory fish or wildlife species or with movement corridors, or nursery sites	LTS	LTS	NI	No mitigation is necessary.
Growth Inducement				
GRO-1: Potential to directly or indirectly induce population growth or development of the built environment.	SU	SU	PS	Mitigation is outside the control of the Amador Water Agency.

Notes: NI= No Impact, LTS= Less than Significant, SU= Significant and Unavoidable. PS = Potentially Significant

Chapter 1 Introduction

1.1 Introduction

The Amador Water Agency (AWA) has filed water right Application 5647X03 (Project) with the State Water Resources Control Board, Division of Water Rights (SWRCB), requesting approval to directly divert up to 1,050 acre-feet per year (AFY) of water from Bear River and North Fork Mokelumne River and store up to 1,400 AFY in Lower Bear River Reservoir in connection with AWA's Central Amador Water Project (CAWP). The amount taken by direct diversion and rediversion from storage for consumptive uses within the CAWP service area would not exceed 1,050 AFY.

The water rights process involves water right Permit 12167 (Application 5648B) of Jackson Valley Irrigation District (JVID). Currently, JVID is authorized to directly divert 3,850 acre-feet of water from March through October of each year for irrigation purposes, and throughout the year for incidental domestic and stock watering purposes. JVID's point of diversion is at Pardee Reservoir. JVID's permit includes provisions for the reversion of up to 2,200 acre-feet to upstream diverters within Amador County. In 1978, AWA obtained a reversion of 1,150 acre-feet for CAWP, leaving an additional potential reversion of 1,050 acre-feet. The reversion causes a subtraction from what JVID may divert and an addition to what AWA may divert so that there is no net increase in direct diversions from the Mokelumne River. Concurrent with the filing of Application 5647X03, AWA submitted a petition requesting the reversion of the remaining 1,050 acre-feet. AWA's proposed direct diversion and storage may reduce water flow along the Mokelumne River between the AWA's points of diversion and Pardee Reservoir. However, there would be no net change in water flow downstream of Pardee Dam. The proposed diversions and storage would be accomplished using existing infrastructure, and no construction of new water facility infrastructure would be required.

JVID and AWA have agreed that the reversion would occur incrementally year-by-year based on projected annual increases in demand in the CAWP service area. AWA would thus not have access to the full additional 1,050 AFY upon approval of the water right, but would have to apply to the SWRCB for an appropriate quantity every year, based on expected demand.

AWA prepared an Initial Study (IS) to provide the public and Responsible and Trustee Agencies reviewing the proposed Project with information about the Project's potential impacts on the environment. The IS evaluated the Project relative to various environmental resource areas and identified potentially significant impacts to several resource areas that require further study to determine whether such impacts are significant, and if so, whether or not they can be mitigated to less than significant levels. These include the Project's potential direct impacts on aquatic biological resources and hydrology, and potential indirect impacts associated with land development and population growth that could be accommodated by the Project. These environmental topics will be addressed in detail in this Draft Environmental Impact Report (Draft EIR). **Figure 2-1** (in the Project Description chapter) shows an overview of the Study Area.

The AWA is the Lead Agency for compliance with the California Environmental Quality Act (CEQA) environmental review process for the Project.

1.2 Compliance with CEQA

1.2.1 State Requirements

CEQA requires that all state and local government agencies consider the environmental consequences of projects over which they have discretionary authority before taking an action that has the potential to affect the environment. In conformance with CEQA (California Public Resources Code, Section 21000 et seq.), and CEQA Guidelines (CCR Title 14 Section 15000 et seq.), AWA has conducted the CEQA process,

including the preparation and circulation of this Draft EIR, to provide to the public and Responsible and Trustee Agencies reviewing this Project with information about the Project's potential effects on the local and regional environment. The Draft EIR was prepared in compliance with Section 15121 of the State CEQA Guidelines, which states that the purpose of an EIR is to serve as an informational document that:

> "...will inform public agency decision-makers and the public generally of the significant environmental effects of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project..."

1.2.2 CEQA EIR Process

Notice of Preparation

In accordance with Sections 15082(a), 15103, and 15375 of the CEQA Guidelines, AWA prepared a Notice of Preparation (NOP) for this Draft EIR (see Appendix A). The NOP was circulated to local and state agencies and other interested parties for 30 days, beginning on September 2, 2016, and ending on October 3, 2016. An advertisement stating that the NOP would be available on September 2, 2016 was published in the Amador Ledger on September 2, 2016. The NOP was also posted on the AWA website in advance of the publication date. The NOP provides a Project description, maps and location, along with a brief description of the Project's potential environmental effects.

Scoping – Areas of Known Controversy

Following noticing in the local newspaper and on the AWA website, one public scoping meeting for the EIR was held at the Board of Supervisors Chambers at the Amador County Government Center at 810 Court Street, Jackson, California on September 21, 2016. The purpose of the meeting was to describe the proposed Project and CEQA requirements to interested parties and to solicit their input about issues and concerns that are relevant to the scope and content of this Draft EIR. Table 1-1 lists the names of parties who submitted comments during the 30-day public scoping period, while Appendix B includes the text of the comments received during the public scoping period.

Comments received during the public scoping period addressed impacts related to potential growth-inducing impacts of the Project. The areas of controversy identified during the scoping process were all associated with the growth-inducing impacts of a new water supply. Growth inducing impacts have been evaluated in this Draft EIR. However, there was a request that AWA send out a revised "environmental transmittal" (presumably the Notice of Preparation) mentioning all of the indirect impacts that the EIR will address. Because the Notice of Preparation identified the fact that the EIR will address the "potential for growth inducement and associated indirect impacts" AWA determined that it was not necessary to recirculate the Notice of Preparation. The same comment letter requested that AWA work with the County to mitigate secondary impacts. AWA would provide water to only those projects that are approved by Amador County, after they have undergone environmental review and have obtained appropriate land use entitlements consistent with the adopted General Plan. It is outside the scope of AWA's legal authority to develop or implement mitigation for secondary impacts such as traffic.

Table 1-1: Parties that Submitted Comments during the Scoping Period

Number	Comment Author, Title and Affiliation	Comment Date
1	Cecily Smith, Foothill Conservancy	9/21/2016
2	Gene Whitehouse, Chairman, United Auburn Indian Community	9/14/2016
3	Lena Tam, Manager Water Resources Planning, East Bay Municipal Utility District	10/3/2016
4	Thomas P. Infusino, Foothill Conservancy	10/3/2016

Draft EIR

This document constitutes the Draft EIR for the Project (water right Application 5647X03). It contains a description of the Project, description of the environmental setting, identification of potential Project impacts, mitigation measures for impacts found to be potentially significant, and an identification and analysis of Project alternatives. Impacts analyzed in this Draft EIR, including those determined to be less than significant, are summarized in Table ES-1 in the Executive Summary of this document.

Public Review of Draft EIR

Upon completion of the Draft EIR, AWA will file a Notice of Completion (NOC) with the State Office of Planning and Research to begin the 45-day public review period (Public Resources Code, Section 21161). Concurrent with the NOC, this Draft EIR will be distributed to Responsible and Trustee agencies, other affected agencies, and interested parties, as well as all parties requesting a copy of the Draft EIR in accordance with Public Resources Code 21092(b)(3). During the public review period, the Draft EIR is available in print for review at:

Amador Water Agency
12800 Ridge Road
Sutter Creek, CA 95685

Amador County Main Library
530 Sutter Street
Jackson, CA 95642

or online at:

http://www.amadorwater.org/

Agencies, organizations, and interested parties, including those not previously contacted, or who did not respond to the NOP, have the opportunity to comment on the Draft EIR during the public review period.

Written comments on this Draft EIR should be addressed to:

Mr. Gene Mancebo
Amador Water Agency
12800 Ridge Road
Sutter Creek, CA 95685
Phone: 209.223.3018
Email: gmancebo@amadorwater.org

During the 45-day public review period, AWA will conduct a public meeting to answer questions about, and to receive oral comments on, the Draft EIR.

Final EIR Certification

Upon completion of the public review period, comments received will be addressed in a Response to Comments Document, which together with the Draft EIR will constitute the Final EIR. A public meeting on certification of the Final EIR for the Project will be held by the AWA Board of Directors (Board). Public comments on the Draft EIR received during the public review period, as well as responses to the comments, will be included as part of the record for consideration by the AWA Board. The Final EIR will be made available for review at least 10 days before the public meeting by the Board. As the CEQA Lead Agency, AWA will consider certifying the EIR as complete under CEQA Guidelines Section 15090.

1.2.3 Action on the Project

If the AWA Board certifies the EIR, it may proceed at the same meeting to consider approval of the proposed Project, although it is possible the AWA Board could schedule a Project approval meeting for a later date. Project approvals would require that AWA make written findings with respect to any significant environmental effects identified in the EIR that are relevant to implementation of the Project. In making its decision about the proposed Project, the AWA Board will consider the environmental impacts and required

mitigation measures, make findings regarding any identified significant impacts, and if necessary, adopt a statement of overriding considerations regarding any significant unavoidable impacts.

1.2.4 Mitigation Monitoring and Reporting

CEQA Section 21081.6(a) requires lead agencies to "adopt a reporting or monitoring program for the changes made to the project or conditions of project approval, adopted in order to mitigate or avoid significant effects on the environment." The mitigation monitoring and reporting program (Monitoring Program) required by CEQA need not be included in an EIR. This Draft EIR has not identified any mitigation measures and thus a Monitoring Program is not required.

1.3 Organization of this EIR

This Draft EIR is organized into the following main chapters:

- **Executive Summary.** This chapter includes a summary of the proposed Project evaluated in this Draft EIR and a table that summarizes the impacts and level of impact significance. In addition, the Executive Summary provides a brief discussion of the Project alternatives considered, the areas of controversy, and issues to be resolved.
- **Chapter 1: Introduction.** This chapter (presented here) provides an introduction, a discussion of CEQA compliance, and a brief description of the Draft EIR document's organization.
- **Chapter 2: Project Description.** This chapter includes a detailed description of the proposed Project.
- **Chapter 3: Environmental Analysis.** This chapter includes a description of the existing environmental setting, environmental analysis methodology, impact thresholds of significance, potential Project impacts, and impact levels of significance.
- **Chapter 4: Other CEQA Considerations.** This chapter presents alternatives to the proposed Project, including the No Project Alternative. The alternatives analysis provides a comparison of the impacts of the proposed Project with other alternatives considered by AWA and presents the environmentally superior alternative. In addition, this chapter summarizes the evaluation of cumulative impacts associated with the Project, any significant unavoidable impacts, and any irreversible and irretrievable commitment of resources.
- **Chapter 5: References and Document Preparation**. This chapter lists reference materials used during preparation of the Draft EIR, and identifies the authors involved in Draft EIR preparation.
- **Appendices.** This section includes all notices, public comment letters received on the NOP, as well as all technical material prepared to support the analysis. The list of appendices is as follows:
    - Appendix A: Notice of Preparation and Initial Study
    - Appendix B: Public Comments Received on the NOP
    - Appendix C: Summary of MOCASIM Modeling Results to Support Hydrology Impact Analysis
    - Appendix D: Summary of Project Effects on Fisheries and Aquatic Habitat

Chapter 2 Project Description

2.1 Introduction

This section includes information related to the location of the Project, background information, purpose and need for the Project, Project description, existing facilities and operational requirements, and also identifies Responsible Agencies, required permits and approvals.

2.2 Project Location

The proposed Project would serve an area in the Sierra foothills of Amador County as shown in **Figure 2-1** (Project Vicinity), which is generally located along the California State Route 88 (SR 88) corridor, encompassing the communities of Pine Grove, Pioneer, Ranch House Estates, Mace Meadows, and surrounding areas. Project facilities already exist and are generally located in open space and agricultural areas, with some portions of the existing water conveyance system extending through residential suburban areas.

2.3 Background

CAWP was constructed in the late 1970s to provide surface water to communities in central Amador County hard hit by the multi-year drought being experienced in the area at that time. CAWP currently draws raw water via the Gravity Supply Pipeline from PG&E's Tiger Creek Regulator Reservoir to the Buckhorn Water Treatment Plant (WTP) in Pioneer. The Buckhorn WTP currently provides treated water on a wholesale basis to two retail water purveyors, and provides treated water for direct retail sale to customers. There are currently about 3,500 parcels actively using water. Most water services are for residential use, though some services are for commercial use. Over the last 5 years, the total annual water use under AWA's existing water right permit (Permit 17579) has ranged from about 777 AF to about 952 AF. **Figure 2-2** shows the service area authorized by Permit 17579 (also referred to as place of use) and the areas within that place of use which are presently being served. The proposed Project does not seek to increase the currently authorized place of use.

The sources of supply for CAWP are the North Fork Mokelumne River (North Fork) and Bear River (tributary to the North Fork). Water rediverted by AWA at PG&E's Tiger Creek Regulator Reservoir may be comprised of natural flow or stored Bear River water released from Pacific Gas & Electric Company's (PG&E) Lower Bear River Reservoir. PG&E delivers water to its Tiger Creek Regulator Reservoir by way of facilities owned and operated by it in connection with its Mokelumne Hydroelectric Project (Federal Energy Regulatory Commission [FERC] Project No. 137). Use of the PG&E facilities by AWA is per an agreement between the two parties, most recently amended in 2012. PG&E's facilities used by AWA consist of the following: Lower Bear River Reservoir; Bear River Tunnel and Penstock; Salt Springs Reservoir and Powerhouse; Tiger Creek Conduit; Tiger Creek Regulator Reservoir; and Tiger Creek Forebay, Powerhouse and Afterbay. Tiger Creek Afterbay serves as a standby point of direct diversion of natural flow and rediversion of water released from storage in Lower Bear River Reservoir in the event that AWA is unable to divert from the Tiger Creek Regulator Reservoir.

Figure 2-1: Vicinity Map

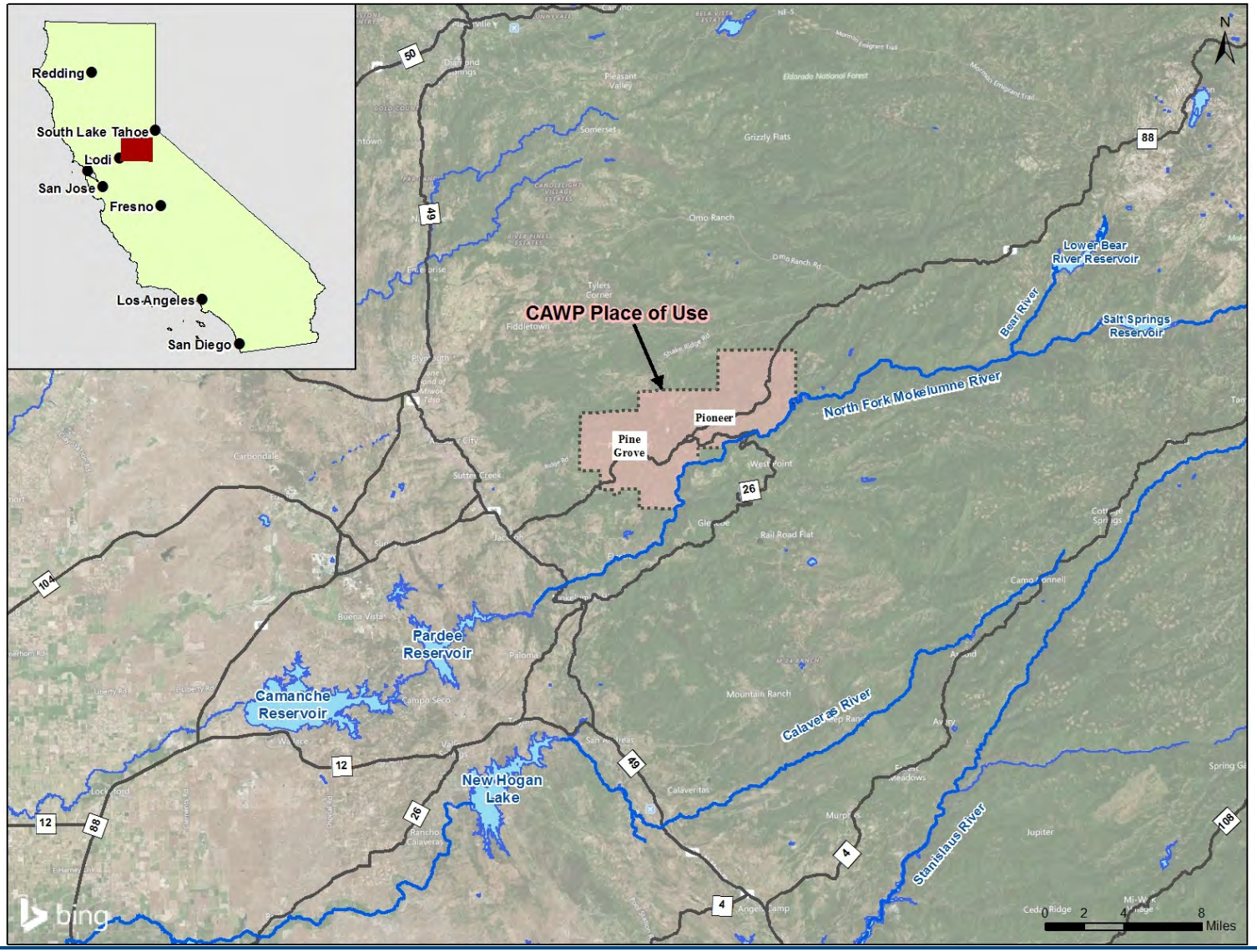
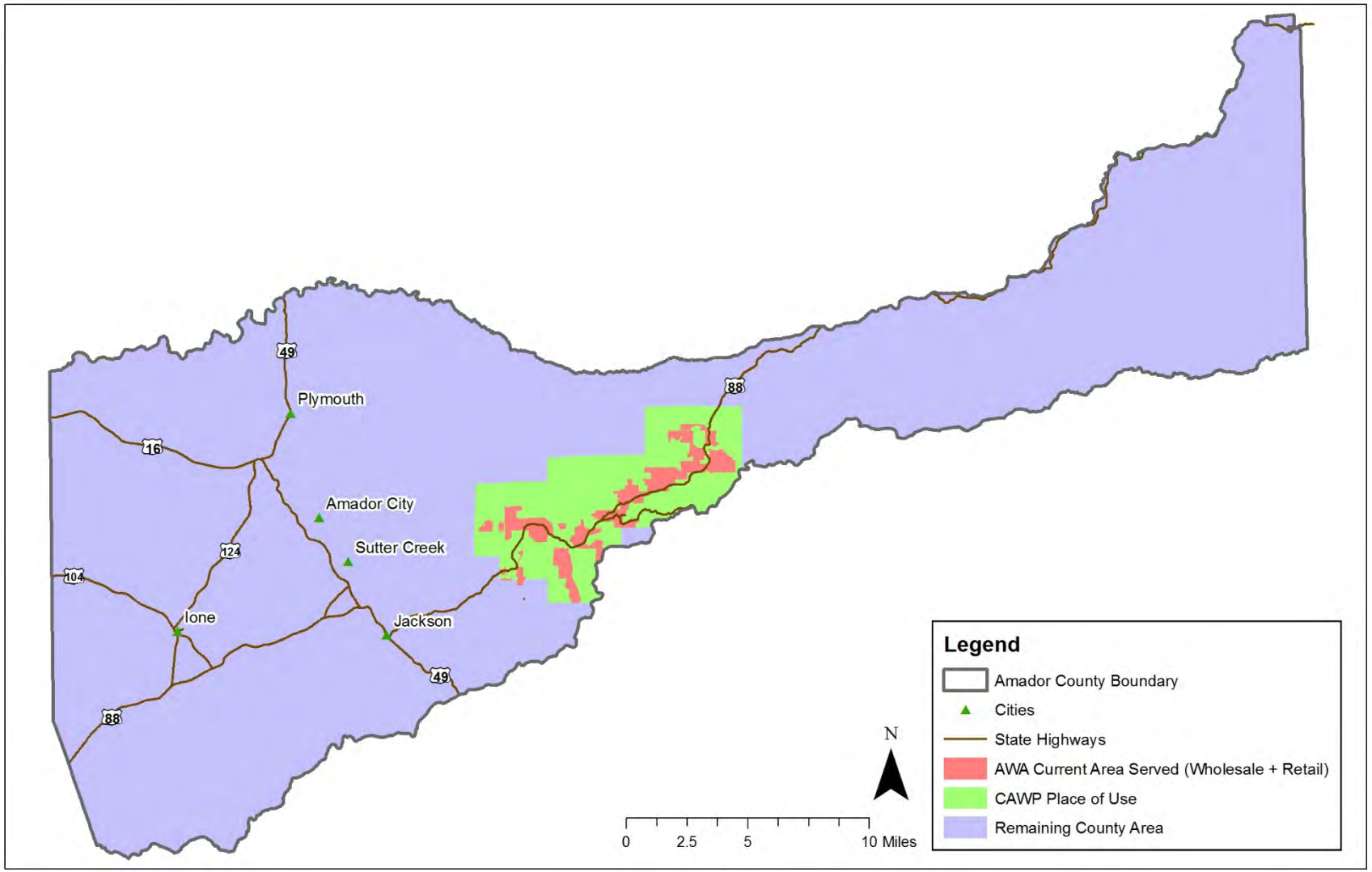


Figure 2-2: AWA Current Area Served and CAWP Place of Use



2.3.1 Water Rights

In 1927, the Department of Water Resources filed two state applications (Application 5647 and 5648) for the appropriation of unappropriated waters of the Mokelumne River. The applications were made for the purpose of ensuring adequate water supply for counties in the mountain and foothill areas, including Amador County. In 1959, the Department of Water Resources executed a release from priority of Applications 5647 and 5648 in favor of East Bay Municipal Utility District's Camanche Reservoir Project, pursuant to which the Department reserved water for direct diversion and storage from the Mokelumne River for use in Amador County under State Applications 5647 and 5648 which, when combined with diversions then and thereafter made through the Amador Canal, would produce an annual safe yield of 20,000 AF and would have priority over the Camanche Project.

On August 29, 1959, the predecessor of the State Water Resources Control Board (SWRCB) issued water right Permit 12167 to JVID, assigning a portion of Application 5648 to JVID and authorizing it to directly divert 5,000 AF from Pardee Reservoir at a rate not to exceed 50 cubic feet per second (cfs) from March 1 through October 31 of each year for irrigation purposes, and throughout the year for incidental domestic and stock watering purposes. The permit was made subject to a condition that up to 2,200 of the 5,000 AF could revert to water users within Amador County, such as AWA, upstream of JVID's diversion point (Pardee Reservoir). A reversion is allowed only after a determination is made by the State indicating that the reverted water is needed by the upstream water user requesting the reversion. The reversion causes a subtraction from what JVID may divert and an addition to what AWA may divert so that there is no net increase in direct diversions from the Mokelumne River.

In 1979, the SWRCB issued Permit 17579 to AWA as a result of Decision 1490. As part of the Decision, the SWRCB approved the reversion of 1,150 AF from JVID's permit. Permit 17579 has a 1927 priority based on an assignment of a portion of State-filed Application 5647 to AWA pursuant to procedures set forth in California Water Code (Water Code) sections 10500-10506. Permit 17579 authorizes a year-round direct diversion of 1,150 AF at a rate not to exceed 3 cfs and the storage of 1,600 AFY in Lower Bear River Reservoir with the limitation that the total that can be taken from the sources for consumptive use in the CAWP service area whether by direct diversion or rediversion from storage is 1,150 AFY.

AWA has submitted Application 5647X03 to the SWRCB, and if approved, JVID's Permit 12167 would be further reduced by 1,050 AFY in favor of AWA. Together with the previous reversion amount of 1,150 AFY, this would bring the total amount of reversion to 2,200 AFY. Relative to the Agency's existing water right Permit 17579, the new permit would effectively:

- Increase the maximum rates of direct diversion allowed from the Bear River and North Fork Mokelumne River from 3 cfs to 5 cfs, with the combined rate between these sources not to exceed 5 cfs.
- Increase the amount of water that may be diverted into storage annually at Lower Bear River Reservoir from 1,600 AF to 3,000 AF.
- Increase the amount of water that may be beneficially used annually, whether by direct diversion or re-diversion of water released from storage, from 1,150 AF to 2,200 AF.
- The authorized CAWP place of use (service area) would not change from that which presently exists.

The new permit also would have a 1927 priority as the Agency, in conjunction with the filing of Application 5647X03, submitted a petition for partial assignment of State Application 5647 pursuant to Water Code sections 10500-10506. The current application is thus part of the annual safe yield of 20,000 AF which was reserved for use in Amador County in 1959.

2.4 Project Description

2.4.1 Purpose and Need

AWA expects water use in the CAWP service area to increase in the future beyond the amount allowed in its existing water right Permit 17579, and for that reason, filed Application 5647X03, along with the above-referenced reversion request. AWA's existing Permit 17579 allows the direct diversion of 1,150 AFY and the storage of 1,600 AFY at Lower Bear River Reservoir, with the total taken for consumptive use by direct diversion and rediversion from storage not to exceed 1,150 AFY. In 2006, AWA's annual diversion for the CAWP service area was 1,149.7 AF, which was very close to the amount of water allowed under the permit. Although water use declined during the recession and was further reduced due to conservation during the multi-year drought that extended through 2015, AWA has projected that the need for water has not decreased and will likely increase in the future.

2.4.2 Project Objectives

The objectives of the proposed Project are:

- Augment existing water supply to meet the needs of existing customers and accommodate future planned growth; and
- Increase supply resiliency for current and future customers in central Amador County.

AWA is statutorily authorized to provide water service to all territory in Amador County. (West's Ann. Water Code App., Secs. 95-1 and 95-4.) AWA's statutory authorization to provide public water service also imposes a "duty to serve" upon AWA. (Maddow, *The Role of Water Agencies in Land Use Planning* (March 1992) California Water Law and Policy Reporter, at p.105.) The duty to serve requires public utilities, such as AWA, "to provide adequate and reasonably efficient service in an impartial manner, without unjust discrimination, to those within the agency's service area who comply with its rules and regulations and pay its rates and charges." (Id.)

Accordingly, AWA "must hold itself out as ready to serve" and must provide water service to its service area without discrimination or preferences, unless differences in the services provided are justified by differences in cost of service. (*Butte County Water Users' Association v. Railroad Commission* (1921) 185 Cal. 218, 224-225.) Furthermore, AWA has an obligation to "exert every reasonable effort" to augment and expand its supplies and facilities to meet increasing demands for service within the county. (*Swanson v. Marin Municipal Water District* (1976) 56 Cal. App. 3d 512, 524.)

2.4.3 Project Description

AWA has filed a water right application (Application 5647X03) requesting year-round direct diversion of up to 1,050 AF from Bear River and the North Fork Mokelumne River and the annual storage of up to 1,400 AF in Lower Bear River Reservoir during the period of October 1 to July 15. The total amount to be directly diverted and rediverted from storage for consumptive uses in the CAWP service area on an annual basis would not exceed 1,050 AF. To achieve the direct diversion of 1,050 AF annually, the application is coupled with a request that of JVID's currently authorized direct diversion right of 3,850 AF pursuant to its Permit 12167, 1,050 AF revert to AWA as contemplated in that permit. Under AWA's application, water would either be diverted or re-diverted from the Bear River and North Fork of the Mokelumne River at four different locations, which are shown in **Figure 2-3**:

- Bear River at Lower Bear River Reservoir Dam
- North Fork Mokelumne River at Salt Springs Reservoir Dam
- North Fork Mokelumne River at Tiger Creek Afterbay Dam
- Tiger Creek at Tiger Creek Regulator Dam

The additional 1,400 AF of storage in Lower Bear River Reservoir would provide additional dry-year reliability to AWA customers in the CAWP service area. During times when AWA's CAWP direct diversion rights are curtailed, as was the case during portions of the 2012-2015 drought, AWA would have additional stored water available to meet demands. The water right application defines the proposed service area or place of use, which is shown in **Figure 2-3**. It is the same as what presently exists for the CAWP service area under Permit 17579.

AWA's proposed points of diversion and rediversion are upstream from JVID's current point of diversion at Pardee Reservoir. Water would be diverted, stored, and conveyed to the Buckhorn WTP for delivery within AWA's CAWP service area. There may be an incremental reduction in flows at times in the North Fork Mokelumne River and Bear River between the AWA diversion points and the existing JVID diversion at Pardee Reservoir. PG&E would still maintain minimum flows in these streams, but flows may be reduced by up to 2 cfs during periods when flows are above those minimums. There would be no net change in flow downstream of Pardee Dam.

AWA's pending water right application for the Project does not require the development or construction of any new water supply infrastructure, as existing facilities owned by AWA and PG&E would be used to store and convey the water.

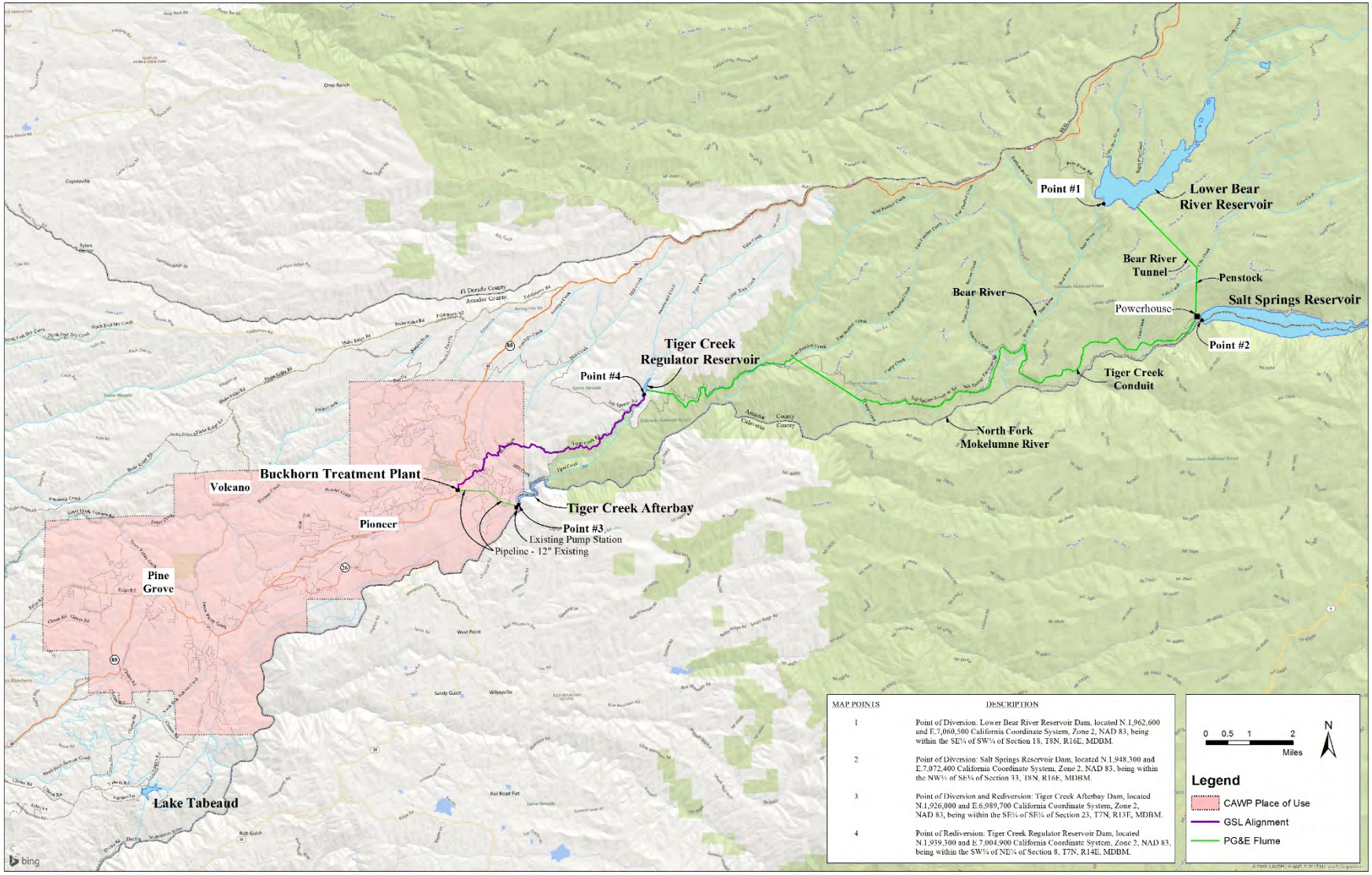
2.4.4 Management Practices for CAWP Water Supply

Under the proposed Project water would be diverted only as needed and, pursuant to an agreement with JVID, the reversion of 1,050 acre-feet from JVID's right would occur over time commensurate with AWA's increase in demand. On an annual basis, AWA would notify the SWRCB and JVID how much water should revert for the forthcoming year to meet the projected increase in demand for that year. JVID would retain the right to divert the non-reverted portion of the 1,050 AFY until such time as it is needed by AWA.

In addition, AWA intends to implement the following policies:

- AWA will only provide water service to developments that are approved by Amador County consistent with their adopted General Plans, and that have obtained appropriate land use entitlements.
- The cost of water infrastructure expansion or improvements will be borne by those who will benefit from and use the infrastructure.
- The cost of water infrastructure expansions that are needed solely to accommodate new development will not be borne by existing water utility ratepayers.
- Water infrastructure planning will be done within an open, inclusive process that actively involves all affected stakeholders and the public, using methods that will ensure broad public participation.
- Water infrastructure facilities will not be extended into undeveloped areas with the intent to provide those areas service unless those areas are approved for development after any required environmental review and consistent with the County General Plan.
- AWA will employ reasonable demand-side water management techniques, including conservation and efficiency, before taking on expensive expansion projects.
- Water infrastructure will be developed in a way that works with natural systems and minimizes damage to the natural and built environment to the extent reasonably possible.

Figure 2-3: Diversion Locations for Water Right Application 5647X03 – Proposed Project



2.4.5 Existing Facilities and Operational Requirements

The Project would use existing facilities of AWA and PG&E, which have ample capacity for the increased diversion rates and storage amounts. Lower Bear River Reservoir has a total storage capacity of about 51,400 AF. AWA leases storage capacity in the reservoir under an existing agreement with PG&E that allows for increasing AWA's storage allocation from 1,600 AF to 3,000 AF with a pre-condition of compliance with CEQA, which will be provided by this document.

PG&E is required to maintain certain minimum flows for streams affected by PG&E's hydroelectric operations within the Mokelumne River system, including the North Fork Mokelumne River, Bear River, and Tiger Creek. Minimum flow criteria are set forth in Appendix A to PG&E's Relicensing Settlement Agreement for its Mokelumne River Project (FERC No. 137) dated July 21, 2000. Under the terms of AWA's agreement with PG&E, PG&E is solely responsible for providing and maintaining the specified minimum flows, notwithstanding AWA's diversions under its existing and future appropriative water rights.

Under the terms of its agreement with PG&E, AWA's storage of water in Lower Bear River Reservoir is tracked in a water account that is maintained by PG&E using a set of rules established in the *Fourth Amended Contract between Pacific Gas and Electric Company and Amador Water Agency* (PG&E and AWA 2012). The agreement also specifies a schedule of payments from AWA to PG&E for the right to store water, and to compensate PG&E for lost power generation revenues resulting from diversion of water by AWA.

As mentioned above and as part of AWA's pending Application 5647X03, AWA is requesting that of JVID's current direct diversion right of 3,850 AF, 1,050 AF revert to the state, and then be assigned to AWA. AWA and JVID have entered into an arrangement which provides that the entire 1,050 AF would not revert initially upon approval of the application. Rather, before the beginning of each calendar year, AWA would notify the SWRCB and JVID how much water it would need in the forthcoming year to meet increasing demands. The requested amount then would revert to the state and then be assigned to AWA. This annual process would continue until the entire 1,050 reverts and is assigned.

2.4.6 Required Permit

The Project would require a water right permit from the SWRCB Division of Water Rights.

2.5 References

Maddow, Robert B. 1992. *The Role of Water Agencies in Land Use Planning.* California Water Law and Policy Reporter, page 105, March 1992.

PG&E and AWA. 2012. *Fourth Amended Contract between Pacific Gas and Electric Company and Amador Water Agency*. December 13, 2012

Chapter 3 Setting, Impacts, and Mitigation

3.0 Introduction to Environmental Analysis

3.0.1 Organization of Chapter 3

Chapter 3 includes evaluation of each impact for which the Initial Study identified a potentially significant effect, and is organized by environmental resource area, as follows:

- 3.1 Hydrology
- 3.2 Biological Resource
- 3.3 Growth Inducement

3.0.2 Organization of Discussion of Environmental Issue Areas

For each resource area, this Draft EIR evaluates the environmental impacts of the proposed Project. Sections 3.1 through 3.3 discuss the environmental impacts that may result with approval and implementation of the proposed Project. The Initial Study, which is included in Appendix A, includes a discussion of all of the other environmental resources and explains why the Project would have no impact on those resources. Each environmental resource section contains the following components:

1. **Environmental Setting** describes the setting as it relates to the specific resource topic. The setting information covers the areas affected by the proposed Project: CAWP service area, Bear River below Lower Bear River Reservoir, the North Fork Mokelumne River downstream of Salt Springs Reservoir, and the Mokelumne River from the confluence with the North Fork to JVID's point of diversion in Pardee Reservoir.

2. **Regulatory Framework** provides an overview of relevant Federal, State, and local laws, regulations, and ordinances applicable to each resource area.

3. **Impact Analysis** includes the following subsections:
    - **Methodology for Analysis**, which describes the approach used in analyzing the potential impacts;
    - **Thresholds of Significance** or the CEQA significance criteria are based on those identified in the Initial Study Checklist in Appendix G of the CEQA Guidelines, but are modified or supplemented as appropriate to address the proposed Project impacts; and
    - **Impacts and Mitigation Measures** provides an evaluation of impacts and identification of mitigation measures, if needed. The impact analysis is presented by a numbered impact summary statement that corresponds to the resource area. Because the Project would not require any construction, the evaluation of impacts is limited to the effects of operating the Project.

The end of each impact statement includes a determination of the level of significance before and after any identified mitigation measures are implemented. Impacts that exceed identified threshold levels of significance would be considered significant. In describing the significance of impacts, the following categories of significance are used:

- **Significant and Unavoidable.** Adverse environmental consequences that exceed the threshold criteria identified for the resource, even after feasible mitigation strategies are applied and/or an adverse effect that could be significant and for which no feasible mitigation has been identified.

- **Less than Significant with Implementation of Mitigation Measures.** Adverse environmental consequences with the potential to be significant, but can be reduced to less than significant levels through the application of identified mitigation strategies for the relevant alternative.
- **Less than Significant.** Potential adverse environmental consequences have been identified. However, they are not so adverse as to meet the significance threshold criteria for a resource. Therefore, no mitigation measures are required.
- **No Impact.** No adverse environmental consequences have been identified for the resource, or the consequences are negligible or undetectable. Therefore, no mitigation measures are required.

3.0.3 Approach to Analysis of Cumulative Impacts

CEQA Requirements

CEQA requires consideration of cumulative impacts. A cumulative impact is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. Cumulative impacts, as defined in Section 15355 of the CEQA Guidelines, refer to two or more individual effects that, when considered together, are considerable or that compound or increase other environmental impacts. 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, or reasonably foreseeable future projects. Pertinent guidance for cumulative impact analysis is provided in Section 15130 of the CEQA Guidelines, and included below:

- An EIR shall discuss cumulative impacts of a project when the project's incremental effect is "cumulatively considerable" (i.e., the incremental effects of an individual project are considerable when viewed in connection with effects of past, current, and probable future projects, including those outside the control of the agency, if necessary).
- An EIR should not discuss impacts that do not result in part from the project evaluated in the EIR.
- The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not be as detailed as it is for the effects attributable to the project alone.
- A project's contribution is less than cumulatively considerable, and thus not significant, if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.
- The focus of analysis should be on the cumulative impact to which the identified other projects contribute, rather than on attributes of the other projects that do not contribute to the cumulative impact.

The cumulative impact analysis for each individual resource topic is described at the end of each resource section in this Chapter.

Approach to Analysis

For evaluation of cumulative impacts, this EIR uses a list-based approach, and evaluates the potential for past, present, and probable future projects in the Project area to result in cumulative impacts. Because direct effects of the Project are limited to operational impacts on the hydrology of the Mokelumne River watershed and the resultant effects on aquatic biological resources, the geographic scope of potential cumulative operational impacts is the Bear River and upper Mokelumne River system between the existing and proposed points of diversion. Evaluation of Project hydrologic impacts used the MOCASIM reservoir operations model, which is designed to simulate water storage and diversion operations on the upper Mokelumne River system and considers the operation of PG&E facilities on the North Fork Mokelumne River, incorporating requirements of the Federal Energy Regulatory Commission in accordance with the

Lodi Decree, which mandates monthly outflows from storage. Flow data from the hydrologic model was used to evaluate potential impacts on aquatic biota using information on the stage-discharge relationship from U.S. Geological Survey gage calibration measurements for the North Fork Mokelumne River below Salt Springs Dam to estimate the magnitude in change in water depth that would result from proposed diversions. That information was used to evaluate whether proposed diversions would result in an adverse effect on water velocity, channel depth, channel wetted width or water temperature at Mokelumne Hill and resultant effects on aquatic biota.

The MOCASIM model considers water rights and agreements associated with existing water users on the Mokelumne River, and thus considers Project impacts in the context of ongoing operations of other projects that divert water from the upper Mokelumne River watershed. Modeling has thus already considered cumulative hydrologic effects on the upper Mokelumne River system. Because the MOCASIM model does not consider the effects of unapproved or pending water right applications that might result in additional future diversions, the evaluation of cumulative impacts also included a review of other water right applications that could affect the Mokelumne River watershed, based on information available on the State Water Resources Control Board, Division of Water Rights web page (SWRCB 2016).

Table 3.0-1 contains a list of diverters that either currently operate in the Project area and which are included in the MOCASIM modeling, or for which there are pending water right applications, and identifies those projects that have a potential nexus with the proposed Project (i.e. there is a possibility that the proposed Project could contribute to incremental effects on the upper Mokelumne River system). None of the pending water right applications propose diversions in the portion of the Mokelumne River watershed that could be affected by the proposed Project. Therefore, there are no incremental effects associated with implementation of the proposed Project and the pending water right applications.

Because the only potential direct impacts associated with the Project are due to changes in hydrology, there would be no physical impacts on environmental resources other than potential impacts on hydrology and aquatic biological resources. There is thus no potential for cumulative impacts to other environmental resources, so the list of projects considered for the cumulative analysis is limited to those projects that directly affect the same portion of the watershed through diversion of water.

Table 3.0-1: List of Cumulative Projects

Diverter	Diversion Amount (AFY)	Location	Nexus?
Existing Diversions			
AWA Central Amador Water Project (CAWP)	2,200[1]	Mokelumne River above Pardee	Y
AWA Amador Water System (AWS)	15,000	Mokelumne River above Pardee	Y
Calaveras County Water District (CCWD)	2,030	Mokelumne River above Pardee	Y
Calaveras Public Utility District (CPUD)	1,930	Mokelumne River above Pardee	Y
East Bay Municipal Utility District (EBMUD)	257,800	Pardee Reservoir	Y
Jackson Valley Irrigation District (JVID)	3,850[2]	Pardee Reservoir	Y
North San Joaquin Water Conservation District (NSJWCD)	20,000	Mokelumne River below Pardee	N
Woodbridge Irrigation District (WID)	72,000	Mokelumne River below Pardee	N
Pending Water Right Applications and Registrations			
Mokelumne River Water & Power Authority[3]	544,000	Camanche Reservoir, downstream of Pardee	N
Steffan Ranch (two registrations)	15	Murphy Creek, downstream of Pardee	N
Thomas A. Oneto	7	Upper Jackson Creek	N

Source: RMC Water and Environment 2016

3.0.4 References

RMC Water and Environment. 2016. Summary of MOCASIM Modeling Results to Support Hydrology Impact Analysis. October 6, 2016.

State Water Resources Control Board (SWRCB). 2016. Water Rights web page, accessed October 6, 2016 available at: http://ciwqs.waterboards.ca.gov/ciwqs/ewrims/EWServlet?Page_From=EWWaterRightPublicSearch.jsp&Redirect_Page=EWWaterRightPublicSearchResults.jsp&Object_Expected=EwrimsSearchResult&Object_Created=EwrimsSearch&Object_Criteria=&Purpose=&subTypeCourtAdjSpec=&subTypeOtherSpec=&status=1&appNumber=&permitNumber=&licenseNumber=&countyTypeIDs=3&countyTypeIDs=5&countyTypeIDs=39&waterHolderName=&source=&hucNumber=&watershed=

[1] Includes the proposed Project
[2] Will be reduced to 2,800 AFY if Project is approved.
[3] Water right application was filed in 1990, and as no current information about status was available it is uncertain whether the application is likely to move forward. Project may have been abandoned.

3.1 Hydrology

This section describes the existing river system in the Project area, and an evaluation of how the proposed Project would directly affect hydrology. Water quality impacts were evaluated in the Initial Study, which is included in Appendix A, and were found not to be significant. Indirect effects that might result from growth that could be accommodated by additional water supply are not addressed in this section, but are discussed in Section 3.3, Growth Inducement.

3.1.1 Environmental Setting

The Mokelumne River extends 96 miles from the central Sierra Nevada to the Sacramento-San Joaquin Delta (Delta). In Amador County, the river is the source of 98 percent of the total water supply provided by AWA. The North Fork Mokelumne River is 62 miles (100 km) long, originating at Highland Lakes (elevation 8,584 feet). The upper 8.7 miles (14 km) of the North Fork Mokelumne River are characterized as a meadow stream flowing through a wide glaciated valley with sub-alpine and riparian vegetation (Hanson Environmental 2016). The river then flows 18 miles (29 km) through the Mokelumne Wilderness Area, which includes a deeply incised canyon with bedrock pools, boulder clusters, and waterfalls. Access to the canyon reach is limited by steep side slopes. Exiting the canyon reach, the river flows into Salt Springs Reservoir, which was constructed and operated by PG&E for hydroelectric power generation. The Bear River enters the North Fork Mokelumne River downstream of Salt Springs Reservoir, and then the North Fork passes downstream through Tiger Creek Reservoir before joining the Middle Fork, southeast of Pine Grove. The mainstem Mokelumne River flows past Mokelumne Hill before discharging into East Bay Municipal Utility District's Pardee Reservoir. The discharge from Pardee Reservoir flows directly into Camanche Reservoir, which then discharges into the lower Mokelumne River, which meanders 34 miles (55 km) downstream into the Sacramento-San Joaquin River Delta where it joins the lower San Joaquin River. The lower reaches of the river are characterized by a lower gradient when compared to the canyon reach, substrate becomes finer, and water temperatures during the summer increase as the river flows downstream into Pardee Reservoir and the lower Mokelumne River (Hanson Environmental 2016).

3.1.2 Regulatory Framework

State/Federal

The proposed Project would be subject to terms and conditions of any water right permit issued by the SWRCB on AWA's Application 5647X03. No other state or federal approval for the Project is needed. As mentioned earlier, no new construction would be required to implement the Project.

Regional/Local

Integrated Regional Water Management Plan (IRWMP)

The Mokelumne-Amador-Calaveras (MAC) IRWMP effort is a cooperative effort by AWA, Calaveras County Water District, Amador County, City of Jackson, City of Sutter Creek, City of Plymouth, Amador Regional Sanitation Authority, and East Bay Municipal Utility District (EBMUD). These entities operate under a Memorandum of Understanding to coordinate water resources planning and implementation activities, and formed the official MAC Regional Water Management Group. In 2009 the Upper Mokelumne River Watershed Authority (UMRWA) became the lead agency for updating the MAC IRWMP. UMRWA includes the original members of the MAC IRWMP, plus Alpine County and the Jackson Valley Irrigation District. In fulfilling this role UMRWA established the Regional Participants Committee (RPC). The RPC is a committee of city, county, special district, non-governmental organizations, and federal agency stakeholders, which provided essential input and guidance to the development of the 2012 MAC Plan Update and 2015 MAC IRWM Addendum. The RPC has a continuing

role in both maintaining the Plan's list of implementation projects and programs, and in future Plan updates whenever such updates are determined necessary and appropriate. The 2015 MAC IRWM Addendum identifies a number of AWA projects, including the ongoing Long Term Water Needs Study, which identifies the need for the proposed Project.

Amador County Erosion Control Ordinance

Because the Project would not require any new construction, there are no activities that would be subject to the County's erosion control ordinance.

3.1.3 Impact Analysis

Methodology for Analysis

The proposed Project would not require construction of new water conveyance or water storage infrastructure, nor construction of any kind. Therefore, evaluation of the Project's potential impacts to hydrology was limited to potential operational effects of the Project on changes in water flow in the North Fork Mokelumne River and Bear River upstream from the Pardee Reservoir and downstream from the proposed AWA diversion points. To that end, the Mokelumne Calaveras Amador Simulation (MOCASIM) Model was used to identify projected changes in river flow as a result of AWA increasing its water diversion. A technical memorandum was prepared to summarize the proposed Project's effect on flows in these waterways (RMC Water and Environment 2016).

MOCASIM is a reservoir operations model designed to simulate water storage and diversion operations on the Mokelumne River. MOCASIM is capable of analyzing various operating strategies of Pardee and Camanche reservoirs on the Mokelumne River, assessing water availability to serve Mokelumne River water users; and then simulating newly proposed storage and diversion alternatives for beneficial use.

MOCASIM is a mass-balance simulation model. It uses either a monthly or a daily time-step (depending on the geographical area) for the hydrologic period from 1953 through 2010. Senior appropriations, fishery flows, and hydropower releases are based on historical and/or future levels of development in the basin, water rights and agreements, and reservoir operating rules. The model is being used to evaluate potential changes in Mokelumne River flow as a result of the proposed Project, which would allow additional direct diversion of up to 1,050 AFY (with actual amounts determined by demand) and annual storage of up to 1,400 AF in Lower Bear River Reservoir.

Four separate scenarios were considered to determine Project impacts:

- Current Diversion (without proposed Project). The first baseline case was based on current level of diversions, which was assumed to be 2010 (demand in 2015 was artificially low due to the drought and the Governor's conservation mandates). Demand in the year 2010 was selected to represent current diversion levels as it most likely reflects current non-drought water requirements.
- Current Diversion (with proposed Project). This scenario is based on current level of diversions for all diverters, except for AWA, where full use of the proposed water right is assumed. However, this scenario is not realistic, as demand for full utilization of the requested water right does not presently exist. Instead, AWA diversions under the requested water right would increase over time until the maximum diversion amount is needed.
- Maximum Diversions (without proposed Project). The second baseline case assumed maximum diversions without Project implementation.
- Maximum Diversions (with proposed Project). The third case assumed maximum diversions with full Project implementation.

In both maximum diversion level cases, all agencies were assumed to divert their full Mokelumne River water right, except for EBMUD. EBMUD's maximum diversion levels were assumed to be 2040 projected demand from EBMUD's 2015 Urban Water Management Plan. EBMUD does not have projections beyond 2040. **Table 3.1-1** indicates the diversion amounts for all four scenarios.

Table 3.1-1 Diversion Scenarios

Diverter	Current Diversions (AFY)		Maximum Diversions[a] (AFY)	
	Without Project	With Project	Without Project	With Project
AWA CAWP	938[b]	2,200[c]	1,150	2,200
AWA AWS	7,160[b]	7,160[b]	15,000	15,000
CCWD[d]	159	159	2,030	2,030
CPUD	1,299	1,299	1,930[e]	1,930[e]
EBMUD[f]	241,920	241,920	257,800	257,800
JVID	3,850	2,800	3,850	2,800
NSJWCD	3,021	3,021	20,000	20,000
WID	72,000	72,000	72,000	72,000
TOTAL	**330,347**	**330,559**	**373,760**	**373,760**

Notes:

a. Aside from EBMUD, all maximum diversions assume full utilization of the associated Mokelumne River water right.
b. From AWA data for 2010.
c. Direct diversion to CAWP. Water right would also allow an increase of diversion to storage of 1,400 AFY; total diversion to storage would be 3,000 AFY. Point of diversion to Lower Bear River Reservoir would not change and total storage capacity of reservoir would not change.
d. From CCWD's 2010 UWMP, page 3-15; maximum diversion includes 1,830 AFY Bear Creek right plus 200 AFY from CPUD.
e. Total right is 2,130 AFY; this is reduced by 200 AFY, which is applied to CCWD's total per CCWD-CPUD agreement.
f. Current diversions as used in Mokelumne Watershed Interregional Sustainability Evaluation (MokeWISE). Maximum diversions represent 2040 projected demand from EBMUD 2015 draft UWMP, page 56.

As shown in **Table 3.1-1**, AWA is assumed to ultimately use the full amount authorized under existing Permit 17579 (1,150 AFY) and the full amount requested under Application 5647X03 (1,050 AFY). If current diversions without the Project are compared to current total diversions with Project, with AWA using a total of 2,200 AFY, this would result in an increase in total diversions of 212 AFY, an increase of 0.06% (or an average of 0.3 cubic feet per second [cfs]). Any flow change less than 1 cfs is not considered measurable in the environment or substantially different between scenarios (RMC 2016).

However, actual impacts of the Project are more accurately evaluated by considering the effect of the Project when all diverters are using their maximum allocation. Accordingly, a more detailed evaluation of changes in flow was performed to determine the impact of the Project when all diverters are using their maximum allocations.

To determine changes in flow, modeling was performed to compare flows at various locations (termed Control Points) for the maximum diversion scenario without the Project (Pre-Project) and the maximum diversion scenario with the Project (Post-Project). However, flow in the Mokelumne River varies greatly

from year to year and largely depends on the year type. To account for natural differences in hydrology, the average flow in wet, above normal, below normal, dry, and critically dry years was calculated at five different locations, including:

1. Mokelumne Hill (Pardee Inflow)
2. North Fork below Electra Diversion (Control Point 1)
3. North Fork below Tiger Creek Afterbay Dam (Control Point 2)
4. North Fork below Salt Springs Reservoir (Control Point 4)
5. Bear River below Lower Bear River Reservoir (Control Point 5)

These average flows for the Pre-Project scenario are shown in **Table 3.1-2** below.

Table 3.1-2: Average Annual Flow in cfs by Year Type for Maximum Diversion Pre-Project

Year Type	Mokelumne Hill (Pardee Inflow)	CP1 - NF below Electra Diversion	CP2 - NF below Tiger Cr. Afterbay	CP4 - NF below Salt Springs Reservoir	CP5 - Bear River below Lower Bear River Reservoir
Wet	1,594	472	641	429	241
Above Normal	1,130	226	329	232	203
Below Normal	826	131	186	156	169
Dry	611	50	60	56	128
Critically Dry	442	37	45	44	104

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines* an impact would be considered significant if the Project would:

- Violate any water quality standards or waste discharge requirements;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion 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 which would result in flooding on- or off-site;
- Create or contribute runoff water which would exceed the capacity of existing or planned storm water 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 which 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; or
- Be susceptible to inundation by seiche, tsunami, or mudflow.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the Project are identified below, along with a supporting rationale as to why further consideration is unnecessary and a no-impact determination is appropriate.

- *Violate any water quality standards or waste discharge requirements*: The Project requires no new construction and does not include any discharge to surface waters and thus would not violate any water quality standards or waste discharge requirements. No further evaluation is required.
- *Substantially deplete groundwater supplies or interfere substantially with groundwater recharge:* The Project would not involve groundwater extraction nor would it interfere with groundwater recharge because no new impervious surfaces would be created. No further evaluation is required.
- *Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff:* The Project would not require new construction, and therefore would not be a source of storm water runoff. No further evaluation is required.
- *Substantially degrade water quality*: The Project does not include new construction or new discharge to surface waters, and therefore would not degrade water quality. No further evaluation is required.
- *Place housing within a 100-year flood hazard area*: The Project would not place housing within a 100-year flood hazard area. No further evaluation is required.
- *Place within a 100-year flood hazard area structures which would impede or redirect flood flows*: The Project would not place structures in flood hazard areas and thus would not impede or redirect flood flows. No further evaluation is required.
- *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*: The Project does not include new structures and thus would not expose people or structures to flooding. No further evaluation is required.
- *Be susceptible to inundation by seiche, tsunami, or mudflow*: The Project does not include new structures that would be susceptible to inundation by seiche, tsunami or mudflow. No further evaluation is required.

Impacts and Mitigation Measures

Impact HYD-1 Potential to Substantially Alter the Existing Drainage Pattern of the Project Site or Area

The proposed Project has the potential to alter the existing flow of the Mokelumne River. However, results from the MOCASIM model, described above, indicate minimal changes in flow as a result of the proposed Project.

Table 3.1-3 below shows the change in average flow from Pre-Project to Post-Project conditions in cfs and as a percent change in average baseflow. As shown, average flow does not decrease by more than 2 cfs in

any year type at any control point. At Control Points 1, 4, and 5, the percentage reduction in average base flows was less than 0.1% in every year type. Pardee Inflow and Control Point 2 saw higher changes (0.22%) than the other Control Points. However, regardless of year type or location, all changes in flow are less than 0.3% of average baseflow. Given the small change in flow, the proposed Project has a less than significant impact on the existing drainage pattern of the Project area.

Table 3.1-3: Change in Average Flow from Pre-Project to Post-Project by Year Type (in cfs and %)

Year Type	Mokelumne Hill (Pardee Inflow)	CP1 - NF below Electra Diversion	CP2 - NF below Tiger Cr. Afterbay	CP4 - NF below Salt Springs Reservoir	CP5 - Bear River below Lower Bear River Reservoir
Wet	-1.6 cfs	-0.4 cfs	-0.9 cfs	0.0 cfs	-0.1 cfs
	0.10%	0.08%	0.14%	0%	0.04%
Above Normal	-1.4 cfs	-0.2 cfs	-0.6 cfs	-0.1 cfs	0.0 cfs
	0.12%	0.09%	0.18%	0.04%	0%
Below Normal	-1.5 cfs	-0.1 cfs	-0.4 cfs	0.0 cfs	0.0 cfs
	0.18%	0.08%	0.22%	0%	0%
Dry	-1.1 cfs	0.0 cfs	-0.1 cfs	0.0 cfs	0.1 cfs
	0.18%	0%	0.17%	0%	0.08%
Critically Dry	-1.3 cfs	0.0 cfs	-0.1 cfs	0.0 cfs	0.0 cfs
	0.29%	0%	0.22%	0%	0%

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation required.

Cumulative Impacts

The geographic scope of potential cumulative operational impacts is the Bear River and upper Mokelumne River system between the existing and proposed points of diversion. Evaluation of Project impacts used the MOCASIM reservoir operations model, which is designed to simulate water storage and diversion operations on the Mokelumne River. The model simulates operations of the upper Mokelumne River System and considers the operation of PG&E facilities on the North Fork Mokelumne River, incorporating requirements of the Federal Energy Regulatory Commission in accordance with the Lodi Decree, which mandates monthly outflows from storage. The model considers water rights and agreements associated with existing water users on the Mokelumne River, and thus considers Project impacts in the context of ongoing operations of other projects that divert water from the upper Mokelumne River system. Modeling has thus already considered cumulative hydrologic effects on the upper Mokelumne River system. Because the MOCASIM model does not consider the effects of unapproved or pending water right applications that

might result in additional future diversions, the evaluation of cumulative impacts also included a review of other water right applications that could affect the Mokelumne River watershed, based on information available on the State Water Resources Control Board, Division of Water Rights web page (SWRCB 2016). There are no pending applications that would affect the Bear River or upper Mokelumne River system between the existing and proposed points of diversion. There are four pending applications/registrations for water rights in the Mokelumne River watershed, three of which are for small amounts of water for stock ponds. Only one project, the MORE WATER project, which is proposed by the Mokelumne River Water and Power Authority, would divert substantial amounts of water, and that project would divert water from the lower Mokelumne River, where flows would not be affected by AWA's Project. Therefore, based on the above evaluation, potential cumulative impacts on hydrology are determined to be less than significant.

3.1.4 References:

County of Amador. 2016. Amador County General Plan Final Environmental Impact Report. July.

Hanson Environmental, Inc. 2016. *AWA Central Amador Water Project Water Rights Application Support: Summary of Project Effects on Fisheries and Aquatic Habitat.* October 6, 2016.

RMC Water and Environment. 2016. Summary of MOCASIM Modeling Results to Support Hydrology Impact Analysis. October 6, 2016.

State Water Resources Control Board (SWRCB). 2016. Water Rights web page, accessed October 6, 2016 available at: http://ciwqs.waterboards.ca.gov/ciwqs/ewrims/EWServlet?Page_From=EWWaterRightPublicSearch.jsp&Redirect_Page=EWWaterRightPublicSearchResults.jsp&Object_Expected=EwrimsSearchResult&Object_Created=EwrimsSearch&Object_Criteria=&Purpose=&subTypeCourtAdjSpec=&subTypeOtherSpec=&status=1&appNumber=&permitNumber=&licenseNumber=&countyTypeIDs=3&countyTypeIDs=5&countyTypeIDs=39&waterHolderName=&source=&hucNumber=&watershed=

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3.2 Biological Resources

This section contains a description of the existing biological resources in the Project area, and an evaluation of how implementation of the proposed Project would directly affect biological resources. Indirect effects on biological resources that might result from growth that could be accommodated by additional water supply are not addressed in this section, but are discussed in Section 3.3, Growth Inducement.

3.2.1 Environmental Setting

The Project area is located in central Amador County, on the western slope of the Sierra Nevada mountains. Elevation in the county ranges from just under 200 feet at the edge of the Central Valley floor to 9,334 feet at Mokelumne Peak. This broad range of elevation and topography results in a rich diversity of biological resources in the county. The Project area is characterized by rolling hills covered with oak woodland, grassland, and chaparral, as well as multiple creeks and rivers that meander through the area.

Aquatic Biological Resources

Information on aquatic resources in the Project area was developed as part of a Technical Memorandum on Fisheries and Aquatic Habitat that was prepared by Hanson Environmental, Inc. (2016).

The Bear River and North Fork Mokelumne River provide habitat for populations of resident fish and other aquatic species, and support recreational fishing in the area. The fish community inhabiting the upper reaches of the watershed includes both native wild and hatchery produced rainbow trout, non-native brown trout, dace, and hitch in the riverine reaches; while kokanee primarily reside in the reservoirs. Aquatic insect production in the upper watershed provides a food resource for resident fish. The rainbow and brown trout support an active recreational fishery.

Further downstream in the reach between West Point Diversion Dam and Electra Powerhouse, as well as in Pardee and Camanche Reservoirs, water temperatures generally increase and there is a shift in species dominance from a cold water trout community to a greater number of warm water fish species including largemouth bass.

Recently, there has been growing interest in evaluating the feasibility of reintroducing anadromous fall-run Chinook salmon into the upper reaches of the watershed. A collaborative effort, known as MokeWISE, has begun with participation from a number of governmental agencies, local non-governmental organizations, EBMUD, California Sportfishing Protection Alliance, Trout Unlimited, and others to provide a forum for discussing future actions that could potentially be implemented in the upper watershed. As part of the process, a draft proposal has been developed to conduct a pilot level study of salmon reintroduction. The pilot study would include collection of adult fall-run Chinook salmon from the Mokelumne River Fish Hatchery, located downstream of Camanche Dam, so that fish can be trucked and released upstream of Pardee Reservoir. Spawning site selection, hatching success, juvenile rearing, and the ability to effectively capture juvenile salmon that could then be transported and released into the lower river are all proposed elements of the pilot study. Habitat mapping and a suitability assessment of the upper watershed have also been discussed.

The lower Mokelumne River, downstream of Camanche Dam, supports a diverse community of resident and migratory fish. Camanche Dam is a complete barrier to upstream migration by anadromous fish. The lower river provides habitat for approximately 35 species of fish, including fall-run Chinook salmon, steelhead, resident rainbow trout, prickly sculpin, and Sacramento sucker. The lower river is also habitat for a number of non-native fish, including mosquitofish, largemouth bass, bluegill, and striped bass (Hanson Environmental 2016).

3.2.2 Regulatory Framework

State/Federal

The proposed Project would be subject to terms and conditions of any water right permit issued by the SWRCB on AWA's Application 5647X03. No other state or federal approval for the Project is needed. As mentioned earlier, no new construction would be required to implement the Project.

Regional/Local

There are no regional or local regulations that would apply to the proposed Project.

3.2.3 Impact Analysis

Methodology for Analysis

The proposed Project would not require construction of new water conveyance or water storage infrastructure, or construction of any kind. Therefore, evaluation of the Project's potential impacts to biological resources was limited to potential operational effects of the Project on fisheries and aquatic habitat. Because the Project may have a small occasional effect on flows in the North Fork Mokelumne River and Bear River, it could have the potential to affect aquatic species of concern. Potential effects of changes in instream flows on aquatic species were evaluated by conducting hydrologic modeling simulations (RMC 2016). As described in Section 3.1, Hydrology, flows at various control points in the upper watershed were evaluated with and without the Project for five water year types: wet, above normal, below normal, dry and critically dry. Hanson Environmental used information on the stage-discharge relationship from U.S. Geological Survey gage calibration measurements for the North Fork Mokelumne River below Salt Springs Dam to estimate the magnitude in change in water depth that would result from proposed diversions. The percentage reduction in average flow by water-year was calculated and that information was used to evaluate whether proposed diversions would result in an adverse effect on water velocity, channel depth, channel wetted width or water temperature at Mokelumne Hill.

Thresholds of Significance

Consistent with Appendix G of the *CEQA Guidelines* an impact would be considered significant if the Project would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Criteria Requiring No Further Evaluation

Criteria listed above that are not applicable to actions associated with the Project are identified below, along with a supporting rationale as to why further consideration is unnecessary and a no-impact determination is appropriate.

- *Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means*: The Project requires no new construction and thus would not involve direct removal, filling or hydrological interruption of any federally protected wetlands as defined by Section 404 of the Clean Water Act. No further evaluation is required.
- *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance:* Because the Project would not require construction of new facilities, there would be no need for tree removal. Because there are no effects on terrestrial biological resources, there would be no conflicts with policies protecting those biological resources. No further evaluation is required.
- *Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan:* There are no Habitat Conservation Plans or Natural Community Conservation Plans that cover the Project area. No further evaluation is required.

Impacts and Mitigation Measures

Impact BIO-1 Potential to Affect Species Identified as Candidate, Sensitive, Or Special Status

Because there would be no construction of new facilities, the Project would have no potential to affect special-status terrestrial species. Therefore, potential effects on aquatic species of concern would be limited to operational impacts associated with the small reductions in flow that would result from proposed diversions. As described in Section 3.1, Hydrology, flow reductions on the Mokelumne and Bear Rivers would range from 0 to 1.6 cfs, and from 0% to 0.29% (see Table 3.1-3), with the largest reduction in cfs occurring in wet years, when reductions in flows are not biologically meaningful. Reductions of this magnitude are within the range of natural variability in the watershed and would not be expected to have a detectable effect on quality or availability of suitable habitat for trout or other fish. PG&E would continue to manage its operations to maintain minimum bypass flows and to maintain water temperatures of less than 20°Celsius within designated river reaches to provide suitable habitat for cold water fish such as rainbow trout. No adverse effects on any native fish, including special-status species, would result from the proposed diversions. The reduction in flows would not be expected to result in a detectable change or significant reduction in aquatic habitat quality or availability, water velocities, channel depth, channel wetted width, or adversely affect seasonal water temperatures. No change in the volume of water entering Camanche Reservoir from Pardee Reservoir would occur, and thus the Project would have no effect on aquatic habitat in Camanche Reservoir or on streamflow releases and water temperature management for salmonids in the lower Mokelumne River (Hanson Environmental 2016). Impacts to special-status aquatic species would be less than significant.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation is necessary.

Impact BIO-2 Potential to Affect Riparian Habitat or Other Sensitive Natural Community

The effect of Project diversions on riparian habitat was evaluated by determining whether the Project would result in a change in water depth, which would have the potential to adversely affect riparian habitat. As described in Section 3.1, Hydrology, for the North Fork Mokelumne River (Control Points 1, 2 and 4, below the Electra Diversion, below Tiger Creek Afterbay, and below Salt Springs Reservoir, respectively), and for Bear River (Control Point 5, below Lower Bear River Reservoir), for all hydrologic modeling scenarios, the reduction in average base flows was less than 1 cfs. This is a reduction of less than 0.1 percent for Control Points 1, 4, and 5, and a maximum 0.29 percent reduction at Control Point 2. Sensitivity analysis showed that a change in stream flows of 1 cfs did not result in a detectable change in predicted water depth (Hanson Environmental 2016). Flow reductions were greater at the Mokelumne Hill location just upstream of Pardee Reservoir, but reductions in all year types were less than 2 cfs and percentage reductions ranged from 0.1 to 0.29 percent. Given that average base flow at Mokelumne Hill ranges from 442 cfs in critically dry years to 1,594 cfs in wet years, changes in quality or availability of river habitat would not be detectable (Hanson Environmental 2016).

The Project would not affect riparian habitat downstream of Pardee Reservoir. As discussed in Section 3.1, Hydrology, there would be very minor changes in the amount of water flowing into Pardee Reservoir. The volume of water entering Pardee Reservoir at Mokelumne Hill would be reduced by only 0.1 percent in a wet year, and 0.29 percent in a critically dry year. These changes are sufficiently small that they would not be expected to materially affect the quantities of water that are released from Pardee Reservoir. Because the Project would not be expected to require changes in operations of Pardee Reservoir there would be no effect on the annual volume of water entering Camanche Reservoir from Pardee Reservoir, and thus no effect on downstream riparian habitat. Therefore, impacts would be less than significant.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation is necessary.

Impact BIO-3 Potential to Interfere Substantially with Movement of Any Native Resident or Migratory Fish or Wildlife Species or with Movement Corridors or Nursery Sites

Although anadromous fish historically occurred in the Project area, the portions of the Mokelumne River and its tributaries above Pardee Reservoir that would be affected are no longer accessible to migratory fish. The Project would thus not interfere with fish migration but could affect resident fish. Because no new facilities would be constructed, there is no possibility that the Project would interfere with migration of terrestrial wildlife species, terrestrial movement corridors or nursery sites.

Appendix D provides a detailed evaluation of Project effects on fisheries and aquatic habitat. To evaluate effects of flow changes in the upper watershed on aquatic habitat, USGS data on the relationship between flow and water level at the Salt Springs gage site was used. The magnitude of the predicted reduction in average instream flows in the upper watershed (all control points except Mokelumne Hill) is less than 1 cfs, and no detectable change in water depths at the Salt Springs gage site is expected. Reductions in flow at Mokelumne Hill range from 1.1 to 1.6 cfs, but are still not projected to result in a detectable change in the quality or availability of river habitat for resident fish. The proposed Project diversions are therefore not estimated to have a significant impact on river habitat for resident fish such as rainbow trout (Hanson Environmental 2016). Impacts on movement of species, movement corridors, and nursery sites would be less than significant.

Significance Determination before Mitigation

Less than significant.

Mitigation Measures

No mitigation is necessary.

Cumulative Impacts

The geographic scope of the Project's potential operational impacts is the Bear River and upper Mokelumne River system between the existing and proposed points of diversion. As discussed in Section 3.1, Hydrology, modeling of Project effects has considered Project impacts in the context of ongoing operations of all other projects that divert water from the upper Mokelumne River system. The evaluation presented above demonstrates that Project operations, combined with the operation of other ongoing projects on the upper Mokelumne River system, would not have a cumulative adverse effect on fisheries.

3.2.4 References:

County of Amador. 2016. Amador County General Plan Final Environmental Impact Report. July.

Hanson Environmental, Inc. 2016. *AWA Central Amador Water Project Water Rights Application Support: Summary of Project Effects on Fisheries and Aquatic Habitat*. October 6, 2016.

RMC Water and Environment. 2016. Summary of MOCASIM Modeling Results to Support Hydrology Impact Analysis. October 6, 2016.

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3.3 Growth Inducement

This section defines the concept of growth inducement in terms of how a project could directly or indirectly result in population growth or development of the built environment. The section also discusses the context within which growth inducement is evaluated under CEQA, and evaluates whether the proposed Project would induce growth and any corresponding environmental effects thereof.

3.3.1 Consideration of Growth Inducement under CEQA

CEQA requires the Lead Agency to evaluate whether a proposed project would directly or indirectly induce growth of population, economic development, or housing construction. Specifically, CEQA Guidelines Section 15126.2(d) states the need to evaluate the potential for a proposed project to "foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth (a major expansion of a waste water treatment plant might, for example, allow for more construction in service areas)."

Directly induced growth is associated with residential or commercial development projects that would result in a population increase or in an increase in the number of employees. Indirectly induced growth is associated with reducing or removing barriers to growth, or creating a condition that encourages additional population or economic activity. Ultimately, both types of growth inducement result in population increase, which "may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects" (CEQA Guidelines Section 15126.2[d]). Other potential environmental impacts related to growth include increased traffic, air emissions, and noise; degradation of water quality; loss of sensitive biological and cultural resources; increased demand on public services and infrastructure; and changes in land use and conversion of agricultural or open space to accommodate development.

Under CEQA, growth is not considered necessarily detrimental, beneficial, or of little significance to the environment.

Projects are considered to have growth inducing implications when economic, housing, or population growth occur either directly or indirectly. Local land use plans (e.g., general plans) provide for development patterns and growth policies that allow for the planned and orderly expansion of urban development (i.e., residential, commercial and industrial uses) supported by adequate urban public services (e.g., water supply, wastewater treatment, solid waste service disposal capacity, police and fire services). A project that would induce unplanned growth (i.e., conflict with local land use plans) could indirectly cause adverse environmental impacts not previously envisioned. Thus, to assess whether a project has the potential to induce growth and result in adverse secondary effects beyond what is anticipated by the local jurisdiction, it is important to assess the degree to which the growth associated with a project would or would not be consistent with the applicable land use plan.

3.3.2 Growth Inducement

Implementation of the proposed Project would not directly induce population growth, as the Project is not tied directly to any new residential or commercial development. The Project would augment existing water supply and increase supply resiliency within the CAWP service area, but it does not involve the construction of new water conveyance infrastructure to extend service to areas within the CAWP service area not currently served by AWA. Application 5647X03 provides a defined place of use, which is shown in Figure 2-3 in the Project Description and is exactly the same as the existing place of use allowed by AWA's currently held water right Permit 17579 (CAWP service area). Thus, the Project proposes no increase in

the existing CAWP service area. Under water rights law, water cannot be legally used outside a place of use or service area without the SWRCB's approval of a water right petition for a change in place of use.

Though the recently updated Amador County General Plan allows for future development of residential, commercial, and industrial uses throughout the County's planning area, it is the County's intent to focus new growth in existing unincorporated communities, primarily through the development of a Regional Service Center in the community of Martell, and Town Centers in the communities of Pine Grove, Buckhorn and River Pines. These areas slated for future development are located in key locations within the county, each of which has unique future development objectives that respond to priorities established in the General Plan. The communities of Pine Grove and Buckhorn are located within the CAWP service area.

The proposed Project would not directly generate new development in areas of the CAWP service area where water service is currently not being provided, but the Project would remove a constraint to development by augmenting the existing water supply. However, new development projects within the CAWP service area would be required to go through the customary environmental review process, which would involve an evaluation of a project's environmental impacts, including impacts related to the provision of utility services such as potable water. Additionally, JVID and AWA have agreed that the reversion would occur incrementally year-by-year based on projected annual increases in demand in the CAWP service area. AWA would thus not have access to the full additional 1,050 AFY upon approval of the water right, but would have to apply to the SWRCB for an appropriate quantity every year, based on expected demand.

3.3.3 Constraints to Growth

While the lack of water supply availability is a constraint to growth, there are a number of other constraints that limit the potential for growth in the CAWP service area. Constraints to growth are identified in Section 4.15 of the Amador County General Plan Final EIR (Amador County 2016), which projects that full build-out of the land use designations in the General Plan is not likely to occur because of the following constraints:

- "*Physical constraints on development, including areas with existing development that are unlikely to be replaced with new development at maximum possible density, and the large areas of the county which have steep slopes.*
- *Water supply constraints, including parcel size minimums where no public water supply is available, the amount of available water rights,* ***limitations on treatment and conveyance infrastructure, and unpredictable groundwater availability on many parcels*** (emphasis added).
- *Economic conditions and market demand, including the very low likelihood for a great increase in population growth compared to historic growth rates.*
- *Property owners deciding not to develop their property based* (on) *any one of a number of factors, including lack of demand for dwellings or non-residential buildings or financial feasibility.*"

In addition to the constraints identified in the General Plan EIR, the lack of wastewater treatment capacity limits the potential for new development. The majority of the CAWP service area is without wastewater collection and treatment systems.

Approval of AWA's Application 5647X03 would thus remove one constraint to growth, but growth could not occur until other obstacles are also removed. In addition to the items listed above, individual development proposals would need to be reviewed (including completion of CEQA documentation) and approved, and in most cases, facilities to convey (and possibly treat) the water would need to be developed.

3.3.4 Projected Extent of Growth in CAWP Service Area

To assess the potential extent of growth in the CAWP service area, population numbers and water demand were estimated for existing conditions and potential build-out.

Existing Population and Demand

Existing levels of development were estimated using AWA residential connection data and persons per household derived from 2010 census block group data. The existing population and demand are defined as the average population and demand between 2008 and 2012. This date range was chosen to show typical demand served by AWA under pre-drought conditions. More recent demand from 2013 through 2016 was altered due to drought restrictions and thus is not representative of average water use. From 2008 through 2012, AWA served an average of 2,546 retail residential customer connections and 852 wholesale residential customer connections in the CAWP service area. 2010 Census data showed that the average persons per household in the CAWP service area is 2.23. Multiplying this persons-per-household factor by the total number of residential connections served by AWA yields a population served of 7,578. The average demand served by AWA to retail and wholesale customers in the CAWP service area between 2008 and 2012 was 969 AFY.

Build-out Population and Demand

AWA is in the process of evaluating long-term water demands and total population in the CAWP service area at build-out as part of AWA's Long-Term Water Needs Study (Study) process. The build-out population and demand projections developed in this Study for the CAWP service area are based on Amador County's recently updated General Plan (County of Amador, 2014). The Study process has yielded an estimated population of 22,961 at build-out using the maximum number of dwelling units per acre for all residential land use types and persons per household information from the 2010 Census.

The demand projection assumes that AWA will serve all demands at build-out within the CAWP service area except most agriculture and some industrial demands. The majority of the projected increased demand is residential and commercial, with only a small amount of agricultural land served by AWA. AWA is not expected to serve 10,000 of the 10,300 acres of agricultural land within the CAWP service area anticipated in the General Plan. Additionally, AWA is not expected to serve 90 percent of the potential industrial demand from the designated mineral resource zone in the CAWP service area. **Figure 3.3-1** shows which parcels in the CAWP service area AWA is expected to serve at build-out. Because build-out is expected to occur far into the future, climate change impacts have been incorporated into the demand projection. The anticipated increase in temperature and shifts in precipitation patterns are expected to increase demand by 3 to 16 percent. This increase in demand due to climate change has been incorporated into the projection so that the total anticipated demand served by AWA in the CAWP service area at build-out is 5,189 AFY. The population and demand at build-out, along with existing population and demand, are summarized in **Table 3.3-1**.

Figure 3.3-1: Current Parcels Served and Anticipated Parcels Served at Build-out

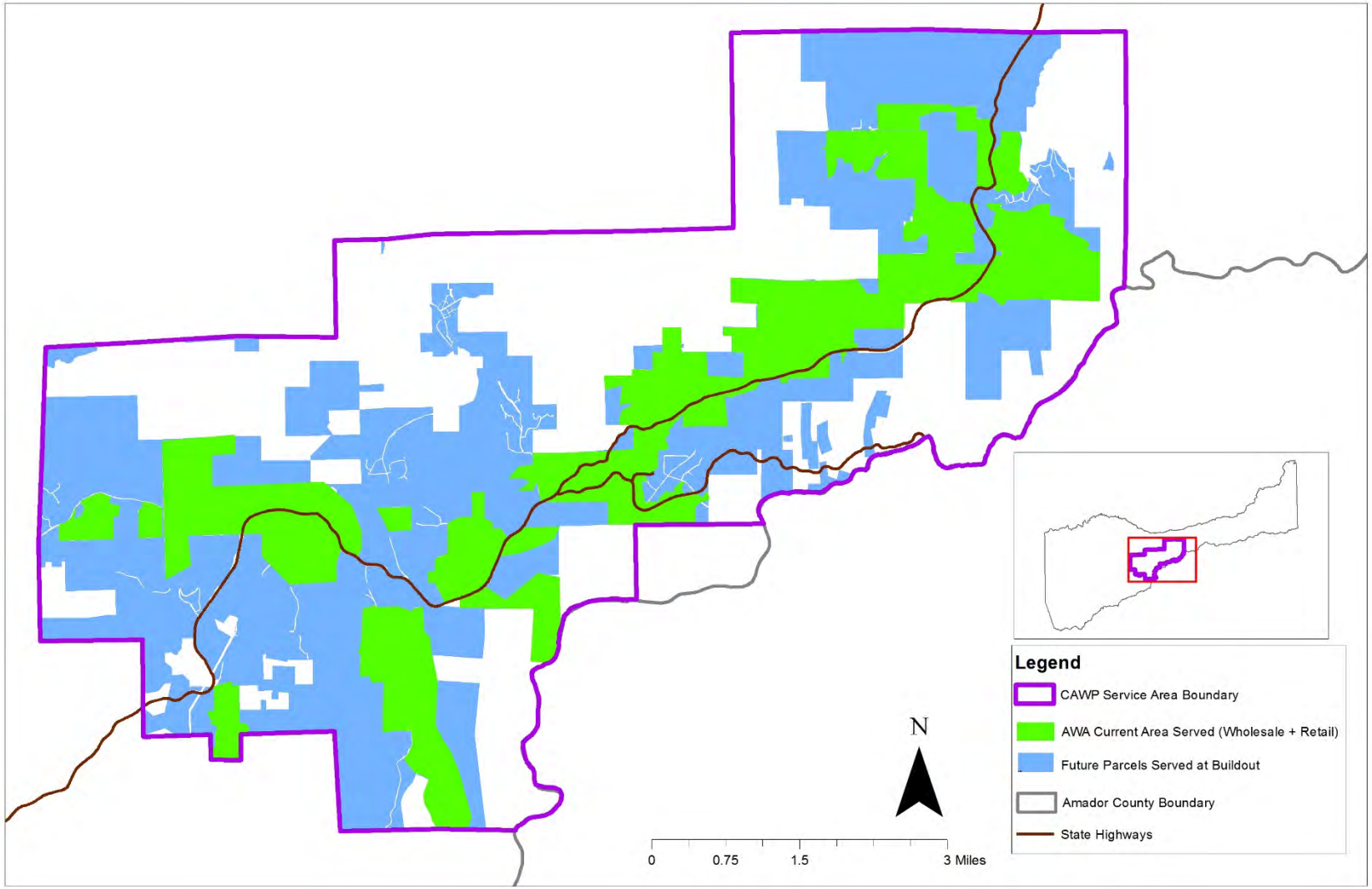

Table 3.3-1: Estimated Population and Water Demand in CAWP Service Area - Existing and Build-out

Scenario	Population Estimate	Water Demand (AFY)[1]
Existing	7,578	969
Buildout	22,961	5,189

[1] Demand includes residential, commercial and a small portion of agricultural and industrial demand

3.3.5 Indirect Impacts Associated with Growth

The recent Amador County General Plan EIR identified various resources which could be impacted by future development and growth within the County associated with build-out under the updated General Plan. The following is a discussion of environmental impacts identified in that General Plan EIR that are associated with growth that could be accommodated by the additional water supply that would be provided with approval of Application 5647X03. The General Plan EIR specifically took Application 5647X03 into account and considered it within the context of the various resource areas that would be potentially affected by implementation of the updated General Plan. The General Plan EIR evaluates impacts of projected development through 2030 and at build-out, and those impacts are summarized here.

Agricultural and Forest Resources

Section 4.2 of the General Plan EIR addresses impacts to agricultural and forest resources, and includes mapping of important farmland (Prime Farmland, Farmland of Statewide Importance and Unique Farmland). There is no important farmland within the CAWP service area, so there would be no adverse indirect effects associated with conversion of important farmland. However, there are areas in the vicinity of both Pine Grove and Buckhorn where existing agricultural uses are adjacent to areas that could be developed in the future, and land use conflicts with existing agricultural uses were identified in the General Plan EIR as a significant unavoidable impact.

The General Plan EIR also provides mapping of Timberland Production Zones, and there is an area east of Buckhorn that is designated for timber production. Although growth in the CAWP service area would not be permitted within designated Timberland Production Zones, the General Plan EIR identifies the fact that new development could result in the conversion of forestland to non-forest use both directly and through construction of roadways, utilities, and other improvements associated with new development.

There would be less than significant impacts related to conflicts with existing Williamson Act contracts, and under the updated General Plan, proposed land use designations would not conflict with zoning districts permitting forest and timber uses.

Growth within the CAWP service area through 2030 would thus result in potential impacts associated with conflicts with existing agricultural uses and conversion of forestland, and Section 4.15 of the General Plan EIR predicts that those impacts would be even greater at build-out. The proposed Project accommodates growth that could potentially result in secondary impacts within the CAWP service area.

Air Quality

Air quality impacts associated with the updated General Plan were evaluated in Section 4.3 of the General Plan EIR. The EIR determined that development consistent with the General Plan would result in short term (construction related) and long term emissions of criteria air pollutants that could violate or contribute substantially to an existing or projected air quality violation, result in a cumulatively considerable net increase in non-attainment criteria pollutants, and/or expose sensitive receptors to substantial pollutant concentrations. This impact would result from new buildings, structures, paved areas, roadways, utilities and other improvements associated with future new development in the General Plan area. Though

mitigation measures were outlined for this impact in the General Plan EIR, the EIR determined that it would not be reduced to a level of less than significant because project level mitigation cannot be guaranteed to be effective for all projects. Therefore, according to the General Plan EIR, the impact of growth through 2030 would remain significant and unavoidable. Section 4.15 of the General Plan EIR predicts that those impacts would be even greater at build-out.

The General Plan EIR determined that development consistent with the updated General Plan would not result in significant impacts related to carbon emissions, but it would result in exposure of sensitive receptors to short and long term emissions of toxic air contaminants, which would be significant and unavoidable even after implementation of mitigation measures. The General Plan EIR found that exposure of sensitive receptors to construction generated emissions of naturally occurring asbestos and odors would be less than significant after implementation of mitigation measures.

Because air quality impacts are experienced across the entire air basin, it is expected that growth within the CAWP service area would contribute to air quality impacts. The significance of the contribution is not possible to ascertain at this time. The proposed Project accommodates growth that therefore could potentially result in secondary air quality impacts within the service area.

Biological Resources

As discussed in Section 4.4 of the General Plan EIR, development consistent with the updated General Plan would have a significant and unavoidable impact on special-status species that inhabit future growth areas in the County, as well as areas that contain Ione chaparral. Complete avoidance of these impacts would not be possible because these sensitive resources occur on land which would transition to developed land uses under the General Plan. Areas of Ione chaparral occur in the western part of Amador County and would not be affected by development within the CAWP service area. However, there are identified occurrences of sensitive species such as foothill yellow-legged frog and prairie wedge grass in the vicinity of Pine Grove, and Red Hills soaproot populations have been identified in the vicinity of both Pine Grove and Buckhorn. Although the General Plan EIR includes mitigation to protect sensitive species, it concludes that complete avoidance of all impacts would not be possible because special-status species would occur on land that would transition to developed land uses under the updated General Plan. Impacts of growth through 2030 were considered to be significant and unavoidable, and Section 4.15 of the General Plan EIR predicts that those impacts would be even greater at build-out. The proposed Project accommodates growth that therefore could potentially result in secondary impacts to sensitive species within the CAWP service area, although the extent of any such impacts is not possible to forecast now without knowing how and where the growth will actually occur in the CAWP service area.

The General Plan EIR determined that the updated General Plan would result in less than significant impacts to riparian habitat, oak woodland, wetland areas and to the movement of wildlife, which would be accomplished through the implementation of mitigation measures and avoidance of sensitive areas.

Public Services and Utilities

Impact 4.13-1 (Increased Demand for Water Supplies), on page 4.13-32 of the General Plan EIR's Public Services and Utilities section, states that AWA's planned water supplies would be adequate to meet 2030 water demands within its service areas, including water demands for new development identified in the updated General Plan, though the availability of the additional surface water rights for CAWP is uncertain. The County's land use permitting process requires project applicants to demonstrate the availability of water supplies to meet proposed project demands. However, due to uncertainties regarding the availability of long-term water supplies needed to serve new development, the EIR identifies this as a significant and unavoidable impact. If approved, the proposed Project would eliminate this impact relative to the CAWP service area.

Impact 4.13-2 (Increased Demand for Water Conveyance and Treatment Facilities), on page 4.13-35 of the General Plan EIR, also found that a potential increased demand for potable water and wastewater conveyance and treatment facilities would be a significant and unavoidable impact due to uncertainties associated with potential future conveyance and treatment capacity in certain locations, and because project-specific mitigation of the impacts of specific water supply facilities cannot be guaranteed. Section 4.15 of the General Plan EIR predicts that those impacts would be substantially greater at build-out. The proposed Project would address the matter of water supply uncertainty for the CAWP service area, but it does not include construction of facilities to convey water to new users. As noted in the General Plan EIR, impacts of new or expanded water supply facilities would be evaluated and mitigated through project-specific CEQA review, and construction of new facilities could result in significant impacts unless mitigated.

The General Plan EIR concludes that expansion of wastewater facilities to accommodate growth also could result in significant unavoidable impacts, and Section 4.15 of the General Plan EIR predicts that those impacts would be even greater at build-out. Existing wastewater treatment systems for Pine Grove, Buckhorn, and vicinities, which are within the CAWP service area, are subject to limited capacity for expansion, and many of the small, local sewer systems in the County do not permit or greatly restrict new connections based on lack of capacity. As with water supply infrastructure, impacts of new or expanded wastewater facilities would be evaluated and mitigated through project-specific CEQA review, but could result in significant impacts unless mitigated.

The General Plan EIR also addresses other public services such as storm drainage facilities, increased generation of solid waste, increased demand for fire and police protection, and public schools, park services and facilities. Generation of solid waste, demand for school facilities and park impacts were determined to be less than significant, both at the 2030 projected level of development and at build-out (see page 4.15-6 in Section 4.15 of the General Plan EIR). Environmental impacts related to increased demand for fire and law enforcement services and storm drainage were determined to be less than significant with mitigation, both in 2030 and at build-out, given that development impact fees would ensure that additional service facilities and service levels would be provided as needed to keep pace with future development. As noted on page 4.15-6 of the General Plan EIR: "…buildout mitigation measures would identify service standards and require fees to be paid to support continued public service provision."

Although the proposed Project would remove uncertainties regarding water supply for the CAWP service area, the additional water supply would accommodate growth that would also place demand on other services, especially wastewater services. The proposed Project thus accommodates growth that could potentially result in secondary impacts regarding construction of new water and wastewater infrastructure unless mitigated.

Transportation

Section 4.14 of the General Plan EIR addresses the Project's potential transportation related impacts. The EIR concludes that development consistent with the updated General Plan would result in increases in traffic levels on State Highways within the County that would operate below Caltrans Level of Service (LOS) thresholds. Mitigation measures were identified requiring that projects under the General Plan provide their fair share of funding for future transportation improvements. However, in the case of certain highway segments, improvements that would reduce highway LOS impacts would not reduce these to less than significant levels, and impacts would remain significant and unavoidable. Within the CAWP service area, several segments of SR 88 are projected to experience unacceptable LOS. The General Plan EIR projects that highway conditions would degrade to LOS E or F in the vicinity of both Pine Grove and Buckhorn, with the following areas listed as experiencing significant reductions in LOS:

- SR 88 west of Ridge Road (Pine Grove) is projected to degrade from LOS D to LOS F;

- SR 88 east of Ridge Road (Pine Grove) LOS F is projected to degrade further with traffic volumes more than doubling;
- SR 88 west of Tiger Creek Road near Buckhorn is projected to degrade from LOS C to LOS F; and
- SR 88 West of Inspiration Drive near Buckhorn is projected to degrade from LOS B to LOS E.

The General Plan EIR identifies mitigation for this increased congestion. Mitigation Measure 4.14-1c: Implement State Highway Roadway Improvements, states that "The County will work with Caltrans and ACTC (Amador County Transportation Commission) to implement roadway improvements required to meet Caltrans LOS standards." For SR 88 this would include widening the highway to four lanes throughout Amador County. However, the General Plan EIR finds that, "Even with widening to four lanes, some of the urban portions of SR 88 in … Pine Grove could still experience LOS E or F conditions." The General Plan EIR also recognizes that some portions of SR 88 may remain at two lanes, and could thus be significantly affected by increased traffic resulting from new development. Growth in Pine Grove and Buckhorn could thus result in significant unavoidable impacts on highway traffic on SR 88.

The EIR also indicates that development associated with the updated General Plan would result in increased traffic levels that could produce unacceptable LOS conditions on some surface roadway segments in the CAWP service area. In the Pine Grove area, Ridge Road would experience LOS degradation, with the following areas listed as experiencing unacceptable LOS:

- Ridge Road west of Climax Road degrades from LOS D to LOS F;
- Ridge Road east of Climax Road degrades from LOS C to LOS E; and
- Ridge Road west of SR 88 degrades from LOS C to LOS E.

The General Plan EIR states that given the lack of funding for roadway improvements that are already needed under baseline conditions, and uncertainty related to the timing of future projects, funding might not be in place and all improvements might not be feasible prior to increases in traffic that would result in inadequate LOS on the roadways identified in the EIR. Because of these uncertainties related to the timing and availability of funding for improvements, the EIR concludes that impacts of increased congestion due to growth through 2030 would be significant and unavoidable. Section 4.15 of the General Plan EIR predicts that those impacts would be even greater at build-out.

The EIR found that the updated General Plan would have less than significant impacts related to air traffic patterns, design hazards, non-motorized transportation and transit both in 2030 and at build-out.

The proposed Project thus accommodates growth that could result in secondary impacts related to roadway and highway transportation within the CAWP service area.

Land Use and Planning

Section 4.10 of the General Plan EIR addresses land use and planning impacts associated with the updated General Plan, which addresses development through 2030. The EIR concludes that no new infrastructure improvements with the potential to divide existing communities are proposed as part of the General Plan, and that the General Plan would not conflict with other applicable land use plans, policies or regulations.

For areas designated as Rural Residential (RR), the updated General Plan specifies that "One-acre net minimum lot sizes are acceptable in areas served by public water. Five-acre minimum lot sizes are required in areas lacking public water service". The proposed Project provides additional water supply, but because the Project does not include construction of new infrastructure, it does not provide public water to areas that are not already served by AWA, and is thus not expected to directly result in a change in the density of land use in areas that are not served by the existing water distribution system. The General Plan EIR projects

that land use impacts of development through 2030 would be less than significant, but the evaluation of build-out impacts in Section 4.15 of the General Plan EIR assumes that for build-out to occur "existing housing and structures, which are at a lower density or intensity than would be permitted under the General Plan, would be replaced with new development at the maximum intensity permitted, disrupting and potentially dividing existing communities. This would be a new significant and unavoidable impact" (see page 4.15-5 of the General Plan EIR). To the extent that additional water supply might accommodate higher density development in the existing service area, this impact would be considered significant.

Population and Housing

Section 4.12 of the General Plan EIR addresses impacts related to population and housing. The EIR concludes that development through 2030 consistent with the updated General Plan would result in substantial population growth through future development of residential, commercial and industrial uses throughout the planning area. The updated General Plan intends to reduce impacts associated with population and housing growth in the planning area by accommodating this growth in an orderly fashion. As noted on page 4.12-1 of the General Plan EIR, the purpose of the updated General Plan "is to accommodate the most recent population growth, housing, and employment projections in an orderly manner." Because the purpose of the General Plan is to accommodate growth, no feasible mitigation measures are available to reduce the potential for population growth to a less than significant level. Furthermore, the County cannot meet its economic development and housing needs without accommodating additional residents and workers. Because there are no feasible mitigation measures, the General Plan EIR states that this impact would remain significant and unavoidable, both for development through 2030 and for build-out.

The proposed Project may result in secondary growth inducement impacts in that an additional water supply could accommodate an increase in the County's population.

To address the potential that the Project would contribute to impacts associated with population and housing growth, the infrastructure planning and development policies listed in the Project Description (Section 2.4.4) would provide guidance when new development projects are being considered and/or constructed. Adherence to these policies would help to minimize the Project's potential indirect growth inducing impacts.

Infrastructure Planning and Development Policies

AWA is committed to providing water to its service areas consistent with its Mission Statement: "To enhance the quality of life in Amador County by providing safe, reliable water, waste-water, conservation and reclamation services. We will accomplish this as a professional team dedicated to public transparency, community partnerships and excellent customer service." In keeping with this mission, AWA will implement the policies identified in the Project Description (see Section 2.4.4, Management Practices for CAWP Water Supply).

Summary

Section 15126.2 (d) of the CEQA Guidelines notes that "It must not be assumed that growth in any area is necessarily beneficial, detrimental or of little significance to the environment." Potential effects of growth in the CAWP service area have been identified above. Implementation of the proposed Project would not directly induce population growth, as the Project is not tied directly to any new residential or commercial development. The Project would augment existing water supply and increase supply resiliency within the CAWP service area. It does not involve the construction of new water conveyance infrastructure to extend service to areas not currently served by AWA. Any proposed new development projects would be required to go through the customary environmental review process, which would involve an evaluation of a

project's environmental impacts, including impacts related to the provision of utility services such as potable water.

In conclusion, the Project would accommodate growth that could result in some indirect impacts, as follows:

- Conflicts with existing agricultural uses and conversion of forestland;
- Exposure to toxic air contaminants;
- Impacts to sensitive species;
- Impacts associated with construction of new water and wastewater infrastructure;
- Reduction in Levels of Service on roadways and highways within the CAWP service area;
- Disruption of existing communities through new development; and
- Accommodation of population growth.

All of these impacts would be significant and unavoidable as identified in the Amador County General Plan EIR. AWA will implement policies to encourage orderly development. AWA would also implement mitigation for construction of any new water infrastructure, with the aim of avoiding any significant impacts on the environment. However, AWA does not have the legal authority to require that development projects provide for mitigation of any of the significant effects identified above to which they contribute, except for the impacts associated with the water and wastewater infrastructure needed to serve such projects. Additionally, CEQA does not require an EIR to anticipate and mitigate the effects of the Project's growth. It is not feasible or necessary to identify measures to mitigate impacts of development projects that have not yet been proposed. That process is best reserved until such time as a particular development project is proposed.

3.3.6 References

Amador Water Agency. 2016. Urban Water Management Plan. June 2016.

County of Amador. 2014. Amador County General Plan Land Use Element. October 2014.

County of Amador. 2016. Amador County General Plan, Final Environmental Impact Report. July 2016.

Foothill Conservancy. 2010. Letter to Amador Water Agency regarding 2/5/10 meeting on Proposed Gravity Supply Pipeline Project. February 16, 2010.

Chapter 4 Other CEQA Considerations

4.1 Significant and Unavoidable Impacts

As described in Chapter 3, the proposed Project would accommodate growth, which could result in some significant and unavoidable indirect impacts. AWA will be required to adopt Findings as part of its EIR certification process, and will prepare a Statement of Overriding Considerations for those unavoidable significant impacts.

4.2 Significant Irreversible Environmental Changes

Because no construction activity would be required to implement the Project, no commitment of resources such as construction materials, labor, or energy for construction would be required. In terms of Project operation and maintenance, both AWA and JVID primarily use gravity to move water from their diversion/rediversion points and thus the reversion of the water right from JVID to AWA would not have a substantial effect on energy required for diversion. AWA would use a small amount of pumping energy to treat raw water for potable use, but the net increase in energy use during the operations phase of the Project is expected to be minimal.

However, Project implementation could indirectly result in some irreversible environmental changes related to growth inducement as discussed in Section 3.3. The proposed Project could accommodate population growth, economic development and housing construction, which could irreversibly change the environment as explained in Section 3.3.

4.3 Effects Not Found to be Significant

The Initial Study for the Project is included in Appendix A of this EIR. The Initial Study found that the Project had no direct impacts on aesthetics, agriculture and forestry resources, air quality, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, land use and planning, mineral resources, noise, public services, transportation/traffic, or utilities and service systems.

4.4 Cumulative Impacts

The cumulative impact analysis for each individual resource topic is included in each of the resource sections.

4.5 Alternatives Evaluation

4.5.1 Methodology

CEQA Guidelines Section 15126.6 requires that "An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which 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. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives which are infeasible." The Project has no direct significant environmental impacts. It would have the indirect effect of inducing growth in the CAWP service area, which could lead to some significant adverse environmental effects as identified in Section 3.3. CEQA thus requires that the evaluation of alternatives be focused on reducing the potential to accommodate growth, which creates an inherent conflict in that the Project's purpose is to accommodate planned growth. The information below describes two alternatives to the proposed Project, including the Reduced Growth Alternative and the No Project Alternative. As will be

discussed below, neither alternative is found to be feasible, and therefore, consistent with CEQA, the consideration of them is not detailed.

4.5.2 Reduced Growth Alternative

AWA has considered two potential options to reduce the amount of growth that could be accommodated by the Project 1) the Reduced Water Supply (RWS) Alternative and 2) the Reduced Place of Use (RPU) Alternative.

Reduced Water Supply Alternative: Under the RWS Alternative, the amount of water that could be put to beneficial use under Application 5647X03, whether by direct diversion or rediversion of releases from storage, would be reduced so as to reduce to some uncertain extent the Project's potential to contribute to secondary growth inducing impacts.

Reduced Place of Use Alternative: Under the RPU Alternative, the geographic extent of the CAWP service area as shown in Figure 2-2 (Project Description Chapter) would be reduced in size from its current authorized configuration. Reducing the size of the service area is another means by which it might be possible to limit the potential for growth that could be served by an additional water supply.

Both options would limit the potential additional development that AWA could serve in the future, thus reducing the Project's potential to contribute to secondary growth inducing impacts. A reduction in water supply under the RWS Alternative or a reduction in the area served under the RPU Alternative could limit potential future residential and commercial development and thus reduce the secondary impacts associated with that growth, including effects on agriculture and forest resources, air quality, biological resources, public services and utilities, transportation, land use and planning and population and housing. It is, however, uncertain whether growth could be reduced to an extent that impacts would be considered less than significant. It is also possible that either Reduced Growth Alternative could result in environmental consequences associated with the development of alternative sources of water supply if water is not available from AWA to users within the CAWP service area. Users who cannot be supplied with water from AWA might attempt to meet their water demands with groundwater, or by diversions from other surface waters. Groundwater basins and aquifers in the CAWP area are not well defined; most groundwater is transient and found in fractured rock. Because there is no defined basin in the area, groundwater use in the CAWP area would not be regulated by the Sustainable Groundwater Management Act. There is thus the possibility that unmanaged use of local groundwater resources could result in adverse effects on groundwater levels, and use of other surface water could affect local streams other than the Mokelumne River. These effects could potentially be significant.

The recently published Amador County General Plan EIR identified potential environmental impacts related to growth in the County as a whole. Given the broad-based nature of the discussion of these impacts in that EIR, it would be highly speculative to assess the specific extent to which growth in the CAWP service area would contribute to the totality of growth related significant impacts in the County that were identified in the General Plan EIR. Therefore, it is difficult to conclude to what extent the Reduced Growth Alternative would result in less overall growth related environmental impacts in the County compared to the proposed Project. Additionally, AWA does not have the authority to refuse service to future development approved by Amador County assuming it has a water supply available to serve it and the development complies with AWA's rules and regulations concerning service. As noted in the Project Description, AWA is authorized to provide water service to all territory in Amador County, and thus has a duty to serve, which requires AWA "to provide adequate and reasonably efficient service in an impartial manner, without unjust discrimination, to those within the agency's service area who comply with its rules and regulations and pay its rates and charges" (Maddow 1992). A reduction in the size of the water supply under the RWS Alternative or a reduction in service area under the RPU Alternative would for all intents and purposes be a mechanism through which AWA would be precluded from providing water service to areas of the County for which it is obligated to serve.

The Reduced Growth Alternative thus would not meet the Project's most basic objectives, which are to augment existing water supply to meet the needs of existing customers and accommodate future planned growth, and increase supply resiliency for current and future customers in the CAWP service area. This alternative is thus not considered feasible.

4.5.3 No Project Alternative

CEQA requires the evaluation of a No Project Alternative. Under the No Project Alternative, existing conditions as of the Notice of Preparation publication date would continue indefinitely. No additional water would be diverted from the Bear River or the North Fork Mokelumne River, nor would additional diverted water be stored in Lower Bear River Reservoir. The augmented water supply capacity and increased reliability of water supply to serve existing and future residents in the CAWP service area associated with the proposed Project would not occur, and thus the No Project Alternative would not meet the most basic objectives of the Project. AWA could potentially look for other sources of water to ensure adequate water supply capacity and reliability. Potential sources of water could include groundwater (although groundwater is not a reliable source of supply in the CAWP service area), or other surface water sources, and use of those other sources could have significant adverse effects on the groundwater levels or on local streams other than the Mokelume River. In the absence of the Project, growth might still occur in the CAWP service area, and although the extent of growth might be reduced, it is not certain that any secondary effects of growth in the service area would be reduced to less than significant. Even without the Project there could be significant impacts associated with the secondary effects of growth in the service area.

4.5.4 Comparison of Alternatives

Table 4-1 provides a comparison of the environmental impacts that could result from implementation of the proposed Project, the Reduced Growth Alternative and the No Project Alternative.

Table 4-1: Comparison of Alternatives

Impact Statement	Proposed Project	Reduced Growth Alternative	No Project Alternative
HYD-1: Potential to substantially alter existing drainage pattern of Project site or area.	LTS	PS	PS
Substantially deplete groundwater supplies	NI	PS	PS
BIO-1: Potential to affect species identified as candidate, sensitive, or special-status.	LTS	LTS	NI
BIO-2: Potential to affect riparian habitat or other sensitive natural community.	LTS	LTS	NI
BIO-3: Potential to interfere substantially with movement of native resident or migratory fish or wildlife species, with movement corridors or nursery sites.	LTS	LTS	NI
GRO-1: Potential to directly or indirectly induce population growth or development of the built environment.	SU	SU	PS

Notes: NI = No Impact, LTS = Less than Significant, SU = Significant and Unavoidable, PS = Potentially Significant

4.5.5 Environmentally Superior Alternative

CEQA Guidelines Section 15126.6(e)(2) requires that an environmentally superior alternative be identified among the alternatives considered. The environmentally superior alternative is generally defined as the alternative which would result in the least adverse environmental impacts to the Project site and surrounding

area. It still needs to attain the Project's most basic objectives. If the No Project Alternative is found to be the environmentally superior alternative, the environmental document must identify an environmentally superior alternative among the other alternatives.

The No Project Alternative might reduce secondary environmental impacts associated with growth as compared to the proposed Project. However, the No Project Alternative could result in physical impacts to the environment associated with developing alternative water supplies, and it would fail to meet the basic objectives of the Project. The No Project Alternative would not augment existing water supply to meet the needs of existing customers and accommodate future planned growth, and would not increase supply resiliency for current and future customers in the CAWP service area. Therefore, the No Project Alternative does not meet the basic objectives of the Project. Over the long term, the No Project Alternative would not be considered an environmentally superior alternative.

The proposed Project would result in less than significant impacts to hydrology and biological resources. However, the proposed Project may result, to an extent difficult to forecast, in greater impacts related to indirect growth inducement, because the water supply would be larger under the proposed Project compared to the reduced water supply under the Reduced Growth Alternative. The proposed Project is the only alternative that would meet the Project's most basic objectives, but it could result in more secondary impacts associated with growth than the Reduced Growth Alternative.

As shown in Table 4-1, implementation of the Reduced Growth Alternative would result in less than significant impacts to biological resources in the Project area, as is the case with the proposed Project, but has the potential to result in environmental effects on groundwater and surface water hydrology. Given that under the Reduced Growth Alternative the water supply would be reduced compared to the proposed Project, indirect growth inducement impacts could be less under the Reduced Growth Alternative compared to growth inducement impacts under the proposed Project, but still may be significant. The Reduced Growth Alternative also would fail to meet the Project's basic objectives (meeting demands of planned growth and providing water supply resiliency in the CAWP service area). Because of the uncertainty of the direct hydrological environmental effects of the Reduced Growth Alternative relative to the less-than-significant impacts of the proposed Project and because its effects associated with growth may still be significant, the Reduced Growth Alternative is not considered to be environmentally superior. Thus, on the basis of the above analysis, the proposed Project is considered to be the Environmentally Superior Alternative.

4.6 References

County of Amador. 2014. Amador County Draft General Plan. October 2014.

County of Amador. 2016. Amador County General Plan, Draft Environmental Impact Report. July 2016.

Maddow, Robert B. 1992. *The Role of Water Agencies in Land Use Planning.* California Water Law and Policy Reporter, page 105, March 1992.

Chapter 5 Report Preparers

5.1 Amador Water Agency

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Appendix A – Notice of Preparation and Initial Study

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Amador Water Agency
12800 Ridge Road
Sutter Creek, CA 95685

NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT AND SCOPING MEETING

TO: Responsible and Trustee Agencies, Organizations, and Interested Parties

FROM: Amador Water Agency (AWA)
12800 Ridge Road
Sutter Creek, CA 95685

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report for the Central Amador Water Project Water Right Application

AGENCIES: AWA will be the lead agency under the California Environmental Quality Act (CEQA) and will prepare an Environmental Impact Report (EIR) for the project identified below. AWA requests the views of public agencies as to the scope and content of the environmental information that is relevant to the agency's statutory responsibilities in connection with the proposed project, in accordance with California Code of Regulations, Title 14, Section 15082(b), if the agency will need to use the EIR prepared by AWA when considering any permit or other approval for the project.

ORGANIZATIONS AND INTERESTED PARTIES: AWA requests comments and concerns from organizations and interested parties regarding the environmental issues associated with operation of the proposed project.

PROJECT TITLE: Central Amador Water Project Water Right Application

PROJECT LOCATION: Amador County, with existing diversion facilities on Bear River, Tiger Creek, and North Fork of Mokelumne River (see Figure 1 and 2)

PROJECT DESCRIPTION: AWA has applied to the State Water Resources Control Board (SWRCB) for a water right permit to store up to 1,400 acre-feet per year (AFY) in Lower Bear River Reservoir and to directly divert up to 1,050 AFY of water that is currently diverted by the Jackson Valley Irrigation District (JVID) further downstream. The proposed diversion will provide additional supply to the Central Amador Water Project (CAWP) service area, where AWA expects water use to increase beyond the amount allowed in its existing water right permit.

JVID's water right Permit 12167 allows for the reversion of up to 2,200 AF of the face value amount of 5,000 AF to water users within Amador County (such as AWA) upstream of JVID's diversion point. A reversion is allowed only after a determination is made by the SWRCB indicating that the reverted water is needed by the upstream water user requesting the reversion. Previous actions by the SWRCB resulted in the reversion of 1,150 acre-feet to AWA. If approved, AWA's new water right permit would have the following effects (relative to AWA's existing Permit 17579):

- Increase the maximum rates of direct diversion allowed from the Bear River and North Fork Mokelumne River from 3 cubic feet per second (cfs) to 5 cfs, with the combined rates between these sources not to exceed 5 cfs.
- Increase the amount of water that may be diverted into storage annually at Lower Bear River Reservoir from 1,600 AF to 3,000 AF.

- Increase the amount of water that may be beneficially used annually, whether by direct diversion or re-diversion of water released from storage, from 1,150 AF to 2,200 AF.

The proposed diversions and storage would be accomplished using existing facilities of AWA and PG&E, which have ample capacity for the increased diversion rates and storage amounts. No new water facility infrastructure would be required. AWA's proposed points of diversion and rediversion are upstream from JVID's current point of diversion at Pardee Reservoir. Water would be diverted, stored, and conveyed to the Buckhorn Water Treatment Plant for delivery within AWA's Central Amador Water Project (CAWP) service area.

Additional details on the Project are provided in the Initial Study, which is available at the AWA website:

POTENTIAL ENVIRONMENTAL EFFECTS: The following areas of potentially significant environmental impact will be analyzed in the Draft EIR: Biological Resources, and Hydrology and Water Quality. Potential cumulative impacts and potential for growth inducement and associated indirect impacts will be addressed. Further details on the probable environmental effects of the proposed project can be found in Attachment A.

PUBLIC REVIEW PERIOD: This NOP is available for public review and comment pursuant to California Code of Regulations, Title 14, Section 15082(b) for 30 days. The comment period for the NOP begins **September 2** and ends on **October 3, 2016**. Due to the limits mandated by State Law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

RESPONSES AND COMMENTS: Please indicate a contact person for your agency and send your responses and comments by 5:00 October 3, 2016 to:

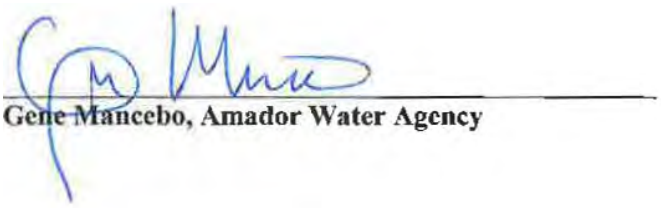
Gene Mancebo
Amador Water Agency
12800 Ridge Road
Sutter Creek, CA 95685
(209) 223-3018

SCOPING MEETING: AWA will hold a scoping meeting on **September 21** from **5:00 p.m**. to **7:00 p.m**. at the Board of Supervisors Chambers at the Amador County Government Center on 810 Court Street, Jackson. You are welcome to attend and present environmental information that you believe should be addressed in the EIR.

The NOP and all CEQA related documents for this project will be available for review on the web. You can view the NOP and Initial Study electronically at:

http://www.amadorwater.org/

If you require additional project information, please contact Gene Mancebo at (209) 223-3018 or visit the AWA website indicated above.



Gene Mancebo, Amador Water Agency

8/31/2016
Date

Figure 1: Vicinity Map

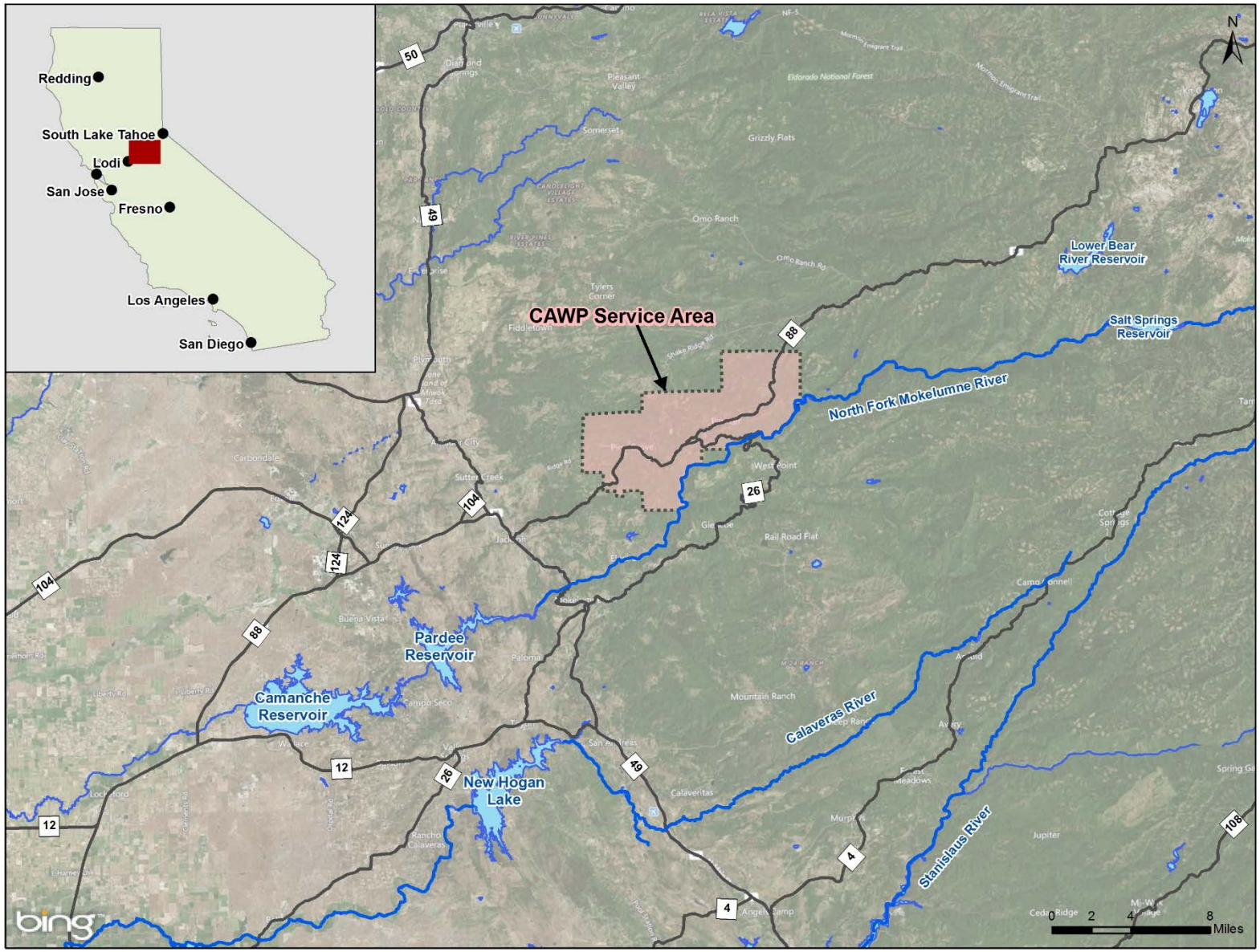
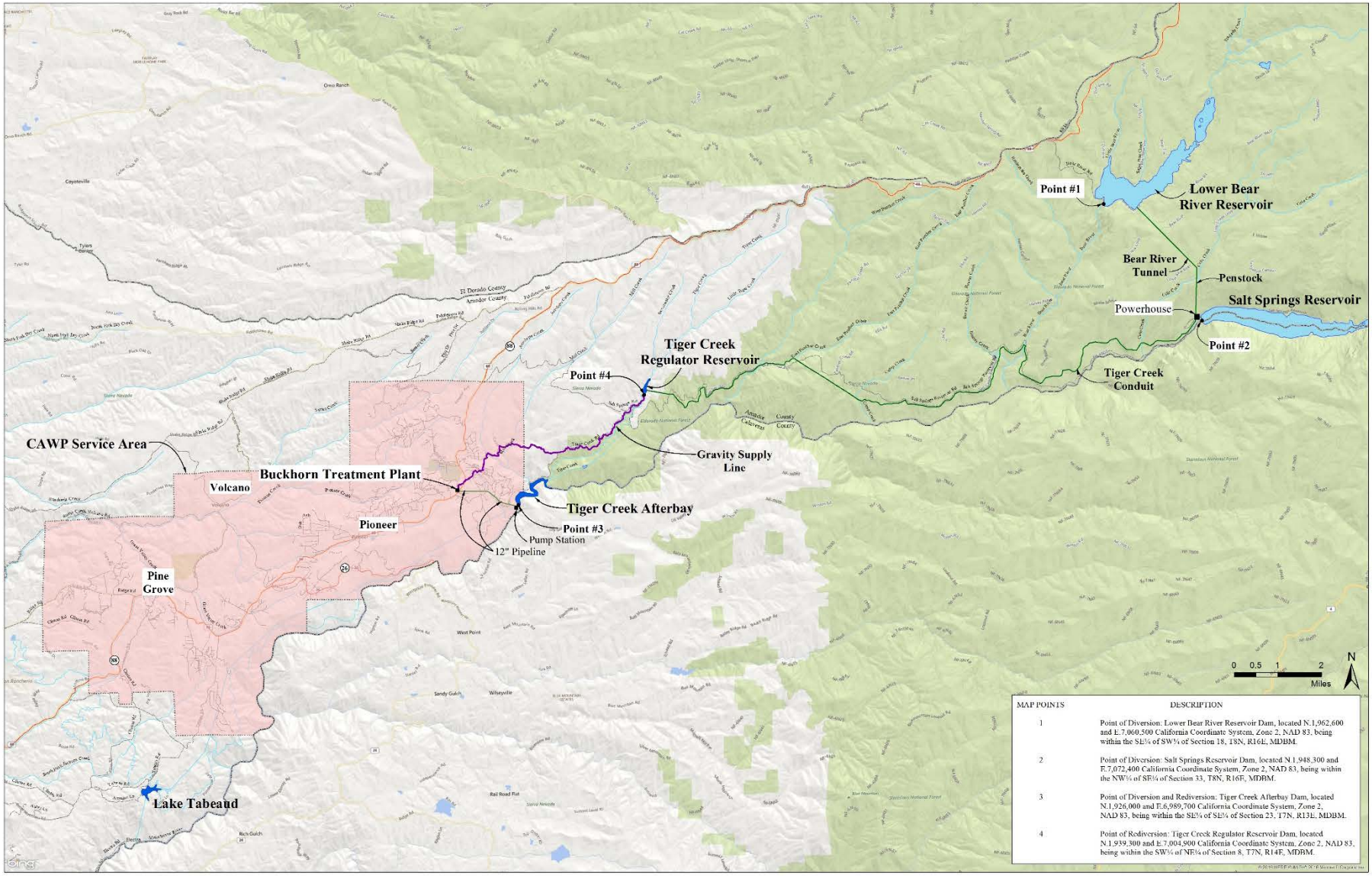


Figure 2: Diversion Locations



Initial Study

Central Amador Water Project
Water Right Application

Prepared for:

Amador Water Agency
12800 Ridge Road
Sutter Creek, CA 95685

May 2016

Initial Study for the Amador Water Agency Central Amador Water Project Water Right Application

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Project Sponsor

Amador Water Agency

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Acronym List

AF	acre-feet
AFY	acre-feet per year
AWA	Amador Water Agency
CAWP	Central Amador Water Project
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
cfs	cubic feet per second
EIR	Environmental Impact Report
FERC	Federal Energy Regulatory Commission
GHG	Greenhouse gases
HCP	Habitat Conservation Plan
IS	Initial Study
JVID	Jackson Valley Irrigation District
PG&E	Pacific Gas and Electric Company
RMC	RMC Water and Environment
SAA	Streambed Alteration Agreement
SWRCB	State Water Resources Control Board
WTP	Water Treatment Plant

Chapter 1 Introduction

1.1 Purpose of this Document

The Amador Water Agency (AWA) has filed a water right application with the State Water Resources Control Board (SWRCB), requesting approval to directly divert up to 1,050 acre-feet per year (AFY) of water from Bear River and North Fork Mokelumne River and store up to 1,400 AFY in Lower Bear River Reservoir (Project). The amount taken by direct diversion and rediversion from storage for consumptive uses in the central portion of Amador County would not exceed 1,050 AFY. The water rights process involves water right Permit 12167 of Jackson Valley Irrigation District (JVID). Currently, JVID is authorized to directly divert 3,850 acre-feet of water from March through October each year at Pardee Reservoir. JVID's permit provides that of that amount, 1,050 acre-feet may revert to upstream diversions. AWA is requesting such reversion. AWA's proposed direct diversion and storage may reduce water flow along the Mokelumne River between the AWA diversions and Pardee Reservoir. However there would be no net change in water flow downstream of Pardee Dam.

The proposed diversions and storage would be accomplished using existing infrastructure. No new water facility infrastructure would be required.

AWA has prepared this Initial Study (IS) to provide the public and Responsible and Trustee Agencies reviewing the proposed Project with information about the potential impacts on the environment. AWA proposes to complete an Environmental Impact Report (EIR) for the proposed Project and is using this Initial Study to focus environmental review. This project-level Initial Study evaluates potential environmental impacts associated with the Project and identifies potentially significant impacts that require further study to determine whether or not such impacts are significant, and if so, whether or not they can be mitigated to less than significant levels with mitigation. These include the Project's potential direct impacts on hydrology and aquatic biological resources, and indirect impacts that could be associated with growth that could be accommodated by the Project. These environmental topics will be addressed in detail in a focused EIR to be prepared for this Project

1.2 Scope of this Document

The IS was prepared to examine any impacts on environmental resources that would result from approval of the Project. Areas of potential impacts that were evaluated include:

- Aesthetics
- Agricultural and Forestry Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation/Traffic
- Utilities and Service Systems

1.3 Impact Terminology

The environmental impact analysis for each resource defines the criteria used to judge whether an impact may be significant based on the CEQA Initial Study Checklist and regulatory agency standards. Impacts that exceed identified threshold levels are considered significant. In describing the significance of

impacts, the following categories of significance are used and are based on the best professional judgment of the preparers of the Initial Study:

No Impact: An effect that would have no impact, or would have a positive impact on the environment, such as reducing an existing environmental problem.

Less than Significant: An impact that may be adverse, but does not exceed the threshold levels and does not require mitigation measures.

Less than Significant with Mitigation: An impact is potentially significant, but can be reduced to below the threshold level (to less than significant) given reasonable and available mitigation measures.

Potentially Significant: An impact that may cause substantial impacts above the threshold level. Such an impact requires further evaluation necessitating the preparation of an EIR for the project and may require consideration of mitigation measures if, after further evaluation, the impact is determined to be significant.

Chapter 2 Project Description

2.4 Project Overview

AWA has filed a water right application (Application 5647X03) requesting year-round direct diversion of up to 1,050 AF from Bear River and the North Fork Mokelumne River and the annual storage of up to 1,400 AF in Lower Bear River Reservoir during the period of October 1 to July 15. The total amount to be directly diverted and rediverted from storage for consumptive uses on an annual basis would not exceed 1,050 acre-feet. To achieve the direct diversion of 1,050 acre-feet annually, the application is coupled with a request that of JVID's currently authorized direct diversion right of 3,850 acre-feet pursuant to its Permit 12167, 1,050 acre-feet revert to AWA as contemplated in said permit. Under AWA's application, water would either be diverted or re-diverted from the Bear River and North Fork of the Mokelumne River at four different locations:

1) Bear River at Lower Bear River Reservoir Dam
2) North Fork Mokelumne River at Salt Springs Reservoir Dam
3) North Fork Mokelumne River at Tiger Creek Afterbay Dam
4) Tiger Creek at Tiger Creek Regulator Dam

AWA's proposed points of diversion and rediversion are upstream from JVID's current point of diversion at Pardee Reservoir. Water would be diverted, stored, and conveyed to the Buckhorn Water Treatment Plant (WTP) for delivery within AWA's Central Amador Water Project (CAWP) service area. AWA's pending water right application for the Project does not require the development or construction of any new water supply infrastructure, as existing facilities owned by AWA or Pacific Gas and Electric Company (PG&E) would be used to store and convey the water. **Figure 2-1** shows the Project vicinity.

2.5 Purpose and Need for Project

AWA expects water use in the CAWP service area to increase in the future beyond the amount allowed in its existing water right Permit 17579, and for that reason, filed Application 5647X03, along with the above-referenced reversion request. AWA's existing Permit 17579 allows the direct diversion of 1,150 AFY and the storage of 1,600 AFY at Lower Bear River Reservoir, with the total taken for consumptive use by direct diversion and rediversion from storage not to exceed 1,150 AFY. In 2006, AWA's annual diversion for the CAWP service area was 1,149.7 AF, which was very close to the amount of water allowed under the permit. Although water use declined during the recession and was further reduced due to conservation during the multi-year drought that extended through 2015, AWA has projected that the need for water has not decreased and will likely increase in the future.

2.6 Background

CAWP was constructed in the late 1970s to provide surface water to communities in central Amador County hard hit by the multi-year drought being experienced at that time. The service area is generally along the Highway 88 corridor near the communities of Pine Grove, Mace Meadows, Sunset Heights, Ridgeway Pines, Rabb Park, Pioneer and Pine Acres (see attached map). CAWP currently draws raw water via the Gravity Supply Pipeline from PG&E's Tiger Creek Regulator Reservoir to the Buckhorn WTP in Pioneer. The Buckhorn WTP currently provides treated water on a wholesale basis to three retail water purveyors, and provides treated water for direct retail sale to customers. There are currently about 3,500 parcels actively using water. Most water services are for residential use; however, there are some commercial services. Over the last 5 years, the total annual water use under AWA's existing water right permit (Permit 17579) has ranged from about 777 acre-feet (AF) to about 952 AF.

The sources of supply for CAWP are the North Fork Mokelumne River (North Fork) and Bear River (tributary to the North Fork). Water rediverted by AWA at PG&E's Tiger Creek Regulator Reservoir may be comprised of natural flow or stored Bear River water released from PG&E's Lower Bear River

Reservoir. PG&E delivers water to its Tiger Creek Regulator Reservoir by way of facilities owned and operated by it in connection with its Mokelumne Hydroelectric Project (Federal Energy Regulatory Commission [FERC] Project No. 137). Use of the PG&E facilities by AWA is per an agreement between the two parties, most recently amended in 2012. PG&E's facilities used by AWA consist of the following: Lower Bear River Reservoir; Bear River Tunnel and Penstock; Salt Springs Reservoir and Powerhouse; Tiger Creek Conduit; Tiger Creek Regulator Reservoir; and Tiger Creek Forebay, Powerhouse and Afterbay. Tiger Creek Afterbay serves as a standby point of direct diversion and rediversion of water released from storage in Lower Bear River Reservoir in the event that AWA is unable to divert from the Regulator.

2.6.1 Water Rights

In 1960, the predecessor of the SWRCB issued water right Permit 12167 to JVID authorizing it to directly divert 5,000 acre-feet from Pardee Reservoir at a rate not to exceed 50 cubic feet per second (cfs) from March 1 through October 31. The permit was made subject to a condition that up to 2,200 of the 5,000 acre-feet could revert to water users within Amador County, such as AWA, upstream of JVID's diversion point (Pardee Reservoir). A reversion is allowed only after a determination is made by the state indicating that the reverted water is needed by the upstream water user requesting the reversion.

In 1979, the SWRCB issued Permit 17579 to AWA as a result of Decision 1490. As part of the Decision, the SWRCB approved the reversion of 1,150 acre-feet from JVID's permit. Permit 17579 has a 1927 priority based on an assignment of a portion of State-filed Application 5647 to AWA pursuant to procedures set forth in California Water Code (Code) sections 10500-10506. Permit 17579 authorizes a year-round direct diversion of 1,150 AF at a rate not to exceed 3 cfs and the storage of 1,600 AFY in Lower Bear River Reservoir with the limitation that the total that can be taken from the sources for consumptive use whether by direct diversion or rediversion from storage is 1,150 AFY.

AWA has submitted Application 5647X03 to the SWRCB, and if approved, JVID's Permit 12167 would be further reduced by 1,050 AFY in favor of AWA. Together with the previous reversion amount of 1,150 AFY, this would bring the total amount of reversion to 2,200 AFY. Relative to the Agency's existing water right Permit 17579, the new permit would effectively:

- Increase the maximum rates of direct diversion allowed from the Bear River and North Fork Mokelumne River from 3 cubic feet per second (cfs) to 5 cfs, with the combined rate between these sources not to exceed 5 cfs.
- Increase the amount of water that may be diverted into storage annually at Lower Bear River Reservoir from 1,600 AF to 3,000 AF.
- Increase the amount of water that may be beneficially used annually, whether by direct diversion or re-diversion of water released from storage, from 1,150 AF to 2,200 AF.

The new permit also would have a 1927 priority as the Agency, in conjunction with the filing of Application 5647X03, submitted a petition for partial assignment of State Application 5647 pursuant to Water Code sections 10500-10506.

Figure 2-1: Vicinity Map

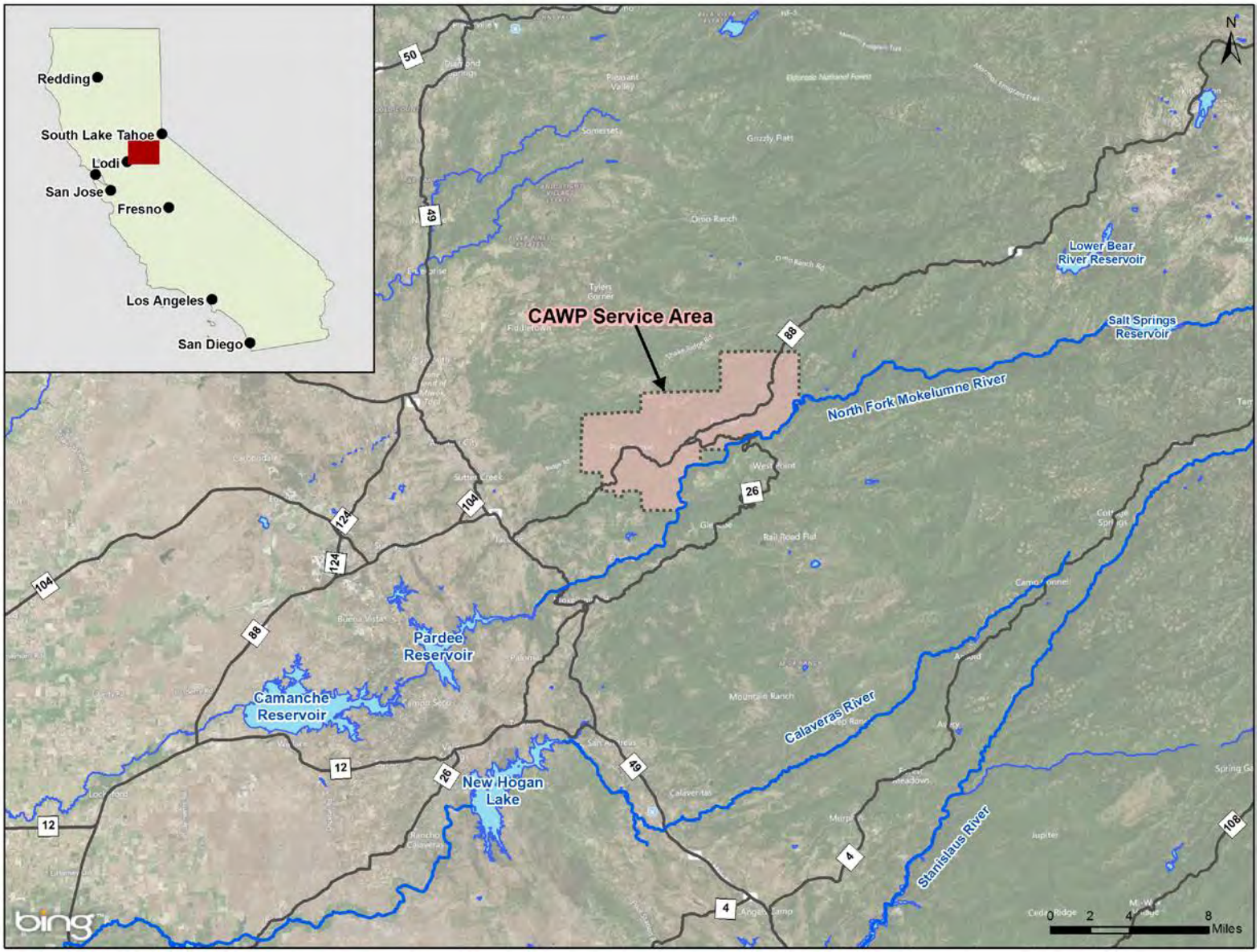
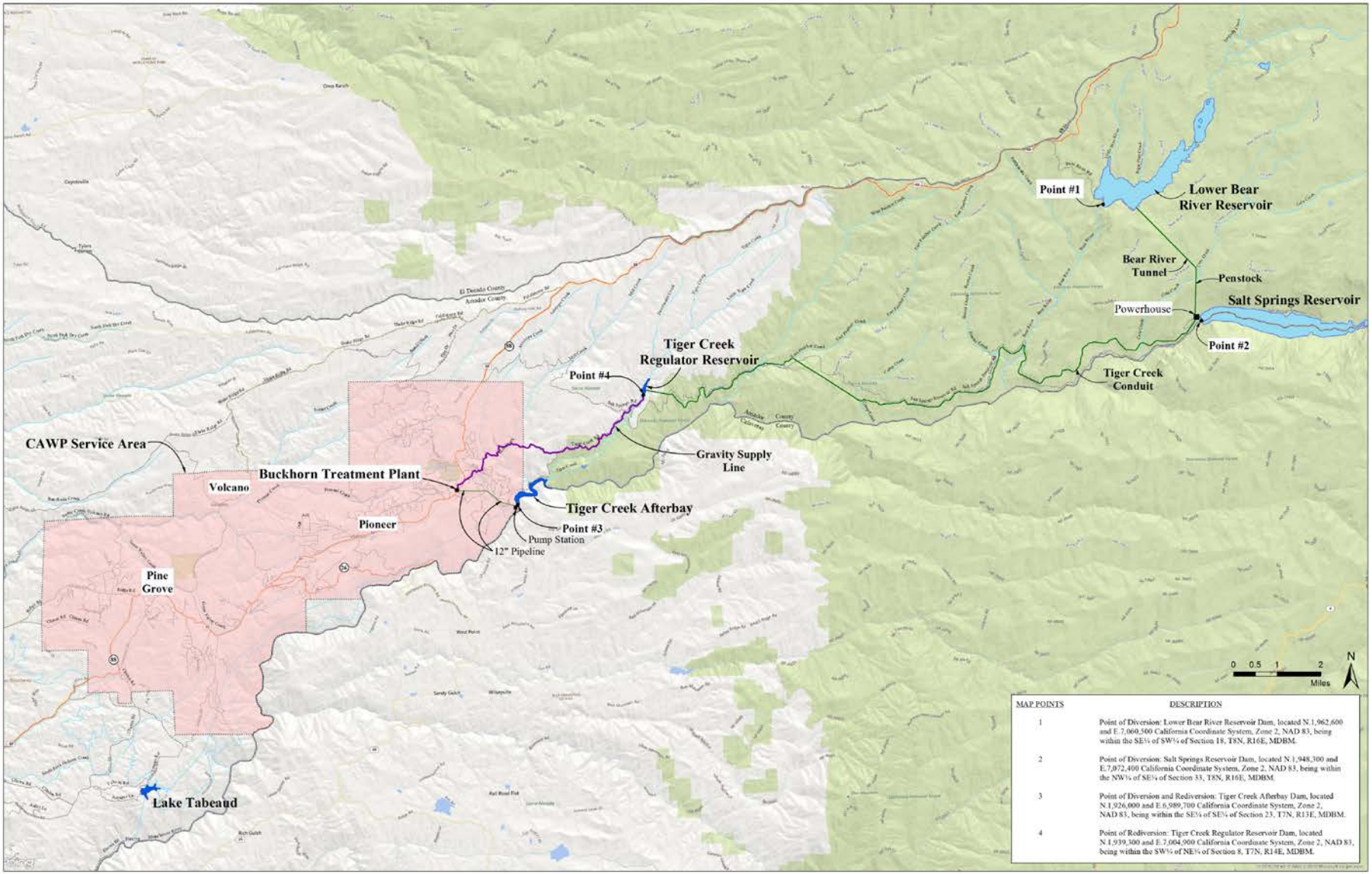


Figure 2-2: Diversion Locations



2.7 Existing Facilities and Operational Requirements

The Project would use existing facilities of AWA and PG&E, which have ample capacity for the increased diversion rates and storage amounts. Lower Bear River Reservoir has a total storage capacity of about 51,400 AF. AWA leases storage capacity in the reservoir under an existing agreement with PG&E that allows for increasing the AWA's storage allocation from 1,600 AF to 3,000 AF with a pre-condition of compliance with CEQA, which will be provided by this document.

PG&E is required to maintain certain minimum flows for streams affected by PG&E's hydroelectric operations within the Mokelumne River system, including the North Fork Mokelumne River, Bear River, and Tiger Creek. Minimum flow criteria are set forth in Appendix A to PG&E's Relicensing Settlement Agreement for its Mokelumne River Project (FERC No. 137) dated July 21, 2000. Under the terms of the AWA's agreement with PG&E, PG&E is solely responsible for providing and maintaining the specified minimum flows, notwithstanding AWA's diversions under its existing and future appropriative water rights.

2.8 Permits Required

Anticipated permits include, but may not be limited to:

- Water right permit from SWRCB

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Chapter 3 Environmental Checklist Form

1. **Project Title:** Central Amador Water Project Water Right Application

2. **Lead Agency Name and Address:** Amador Water Agency
12800 Ridge Road
Sutter Creek, CA 95685

3. **Contact Person and Phone Number:** Gene Mancebo
Amador Water Agency
12800 Ridge Road
Sutter Creek, CA 95685
(209) 223-3018

4. **Project Location:** Amador County, with diversion facilities on Bear River, Tiger Creek and North Fork of Mokelumne River

5. **Project Sponsor's Name:** Amador Water Agency

6. **General Plan Designation:** Not Applicable, no new facilities would be constructed

7. **Zoning:** Not applicable, no new facilities would be constructed

8. **Description of Project**: Amador Water Agency has applied to the SWRCB for a water right permit to store 1,400 AFY in Lower Bear River Reservoir and to directly divert 1,050 AFY of water that is currently diverted by the Jackson Valley Irrigation District at a location downstream of AWA's proposed diversion locations. No new facilities would need to be constructed.

9. **Surrounding Land Uses and Setting.** Project facilities already exist and are generally located in open space and agricultural areas, with some portions of the existing conveyance system extending through residential suburban areas.

10. **Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)**
    - Water right permit for the Amador Water Agency from State Water Resources Control Board

Environmental Factors Potentially Affected

The proposed Project could potentially have direct effects on the environmental factor(s) checked below. The following pages present a more detailed checklist and discussion of each environmental factor.

☐ Land Use	☐ Air Quality	☐ Geology and Soils
☐ Aesthetics	☐ Wind and Shadow	☒ Hydrology and Water Quality
☒ Population and Housing	☐ Recreation	☐ Hazards/Hazardous Materials
☐ Cultural and Paleo. Resources	☐ Utilities and Service Systems	☐ Mineral/Energy Resources
☐ Transportation and Circulation	☐ Public Services	☐ Agricultural and Forestry Resources
☐ Noise	☒ Biological Resources	☐ Greenhouse Gas Emissions
☐ Environmental Justice	☐ Indian Trust Assets	☒ Mandatory Findings of Significance

DETERMINATION: (To be completed by Lead Agency)

On the basis of this initial study:

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

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

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

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

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or, including revisions or mitigation measures that are imposed upon the proposed project, no further environmental documentation is required.

Signature

8-31-2016
Date

Gene Mancebo
Printed Name

Amador Water Agency
For

3.1 Aesthetics

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

Discussion

a-d) Because no facilities would be constructed, there would be no effects on scenic vistas or scenic resources, and the Project would not degrade the existing visual character of the Project area. PG&E would still be required to maintain minimum flows in the North Fork Mokelumne River, Bear River and Tiger Creek (FERC 2000), so no change in the visual character of any of these streams would occur. Because no new facilities are needed, the Project would not create any sources of light or glare.

Mitigation Measures: None required or recommended.

3.2 Agriculture and Forestry Resources

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220 (g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104 (g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Discussion

a-e) Because the Project would not require the construction of any new facilities there would be no conflicts in zoning and no adverse effects on agricultural or forest lands.

Mitigation Measures: None required or recommended.

3.3 Air Quality

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

Discussion

a-e) The Project would not generate any construction-period emissions because there is no construction associated with the proposed Project. Operation of the Project would use existing facilities and is not expected to result in additional emissions. Water would be diverted at the existing intakes, and conveyed to users through AWA's existing gravity system. Conveyance of surface water would not be a source of odors. The Project thus would not result in new operational emissions.

Mitigation Measures: None required or recommended.

3.4 Biological Resources

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☒	☐	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Discussion

a) Terrestrial species of concern that could occur in the Project area include a variety of plants and wildlife species such as the California tiger salamander, California red-legged frog, giant garter snake, vernal pool fairy shrimp, vernal pool tadpole shrimp, and valley elderberry longhorn beetle (AWA 2009). However, the Project does not include construction of new facilities and thus would have no effects on any terrestrial species of concern.

Because the Project may have a small effect on flows at times in the North Fork Mokelumne River and Bear River, it could have the potential to affect aquatic species of concern. PG&E would still be responsible for maintaining minimum flows in these streams, but when flows are above the minimum flow requirements, there may be slight reductions in flows. The Mokelumne River watershed upstream of Pardee Reservoir supports populations of resident trout and other fish species, as well as being considered for potential experimental reintroduction of fall-run Chinook salmon. A more detailed analysis of potential effects on aquatic biota will be presented in an EIR.

b) As noted above, the Project may result in a minor change in water levels at times, but minimum flows would still be maintained. Effects on riparian habitat will be addressed in an EIR.

c) The Project requires no new construction and thus would not involve direct removal, filling or hydrological interruption of any federally protected wetlands as defined by Section 404 of the Clean Water Act.

d) Although anadromous fish historically occurred in the Project area, the portions of the Mokelumne River and its tributaries above Pardee Reservoir are no longer accessible to migratory fish. The Project would thus not interfere with fish migration but could affect resident fish. Because no new facilities would be constructed, there is no possibility that the Project would interfere with migration of terrestrial wildlife species. A more detailed evaluation of potential impacts to resident fish populations will be presented in the EIR.

e) Because the Project would not require construction of new facilities, there would be no need for tree removal. Because there are no effects on terrestrial biological resources, there would be no conflicts with policies protecting biological resources.

f) There are no Habitat Conservation Plans or Natural Community Conservation Plans that cover the Project area.

Mitigation Measures: Mitigation would be developed if needed based on the analysis of effects on aquatic biota.

3.5 Cultural Resources

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to §15064.5?	☐	☐	☐	☒
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒

Discussion

a-d) Because there would be no construction of facilities, there would be no ground disturbance with the potential to affect archaeological, historic, or paleontological resources, or to disturb human remains.

Mitigation Measures: None required or recommended.

3.6 Geology and Soils

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒

iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on-or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒

Discussion

a-e) Because there would be no construction of facilities, the Project would not expose people or structures to any geologic hazards, would not result in erosion, would not locate structures on unstable or expansive soils, and would not include use of septic systems.

Mitigation Measures: None required or recommended.

3.7 Greenhouse Gas Emissions

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☐	☒
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

Discussion

a,b) Because there would be no construction of facilities, the Project would not generate any construction-period emissions of greenhouse gases. Operation of the Project would use existing

facilities and is not expected to result in additional greenhouse gas emissions. Water would be conveyed through AWA's existing gravity supply line.

Mitigation Measures: None required or recommended.

3.8 Hazards and Hazardous Materials

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the Project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

Discussion

a-d) The Project involves no new facilities and would not require use or transport of hazardous materials. There would be no hazardous emissions associated with operation, and because no new facilities would be constructed, there is no potential to locate facilities within any hazardous materials sites compiled pursuant to Government Code Section 65962.5.

e,f) Operation of the Project would require no new facilities and operation of existing facilities would not result in safety hazards relative to any nearby public airport operations.

g) Because there are no new facilities required for the Project, and thus no construction, there is no potential for interference with an emergency response plans or evacuation plans.

h) There are no activities or new facilities that would expose people or structures to the risk of wildland fires.

Mitigation Measures: None required or recommended.

3.9 Hydrology and Water Quality

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☒
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion of siltation on- or off-site?	☐	☐	☒	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☒	☐	☐	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm				

water drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation of seiche, tsunami, or mudflow?	☐	☐	☐	☒

Discussion

a,f) Because the Project does not require construction of any new facilities, there would be no potential for construction-related water quality impacts. The Project proposes to divert water from the North Fork Mokelumne River and Bear River at existing diversion points and convey water using existing conveyance facilities.

b) The Project does not include any groundwater pumping and would not construct any new facilities. There thus would not be any increase in impervious surface, and therefore no interference with groundwater recharge.

c,d,e) The Project does not include construction of any new facilities, and thus has no potential to alter drainage patterns, increase runoff or to cause erosion or siltation. Ongoing operation of existing facilities that would be used for the Project would not be changed in such a way as to increase runoff, erosion, or siltation.

The Project would result in diversion and storage of additional water at existing diversion points. There may be an incremental reduction in flows at times in the North Fork Mokelumne River and Bear River between the AWA diversion points and the existing JVID diversion at Pardee Reservoir. PG&E would still maintain minimum flows, but flows may be reduced by up to 2 cfs during periods when existing flows are above those minimums. A more detailed evaluation of potential flow impacts will be conducted, and presented in the EIR for the Project.

g-j) The Project does not include housing or other new structures within flood hazard areas and does not include any new structures that would expose people to the risk of flooding or inundation of seiche, tsunami or mudflow.

Mitigation Measures: Mitigation would be developed if needed based on detailed analysis to be conducted for the EIR.

3.10 Land Use and Planning

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable Habitat Conservation Plan or Natural Community Conservation Plan?	☐	☐	☐	☒

Discussion

a-c) The Project does not include any new facilities and thus would not divide an established community and has no potential to conflict with land use plans, policies or regulations. There are no Habitat Conservation Plans or Natural Community Conservation Plans that cover the Project area.

Mitigation Measures: None required or recommended.

3.11 Mineral Resources

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Discussion

a,b) Because the Project includes no new facilities, there would be no effect on the availability of mineral resources.

Mitigation Measures: None required or recommended.

3.12 Noise

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the Project expose people residing or working in the Project area to excessive noise levels?	☐	☐	☐	☒

Discussion

a-d) There would be no construction noise because no new facilities would be constructed. Operation of the Project would use existing facilities and is not expected to result in increased operational noise. Water would be diverted at existing diversion points, and conveyed to AWA users through the existing conveyance system. The Project thus would not increase operational noise.

e,f) Operation of the Project would require no new facilities and would not include construction of housing that would expose people to noise from airport operations.

Mitigation Measures: None required or recommended.

3.13 Population and Housing

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☒	☐	☐	☐
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion

a) The Project would provide a water supply that would increase the availability of water to the CAWP service area. Because the Project would potentially accommodate additional growth in the Project area, this will be evaluated in the EIR for the Project, which will also consider the potential indirect impacts associated with that growth. Potential indirect impacts on public services, recreation, traffic and transportation, and utilities and service systems will be evaluated in the Growth Inducement section of the EIR.

b, c) Because no new facilities would be constructed, the Project would not displace housing or people.

Mitigation Measures: None required or recommended for direct impacts of the Project. The potential for mitigation for indirect impacts will be considered in the EIR.

3.14 Public Services

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Project:				
a) Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable				

service ratios, response times, or other performance objectives for any of the public services:				
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

Discussion

a) The Project would not require construction of new facilities and would not require provision of new or physically altered public service facilities. Potential for indirect impacts to public services associated with possible accommodation of growth in the Project area will be evaluated in the EIR for the Project.

Mitigation Measures: None required or recommended for direct impacts of the Project. The potential for mitigation for indirect impacts will be considered in the EIR.

3.15 Recreation

	Potentially Significant Impact	*Less Than Significant With Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
Would the Project:				
a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Discussion

a, b) The Project would not affect recreational opportunities in the North Fork Mokelumne River, Bear River and Tiger Creek because PG&E would be required to maintain minimum flows in each of these streams. These minimum flows were established to ensure that streamflows are adequate to support recreational uses, including whitewater boating. As noted in Section 3.13, Population and Housing, the indirect effects of growth on recreation, such as park use, will be evaluated in the growth inducement section of the EIR.

Mitigation Measures: None required or recommended.

3.16 Transportation/Traffic

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

Discussion

a-c) The Project would not generate construction or operational traffic and thus would not conflict with any plan, ordinance or policy regarding effectiveness of the circulation system. Because it would not generate any traffic, the Project would also not conflict with any congestion management program or violate any level of service standards. The Project would not change air traffic patterns. As noted in Section 3.13, Population and Housing, the indirect effects of growth on traffic and transportation will be evaluated in the growth inducement section of the EIR.

d-f) No facilities would be constructed, so there would be no design features or uses that could result in traffic hazards, and there would be no effect on emergency access. The Project would have no effect on programs regarding public transit, bicycle or pedestrian facilities.

Mitigation Measures: None required or recommended.

3.17 Utilities and Service Systems

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

Discussion

a-c) The Project does not require the construction of any new water or wastewater treatment facilities. The Project would be operated completely with existing facilities. The Project also would not require any new storm drainage facilities.

d) As part of the Project, AWA has applied to the SWRCB for a water right permit to serve the CAWP service area, as more fully discussed earlier in this document. This environmental document evaluates the effects of that application if approved.

e) The Project would not result in any demand for wastewater treatment.

f,g) The Project would not generate any solid waste, and would not require any disposal of solid waste.

As noted in Section 3.13, Population and Housing, the indirect effects of growth on utilities and service systems will be evaluated in the growth inducement section of the EIR.

Mitigation Measures: None required or recommended.

3.18 Mandatory Findings of Significance

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

Discussion

a) Because the Project would be implemented entirely with existing facilities, there is no potential for impacts on terrestrial biota or cultural resources associated with construction or operation of new facilities. Potential effects of minor changes in flows in the North Fork Mokelumne River and Bear River on aquatic species will be evaluated in the EIR.

b) The only potential physical effect of the Project may be a minor reduction in flows at times in the North Fork Mokelumne River and Bear River between AWA's proposed points of diversion and the existing JVID diversion point in Pardee Reservoir. Potential cumulative effects of flow reduction will be considered in the EIR.

c) The Project would have no direct adverse effects on human beings. As noted in Section 3.13, Population and Housing, the indirect effects of growth will be evaluated in the growth inducement section of the EIR.

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Chapter 4 Report Preparation

4.1 Report Authors

This report was prepared by AWA with assistance from RMC Water and Environment (RMC). Staff that were involved include:

Amador Water Agency
- Gene Mancebo

RMC Water and Environment
- Robin Cort
- Katie Cole
- Dave Richardson

4.2 References

Amador Water Agency (AWA) 2009. Initial Study and Proposed Mitigated Negative Declaration for the Gravity Supply Pipeline Project. November 2009.

AWA 2004. Application 5647X03 to Appropriate Water by Permit and Petition to Change the Point of Diversion of Permit 17579 (Application 5647B), filed October 7, 2004

AWA 2013. Letter to SWRCB regarding Application 5467X03 of Amador Water Agency Proposed Changes

Federal Energy Regulatory Commission (FERC) 2000. Mokelumne River Project, FERC Project No. 137, Mokelumne Relicensing Settlement Agreement

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Appendix B – Public Comments Received on the NOP

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Thomas P. Infusino
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October 3, 2016

Amador Water Agency
12800 Ridge Road
Sutter Creek, CA 95685
(sent by email)

Dear Mr. Mancebo:

My name is Tom Infusino, and I am submitting these comments on behalf of the Foothill Conservancy. Thank you for the opportunity to comment on the scope of the CAWP Water Right Application EIR.

1) Thank you for considering the growth inducing impacts of the project.

Your environmental transmittal documents indicates that the EIR will address the growth inducing impacts of providing additional water to serve the CAWP service area. This is consistent with our understanding of February 16, 2010. (See attached letter.) Thank you.

We strongly encourage you not to make the same mistakes in the EIR that you made when addressing growth inducing impacts in the EA for the pipeline project. To help you avoid those mistakes, our comments on that analysis are attached.

We strongly encourage you not to merely tier down from the three-paragraph analysis of growth inducing impacts in the EIR for the Amador County General Plan. That analysis does not quantify the impacts, and is plagued with circular logic.

2) Please look at more of the secondary impacts of providing water to the CAWP service area.

The Amador County General Plan EIR identifies over three dozen direct or cumulatively significant impacts of development across the County. These impacts result from a combination of a plan that allows too much growth in the wrong places, with EIR findings that reject feasible mitigation measures proposed to promote both economic prosperity and resource conservation. Furthermore, that EIR does not specify which and how much of these impacts will be associated with development in the CAWP service area. Your EIR needs to clarify which of these secondary impacts of your water supply increase will occur in the CAWP service area, and how severe these secondary impacts will be. Your EIR needs to address the problem that, while additional water supplies allow the County to approve new development, that development is not

similarly correlated with the capacities of others to provide infrastructure and services to the CAWP area.

As Cecily Smith stated at the September 21, 2016 scoping meeting, Foothill Conservancy is also concerned with development-related growth inducing impacts created by landowners' ability to subdivide their property in the CAWP area. Under Amador County's current, as well as the proposed final general plan, parcels with an "RR" land use designation have the ability to subdivide a minimum five-acre parcel to "one-acre net minimum lot sizes…in areas served by public water." (Amador County Proposed Final General Plan, page LU-9).

In addition, your environmental transmittal documents are inconsistent with the May 2016 CAWP Water Right Application Initial Study. The transmittal notes that the EIR will only address impacts on biological resources, water supply, growth inducement, and cumulative effects. We strongly encourage you to address the secondary impacts of the water supply project on air quality, greenhouse gas emissions, cultural resources, the fiscal feasibility of impact mitigation, fire hazard, jobs/housing balance, public services/facilities, parks and recreation, schools, wastewater treatment, solid waste management, traffic circulation, water quality, and land use. While not listed in the transmittal, some of these secondary impacts are mentioned in the initial study (see Mitigation Measures for 3.13 Population and Housing through 3.17 Utilities and Public Services, pages 3-14 to 3-18).

We request you send a revised environmental transmittal which mentions all the indirect impacts the EIR will address, including those specific to growth-inducing impacts. We also request that you send a copy of this revised transmittal to the Foothill Conservancy and to the following: CA Air Quality Board, Amador County School District; Cal Fire; Caltrans; CA Department of Resources, Recycling and Recovery; Native American Heritage Commission; and CA Office of Historic Preservation.

3) Please work with County to mitigate more of the secondary impacts of your project.

The future prosperity, livability, and environmental quality of Amador County depend upon public agencies responsible for infrastructure, services, and resource management collaborating to preclude new development from outpacing their ability to maintain current levels of service to existing community residents. Unless and until these agencies reasonably accommodate the competing interests of new development and existing residents, within the context of financial and environmental constraints, Amador County will continue to be a place where people fight about growth, but rarely benefit from it.

Also, do not depend on a statement of overriding considerations to justify the secondary impacts of your project. The jobs, the homes, the businesses and the other benefits associated with this water allocation are not unique to Amador County. Those benefits will flow to whichever locale the State Water Resources Control Board sends this water. The key difference is that other locations competing for the waters of the Mokelumne have done more to reduce development impacts.

There is at least one local agency that adopted policies to mitigate the growth inducing impacts of an infrastructure project (Kirkwood Meadows Public Utilities District). We trust that as you move forward with the environmental analysis for this project, you will look to that and other examples of feasible mitigation.

In closing, we remind the AWA that the State Water Resources Control Board can only allocate the Mokelumne River's water in the public interest. The AWA will be hard pressed to argue that providing water to serve development with over three dozen significant impacts is in the public interest. This is especially true when one considers that some of the other jurisdictions also seeking Mokelumne River water have embraced their obligations to reduce development impacts through the adoption of habitat conservation plans, agricultural land mitigation programs, and other mitigation mechanisms rejected by Amador County.

Sincerely,

Thomas P. Infusino

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February 16, 2010

Gene Mancebo
Interim General Manager
Amador Water Agency
12800 Ridge Road
Sutter Creek, CA 95685

RE: Confirming Letter Regarding 2/5/10 Meeting on Proposed Gravity Supply Pipeline Project.

Dear Mr. Mancebo:

I am writing this letter on the proposed Gravity Supply Pipeline Project on behalf of the Foothill Conservancy. During our discussions on February 5, 2010, I believe that we came to some better understanding of the nature of the project and the anticipated environmental review procedures.

1) The pipeline is intended to transmit up to 2200 afy from the existing and the applied for water rights on the Mokelumne River.

2) The pipeline is sized at 5 cfs to account for short term peak flow needs.

3) It is the intention of the Amador Water Agency to analyze the growth-inducing and secondary impacts of providing the additional water in the CAWP service area in the environmental review document for the water rights application. The Foothill Conservancy looks forward to receiving a copy of that analysis when it is available for public review. While we at the Foothill Conservancy are willing to wait for that analysis, there is no guarantee that others with concerns about the GSL project will be similarly accommodating.

4) Any additional water right acquisition and modification of the water delivery system would similarly be preceded by an analysis of the growth-inducing and secondary impacts of providing the additional water in the CAWP service area.

5) AWA staff anticipates that the costs of the GSL system will be split between the existing users and the future users in proportion to the capacity that they use. For example, if current use is 1150 afy, then current rate payers will pay for 1150/2200 of the AWA costs for the GSL.

We strongly encourage AWA staff to work with staff from the other service providers during the Amador County General Plan Update, to identify levels of growth that can be reasonably accommodated without unmitigated environmental harm and the loss of quality of life in the area. By allocating our precious resources efficiently, we can all move toward a more sustainable environment, economy, and community.

Sincerely,

Thomas P. Infusino

Thomas P. Infusino

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December 28, 2009

Gene Mancebo
Interim General Manager
Amador Water Agency
12800 Ridge Road
Sutter Creek, CA 95685

RE: Comments on the Gravity Supply Pipeline Project Initial Study and Proposed Mitigated Negative Declaration.

Dear Mr. Mancebo and Members of the Board:

I am writing this comment letter on the Gravity Supply Pipeline Project Initial Study and Proposed Negative Declaration on behalf of the Foothill Conservancy. The Foothill Conservancy supports reducing energy use from the Central Amador Water Project water delivery system. However, as explained in this letter, we believe the Initial Study and proposed Negative Declaration for the Gravity Supply Line do not sufficiently consider the growth-inducing impacts of providing far more water to the CAWP service area than will be needed for estimated growth in the region. In addition, the Initial Study does not afford a comparative evaluation of less-impacting alternatives.

Consequently, proceeding with the Gravity Supply Line as proposed could result in AWA's building excess infrastructure capacity at higher than needed public expense or inducing local growth at levels higher than any other local public agency is currently planning to address.

We therefore recommend that the AWA take one of the following actions:

1) Reconsider the capacity of the project and ensure it is sized to meet the water demands of projected growth for the CAWP area in the next 20 years. The growth projection should take into account the amount of growth anticipated for the area for the planning period, considering the *entire* county general plan (not just the maps of the land use element), the Regional Transportation Plan,

school master plans, community fire plans, community fire-safe plans, current and projected (not past) economic conditions, and other local infrastructure and services planning efforts. And the water supply analysis should be modified so it is clear and easy to understand, which is not the case in the current study.

Or

2) Limit the number of new hookups in the CAWP area in the next 20 years to a number consistent with the growth projections of other agencies, not just the land use maps in the county general plan.

Either action would allow the project to legally proceed with its current level of environmental review.

However, if the AWA chooses not to pursue either of those options, it should prepare a focused EIR on the potentially significant impacts of the project on population and housing, public services, transportation, air quality and greenhouse gas emissions, wildlife, growth inducement, and cumulative impacts, as explained below.

Local infrastructure planning and growth

The Foothill Conservancy is a nonprofit organization that seeks to restore, protect, and sustain the natural and human environment in and around Amador and Calaveras Counties. The Foothill Conservancy believes that by working together we can bring communities to prosperity without needless destruction of that which is unique and special about the area. The Foothill Conservancy vision for this area includes protected scenic quality, conserved forest lands, restored natural diversity of native plants and animals, and balanced economic development that is ecologically and socially sustainable.

The Foothill Conservancy has adopted the Infrastructure Planning and Development Principles listed below:

- The user should pay: The cost of infrastructure expansion or improvements should be born by those who will benefit from and use the infrastructure.

- The cost of infrastructure expansions that are needed solely to accommodate new development should not be borne by existing ratepayers and taxpayers.

- Infrastructure planning should be done in open, inclusive processes that actively involve all affected stakeholders and the public, using methods that will ensure broad participation.

- Infrastructure planning should be based on adopted county and city general plans, not on speculative development that is inconsistent with adopted plans.

- The location, scale, and timing of infrastructure development should be done in a way that does not drive growth beyond what is already planned in local land use plans.

- Infrastructure such as roads, water, and wastewater facilities should not be extended into undeveloped areas unless those areas are contiguous to existing communities and approved for dense development in an adopted county or city general plan.

- When infrastructure facilities are extended across lands not planned for development in order to reach existing communities, connections to those facilities outside of developed communities should be limited.

- Infrastructure agencies should employ demand-side management techniques, including conservation and efficiency, before taking on expensive expansion projects.

- When resources are limited or finite, infrastructure providers should develop and follow smart-growth, demand-side management, and efficiency policies in order to allocate resources based on specified criteria rather than serve all applicants on a first-come, first-serve basis.

- Infrastructure should be developed in a way that works with natural systems and minimizes damage to the natural and built environment.

We encourage you to follow these principles as you continue this project planning process. These principles are more than currently popular platitudes. They are the culmination of wisdom learned through two decades of work by the Foothill Conservancy in the Mokelumne River watershed and involvement in land use and water planning in the region.

Members of our community, including members of the Foothill Conservancy, suffer as local cities and counties routinely approve development projects with significant and unmitigated impacts including traffic congestion, air pollution, declining levels of public services, loss of working landscapes, and harm to fish and wildlife. (Exhibit 1: Kirkwood & Gold Rush EIR excerpts.) The proposed water project would provide the County with additional supplies of water without any enforceable commitment from the County to reduce the impacts of the development that water facilitates. Thus, the proposed project will exacerbate the magnitude and intensity of existing problems suffered as a result of poorly planned development. We strongly encourage AWA to coordinate project planning and impact mitigation for the GSL project with the County's General Plan update and ACTC's Regional Transportation Plan update, as well as emergency services planning underway by the Amador Fire Protection Authority and community fire-safe plans of the Amador Firesafe Council. By working together with the public and other service providers, local entities can identify common growth projections and plan for parallel levels of infrastructure development. These efforts are necessary to promote balanced economic development that is financially, ecologically, socially sustainable as well as fiscally viable.

Detailed comments on the Initial Study

I. An EIR is Required Unless AWA Modifies the Project to Avoid Significant Impacts.

An EIR is required when evidence in the record indicates that the proposed project may have a significant impact on the environment either by itself or cumulatively. (CEQA Guidelines, sec. 15063.) As indicated below, there is substantial evidence in the record that the proposed GSL project (even with the proposed mitigation measures) may have significant impacts on the environment, and thus AWA must prepare an EIR for the project. AWA can avoid preparing an EIR only if it further modifies the project to eliminate the potential for these significant impacts.

II. Development Distribution, Population and Housing.

A. Introduction

As the Initial Study concedes, CEQA requires an analysis of a project's impacts on population and housing. With regard to the GSL project, the impacts of housing and population growth are potentially significant secondary impacts associated with the growth induced by the additional water supplied by the project.

It is well established in case law that an environmental review for an infrastructure project must consider the impacts of the future development that the infrastructure will serve. "Construction of the road way and utilities cannot be considered in isolation from the development it presages." (City of Antioch v. City Council of Pittsburgh (1st Dist. 1986) 187 Cal.App.3d 1325.) "It is obvious that constructing a large interchange on a major interstate highway in an agricultural area where no connecting road currently exists will have substantial impact on a number of environmental factors." (City of Davis v. Coleman (9th Cir. 1975) 521 F.2d 661, 674-675.)

When completing an EIR, the EIR must, "Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. (CEQA Guidelines, sec. 15126.2, subd. (d).)

"It also is settled that the EIR must discuss growth-inducing impacts even though those impacts are not themselves a part of the project under consideration, and even though the extent of the growth is difficult to calculate. The case law supports this distinction. The court in *City of Antioch v. City Council* (1986) 187 Cal.App.3d 1325 [232 Cal.Rptr. 507] found that a project required an EIR notwithstanding that the project itself involved only the construction of a road and sewer project which did not in and of themselves have a significant effect on the environment. The court recognized that the sole reason for the construction was to provide a catalyst for further development in the immediate area. It held that because construction of the project could not easily be undone, and because achievement of its purpose would almost certainly have significant environmental impacts, the project should not go forward until such impacts were evaluated in the manner prescribed by CEQA. (*Id.* at pp. 1337-1338.)" (Napa Citizens for Honest Government v. Napa County Board of Supervisors (2001) 91 Cal.App.4th 368.)

B. The growth-inducing impact analysis in the Initial Study is not adequate.

The Initial Study refers to, but does not include, a water demand study for the service area. (IS, p. 5-71.) There are many potential problems with this analysis.

First, it identified 5-acre parcels that could be changed into five 1-acre parcels, and assumed that they would be based on the land use element maps of the Amador County General plan. The Initial Study does not indicate if the five-acre parcels chosen for this division were suitable for division, or were otherwise constrained by roadway capacity, slope, soil type for septic systems, setbacks from other parcels, state fire-safe standards, or potential to contaminate neighboring wells. In addition, there is no indication of the historic mix of 1-acre and 5-acre parcels in the area. If the area has historically had a steady proportion of 1s to 5s, it is unlikely that the bulk of the 5s will convert uniformly to 1s. AWA should review County Planning and County Assessor records to identify the current mix of 1s to 5s, and to note the degree to which the market is not choosing to develop at maximum density in the CAWP service area. There is no support in the record for assuming that the residential parcels will develop to their maximum density.

Second, the analysis assumed that industrial/commercial parcel would develop to the maximum density. There is no evidence in the record to support this assumption. AWA should review County Planning and County Assessor records to identify the percentage of maximum density at which current industrial and commercial projects have developed, and look at the vacancy rate of developed commercial and industrial buildings, which will also influence the amount of development that will occur on undeveloped parcels. Past development patterns are a better indication of future development patterns than an unsupported blanket assumption of development at maximum density.

A critical mistake in the aforementioned analyses is the presumption that the maximum density in the land use designations in the existing General Plan are an accurate predictor of estimated near-term future development in the CAWP service area. The land use designations in the CAWP service area are not a predictor of estimated future development, but merely of the capacity of the landscape to support a particular range of development density on a specific parcel. Buildout to the maximum density under the general plan is not expected (due to constraints noted above), not planned for with regard to public services or infrastructure, nor even desirable given the potential cumulative impacts.

Third, the analysis ignores the time element of buildout relative to the life of the project. The analysis concludes that buildout of these maximum land use designations under the existing general plan in the CAWP service area would add 11,578 residential connections. (IS, p. 5-71) The question remains—but when? The County has estimated that all unincorporated development in the entire County for the

next 20 years under the existing general plan will be about only 6,246 residential units. (Exhibit 2, Amador County Planning, *Land Use Workbook*, June 2008, p. 39, table 3b.) Similarly, the County has estimated that under the *new* general plan, all unincorporated development in the entire County for the next twenty years would be about only 6,200 residential units. (Exhibit 2, Grijalva, *Memo to State Clearinghouse 7/28/09 re NOP for General Plan EIR*, p. 9.) Even if it one were to assume a generous development split of 50/50 between the Highway 49 corridor and the Highway 88 corridor, that would be about only 3,100 additional residential units in the CAWP service area over the next 20 years. There is no evidence in the record to suggest that any time in the foreseeable future, the CAWP service area will reach the maximum theoretical buildout under the existing General Plan of 11,578 residential units. This number is a false and inappropriate basis for planning infrastructure, and for evaluating the potential impacts of growth associated with providing additional water to the CAWP service area.

Fourth, the above discussion suggests that to avoid building more expensive infrastructure capacity than it needs, AWA would be wise to compare the expected life of the project to the expected development in the CAWP service area. For example, if the pipes will have to be replaced in 30 years, and the service area is only expected to need an additional 4,000 connections in 30 years, there is no reason to spend the extra ratepayer money (or other public funds) to install pipes with a capacity to serve 8,000 connections. The EIR should answer questions like how long as it will take for the area to grow enough to benefit from the huge excess capacity of the project? Will current ratepayers end up paying the price for over-sizing the pipeline, and never get reimbursed by future development? Why doesn't AWA size the pipeline to accommodate growth projected for its useful life, and worry about adding additional capacity at the time of replacement? As noted in our infrastructure planning principles, we believe that the location, scale, and timing of infrastructure development should be done in a way that does not drive growth beyond what is already planned in local land use plans.

Fifth, the Initial Study analysis and conclusion is flawed. The Initial Study analysis concludes that there can be no growth-inducing impact from the project unless it provides water in excess of maximum buildout under the existing General Plan land use designations. (IS, pp. 5-71 to 5-72.) This is incorrect. The baseline condition is the development *at this time.* The future condition is buildout under the additional water supply. If the impacts of that future development are significant, then the water project has a significant impact associated with the growth it induces.

Finally, the Initial Study's analysis regarding the amount of water AWA could provide with the GSL is difficult to follow, and would benefit from clear tables indicating the current number of connections served, the amount of water provided by the GSL, and the number of additional residential and non-residential connections to be served . It is also unclear whether or not the Initial Study takes into account additional water supplies that AWA may bring online (1,050 acre feet a year) if its current water rights application 5647X03 is approved?

We strongly encourage AWA to closely consult with Amador County and other service providers in the CAWP service area *before* investing in infrastructure expansion. The Amador Water Agency should not plan to serve an exaggerated estimate of future development that is not expected to be demanded and not expected to be developed if no other service provider is preparing to provide the necessary parallel services needed for such a level of development.

C. The EIR must more thoroughly evaluate growth-inducing impacts.

When evaluating the potential pattern of development from providing additional water supplies in the Central Amador Water Project service area, there are a number of factors that must be considered including: the amount of additional water, the amount of development it can serve, the past demand for development of the area, the likely future demand for development of the area, the constraints to development in the area, the constraints to density increases in the area, and the likelihood of sprawl.

The Initial Study does identify the amount of additional water that will be provided by the GSL project. The Initial Study indicates that the CAWP area is currently served by 2 cfs of raw water, and the GSL will increase delivery capacity to 5 cfs. (IS, p. 5-71.) Also, since the existing supply system is being retained as a "back up" the infrastructure will have the potential to deliver 7 cfs in the future. According to the analysis, 5 cfs is enough water to serve about an additional 8,180 connections, and 7 cfs is enough to serve about 11,450 connections. The Initial Study estimates that 85.5% of the connections would be residential.

Past growth in the area has been served by only 2 cfs of water, so the project would increase growth potential by 150%. If the additional "backup" system is reinstated for regular use, the project could increase growth potential by 250%. Since the County allows for densities higher than 5-acre lots only when public water supply is available, the water supply would reduce a barrier to increasing development in the CAWP service area. (Exhibit 2, Amador County Zoning Code, sec. 19.24.045.) Thus

the additional water supplied by the project has a very substantial growth-inducing impact.

Also, a different buildout scenario than that in the Initial Study could greatly increase the impacts of development in the area. There is no evidence in the record to support the growth scenario assumption that development in the CAWP service area would proceed by densification of existing 5-acre parcels and maximum development of existing commercial/industrial designated parcels. While such a development pattern would reduce the footprint of future growth and thereby limit some of its impacts, there is no mitigation measure or County policy to direct future growth in this fashion. In the CAWP service area there are parcels larger than 5 acres and designated for development on 10, 20, or 40 acre-minimum lots. (Exhibit 2, Amador County, *2007 Existing General Plan Map*; Amador County, *Alternative A Existing General Plan Map*.) If the GSL project made water were available to such parcels, or even if it caused fewer people to be on groundwater in the area, this would facilitate such large-lot ranchette-style development. This would result in a much larger development footprint in the area, and much broader scale impacts on such things as water quality, air quality, and wildlife habitat.

Thus, there is substantial evidence in the record that the project will have significant growth-inducing effects, and an EIR must evaluate those impacts. In doing so, it would also helpful to consider also the potential factors that could limit future development in the CAWP service area. There are factors suggesting that, with the implementation of reasonable policy constraints, the full extent of this growth-inducing effect will not be realized on the ground.

First, there are constraints in addition to surface water availability that discourage or prevent converting 5-acre lots to many 1-acre lots. As evident from the wetland delineation study attached to the Initial Study, much of the CAWP service area is characterized by a steeply sloping landscape. Many of the 5-acre lots in the CAWP service area are on steep terrain. Thus, much of the space on the divided lot will be consumed by access roads, cut & fill areas, and setbacks, precluding the creation of five 1-acre lots for every 5 available acres. In addition, many of the 5-acre lots are not served by roads that could handle the additional traffic associated with full conversion of the 5-acre lots to 1-acre lots. (Exhibit 3: ACTC, *2004 RTP*, Chapter 4.) Also, there may be limitations on the division of lots that will be served by septic systems, based upon the suitability of the soil, and the proximity to down-gradient neighbors still using wells. (Exhibit 2: Amador County Zoning Code, secs. 14.12.061 – 14.12.063.)

Second, there are additional constraints to buildout of the area. The road infrastructure in the region is not now, nor projected to be, sufficient to meet the needs of so much additional development. As noted below, 6,994 units of residential development would generate more than 66, 933 vehicle trips per day. The Regional Transportation Plan does not include the necessary upcountry traffic improvements to serve so much development. In addition, in its current form, the RTP is underfunded by $128 million. (Exhibit 3: ACTC, 2004 RTP, Chapters 4 & 7.) We know of no school infrastructure development plans to serve such an addition of students in the upcountry area. Similarly, we know of no law enforcement financial plans to provide such an addition of officers to serve in the CAWP service area. Furthermore, since the CAWP area is home to a number of sensitive, threatened and endangered species, protection of their habitat may necessitate some reductions in full buildout of the CAWP service area. (See GSP Project Initial Study, Appendix C.) Finally, efforts to reduce greenhouse gas emissions statewide may result efforts to discourage full residential buildout in areas isolated from job centers. (Exhibit 4, Brown, *Addressing Global Warming Impacts at the Local Level*; ARB, *Climate Change Proposed Scoping Plan*, 2008, pp. 26-27.)

Third, the estimated buildout numbers from the Initial Study are dramatically higher than any other projected demand for the area. For example, the County Planning Department estimates *all* unincorporated development in the *entire* County for the next 20 years under the existing general plan will be about only 6,246 residential units. (Exhibit 2, Amador County Planning, *Land Use Workbook*, June 2008, p. 39, table 3b.) Similarly, the County has estimated that, under the proposed new general plan, *all* unincorporated development in the *entire* County for the next 20 years will be about only 6,200 residential units. (Exhibit 2, Grijalva, *Memo to State Clearinghouse 7/28/09 re NOP for General Plan EIR*, p. 9.) Development in the CAWP would only be a portion of that countywide development.

Thus, an EIR is needed for a detailed *and balanced* evaluation of the growth-inducing impacts of the CAWP project.

III. Public Services

Impacts on local public services including schools and law enforcement can dramatically alter the quality of the human environment and are therefore evaluated in CEQA reviews. Because of the potential for the GSL project to result in increased

growth in the CAWP service area, it is critical to evaluate the potential need for increased school and law enforcement services in the area.

Both the Amador Unified School District and past environmental impact reports have used a K-12 student generation rate of about 0.7 students per single-family unit. (Exhibit 5, City of Jackson, *Jackson Hills Revised EDIR*, pp. 4.11-14.) Given that the GSL would accommodate water for an estimated 6,994 single-family residential units, that would result in a need to house an additional 4,895 K-12 students in the CAWP service area. State Department of Education and other studies indicate that construction costs for housing students range from about $10,000 – 20,000 per K-12 student. We know of no school district facility master plan that estimates such an expansion of the system in the CAWP service area, and provides a method of raising the capital to construct such facilities. Thus, opening the way for such growth by providing the water supply may result in excessive classroom and playground overcrowding, and have significant adverse impacts on the ability of the school system to provide a free and appropriate education to the students in the district.

Similarly, studies in the region indicate that growth in population results in a need for additional law enforcement personnel, from deputies on patrol, to staff in the DA and Public Defender's office, to judges on the bench, and guards in the jail. For example, a Calaveras County study showed that one additional deputy and one quarter of an additional sheriff's office support staff person is needed for every 1,340 new residents. (Exhibit 6, Calaveras County Sheriff's *Office, Staffing Analysis and Strategic Plan*, pp. 71-72.) The Initial Study indicates that the GSL would provide water to serve 6,994 residences. The County Planning Department estimates that the average residence houses about 1.9 people. (Exhibit 2, Amador County Planning, *Land Use Workbook*, June 2008, p. 38, table 3a.) Thus the water provided to the CAWP service area would support 13,255 residents. This in turn would trigger the need for additional deputies, and additional Sheriff's Office support staff. Again, we do not know of any plan that is in place to fund such an increase in law enforcement services to the area. Thus, opening the way for such growth by providing the water supply may result in shortages of law enforcement services and significant declines public safety in the CAWP service area. The EIR must evaluate this potentially significant impact.

IV. Transportation

Recent local EIRs figure 9.57 vehicle trips per day are generated by each single-family home. (Exhibit 1, Sutter Creek, *Gold Rush Ranch Revised DEIR*, p. 17.) Thus, since the GSL project will facilitate the development of 6,994 single-family homes, it will generate about 66,933 vehicle trips per day in the CAWP service area. The Regional Transportation Plan does not include the necessary upcountry traffic improvements to serve so much development. In addition, in its current form, the RTP is underfunded by $128 million. (Exhibit 3: ACTC, 2004 RTP, Chapters 4 & 7.) The EIR must evaluate the potentially significant impacts of additional tens of thousands of daily trips on traffic congestion and traffic safety.

V. Wildlife Impacts

As noted in Initial Study Appendix C, the CAWP service area is home to a number of threatened, endangered, and sensitive species. The additional water provided beyond existing growth projections could result in sprawling development of 5, 10, 20, and 40 acre lots across the landscape, with very significant impacts on TES species. In fact, the sprawling scenario is more likely than the compact scenario analyzed in the Initial Study. Sprawl is easier because it involves merely the development of existing lots through the ministerial approval of building permits. Compact development requires speculative attempts to get discretionary approvals for subdivisions from the Board of Supervisors. The EIR must evaluate the impacts on wildlife associated with the growth facilitated by the introduction of the additional water supply by the GSL project.

VI. Alternatives

Since there is a need to do an EIR, AWA will be required to provide a quantitative comparative analysis of the impacts of the alternatives. (Kings County Farm Bureau et al. v. City of Hanford (5th Dist. 1990) 221 Cal.App.3d 692, 730-737.)

We hope that you will consider an alternative with a smaller diameter pipe, which would be consistent with projected growth in the CAWP service area. Since the existing system is always available as a backup, it provides a method of accommodating extra growth, should that occur.

We also encourage you to consider an alternative that includes merely upgrading the existing system with more energy-efficient pumps, and perhaps the addition of solar panels to offset the pumps' power use.

To benefit ratepayers, you may also want to explore the feasibility of pumping water during off-peak periods when energy is less expensive. PG&E is looking for ways to use wind energy at night, as evidenced by its pumped-storage proposals in the Sierra. Also, there are both federal stimulus money and energy efficiency grants available to help fund this infrastructure upgrade. (See Exhibit 7, Energy Efficiency Funding.)

VII. Mitigations

When AWA prepares the EIR, you will need to explore ways to mitigate the impacts of the growth facilitated by the additional water provided by the GSL project. (Pub. Resources Code, secs. 21002, 21081, subd. (a); CEQA Guidelines, secs. 15002, subd. (a)(3), 15021, subd. (a)(2), 15126.4, 15091, subd. (a)(1).) We hope that you will work closely with County Planning, ACTC, and the public to develop policies in the ongoing General Plan Update and Regional Transportation Plan Update that can mitigate these impacts.

VIII. Financial Feasibility

CEQA requires that the EIR or another document in the record evaluate the economic feasibility of alternatives and mitigation measures. (CEQA Guidelines, sec. 15131, subd. (c).) We encourage AWA to carefully evaluate the economic feasibility of the proposed project and its alternatives.

Consistent with our infrastructure planning principles, we encourage AWA to carefully apportion project costs so that the cost of facility expansion for new development is born by the beneficiaries of the new development.

Given today's economic and fiscal challenges, decisionmakers are being even more careful to consider the costs as well as the benefits of a decision. Here in Amador County, the Board of Supervisors and the City of Sutter Creek are asking project applicants for fiscal analyses of their proposed development projects. More often now through bond initiatives we are being asked as a taxpaying and ratepaying public, "Do you want to pay this much for enhanced public goods and services?" Nowhere is the issue of cost-effectiveness more critical than in projects that plan for the long-term. These projects involve the largest commitments of public funds over the longest periods of time.

Different alternatives will have different benefits and different costs. If the GSL project ends up having significant and unavoidable impacts, CEQA does require that AWA to balance the environmental costs against the benefits of the project, to determine if a Statement of Overriding Considerations, and project approval, is supported by substantial evidence in the record.

In this instance, it will be incumbent upon AWA quantify and estimate the benefits and costs of the alternative it chooses. We encourage AWA to prepare such a cost-benefit analysis for each of the alternatives. We encourage you to make this analysis available for AWA Board and public review at least 30-days in advance of your decision. With such an analysis, your directors will have information necessary to make a rational decision regarding the choice of alternatives. With such information, the Statement of Overriding Considerations will have the requisite support of substantial evidence and rational argument in the record. (Sierra Club v. Contra Costa County (1992) 10 Cal.App.4th 1212.)

IX. Public Outreach Process

As noted in our infrastructure planning principles, we believe that infrastructure planning should be done in open, inclusive processes that actively involve all affected stakeholders and the public, using methods that will ensure broad participation. While CEQA does not require that an EIR comparatively evaluate the fiscal merits of a project, we encourage AWA to do such a fiscal analysis, and to give ratepayers a way to respond to the results. Your ratepayers deserve to know how much they will pay for different project alternatives, as well as what projects could do to the character of their community and available services and infrastructure by inducing growth. They deserve to have a vehicle to express this concern early in the development of this program. Ultimately, state law provides the ratepayers with the opportunity to challenge future rate increases. Thus, without timely ratepayer input, AWA could find itself adopting and investing in a costly program now, only to find that the ratepayers are unwilling to pay for the program in the future. The appropriate time for determining ratepayer preference is now, before AWA begins to waste precious funds on a costly project.

Conclusions

The California Environmental Quality Act is designed to help local governments identify and mitigate the potentially significant impacts of their actions. We hope that AWA will take these comments to heart and modify the project, as well as

1) objectively evaluate the impacts of the proposed project and its alternatives,
2) outreach to involve the upcountry community in the decision,
3) coordinate mitigation measure adoption and implementation with responsible agencies to avoid growth-inducing impacts and sprawl,
4) and ensure that costs of facility expansion are passed onto future beneficiaries and not existing ratepayers.

We trust that AWA will properly address the concerns detailed in this letter, and those of expressed by other commenters. Please notify us of your plans, and if you choose to prepare an EIR rather than modify the project, please let us know when the opportunity is available to provide scoping comments, as well as when the draft EIR is available for public review. Please notify us when AWA intends to make its decision on this project.

We are more than willing to work with AWA on this project and to address the concerns raised in this letter.

Sincerely,

Thomas P. Infusino,

for the Foothill Conservancy

cc: AWA Directors, ACTC, Amador County Sheriff, Caltrans District 10, Amador County Unified School District, Amador County Planning Department, Amador County Environmental Health, Amador Fire Protection Authority, CalFire, Amador Firesafe Council

EAST BAY
MUNICIPAL UTILITY DISTRICT

October 3, 2016

Mr. Gene Mancebo
Amador Water Agency
12800 Ridge Road
Sutter Creek, CA 95685

Subject: Comments on Notice of Preparation of a Draft Environmental Impact Report for the Central Amador Water Project Water Right Application

Dear Mr. Mancebo: Gene

Thank you for the opportunity to provide comments on the Notice of Preparation (NOP) of a Draft Environmental Impact Report (Draft EIR) for the Amador Water Agency (AWA) Central Amador Water Project Water Right Application.

Since the 1920's, EBMUD's primary source of water has been the Mokelumne River. EBMUD diverts Mokelumne River water for municipal and hydroelectric uses pursuant to a series of water rights. EBMUD facilities on the Mokelumne River include Pardee and Camanche Reservoirs and the Mokelumne Aqueducts along with hydroelectric generation facilities at the base of Pardee and Camanche Dams. EBMUD operates the Mokelumne River facilities to meet water supply demands and provides releases to satisfy downstream senior rights, provide flood control protection for the lower Mokelumne River area, meet instream flow requirements, manage water temperature to benefit the Mokelumne River fishery, satisfy recreational needs and generate hydropower.

The quantity of water that EBMUD can divert under its water rights is affected by the seniority of those rights, the amount of Mokelumne River runoff, EBMUD's storage capacity, and the myriad of orders, decrees and interagency agreements with various Mokelumne River users. EBMUD's agreements including those with AWA, JVID, PG&E and others govern Mokelumne River operations and the availability of water for EBMUD. Additionally, the 1958 Release from Priority reserved 20,000 acre-feet of water for use in Amador County that is senior to a portion of EBMUD's water rights.

The NOP states that AWA has submitted an appropriation application to the State Water Resources Control Board (SWRCB) for a water right permit to store up to 1,400 AFA in Lower Bear River Reservoir, and for a partial reversion of rights under JVID's Permit 12167 in the amount of 1,050 AFA, reducing JVID's water right to 2,800 acre-feet.

In order to better understand the project, we request the following information be included and discussed in detail in the Draft EIR:

Clarification of AWA's existing water rights and water rights basis for storage in Lower Bear River Reservoir: In 1959, the Department of Water Resources issued a Release from Priority, under which 20,000 acre-feet of water were reserved for Amador County under the 1927 State Filings (Application 5647 and 5648). It is our understanding that AWA's new application to the SWRCB for storage is part of the 20,000 acre-feet reserved in 1959. Please provide clarification confirming the basis of the water rights for the new appropriation application for storage in Lower Bear River Reservoir.

Potential Impact to PG&E Operations and resultant impacts to EBMUD under Lodi Decree operations: Under its appropriation application, AWA proposes to store 1,400 AFA of Mokelumne River water in PG&E's Lower Bear River Reservoir. Such storage could impact EBMUD's water rights under the Lodi Decrees. The Lodi Decrees settle the relative priorities between PG&E, EBMUD and the City of Lodi. The Decrees allow PG&E's junior hydropower project (including Lower Bear River Reservoir) to store water during the spring and requires PG&E to subsequently release that stored water later in the season for EBMUD. Please provide the terms of the agreement between AWA and PG&E facilitating AWA use of Lower Bear Reservoir, including the accounting of water, to demonstrate and ensure that there are no impacts to EBMUD's water rights and operations.

Potential Environmental and Operational Impacts: EBMUD's Pardee Reservoir is located downstream of PG&E's Lower Bear River Reservoir and is a point of diversion for JVID's water supply. Please provide the terms of coordinated operations between AWA and JVID to ensure there are no direct or indirect impacts to EBMUD's water rights and operations.

Thank you for the opportunity to provide comments on the NOP. We look forward to working with you as the DEIR is further developed. Please contact me at 510-287-1240 or lena.tam@ebmud.com if you have any questions or concerns regarding our comments.

Sincerely,

Lena L. Tam.

Lena Tam
Manager, Water Resources Planning

LLT:ARU: dlb

MIWOK MAIDU United Auburn Indian Community of the Auburn Rancheria

Gene Whitehouse, Chairman | John L. Williams, Vice Chairman | Danny Rey, Secretary | Jason Camp, Treasurer | Calvin Moman, Council Member

RECEIVED
AMADOR WATER AGENCY
SEP 27 2016
12800 RIDGE ROAD
SUTTER CREEK, CA 95685

September 14, 2016

Gene Mancebo
Amador Water Agency
12800 Ridge Road
Sutter Creek, CA 95685

RE: AB 52 Consultation Request for NOP DEIR for the Central Amador Water Project Water Right Application, Amador County, CA

Dear Gene Mancebo,

The United Auburn Indian Community (UAIC) received a letter from Amador Water Agency dated 8/31/2016, formally notifying us of a proposed project, the NOP DEIR for the Central Amador Water Project Water Right Application in Amador County, and an opportunity to consult under AB 52. This letter is notice that UAIC would like to initiate consultation under AB 52.

This letter is also a formal request to allow UAIC tribal representatives to observe and participate in all cultural resource surveys, including initial pedestrian surveys for the project. Please send us all existing cultural resource assessments, as well as requests for, and the results of, any records searches that may have been conducted prior to our first consultation meeting. If tribal cultural resources are identified within the project area, it is UAIC's policy that tribal monitors must be present for all ground disturbing activities. Finally, please be advised that UAIC's strong preference is to preserve tribal cultural resources in place and avoid them whenever possible. Subsurface testing and data recovery must not occur without first consulting with UAIC and receiving UAIC's written consent.

In the letter, Gene Mancebo is identified as the lead contact person for consultation on the proposed project. Marcos Guerrero, our Cultural Resources Manager, will be UAIC's point of contact for this consultation. Please contact Mr. Guerrero by phone at (530) 883-2364 or email at mguerrero@auburnrancheria.com to begin the consultation process.

Thank you for involving UAIC in the planning process at an early stage. We ask that you make this letter a part of the project record and we look forward to working with you to ensure that tribal cultural resources are protected.

Sincerely,

Gene Whitehouse
Chairman

CC: Mathew Moore, UAIC Tribal Historic Preservation Officer
Marcos Guerrero, UAIC Cultural Resources Manager

From: Marcos Guerrero
To: Robin Cort
Subject: RE: AB52 Consultation request for Central Amador Water Project Water Right Application
Date: Tuesday, October 04, 2016 2:56:43 PM
Attachments: image001.png

Robin,
UAIC has not comments at this time. thank you for following up.
mg

From: Robin Cort [mailto:RCort@rmcwater.com]
Sent: Monday, October 3, 2016 11:16 AM
To: Marcos Guerrero
Subject: RE: AB52 Consultation request for Central Amador Water Project Water Right Application

Hi, just trying to close the loop with you and make sure that you don't have any concerns about the Amador Water Agency Central Amador Water Rights project.

Thanks

From: Robin Cort
Sent: Thursday, September 29, 2016 8:45 AM
To: 'mguerrero@auburnrancheria.com' <mguerrero@auburnrancheria.com>
Cc: Gene Mancebo <gmancebo@amadorwater.org>
Subject: AB52 Consultation request for Central Amador Water Project Water Right Application

Mr. Guerrero, I just left you a voice mail message. Amador Water Agency (AWA) received a request for AB52 Consultation from Gene Whitehouse, who requested that we contact you. We would like to provide you with additional information about the project so as to clarify the fact that the water rights application does not involve any new construction and thus there would be no ground disturbing activities requiring a monitor. All of the infrastructure to deliver additional water to AWA is already in place so the environmental review process will thus not include any cultural resource assessments, records searches or pedestrian surveys. The entire purpose of the project is to obtain approval to divert a small amount of additional water through existing diversion facilities on the Mokelumne River.

You can contact me at this email address or at the direct (D) phone number below so that I can address any questions you might have.

Thanks,

Robin Cort
Senior Environmental Planner
RMC Water and Environment
2175 North California Boulevard, Suite 315
Walnut Creek, CA 94596
P: 925.627.4100
D: 925.627.4145

rcort@rmcwater.com | www.rmcwater.com

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Appendix C –Summary of MOCASIM Modeling Results to Support Hydrology Impact Analysis

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Final Technical Memorandum

AWA Central Amador Water Project Water Rights Application Support

Subject:	**Summary of MOCASIM Modeling Results to Support Hydrology Impact Analysis**
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This technical memorandum describes the modeling used to support the hydrology analysis of Amador Water Agency's Central Amador Water Project water right application (Project). The memorandum is organized as follows:

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1 Project Overview

Amador Water Agency (AWA) has filed water right Application 5647X03 with the State Water Resources Control Board, Division of Water Rights (SWRCB), requesting a year-round direct diversion of up to 1,050 acre-feet per year (AFY) from Bear River and the North Fork Mokelumne River for delivery within AWA's Central Amador Water Project (CAWP) service area. The proposed maximum rate of direct diversion, in combination with AWA's existing water right Permit 17579 (State Water Right Application 5647-B), would be 5 cubic feet per second (cfs) for the CAWP system. Application 5647X03 also requests the collection of up to 1,400 AF to storage in Lower Bear River Reservoir between October 1 and July 15 each year. The total amount of water to be directly diverted and rediverted from storage for consumptive uses within the CAWP service area would not exceed 1,050 AF annually.

To achieve the direct diversion of up to 1,050 acre-feet annually, the application was filed with a Petition for Partial Assignment of State Water Right Application 5647 and Partial Reversion of Rights Assigned to

Jackson Valley Irrigation District (JVID) under Permit 12167 (State Water Right Application 5648-B). Under the proposed reversion, up to 1,050 acre-feet of JVID's currently authorized direct diversion right of 3,850 acre-feet would revert to AWA as referenced in Permit 12167. The reversion would occur on an annual basis over time as AWA needs the water to meet the demands of its customers in the Central Amador Water Project (CAWP) service area. Under AWA's application, water would either be diverted or re-diverted from the Bear River and North Fork of the Mokelumne River at four locations:

1) Bear River at Lower Bear River Reservoir Dam
2) North Fork Mokelumne River at Salt Springs Reservoir Dam
3) North Fork Mokelumne River at Tiger Creek Afterbay Dam
4) Tiger Creek at Tiger Creek Regulator Dam

AWA's proposed points of diversion and rediversion are upstream from JVID's current point of diversion at Pardee Reservoir. Water would be diverted, stored, and conveyed to the Buckhorn Water Treatment Plant (WTP) for delivery within the CAWP service area. AWA's pending water right application for the Project does not require the development or construction of any new water supply infrastructure, as existing facilities owned by AWA or Pacific Gas and Electric Company (PG&E) would be used to store and convey the water.

AWA expects water use in the CAWP service area to increase in the future beyond the amount allowed in its existing water right Permit 17579 (Application 5647B), and for that reason, filed Application 5647X03, along with the above-referenced Petition. AWA's existing water right Permit 17579 allows for direct diversion of up to 1,150 AFY and collection to storage of up to 1,600 AF seasonally in Lower Bear River Reservoir, with the total taken for consumptive use by direct diversion and rediversion from storage not to exceed 1,150 AFY.[1] In 2006, AWA's annual diversion for beneficial uses within the CAWP service area was 1,149.7 AF, which was very close to the amount of water allowed under the permit. Although water use declined during the recession and was further reduced due to conservation during the multi-year drought that occurred from Water Years 2012 through 2015, AWA has projected that the need for water has not decreased and will likely increase in the future.

To support the environmental analysis of AWA's pending water right application, the Mokelumne Calaveras Amador Simulation (MOCASIM) Model was used identify changes in Mokelumne River flow as a result of AWA increasing its CAWP diversion. Details of the model, model inputs, and results are outlined in the following sections.

2 MOCASIM Model Overview and Logic

MOCASIM is a reservoir operations model designed to simulate water storage and diversion operations on the Mokelumne River. MOCASIM is capable of analyzing various operating strategies of Pardee and Camanche reservoirs on the Mokelumne River, assessing water availability to serve EBMUD; Amador, Calaveras and San Joaquin counties; and then simulating newly proposed storage and diversion alternatives for beneficial use. MOCASIM also incorporates imports from water supply developments in the American and Calaveras River Watersheds.

MOCASIM is a mass-balance simulation model. It uses either monthly or daily time-step (depending on the geographical area, as explained below) for the hydrologic period beginning in 1953 through 2010. Senior appropriations, fishery flows, and hydropower releases are based on historical and/or future levels of development in the basin, water rights and agreements, and reservoir operating rules.

[1] Permit 17579 also allows for diversions from Antelope Creek, however, AWA no longer diverts from this source and has no plans to do so in the future. It is expected that Antelope Creek will be deleted as a source in an amended permit to be issued by the SWRCB pursuant to a pending Petition for Extension of Time for Permit 17579.

The model was developed by AD Consultants in 2007 for the Mokelumne River Water and Power Authority (MRW&PA) and has been maintained and upgraded by AD Consultants ever since. The original version of the model concentrated on the Lower Mokelumne River system starting at the Mokelumne Hill gage upstream of Pardee Reservoir and culminating at the confluence with the Cosumnes River. The model was designed at the time to examine potential yield from the MORE Water Project, an off-stream storage reservoir that would capture non-appropriated high flows from the Mokelumne River and regulate this supply to an integrated system of conjunctive use projects to provide additional water supply and reliability for the region.

In 2012, MOCASIM was expanded to include representation of the Upper Mokelumne River Basin upstream of the Mokelumne Hill gage. The model was also enhanced to allow evaluating the water supply and hydroelectric benefits from potential future developments in the basin.

2.1 Geographical Areas

MOCASIM in its present configuration encompasses two interrelated geographical areas: The Upper Mokelumne system and the Lower Mokelumne system. The model can simulate the operation of each geographical area independently or in sequence (from top to bottom).

The time-step for simulating the Upper Mokelumne is daily while the time-step for simulating the Lower Mokelumne is monthly. The primary reason is that the Upper Mokelumne is "peakier" hydrology wise, than the Lower Mokelumne. The combined storage capacity of Pardee and Camanche reservoirs in the Lower Mokelumne is an order of magnitude greater than the reservoir storage in the Upper Mokelumne, thus providing greater attenuation of flood events (which coincides with the actual practice of regulating flow below Camanche for safety and environmental considerations). Furthermore, most of the water rights and agreements associated with existing water users on the Lower Mokelumne were defined on a monthly basis. Internally in the model, the difference in time-step resolution is handled by converting the daily outflow from the Upper Mokelumne to monthly inflow to the Lower Mokelumne. The transition point is the Mokelumne Hill gage at the Highway 49 Bridge (USGS #11319500), immediately upstream of Pardee Reservoir.

The following describes the characteristics and operating rules associated with each geographical area as simulated in MOCASIM.

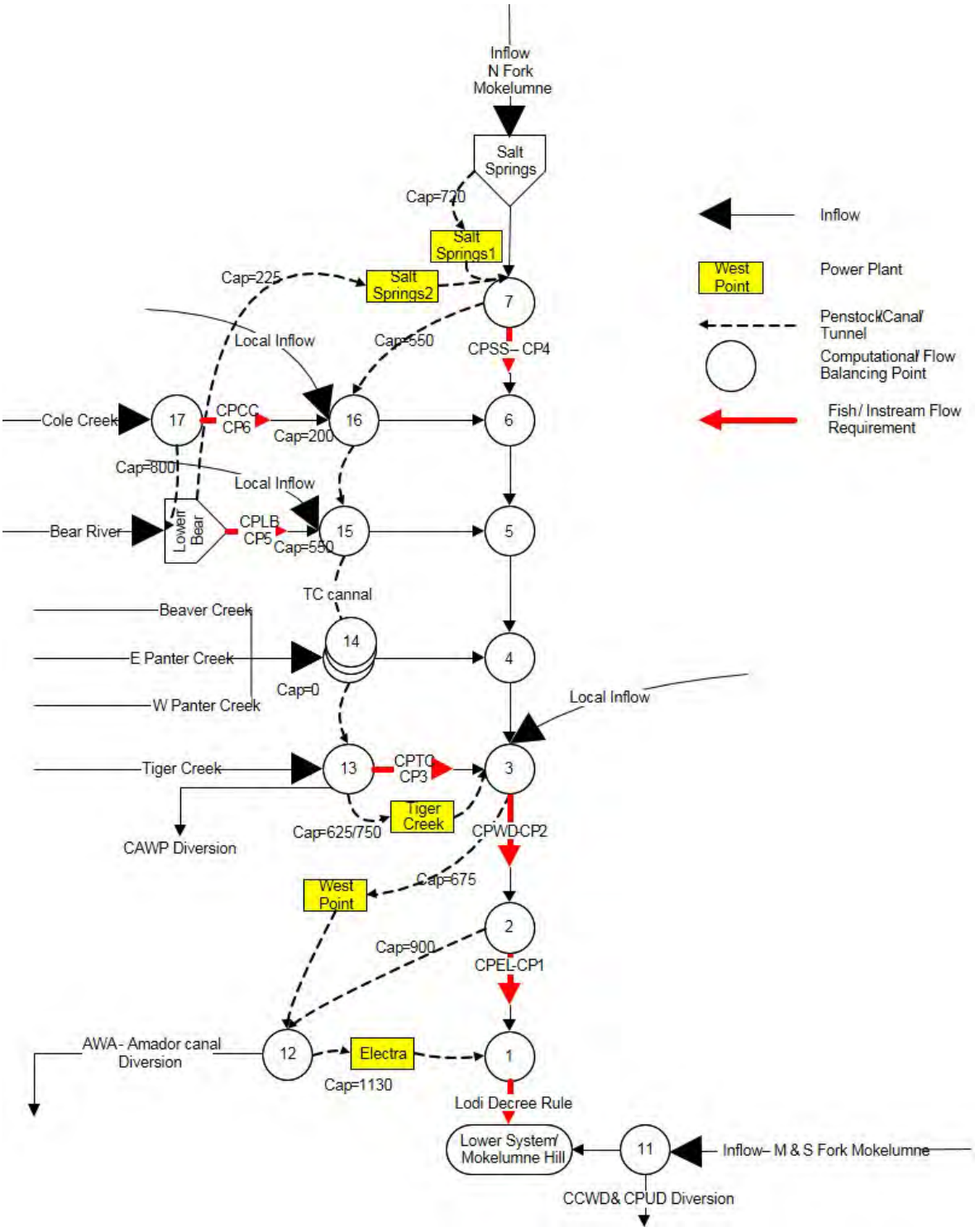
2.1.1 Upper Mokelumne System

The flow regime in the Upper Mokelumne system is primarily dominated by the operation of PG&E Project 137 on the North Fork Mokelumne. Project 137 consists of two primary reservoirs (Salt Springs and Lower Bear River reservoirs), and five hydroelectric power plants: Salt Springs #1 & #2, Tiger Creek, West Point and Electra powerhouses. PG&E operates these facilities with consideration to power generation objectives, instream flow requirements mandated by the Federal Energy Regulatory Commission, and in accordance with the Lodi Decree[2].

MOCASIM is coded to include the physical characteristics of the upper basin including PG&E reservoirs, waterways and power plants as well as all applicable operational rules for these facilities. **Figure 2-1** shows an overview of the Upper Mokelumne system as coded into MOCASIM.

[2] The Lodi Decree is a series of court decisions from the 1940's and 50's that mandate average monthly outflow from Salt Springs and Lower Bear River reservoirs as a function of reservoir storage.

Figure 2-1: Upper Mokelumne System Overview



Note: In standard model operation, Jackson Valley Irrigation District water is assumed to be diverted at Node 3. For the purposes of the Project, this has been updated as explained in **Section 5**.

As shown in **Figure 2-1**, the Middle and South Forks of the Mokelumne were combined in the model into a single inflow node (inflow to Node 11), as the flow in these forks is hardly regulated. Similarly, the

watershed upstream of Salt Springs Reservoir is also represented as a single inflow component to the Salt Springs Reservoir because of the limited storage regulation upstream of the Reservoir.

Other boundary conditions are: inflow to Lower Bear River Reservoir, the flow in Cole Creek, flow in Tiger Creek, and the combined flow in Beaver, East Panther and West Panther creeks. Local inflow is introduced in the model at discrete points as shown this schematic. Local inflow is the net of accretions and depletions to the system and is based on historical hydrology. Channel losses are included in the calculation for depletions.

Primary facilities of Project 137 and operational rules that have been incorporated in the model are described in **Table 2-1** (refer also to **Figure 2-1** for waterways capacities).

Table 2-1: Upper Mokelumne Reservoirs and Power Plants

Reservoirs	Minimum (AF)	Maximum (AF)	Modeling Assumption
Salt Springs Reservoir	5,000	141,860	Reservoir operates based on target rule curve subject to downstream release requirements
Lower Bear River Reservoir	2,150	52,020	Reservoir operates based on target rule curve subject to downstream release requirements
Upper Blue Lake Lower Blue Lake Twin Lakes Reservoir Meadow Lake			Are not explicitly modeled. Represented as a single input node to Salt Springs Reservoir.
Upper Bear River Reservoir			Is not explicitly modeled. Represented as a single input node to Lower Bear River Reservoir.
Cole Creek Diversion			Storage is not explicitly modeled. Represented as a diversion node.
Tiger Creek Regulator, Forebay and Afterbay			Are not explicitly modeled. Represented as diversion nodes.
Lake Tabeaud			Storage is not explicitly modeled. Represented as a diversion node.
Power Plants	**Maximum (MW)**	**Maximum (CFS)**	**Modeling Assumption**
Salt Springs #1	11.0	700	Usually not peaking (although model provides for this option)
Salt Springs #2	33.0	225	Usually not peaking (although model provides for this option)
Tiger Creek	58.0	750	Usually Peaking (defined by specified plant factors)
West Point	14.5	675	Usually Peaking (defined by specified plant factors)
Electra	92.0	1130	Usually Peaking (defined by specified plant factors)

Lodi Decree

The Lodi Decree establishes minimum flow and releases relative to reservoir storage levels in the North Fork Mokelumne reservoirs. The flow is measured immediately upstream of the confluence with the Middle Fork Mokelumne River (Node 1 in **Figure 2-1**). The Lodi Decree is quite complex from the interpretation and implementation point of view. However, in the expanded model, the Lodi Decree was

simplified by defining a required flow schedule in the North Fork (NF) as a function of the combined storage in Salt Springs and Lower Bear River reservoirs (SS+LB), as shown in **Table 2-2** below.

Table 2-2: Lodi Decree (North Fork Flow Schedule in cfs)

	Dry Year		**Normal Year**
Storage (Salt Springs + Lower Bear River)	<130,000 AF		>130,000 AF
When?	Always		June 1st
Month	**And greater than:**	**The following flow or natural flow, whichever is less:**	**Minimum flow**
June	112,000	300	500
July	94,000	300	500
August	76,000	300	500
September	58,000	300	500
October	40,000	200	500
November	30,000	200	500
December	20,000	200	500
January	10,000	200	300
February	0	200	200
March	0	200	200
April	0	200	200
May	0	300	300

In the simplified Lodi Decree, there are two year types depending on the combined storage in Salt Springs and Lower Bear River reservoirs on June 1. If the storage is greater than 130 TAF, then the minimum required flow from the North Fork Mokelumne for the next 12 months is as prescribed in the table for Normal Year. If the storage on June 1 is less than 130 TAF, then the minimum required flow from the North Fork Mokelumne is in accordance with the prescribed schedule for Dry Year, but could also be reduced to the natural flow in a manner to gradually empty the reservoirs down to the target storage levels shown above (in the “and greater than” column).

Instream flow requirements

Instream flow requirements (see **Table 2-3**) are mandated by the FERC and are defined at six control points as depicted in **Figure 2-1** (CP 1 to CP 6). The FERC also requires maintaining pulse flows at these points as shown in **Table 2-4**.

Table 2-3: FERC Instream Flow Requirements in cfs

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
CP1 – North Fork below Electra Diversion												
Critical Dry	20	25	30	40	60	40	20	15	15	15	20	20
Dry	25	30	50	80	95	50	20	20	20	20	20	20
Below Normal	40	40	80	135	250	180	35	20	20	20	25	30
Above Normal	60	60	110	190	490	270	40	20	20	20	20	40
Wet	90	100	150	400	980	950	145	30	20	20	50	50
CP2 – North Fork below Tiger Creek Afterbay (bypass to West Point Powerplant)												
Critical Dry	20	25	30	40	60	40	20	15	15	15	20	20
Dry	25	30	50	80	95	50	20	20	20	20	20	20
Below Normal	40	40	80	135	250	180	35	20	20	20	25	30
Above Normal	60	60	110	190	490	270	40	20	20	20	20	40
Wet	90	100	150	400	980	950	145	30	20	20	50	50
CP3 – Tiger Creek below Tiger Creek Regulator												
Critical Dry	7	7	10	10	7	5	5	3	3	3	5	5
Dry	7	7	10	10	7	5	5	3	3	3	5	5
Below Normal	7	7	10	10	7	5	5	3	3	3	5	5
Above Normal	7	7	10	10	7	5	5	3	3	3	5	5
Wet	7	7	10	10	7	5	5	3	3	3	5	5
CP4 – North Fork below Salt Springs Reservoir												
Critical Dry	20	25	30	40	60	40	20	15	15	15	20	20
Dry	25	30	40	60	70	40	20	20	20	20	20	20
Below Normal	40	40	70	110	210	160	30	20	20	20	20	25
Above Normal	50	50	90	170	430	230	30	20	20	20	20	30
Wet	75	110	135	375	930	720	145	20	20	20	43	43
CP5 – Bear River below Lower Bear River Reservoir												
Critical Dry	4	6	6	10	8	6	40	4	4	4	4	4
Dry	6	8	10	25	20	8	6	4	4	4	6	6
Below Normal	10	10	15	25	40	20	10	6	4	4	6	8
Above Normal	14	14	20	30	70	40	15	6	6	6	8	10
Wet	20	20	25	50	110	70	30	15	6	6	15	15
CP6 – Cole Creek below diversions to Lower Bear River Reservoir												
Critical Dry	2	2	4	8	6	4	2	2	2	2	2	2
Dry	4	6	8	15	14	8	2	2	2	2	4	4
Below Normal	8	8	10	25	50	15	6	4	4	4	4	6
Above Normal	10	10	15	30	70	30	15	6	6	6	6	8
Wet	15	15	20	45	100	60	25	10	6	6	12	12

Table 2-4: FERC Pulse Flow Requirements in cfs

CP/month	Critical Dry	Dry	Below Normal	Above Normal	Wet	Duration and Timing
CP1 – North Fork below Electra Diversion						
May	0	500	1000	1800	0	5 continuous days
CP2 – North Fork below Tiger Creek Afterbay (bypass to West Point Powerplant)						
May	0	500	1000	1800	0	5 continuous days
CP3 – Tiger Creek below Tiger Creek Regulator						
Feb	35	35	35	35	35	One day
Mar	35	35	35	35	35	One day
CP4 – North Fork below Salt Springs Reservoir						
May	0	500	1000	1800	0	5 continuous days
CP5 – Bear River below Lower Bear River Reservoir						
May	0	300	570	700	0	5 continuous days
CP6 – Cole Creek below diversions to Lower Bear River Reservoir						
May	0	0	Natural Flow	Natural Flow	Natural Flow	5 continuous days

Note: for modeling purposes, it was assumed that pulse flow is triggered at the beginning of the month.

Diversions

Upstream water users include those in Amador County and Calaveras County. The model has the provision to handle specific entities within these counties as follows:

Amador County:

- Amador Water Agency (AWA)[3] via Amador Water System (AWS): Diversion at Lake Tabeaud
- Amador Water Agency via Central Amador Water Project (CAWP)
- Jackson Valley Irrigation District (JVID)[4]

Calaveras County:

- Calaveras Public Utility District (CPUD)
- Calaveras County Water District (CCWD)

The monthly distribution of annual water diversions by upstream users is an explicit input into the model, which is further described in **Section 6** below. The model assumes that the annual diversions by the upstream users are distributed on a monthly basis in accordance with the percentages depicted in **Table 2-5**.

Table 2-5: Percent Distribution of Annual Diversion to Upstream Users

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Amador												
AWS	5.8%	5.6%	6.2%	6.8%	8.9%	10.4%	11.7%	12.0%	10.4%	8.6%	7.1%	6.5%
CAWP	5.8%	5.6%	6.2%	6.8%	8.9%	10.4%	11.7%	12.0%	10.4%	8.6%	7.1%	6.5%
JVID	5.8%	5.6%	6.2%	6.8%	8.9%	10.4%	11.7%	12.0%	10.4%	8.6%	7.1%	6.5%
Calaveras												
CPUD	6.9%	5.7%	5.8%	8.2%	10.0%	11.7%	11.1%	10.6%	9.2%	7.4%	6.6%	6.9%
CCWD	6.9%	5.7%	5.8%	8.2%	10.0%	11.7%	11.1%	10.6%	9.2%	7.4%	6.6%	6.9%

Note: as explained in Section 5, the model logic has been updated to reflect JVID diversion from Pardee Reservoir. Given this change, the monthly distribution for JVID does not affect the modeling results for the Project. While JVID's actual monthly distribution may vary from what is shown in the above table, the results will not be affected by altering these percentages.

[3] Formerly known as Amador County Water Agency (ACWA).
[4] Standard model operation combines the diversion for JVID and AWA. As described in **Section 5**, this part of the model logic has been changed to more accurately model the hydrologic impacts of the project.

The flow after being regulated by PG&E's system and reduced by the upstream diversions becomes the inflow to Pardee Reservoir. The flow is measured at the USGS gaging station #11319500 Mokelumne River near Mokelumne Hill (near the Highway 49 Bridge).

In simulating future conditions on the river, MOCASIM uses historical flow at the gage adjusted for the difference between the historical upstream diversions and projected upstream diversions associated with proposed projects.

Power Plant Operations

The operation of the power plants in the Upper Mokelumne River System when plant factors are specified (usually for Tiger Creek, West Point and Electra power plants) can be summarized as follows:

1. The model always tries to run at maximum flow (assuming maximum power).
2. If the available flow is less than the maximum for the specified plant factor, the plant factor is modified to accommodate maximum flow.
3. Two flow rates are reported – average during period (24 hours) and flow 'producing', meaning flow corresponding to the resulting plant factor.

Upper Mokelumne System Operation

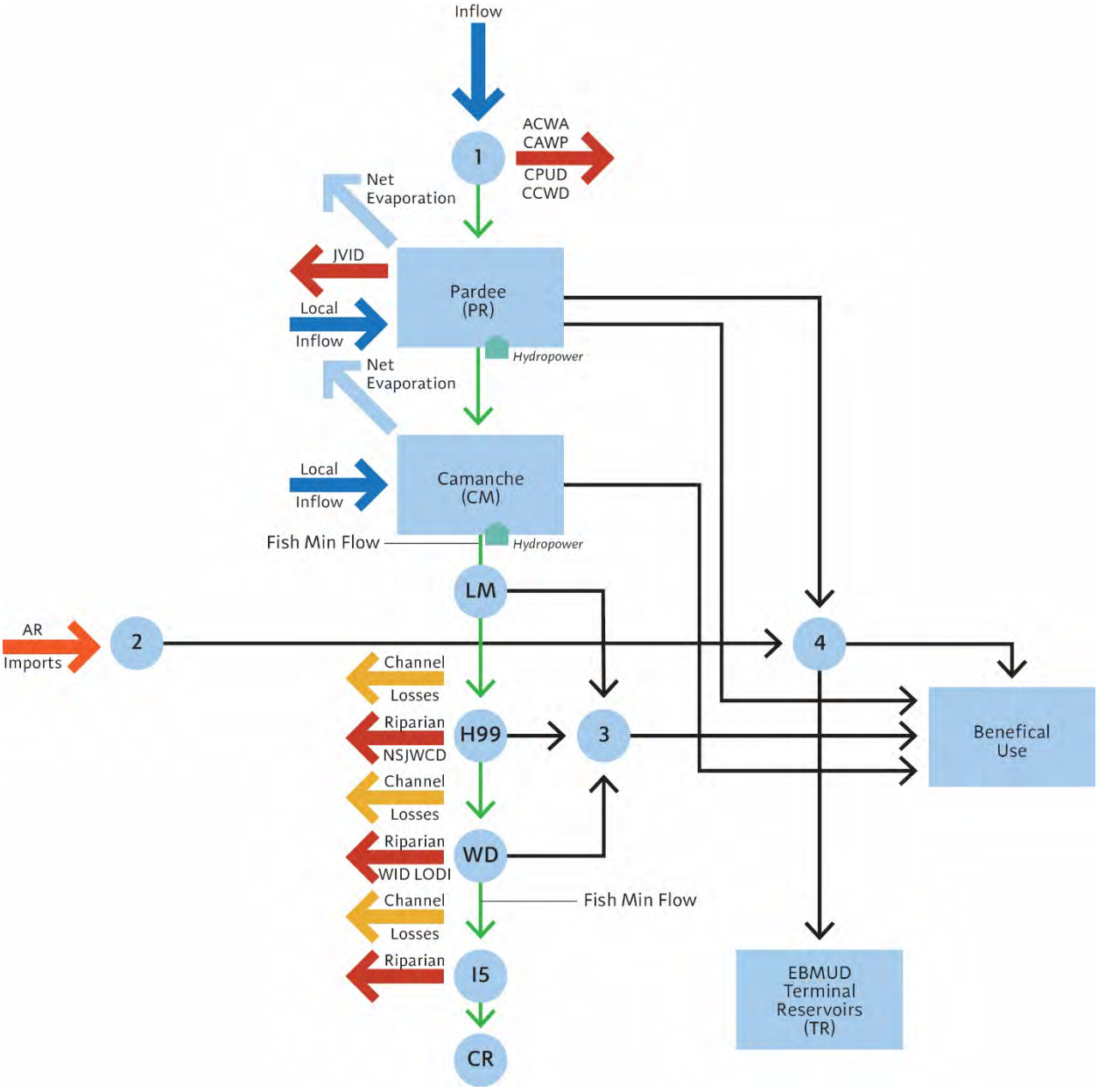
The operation of the Upper Mokelumne River System can be summarized as follows:

1. Minimum demand of the System is computed starting with the most downstream point (Node 1) taking into account the Lodi Decree, instream flow requirements, diversion, local runoff and power plant factors (if specified).
2. Maximum demand is calculated the same way except assuming maximum plant factor for all power plants (=1). This demand represents the maximum release from the upper reservoirs (Salt Springs and Lower Bear River) without hydropower spill.
3. Maximum and minimum demands are divided between Salt Springs (SS) and Lower Bear River (LB) reservoirs based on storage ratios LBR/(SS+LB), SS/(SS+LB).
4. If the computed storage falls below the reservoir rule curve with minimum demand, the model accepts the minimum demand as the release.
5. If the computed storage is above the reservoir rule curve with maximum demand, the model accepts the maximum demand as the release.
6. Otherwise, the model releases to comply with the "rule curve", which is the compilation of operating criteria, guidelines, and specifications that govern the storage and release function of the respective reservoir, subject to downstream release requirements.

2.1.2 Lower Mokelumne River System

The Lower Mokelumne River System is defined as the portion of the Mokelumne basin downstream of Highway 49. A logical overview of the Lower Mokelumne as coded into MOCASIM is presented in **Figure 2-2** below.

Figure 2-2: MOCASIM Logical Overview



The inflow at Node 1 in the above Logical Overview represents the entire flow from the Upper Mokelumne watershed, as measured at the Mokelumne Hill gage after adjustment for historical diversions by users in Amador and Calaveras counties.

The flow regime in this area is governed by channel losses, fish release requirements, flood control curves, and the need to supply water for downstream water users (diversions). Each of these is described in more detail below.

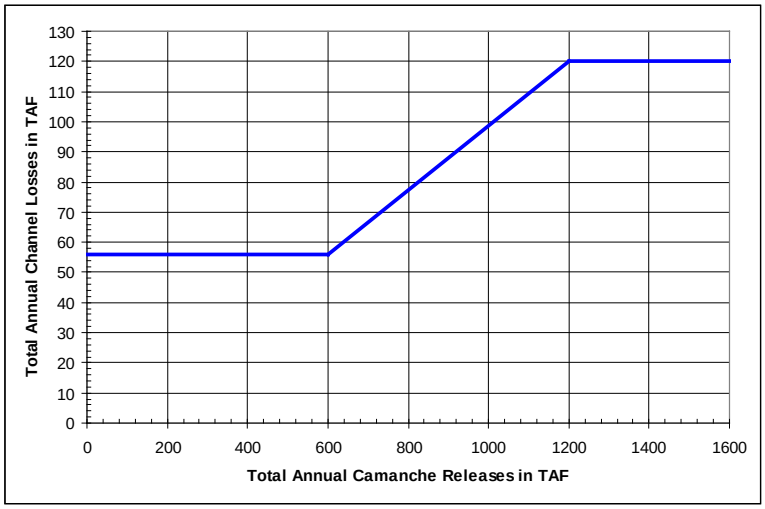
Channel Losses

Channel losses to the groundwater basin occur in the Lower Mokelumne River below Camanche Reservoir. EBMUD, under water rights agreements with other water users on the river, is obligated to release sufficient water to ensure that entitlements are delivered to the users at their points of diversion.

Channel losses deplete the amount of water in the river, thus requiring EBMUD to increase the releases from Camanche Dam to compensate for the losses. MOCASIM incorporates the same methodology used by EBMUD for modeling channel losses (obtained from public records).

Channel losses in the model depend on the total release from Camanche as illustrated in **Figure 2-3**.

Figure 2-3: Channel Losses on the Lower Mokelumne as a function of Camanche Release



Fish Release Requirements

MOCASIM includes fish flow requirements set forth in the 1997 Joint Settlement Agreement (JSA)[5]. The Agreement prescribes minimum release requirements below Camanche Reservoir in different year types, subject to meeting minimum flow conditions below Woodbridge Diversion Dam. In other words, if the minimum release required from Camanche does not result in flow below Woodbridge as prescribed in the schedule, Camanche releases must be increased accordingly.

The annual fish release requirements are summarized in **Table 2-6** below.

[5] The Joint Settlement Agreement is an agreement among East Bay Municipal Utility District (EBMUD), the United States Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (now the California Department of Fish and Wildlife or CDFW). The JSA includes flow and non-flow measures, and requires EBMUD, USFWS, and CDFW to develop a plan for a Water Quality and Resource Management Program.

Table 2-6: Fish Releases as Required by the JSA in cfs

Year Type	Requirements	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual (TAF)
Normal	Minimum Camanche Release	325	325	325	325	325	325	325	325	325	100	100	100	194
Below Normal		250	250	250	250	250	250	250	250	250	100	100	100	154
Dry		220	220	220	220	220	220	220	220	100	100	100	100	130
Critical		115	130	130	130	130	130	130	100	100	100	100	100	80
Normal	Expected Flow below Woodbridge Diversion Dam	100	100	100	100	100	100	150	300	300	25	25	25	86
Below Normal		100	100	100	100	100	100	150	200	200	20	20	20	73
Dry		80	80	80	80	80	80	150	150	20	20	20	20	52
Critical		45	75	75	75	75	75	75	15	15	15	15	15	34

EBMUD Water Supply System

The EBMUD water supply system on the Mokelumne River consists of Pardee Reservoir and power plant, Camanche Reservoir and power plant, and the Mokelumne Aqueducts, which deliver water to the EBMUD service area. The operation of the EBMUD system is modeled in the MOCASIM as follows.

Pardee Reservoir and Power Plant

Pardee Reservoir has a gross storage capacity of about 198 TAF. It fills up and draws down to target storage levels using forecasting procedures that minimize reservoir spills. This mode of operation takes into account delivery of water to EBMUD customers via the Mokelumne Aqueducts and releases to Camanche in order to supply Lower Mokelumne flow requirements.

The Pardee power plant is situated at the base of Pardee Dam and contains three Francis turbines with a total generating capacity of 28,650 kilowatts. The total rated flow for the plant is 1,100 cfs. MOCASIM assumes that the Pardee power plant operates at a uniform flow rate governed by water supply and flood control rules (no peaking).

Because of limited information from public documents about the characteristics of the Pardee power plant, MOCASIM uses generic performance curves for Francis turbines.

Camanche Reservoir and Power Plant

Camanche Reservoir has a gross storage capacity of about 417 TAF. It provides releases to meet flow requirements for the Lower Mokelumne River, including: water demands by downstream diverters, releases to offset channel depletion (loss), fish release, and releases to maintain flood control space in the system.

The Camanche power plant is situated at the base of Camanche Dam and contains three Kaplan turbines with a total generating capacity of 10,680 kilowatts. The total rated flow for the plant is 1,200 cfs. MOCASIM assumes that the Camanche power plant operates at a uniform flow rate (no peaking).

Because of limited information from public documents about the characteristics of the Camanche power plant, MOCASIM uses generic performance curves for Kaplan turbines.

Aqueduct Draft and Early Deficiency Rules

EBMUD demand is expressed in the model as average annual daily demand in Million Gallons per Day (MGD) and percent distribution by month. EBMUD demand is delivered from Pardee Reservoir via the Mokelumne Aqueducts to terminal reservoirs in the Bay Area.

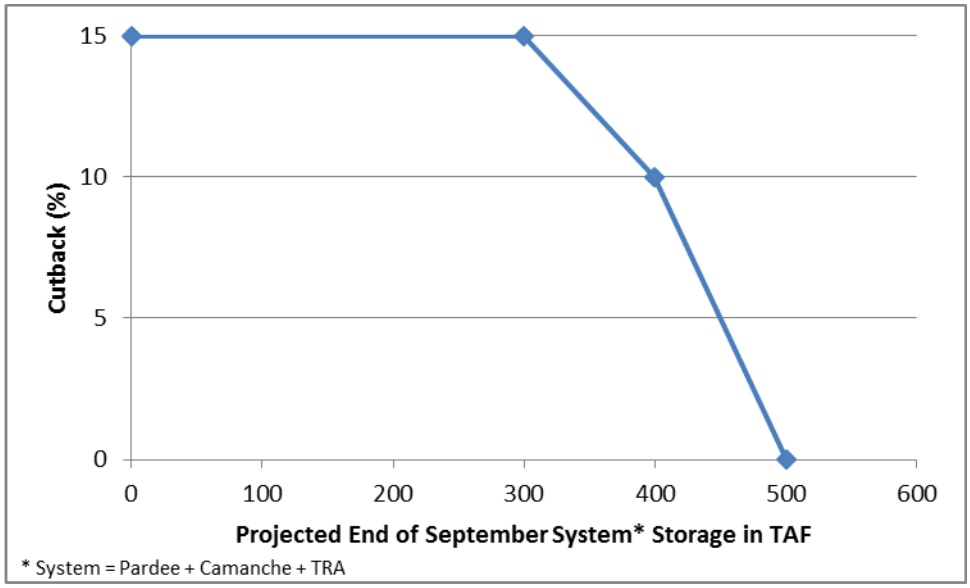
The combined maximum capacity of the Mokelumne Aqueducts is assumed to equal 325 MGD (approximately 500 cfs) which is EBMUD's full allocation under its water rights. The terminal reservoirs in the Bay Area are represented in the model by a single reservoir called Terminal Reservoir Area (TRA) with a combined capacity of 160 TAF.

The TRA has target storage levels which the model tries to maintain during the simulation. Water is withdrawn from the TRA only when there is shortage in supply from the Mokelumne Aqueducts (Pardee Reservoir).

In dry years when shortages in supply occur, EBMUD imposes rationing on its customers, which in the model is called Early Deficiency Rules. These rules impose cutbacks of deliveries to EBMUD whenever total system storage at the end of September is projected to fall below 500 TAF. The total system storage is defined as the combined storage in Pardee, Camanche and TRA.

The Early Deficiency Rules result in a sliding scale of reduction to EBMUD demand, depending on projected end of September total system storage levels, as shown in **Figure 2-4**.

Figure 2-4: EBMUD Early Deficiency Rules



MOCASIM mimics hydrologic forecasting by employing an iterative process of decision making as explained above. Accordingly, the model operates the system first without cutbacks until the end of September. If system storage falls below 500 TAF, it defines the percent of cutbacks based on the Early Deficiency Rules, resets the simulation clock to January and re-operates the system again imposing cutbacks on EBMUD demand. This concept is consistent with the way EBMUD models customer cutback as found in public documents.

Another provision in MOCASIM reduces the computed cutbacks by 50% in the first year of the drought, based on the assumption that in the first year of the drought it could take up to six months before customers respond to the imposed conservation measures. This concept is also compatible with EBMUD modeling assumptions.

Flood Control Operation

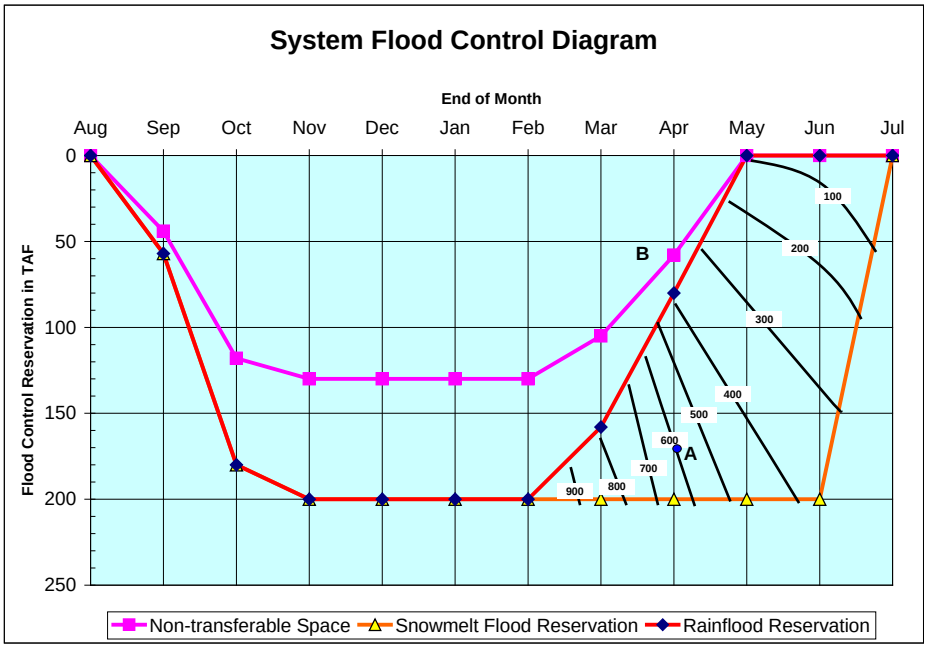
The flood control operation must be done in accordance with the US Army Corps of Engineers (COE) Flood Control Manual for the Mokelumne River Basin and can be summarized as follows:

- System's required flood control storage space is 200 TAF from November 15 to March 15
- Up to 70 TAF is transferable to PG&E's Salt Springs and Lower Bear River reservoirs based on COE guidelines (only a portion of the free space in PG&E's reservoirs can be used to offset flood space requirements in Pardee and Camanche reservoirs).
- Flood control space can be divided in any portion between Pardee and Camanche reservoirs.
- After March 15, flood storage space requirements are based on rainfall and snow pack estimates.

The system flood control diagram is presented in **Figure 2-5**.

MOCASIM simulates the above-mentioned flood control operation rules, with some approximation subject to the model's time-step resolution.

Figure 2-5: Flood Control Diagram



Example: If on end of April the forecasted runoff from May 1 to July 31 is 600 TAF (point A on the 600 TAF curve), then the total flood space requirement is 170 TAF of which 60 TAF (point B) is non-transferable and 110 TAF is transferable (170-60=110. Of this amount, 20 TAF is for rainflood reservation and 90 TAF is for snowmelt reservation. The transferable space is further reduced depending on the free space in PG&E's Salt Springs and Lower Bear reservoirs.

Diversions

Diversions by downstream users depend primarily on the hydrologic conditions.

Table 2-7 summarizes the diversion amounts on an annual basis. **Section 6** provides the specific diversions used for the Project analysis.

Table 2-7: Annual Diversions Downstream

User	Amount (TAF)	Comments
Riparian & Senior Appropriators	20	When Oct to Jun TNF is greater than 250 TAF (see Note 1)
	16.1	When Oct to Jun TNF ≤ 250 TAF, diversions in July, August and September are reduced to 50%
North San Joaquin Water Conservation District (NSJWCD)	20	In normal years
	0	When Camanche storage is in deficit (see Note 2)
Woodbridge Irrigation District (WID)	72	When Pardee actual inflow is greater than 375 TAF
	39	When Pardee Actual Inflow is less than 375 TAF
City of Lodi	3.6	All years (see Note 3)

Notes:

1) TNF is the True Natural Flow as measured at the Mokelumne Hill gage.
2) NSJWCD supply is modeled by providing water equal to the projected November spill (but not more than its full allocation amount of 20 TAF)
3) City of Lodi supply is based on the Lodi Decree which allows the city to divert water to offset declining groundwater levels.

The model assumes that the annual diversions by downstream users are distributed on a monthly basis in accordance with the percentages listed in **Table 2-8**.

Table 2-8: Percent Distribution of Annual Diversion to Downstream Users

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Riparian												
Dry Year	0.9%	0.8%	2.5%	8.1%	20.6%	29.3%	14.3%	9.3%	4.7%	4.4%	1.9%	3.4%
Wet Year	0.7%	0.6%	1.9%	6.3%	16.0%	22.8%	22.3%	14.6%	7.3%	3.4%	1.4%	2.6%
WID												
Dry Year	0.0%	0.0%	1.0%	8.4%	14.8%	19.2%	21.9%	18.9%	12.1%	3.6%	0.0%	0.0%
Wet Year	0.0%	0.0%	0.7%	5.3%	12.9%	18.4%	22.8%	21.1%	12.5%	6.3%	0.0%	0.0%
NSJWCD												
All Years	0.0%	0.0%	0.0%	0.0%	17.0%	23.0%	27.0%	17.0%	10.0%	6.0%	0.0%	0.0%
Lodi												
All Years	0.0%	0.0%	3.4%	14.9%	18.4%	17.7%	17.4%	16.6%	8.9%	2.5%	0.0%	0.0%

3 Hydrology and Simulation Period

The primary source of flow data used in MOCASIM is the recorded flow at the Mokelumne Hill Gage (USGS # 11319500), immediately upstream of Pardee Reservoir. The simulation period in the model is from 1953 to 2010. A flow duration curve showing monthly flow measured at the gage is provided in **Figure 3-1**. The figure also shows the annual runoff in each year for this period.

The year 1953 was selected as the starting year because it provides the first year for which complete records for storage conditions in the Upper Mokelumne River Basin are available. Storage conditions in PG&E's reservoirs at the Upper Mokelumne River Basin (so-called Project 137), namely, Salt Springs and Lower Bear River reservoirs are important factors for the simulation as MOCASIM considers the available space in these two reservoirs when computing the required flood control space in the Pardee-Camanche reservoirs

system (per the COE flood control rules). Lower Bear River Reservoir, the more recently constructed of the two, was completed in 1952 and storage conditions have been available since January 1953, thus defining the beginning year for the simulation period. The year 2010 is the last year for which complete hydrological data were compiled for the latest version of the model.

As explained earlier, the model can simulate the operation of the Upper Mokelumne as a standalone system. To do so, an additional hydrologic data set was developed. Unlike the Lower Mokelumne which operates in the model on a monthly time step (a reasonable assumption given the ability to regulate flow in Pardee and Camanche reservoirs), the Upper Mokelumne required a higher level of resolution given the limited storage in the Upper Mokelumne reservoirs to regulate flow. As such, a daily time step was selected for the upper watershed.

The data was synthesized from over two dozen hydrological monitoring stations provided by PG&E, USGS and CDEC as shown in **Figure 3-2**. This resulted in developing ten discrete inflow time series as illustrated in the logical view in **Figure 2-1** and explained below:

1. **Salt Springs**: Inflow to Salt Springs Reservoir
2. **Lower Bear**: Inflow to Lower Bear River Reservoir
3. **Cole Creek**: Inflow to Cole Creek above Diversion Dam (Node 17)
4. **Cole Creek Local**: Runoff between Cole Creek Diversion Dam and Tiger Creek Canal (Node 16)
5. **Bear River Local**: Runoff between Lower Bear River Dam and Tiger Creek Canal (Node 15)
6. **Other Tiger Creek**: Runoff from Beaver, East and West Panther creeks (Node 14)
7. **Tiger Creek**: Inflow to Tiger Creek Regulator (Node 13)
8. **Tiger Creek AB - Local**: Runoff between Salt Springs Reservoir and Tiger Creek Afterbay (Node 7 to Node 3)
9. **NF, SF, MF – Local to Node 1**: Runoff between Tiger Creek Afterbay and the Mokelumne Hill Gage (Node 3 to Node 1). This also includes local runoff between the Calaveras diversion on the South and Middle Forks of the Mokelumne (Node 11) and Node 1.
10. **MS Fork Mokelumne – Local**: Inflow from the Middle and South Forks of the Mokelumne before the Calaveras diversion (Node 11)

Figure 3-1 - MOCASIM Hydrology

USGS 11319500 MOKELUMNE R NR MOKELUMNE HILL CA
MONTHLY STREAM FLOW (TAF)
Source: US Geological Survey, Water Resources Data

Year	%Exc.	TAF
1977	100%	145
1976	98%	187
1988	97%	229
1987	95%	262
1961	93%	276
1994	91%	277
1992	90%	286
1990	88%	317
1991	86%	318
2001	84%	371
2007	83%	371
2008	81%	372
1959	79%	383
1960	78%	403
1968	76%	436
1985	74%	443
1981	72%	464
1966	71%	468
2004	69%	486
1972	67%	498
2002	66%	529
1989	64%	535
1954	62%	543
1955	60%	545
1964	59%	594
1957	57%	604
1962	55%	629
2009	53%	632
1953	52%	648
2003	50%	651
1979	48%	697
2000	47%	727
1971	45%	732
2010	43%	775
1975	41%	793
1973	40%	822
1963	38%	865
1999	36%	880
1984	34%	896
1978	33%	909
1970	31%	914
1974	29%	918
1993	28%	965
1958	26%	1,024
1965	24%	1,037
1967	22%	1,057
1980	21%	1,074
2005	19%	1,087
1996	17%	1,090
1997	16%	1,095
1956	14%	1,101
1986	12%	1,185
1998	10%	1,247
1969	9%	1,313
2006	7%	1,387
1995	5%	1,496
1982	3%	1,569
1983	2%	1,916
1953-2010	Average	732

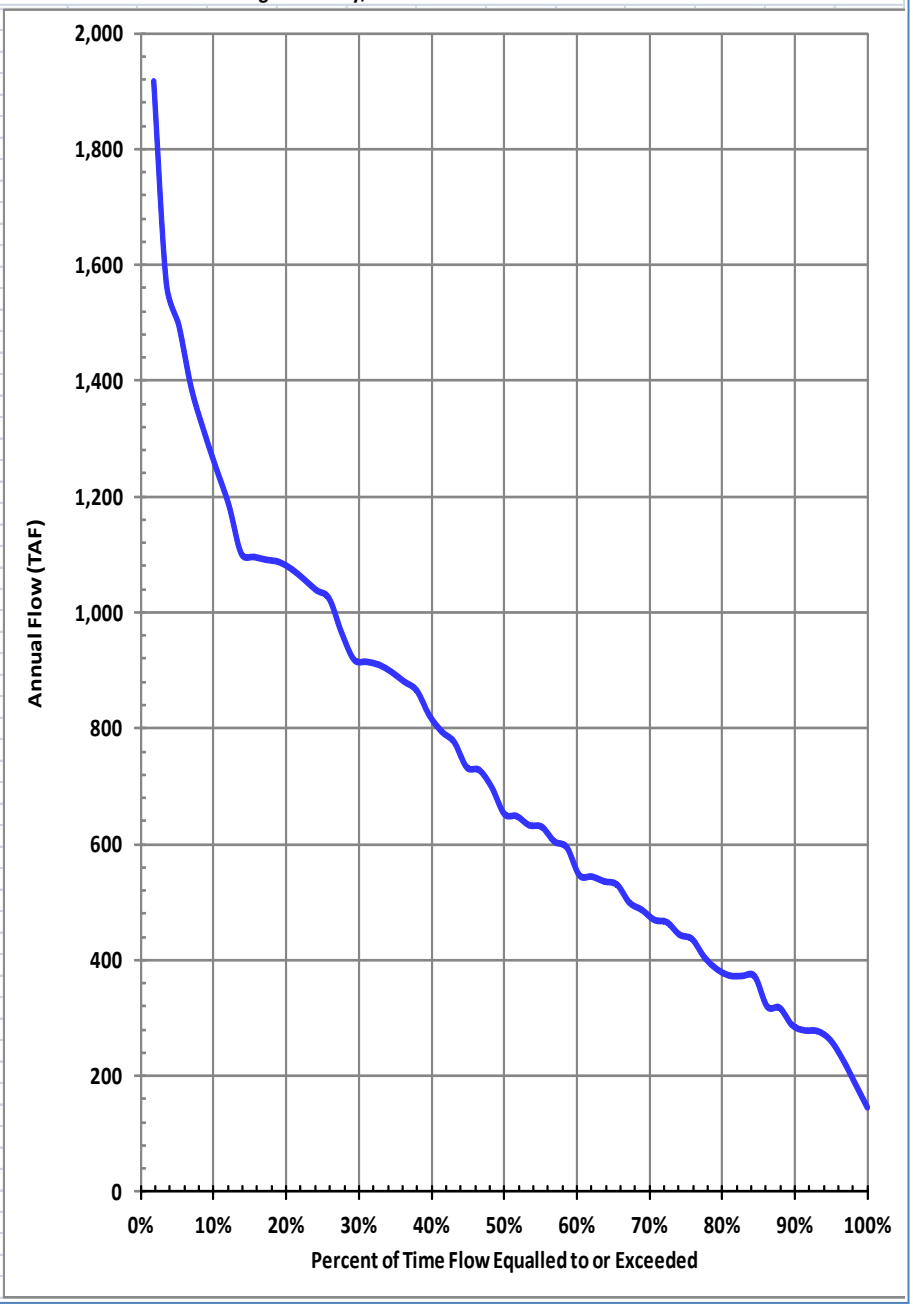
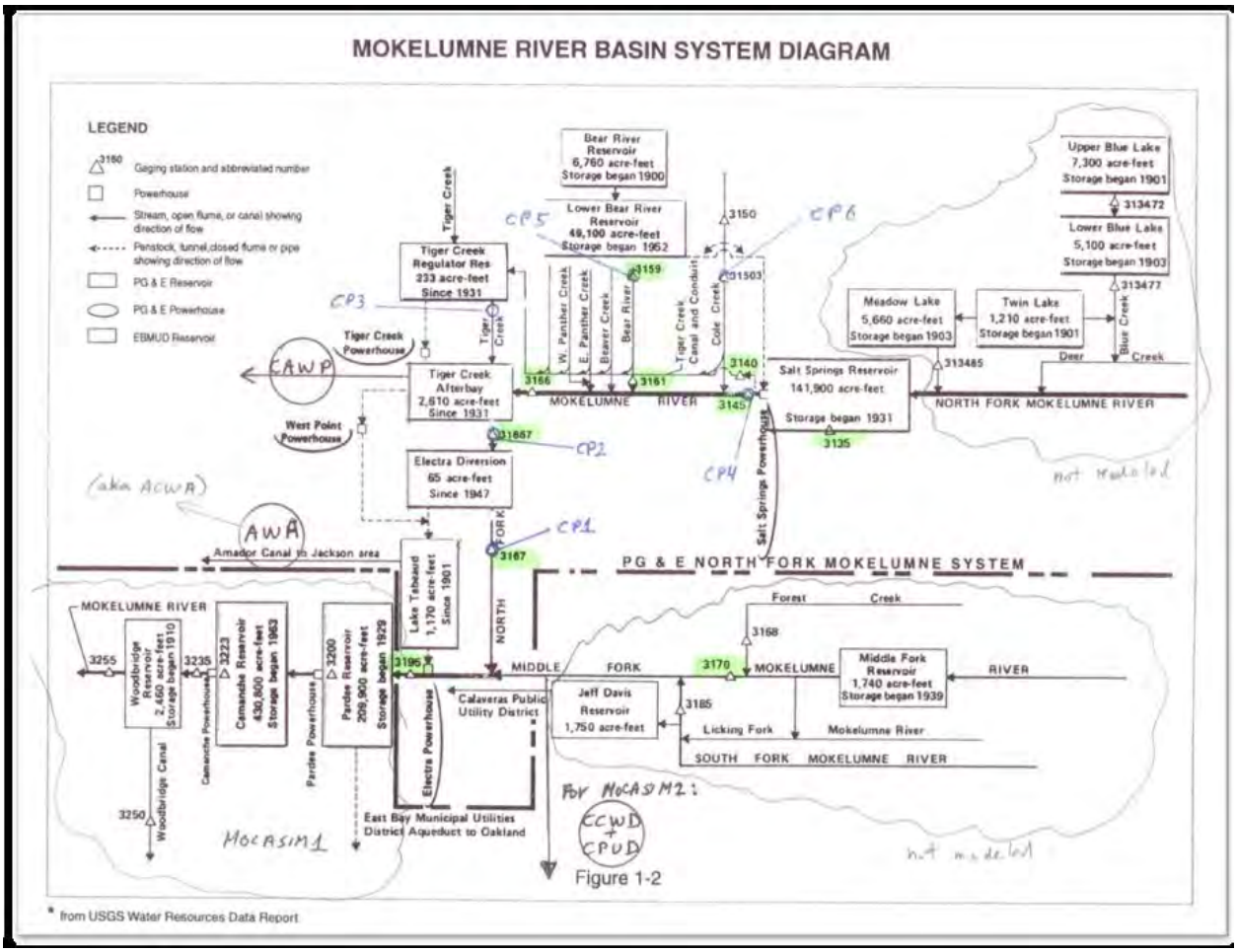


Figure 3-2 - Hydrological Monitoring Stations in the Mokelumne River Basin



4 Model Operation

MOCASIM was designed to perform specific water availability analyses and then to assess the potential yield from proposed new developments in the Mokelumne watershed. In order to do so, the model is run, internally, in two passes (i.e., it performs full simulation for the entire simulation period several times):

1) In the first pass, MOCASIM simulates the operation of the existing facilities in the Mokelumne River system in accordance with current water rights and agreements. The results of this pass are the deliveries to all existing users and the magnitude and duration of non-appropriated water. In general, non-appropriated water is defined in the model as the flow to the Bay-Delta (as measure at Interstate 5 Bridge, not including the contribution from the Cosumnes River), in excess of what is needed to satisfy all existing users in the entire Mokelumne River system (Upper and Lower), including fish flow.

2) In the second pass, MOCASIM allocates the non-appropriated water for beneficial use through new developments. New developments may include additional on-stream storage, off-stream storage, direct diversion for water supply, or groundwater recharge. For the purposes of this project, the new development is the 1,050 AFY of additional consumptive use by AWA associated with water right Application 5647X03.

5 Model Logic Changes

For the purposes of modeling this Project, there were two changes made to the model logic, including (1) moving JVID's diversion point to Pardee Reservoir and (2) assuming that JVID can divert water in each year type. The standard structure of the model, as described above, combines JVID's and AWA's diversion amounts and diverts the combined amount at the modeled location for AWA's diversions. In reality, JVID diverts water at Pardee Reservoir. Additionally, because of its diversion location, JVID cannot physically take water when the elevation of Pardee Reservoir drops below 550 feet. However, discussions with EBMUD indicate that EBMUD would be willing to enter into an agreement that would allow JVID to install infrastructure to extract water from the Pardee Reservoir at elevations below 550 feet. To accurately capture the reality of JVID's diversion, these two changes were made to the model logic.

6 Inputs and Cases

Diversions were included as the primary input to the model. To model changes in the system, three cases were modeled, including two baseline cases and a post-Project case. The first baseline case assumed current level of diversions, which was assumed to be 2010 (demand in 2015 was artificially low due to the drought and the Governor's conservation mandates). In an effort to be more conservative, demand in the year 2010 was selected to represent current diversion levels. The second baseline case assumed maximum diversions without Project implementation. The third case assumed maximum diversions with Project implementation. In both maximum diversion level cases, all agencies were assumed to divert their full Mokelumne River right, except for EBMUD. EBMUD's maximum diversion levels were assumed to be 2040 projected demand from EBMUD's 2015 UWMP. **Table 6-1** indicates the diversion amounts used for each of the three model runs.

Table 6-1: Diversions used for Modeling Cases

Diverter	Current Diversion - Without Project (CASE 1)	Maximum Diversions - Without Project (CASE 2)[a]	Maximum Diversions - With Project (CASE 3)[a]
AWA CAWP	938[b]	1,150	2,200
AWA AWS	7,160[b]	15,000	15,000
CCWD[c]	159	2,030	2,030
CPUD	1,299	1,930[d]	1,930[d]
EBMUD[e]	241,920	257,800	257,800
JVID	3,850	3,850	2,800
NSJWCD	3,021	20,000	20,000
WID	72,000	72,000	72,000
TOTAL	**330,347**	**373,760**	**373,760**

[a] Aside from EBMUD, all maximum diversions assume full Mokelumne River right.
[b] From AWA data for 2010.
[c] From CCWD's 2010 UWMP, page 3-15; maximum diversions includes 1,830 AFY Bear Creek right plus 200 AFY from CPUD.
[d] Total right is 2,130; this is reduced by 200 AFY, which is applied to CCWDs total per CCWD-CPUD agreement.
[e] Current diversions as used in Mokelumne Watershed Interregional Sustainability Evaluation (MokeWISE). Maximum diversions represent 2040 projected demand from EBMUD 2015 draft UWMP, page 56.

7 Results

To determine changes in flow, results from Case 2 (pre-Project) and Case 3 (post-Project) were compared. However, flow in the Mokelumne River varies greatly from year to year and largely depends on the year type. In order to account for natural changes in the system, the average flow in wet, above normal, below normal, dry, and critically dry years was calculated at five different nodes, including:

1. Mokelumne Hill (Pardee Inflow)
2. North Fork below Electra Diversion (Control Point 1)
3. North Fork below Tiger Creek Afterbay Dam (Control Point 2)
4. North Fork below Salt Springs Reservoir (Control Point 4)
5. Bear River below Lower Bear River Reservoir (Control Point 5)

These averages for Case 2 (pre-Project) are shown in **Table 7-1** below.

Table 7-1: Average Flow in cfs by Year Type in Case 2 (Maximum Diversion Pre-Project)

Year Type	Mokelumne Hill (Pardee Inflow)	CP1 - NF below Electra Diversion	CP2 - NF below Tiger Cr. Afterbay	CP4 - NF below Salt Springs Reservoir	CP5 - Bear River below Lower Bear River Reservoir
Wet	1,594	472	641	429	241
Above Normal	1,130	226	329	232	203
Below Normal	826	131	186	156	169
Dry	611	50	60	56	128
Critically Dry	442	37	45	44	104

Flows from Case 3 (maximum diversions with Project) were compared against flows from Case 2 (maximum diversion without Project) at the five different nodes for each day during the simulation period to determine the difference in flow from pre-Project to post-Project. For the purposes of this analysis, any flow change of 1% or more is categorized as a change in flow. It was also assumed that any flow change less than 1 cfs is not considered measurable in the environment or substantially different between modeling scenarios, so in the case where 1% of flow is less than 1 cfs, 1 cfs was used as the threshold. **Table 7-2** indicates, for each year type at each node, the flow threshold used to analyze the results. For example, the Pardee Inflow threshold for a wet year is 16 cfs, which is 1% of the average 1,594 cfs flow in a wet year. If inflow to Pardee post-Project in a wet year changes by 5 cfs, the analysis registers no effective change; if flow changes by 20 cfs, the analysis captures the change in flow.

Table 7-2: Flow Threshold for the Purpose of Determining Changes in Flow Post-Project

Year Type	Mokelumne Hill (Pardee Inflow)	CP1 - NF below Electra Diversion	CP2 - NF below Tiger Cr. Afterbay	CP4 - NF below Salt Springs Reservoir	CP5 - Bear River below Lower Bear River Reservoir
Wet	16	5	6	4	2
Above Normal	11	2	3	2	2
Below Normal	8	1	2	2	2
Dry	6	1	1	1	1
Critically Dry	4	1	1	1	1

The following set of tables show, by year type, the number of days within the period of record that would experience a change in flow post-Project based on the threshold for that location and year.

Table 7-3 shows the results for wet years and indicates the average changes in flow and number of days that the flow changed from Case 2 to Case 3. At four of the five nodes, flows stayed the same in 99% of days falling within a wet year (7,303 days) and only decreased in 1% of days. At Control Point 5, Bear River below Lower Bear River Reservoir, flows stayed the same in 98% of days and decreased in 2% of days.

Table 7-3: Results for Wet Year Analysis

		Mokelumne Hill (Pardee Inflow)	CP1 - NF below Electra Diversion	CP2 - NF below Tiger Cr. Afterbay	CP4 - NF below Salt Springs Reservoir	CP5 - Bear River below Lower Bear River Reservoir
WET	**Threshold (cfs)**	**16**	**5**	**6**	**4**	**2**
	Average Change (cfs)	-1.6	-0.4	-0.9	0.0	-0.1
	Number of Days Flow Increases (#)	4	0	1	0	17
	Percent of Days Flow Increases (%)	0%	0%	0%	0%	0%
	Number of Days Flow Decreases (#)	73	37	90	82	157
	Percent of Days Flow Decreases (%)	1%	1%	1%	1%	2%
	Number of Days Flow Does Not Change (#)	7,226	7,266	7,212	7,221	7,129
	Percent of Days Flow Does Not Change (%)	99%	99%	99%	99%	98%

Table 7-4 shows the results for above normal years and indicates the average changes in flow and number of days that the flow changed from Case 2 to Case 3. At two of the five nodes, flows stayed the same in 99% of the days falling within an above normal year (2,922 days) and only decreased in 1% of days. At Control Points 2, 4, and 5, flows stayed the same in 98% of days and decreased in 2% of days.

Table 7-4: Results for Above Normal Year Analysis

		Mokelumne Hill (Pardee Inflow)	CP1 - NF below Electra Diversion	CP2 - NF below Tiger Cr. Afterbay	CP4 - NF below Salt Springs Reservoir	CP5 - Bear River below Lower Bear River Reservoir
ABOVE NORMAL	**Threshold (cfs)**	**11**	**2**	**3**	**2**	**2**
	Average Change (cfs)	-1.4	-0.2	-0.6	-0.1	0.0
	Number of Days Flow Increases (#)	0	0	0	5	0
	Percent of Days Flow Increases (%)	0%	0%	0%	0%	0%
	Number of Days Flow Decreases (#)	37	16	48	64	68
	Percent of Days Flow Decreases (%)	1%	1%	2%	2%	2%
	Number of Days Flow Does Not Change (#)	2,885	2,906	2,874	2,853	2,854
	Percent of Days Flow Does Not Change (%)	99%	99%	98%	98%	98%

Table 7-5 shows the results for below normal years and indicates the average changes in flow and number of days that the flow changed from Case 2 to Case 3. At three of the five nodes, flows stayed the same in 98% of the days within the period of record (2,920 days) and only decreased in 2% of days (percentages do not add up to 100% at Control Point 4 due to rounding). At Control Point 1, North Fork below Electra Diversion, flows stayed the same in 95% of days and decreased in 5% of days. The average difference in flows post-Project at Control Point 1 is a 0.1 cfs decrease. At Control Point 5, Bear River below Lower Bear River Reservoir, flows stayed the same in 97% of days, decreased in 2% of days, and increased in 1% of days. The increase in flow at Control Point 5 can be attributed to AWA's increased diversion; the model releases additional water from Lower Bear River Reservoir to meet this demand.

Table 7-5: Results for Below Normal Year Analysis

		Mokelumne Hill (Pardee Inflow)	CP1 - NF below Electra Diversion	CP2 - NF below Tiger Cr. Afterbay	CP4 - NF below Salt Springs Reservoir	CP5 - Bear River below Lower Bear River Reservoir
BELOW NORMAL	**Threshold (cfs)**	**8**	**1**	**2**	**2**	**2**
	Average Change (cfs)	-1.5	-0.1	-0.4	0.0	0.0
	Number of Days Flow Increases (#)	0	4	4	6	31
	Percent of Days Flow Increases (%)	0%	0%	0%	0%	1%
	Number of Days Flow Decreases (#)	68	142	52	40	68
	Percent of Days Flow Decreases (%)	2%	5%	2%	1%	2%
	Number of Days Flow Does Not Change (#)	2,852	2,774	2,864	2,874	2,821
	Percent of Days Flow Does Not Change (%)	98%	95%	98%	98%	97%

Table 7-6 shows the results for dry years (with a period of record of 3,654 days) and indicates the average changes in flow and number of days that the flow changed from Case 2 to Case 3. In dry years, the largest decrease in flows is seen at Control Point 2 (North Fork below Tiger Creek Afterbay) and Control Point 5 (Bear River below Lower Bear River Reservoir), with decreases in 4% and 3% of days, respectively. The increase in flows at Control Points 4 and 5 can be attributed to AWA's increased diversion; the model releases additional water from Salt Springs and Lower Bear River Reservoirs to meet this demand.

Table 7-6: Results for Dry Year Analysis

		Mokelumne Hill (Pardee Inflow)	CP1 - NF below Electra Diversion	CP2 - NF below Tiger Cr. Afterbay	CP4 - NF below Salt Springs Reservoir	CP5 - Bear River below Lower Bear River Reservoir
DRY	**Threshold (cfs)**	**6**	**1**	**1**	**1**	**1**
	Average Change (cfs)	-1.1	0.0	-0.1	0.0	0.1
	Number of Days Flow Increases (#)	1	0	0	332	40
	Percent of Days Flow Increases (%)	0%	0%	0%	9%	1%
	Number of Days Flow Decreases (#)	81	7	142	52	103
	Percent of Days Flow Decreases (%)	2%	0%	4%	1%	3%
	Number of Days Flow Does Not Change (#)	3,572	3,647	3,512	3,270	3,511
	Percent of Days Flow Does Not Change (%)	98%	100%	96%	89%	96%

Table 7-7 shows the results for critically dry years (with a period of record of 4,749 days) and indicates the average changes in flow and number of days that the flow changed from Case 2 to Case 3. In critically dry years, the largest decrease in flows is seen at Mokelumne Hill (Pardee Inflow) and Control Point 5 (Bear River below Lower Bear River Reservoir), each with a decrease in flow 3% of days. The increase in flows at Control Points 4 and 5 can be attributed to AWA's increased diversion; the model releases additional water from Salt Springs and Lower Bear River Reservoirs to meet this demand.

Table 7-7: Results for Critically Dry Year Analysis

		Mokelumne Hill (Pardee Inflow)	CP1 - NF below Electra Diversion	CP2 - NF below Tiger Cr. Afterbay	CP4 - NF below Salt Springs Reservoir	CP5 - Bear River below Lower Bear River Reservoir
CRITICAL DRY	**Threshold (cfs)**	**4**	**1**	**1**	**1**	**1**
	Average Change (cfs)	-1.3	0.0	-0.1	0.0	0.0
	Number of Days Flow Increases (#)	13	22	22	283	155
	Percent of Days Flow Increases (%)	0%	0%	0%	6%	3%
	Number of Days Flow Decreases (#)	159	41	117	39	138
	Percent of Days Flow Decreases (%)	3%	1%	2%	1%	3%
	Number of Days Flow Does Not Change (#)	4,577	4,686	4,610	4,427	4,456
	Percent of Days Flow Does Not Change (%)	96%	99%	97%	93%	94%

Table 7-1 at the beginning of this section shows average flow from Case 2 (pre-Project) in cfs by year type. **Table 7-8** below shows the change in average flow from Case 2 (pre-Project) to Case 3 (post-Project) in cfs and as a percent change in average baseflow. As shown, average flow does not decrease by more than 2 cfs in any year type at any node. At Control Points 1, 4, and 5, the percentage reduction in average base flows was less than 0.1% in every year type. The largest changes were seen at Control Point 1 in wet, above normal, and below normal years with 0.08% to 0.09% changes. Pardee Inflow and Control Point 2 saw higher changes than the other Control Points, but all year types have changes less than 0.25% of average baseflow.

Table 7-8: Change in Average Flow from Case 2 to Case 3 by Year Type (in cfs and %)

Year Type	Mokelumne Hill (Pardee Inflow)	CP1 - NF below Electra Diversion	CP2 - NF below Tiger Cr. Afterbay	CP4 - NF below Salt Springs Reservoir	CP5 - Bear River below Lower Bear River Reservoir
Wet	-1.6 cfs	-0.4 cfs	-0.9 cfs	0.0 cfs	-0.1 cfs
	0.10%	0.08%	0.14%	0%	0.1%
Above Normal	-1.4 cfs	-0.2 cfs	-0.6 cfs	-0.1 cfs	0.0 cfs
	0.12%	0.09%	0.18%	0.04%	0%
Below Normal	-1.5 cfs	-0.1 cfs	-0.4 cfs	0.0 cfs	0.0 cfs
	0.18%	0.08%	0.22%	0%	0%
Dry	-1.1 cfs	0.0 cfs	-0.1 cfs	0.0 cfs	0.1 cfs
	0.18%	0%	0.17%	0%	0.1%
Critically Dry	-1.3 cfs	0.0 cfs	-0.1 cfs	0.0 cfs	0.0 cfs
	0.22%	0%	0.22%	0%	0%

Figure 7-1 and **Figure 7-2** below shows the annual storage duration curve for Lower Bear River Reservoir and Salt Springs Reservoir, respectively. Storage duration curves indicate the percentage of time over the period of record that the reservoir will have at least a certain amount of water in storage. Results indicate minimal changes between pre-project (Case 2) and post-project (Case 3) storage in both Lower Bear River Reservoir and Salt Springs Reservoir.

Figure 7-1: Annual Average Lower Bear River Reservoir Storage Duration Curve

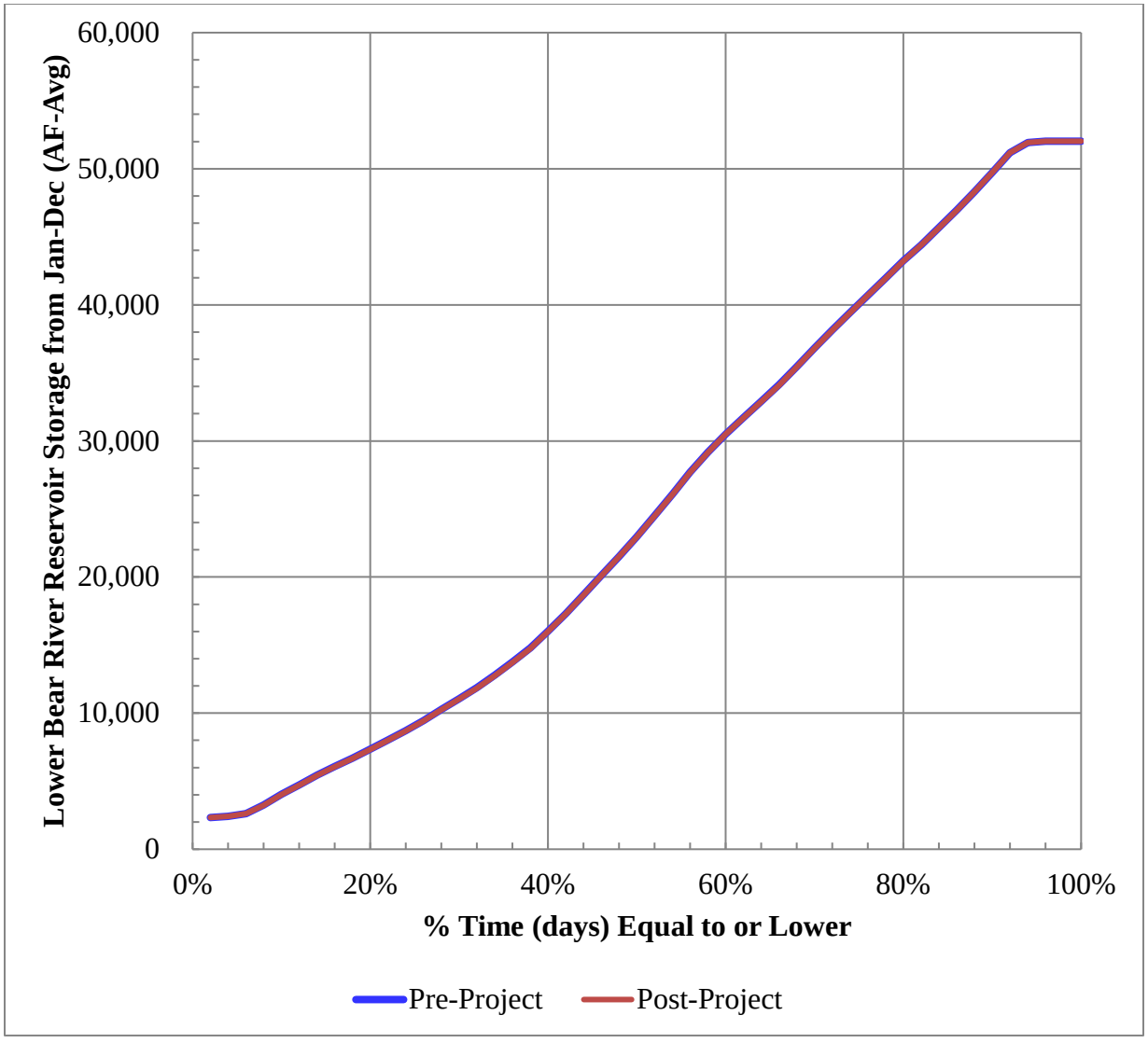
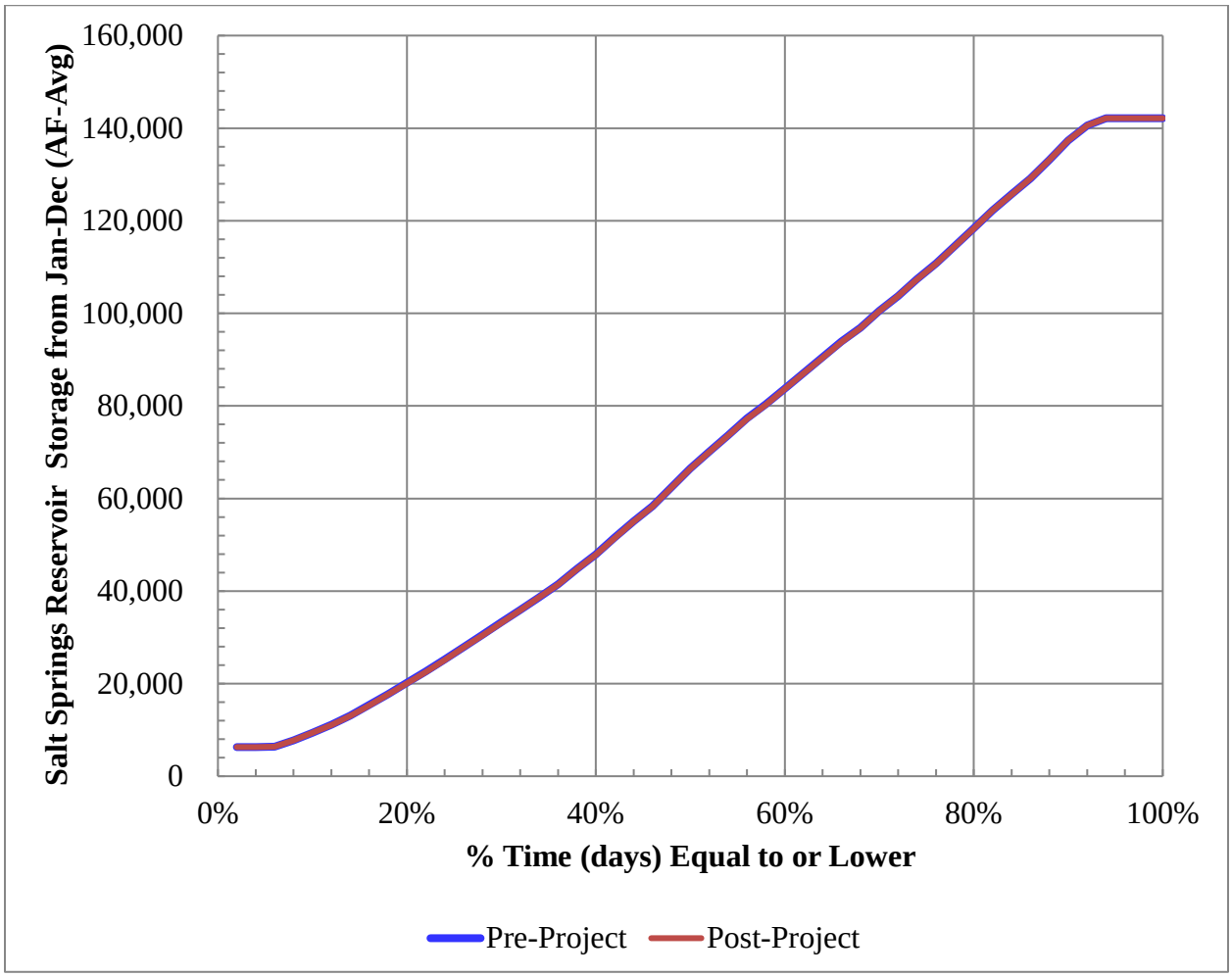


Figure 7-2: Annual Average Salt Springs Reservoir Storage Duration Curve



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Appendix D – Summary of Project Effects on Fisheries and Aquatic Habitat

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FINAL

AWA Central Amador Water Project Water Rights Application Support

Summary of Project Effects on Fisheries and Aquatic Habitat

Prepared for:

RMC Water and Environment

Prepared by:

Hanson Environmental, Inc.

October 6, 2016

Introduction

Amador Water Agency (AWA) has filed water right Application 5647X03 (Proposed Project) with the State Water Resources Control Board, Division of Water Rights (SWRCB), requesting a year-round direct diversion of up to 1,050 AF per year from the Bear River and North Fork Mokelumne River for delivery within AWA's Central Amador Water Project (CAWP) service area. The proposed maximum rate of direct diversion, in combination with AWA's existing water right Permit 17579 (State Water Right Application 5647-B), would be 5 cubic feet per second (cfs) for the CAWP system. Application 5647X03 also requests the collection of up to 1,400 AF to storage in Lower Bear River Reservoir between October 1 and July 15 each year. The total amount of water that would be directly diverted and re-diverted from storage for consumptive use within the CAWP service area would not exceed 1,050 AF annually.

AWA filed Application 5647X03 concurrent with a Petition for Partial Assignment of State Water Right Application 5647 and Partial Reversion of Rights Assigned to Jackson Valley Irrigation District (JVID) under Permit 12167 (State Water Right Application 5648-B). While the total combined face value amount of water that could be directly diverted annually by AWA and JVID would not change, the location of where the water is diverted would move from JVID's existing point of diversion location at Pardee Reservoir upstream to AWA's points of diversion on the North Fork Mokelumne River and Bear River.

Accordingly, there may be an incremental reduction in flows at times in the North Fork Mokelumne River and Bear River between the AWA diversion points and the existing JVID diversion at Pardee Reservoir. PG&E would still maintain minimum flows in these streams, but flows may be reduced by up to 2 cfs during periods when flows are above those minimums. There would be no net change in flow downstream of Pardee Dam.

The Bear River and North Fork Mokelumne River provide habitat for populations of resident fish and other aquatic species, and support recreational fishing in the area. The purpose of this technical memorandum is to evaluate whether the magnitude of change in instream flows and aquatic habitat that could occur as a result of the change in diversions could potentially have a significant adverse effect on resident fish populations. To assess the potential effects of the Proposed Project on instream flows and associated changes to aquatic species, hydrologic simulation modelling was performed using MOCASIM as described by RMC Water and Environment (RMC) (2016). Results of the hydrologic simulation modelling were subsequently used to assess the magnitude of changes in instream flows and aquatic habitat in the analyses presented below.

Proposed Project

The Proposed Project would use existing diversion and water conveyance infrastructure to divert water from the Bear River and/or North Fork Mokelumne River at three locations:

- Bear River at Lower Bear River Reservoir Dam
- North Fork Mokelumne River at Salt Springs Reservoir Dam
- North Fork Mokelumne River at Tiger Creek Afterbay Dam

Under normal operating conditions water would be diverted from Bear River and the North Fork Mokelumne River at Salt Springs Reservoir Dam and conveyed via PG&E-owned facilities to PG&E's Tiger Creek Regulator Reservoir. Water would be "re-diverted" at the Tiger Creek Regulator Reservoir and conveyed to AWA's Buckhorn Water Treatment Plant via AWA's recently-constructed Gravity Supply Pipeline (GSP) for subsequent distribution within the CAWP service area.[1] No new diversion, conveyance, treatment, or distribution facilities would be required.

AWA's existing water right Permit 17579 allows for direct diversion of up to 1,150 AF per year and collection to storage of up to 1,600 acre-feet seasonally in Lower Bear River Reservoir. Under Permit 17579, the maximum amount that AWA can directly divert and

[1] Prior to constructing the GSP, AWA pumped water from the North Fork Mokelumne River at Tiger Creek Afterbay to the Buckhorn Water Treatment Plant. Under the Proposed Project, the pumping system at Tiger Creek Afterbay will remain operational, but will only be used as a back-up system in the event of an outage of PG&E's conveyance facilities.

re-divert from storage for consumptive use is 1,150 AF annually, which is close to the historic maximum demand for the CAWP service area. AWA anticipates further growth in water demand in the future which would be met by diversions under a new water right permit issued pursuant to Application 5647X03.

Environmental Setting

Watershed

The North Fork Mokelumne River is 62 miles (100 km) long originating at Highland Lakes (elevation 8,584 feet). The upper 8.7 miles (14 km) of the North Fork Mokelumne River are characterized by Moyle et al. (1996) as a meadow stream flowing through a wide glaciated valley with sub-alpine and riparian vegetation. The river then flows 18 miles (29 km) through the Mokelumne Wilderness Area which includes a deeply incised canyon with bedrock pools, boulder clusters, and waterfalls. Access to the canyon reach is limited by steep side slopes. Exiting the canyon reach the river flows into Salt Springs Reservoir, which was constructed and operated by Pacific Gas & Electric Company (PG&E) for hydroelectric power generation. The Bear River enters the North Fork Mokelumne River downstream of Salt Springs, and then the North Fork passes downstream though Tiger Creek Reservoir before joining the Middle Fork southeast of Pine Grove. The mainstem river flows past Mokelumne Hill before discharging into Pardee Reservoir. The discharge from Pardee Reservoir flows directly into Camanche Reservoir, which then discharges into the lower Mokelumne River, which meanders 34 miles (55 km) downstream into the Delta where it joins the lower San Joaquin River. The lower reaches of the river are characterized by a lower gradient when compared to the canyon reach, substrate becomes finer, and water temperatures during the summer increase as the river flows downstream into Pardee Reservoir and the lower river.

Facilities

PG&E operates a series of hydroelectric generation facilities on the upper North Fork Mokelumne River known as the Mokelumne River Project (Project 137; originally licensed by FERC in 1925). The dams and reservoirs extend from Upper Blue Lake (elevation 7,300 feet) downstream to the Electra powerhouse (elevation 700 feet). The project has a generation capacity of 201 MW and includes seven storage reservoirs, four powerhouses, and numerous diversions, canals, and conduits used to convey water to generators (Hydropower Reform Coalition and River Management Society 2015). PG&E owns and operates Lower Bear River Reservoir and Salt Spring Reservoir, which are the primary diversion points for the Proposed Project, as well as Tiger Creek Afterbay (back-up diversion point) and the Tiger Creek Regulator Reservoir, which is named as a point of re-diversion under Application 5647X03.

The FERC license and other agreements for the Mokelumne River Project require that PG&E maintain prescribed minimum instream flows that vary by season and hydrologic conditions, however, these required flows have varied substantially over the project life. As part of the most recent FERC relicensing process, which began in 1972 and extended to 2000, a settlement agreement was developed through collaborative negotiations that includes a new agreed-upon minimum instream flow schedule, pulse flows, and ramping rates. The agreement also stipulates minimum pool levels that apply to reservoir operations. The new instream flows identified in the settlement agreement and pulse flow operations for fisheries are shown in Tables 1 and 2 by location, month, and water year-type.

Table 1. FERC instream flow requirements in cfs.

CP1 - NF below Electra Diversion												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Critical Dry	20	25	30	40	60	40	20	15	15	15	20	20
Dry	25	30	50	80	95	50	20	20	20	20	20	20
Below Normal	40	40	80	135	250	180	35	20	20	20	25	30
Above Normal	60	60	110	190	490	270	40	20	20	20	20	40
Wet	90	120	150	400	980	850	145	30	20	20	50	50
CP2 - NF below Tiger Cr. Afterbay (bypass to West Point PP)												
Critical Dry	20	25	30	40	60	40	20	15	15	15	20	20
Dry	25	30	50	80	95	50	20	20	20	20	20	20
Below Normal	40	40	80	135	250	180	35	20	20	20	25	30
Above Normal	60	60	110	190	490	270	40	20	20	20	20	40
Wet	90	120	150	400	980	850	145	30	20	20	50	50
CP3 - Tiger Creek below Tiger Creek Regulator												
Critical Dry	7	7	10	10	7	5	5	3	3	3	5	5
Dry	7	7	10	10	7	5	5	3	3	3	5	5
Below Normal	7	7	10	10	7	5	5	3	3	3	5	5
Above Normal	7	7	10	10	7	5	5	3	3	3	5	5
Wet	7	7	10	10	7	5	5	3	3	3	5	5
CP4 - NF below Salt Springs Reservoir												
Critical Dry	20	25	30	40	60	40	20	15	15	15	20	20
Dry	25	30	40	60	70	40	20	20	20	20	20	20
Below Normal	40	40	70	110	210	160	30	20	20	20	20	25
Above Normal	50	50	90	170	430	230	30	20	20	20	20	30
Wet	75	110	135	375	930	720	145	20	20	20	43	43
CP5 - Bear River below Lower Bear												
Critical Dry	4	6	6	10	8	6	40	4	4	4	4	4
Dry	6	8	10	25	20	8	6	4	4	4	6	6
Below Normal	10	10	15	25	40	20	10	6	4	4	6	8
Above Normal	14	14	20	30	70	40	15	6	6	6	8	10
Wet	20	20	25	50	110	70	30	15	6	6	15	15
CP6 - Cole Creek below div. to Lower Bear												
Critical Dry	2	2	4	8	6	4	2	2	2	2	2	2
Dry	4	6	8	15	14	8	2	2	2	2	4	4
Below Normal	8	8	10	25	50	15	6	4	4	4	4	6
Above Normal	10	10	15	30	70	30	15	6	6	6	6	8
Wet	15	15	20	45	100	60	25	10	6	6	12	12

Table 2. FERC pulse flow requirements in cfs.

CP/month	Critical Dry	Dry	Below Normal	Above Normal	Wet	Duration and timing
CP1 - NF below Electra Diversion						
May	0	500	1000	1800	0	5 continuous days
CP2 - NF below Tiger Cr. Afterbay (bypass to West Point PP)						
May	0	500	1000	1800	0	5 continuous days
CP3 - Tiger Creek below Tiger Creek Regulator						
Feb	35	35	35	35	35	one day
Mar	35	35	35	35	35	one day
CP4 - NF below Salt Springs Reservoir						
May	0	500	1000	1800	0	5 continuous days
CP5 - Bear River below Lower Bear						
May	0	300	570	700	0	5 continuous days
CP6 - Cole Creek below div. to Lower Bear						
May	0	0	Natural Flow	Natural Flow	Natural Flow	5 continuous days

The minimum required instream flow schedule is designed to mimic the natural seasonal pattern of flows in the area reflecting late winter and spring precipitation and snow melt. Typically, flows in the river are greater than the minimum flows outlined above.

Minimum instream flows for Chinook salmon, steelhead, and other aquatic resources in the lower Mokelumne River downstream of Camanche Dam were agreed upon in the 1997 Joint Settlement Agreement (JSA). [2] The JSA prescribes minimum release requirements below Camanche Reservoir in different year types, subject to meeting minimum flow conditions below Woodbridge Diversion Dam. The annual fish release requirements are summarized in Table 3.

Table 3. Fish release requirements in cfs downstream of Camanche Dam.

Year Type	Requirements	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual (TAF)
Normal	Minimum Camanche Release	325	325	325	325	325	325	325	325	325	100	100	100	194
Below Normal		250	250	250	250	250	250	250	250	250	100	100	100	154
Dry		220	220	220	220	220	220	220	220	100	100	100	100	130
Critical		115	130	130	130	130	130	130	100	100	100	100	100	80
Normal	Expected Flow below Woodbridge Diversion Dam	100	100	100	100	100	100	150	300	300	25	25	25	86
Below Normal		100	100	100	100	100	100	150	200	200	20	20	20	73
Dry		80	80	80	80	80	80	150	150	20	20	20	20	52
Critical		45	75	75	75	75	75	75	15	15	15	15	15	34

[2] The Joint Settlement Agreement is an agreement among East Bay Municipal Utility District (EBMUD), the United States Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (now the California Department of Fish and Wildlife or CDFW). The JSA includes flow and non-flow measures, and requires EBMUD, USFWS, and CDFW to develop a plan for a Water Quality and Resource Management Program.

Hydrology

Hydrology in the Mokelumne River and its tributaries varies substantially on a daily, seasonal, and annual basis in response to precipitation and snow melt in the watershed, in addition to reservoir releases. USGS streamflow data for the North Fork Mokelumne River downstream of Salt Springs Dam (USGS 11314500) were used to characterize the hydrologic conditions in the vicinity of the Proposed Project diversions. Streamflow data were summarized using average daily flow measured over an 89-year period of record extending from October 1926 through September 2015. Average daily flows were greatest (>500 cfs) beginning in early May and extending through June reflecting primarily snow melt runoff. Average daily flow ranged from 440 cfs on July 1 declining to 78 cfs by July 31. Average daily flows were typically less than 100 cfs from August 1 through January 31. The lowest average daily flows occurred from mid-September through mid-November at levels typically ranging from 35 to 50 cfs.

Average monthly flow below Salt Springs Dam over the 89-year period of record averaged 84 cfs in January, 99 cfs in February, 125 cfs in March, and 235 cfs in April. Average monthly flows increased in May (724 cfs) and June (875 cfs). Average monthly flows then showed a pattern of decline in July (190 cfs), August (67 cfs), September (51 cfs), October (41 cfs), November (51 cfs) and December (79 cfs).

Annual average flow below Salt Springs Dam over the 89-year period of record varied from 4.3 cfs in 1977 to 710.1 cfs in 1983, reflecting drought and wet hydrologic conditions in the watershed. This includes the period before the Mokelumne Relicensing Settlement Agreement, which established minimum flow requirements.

Water Quality

The two primary water quality parameters of interest in the watershed with respect to aquatic habitat suitability are dissolved oxygen concentrations and water temperatures. PG&E is required to routinely monitor and report dissolved oxygen concentrations associated with the Mokelumne River Hydroelectric Project (P-137) operations. Dissolved oxygen levels are within the suitable range for fish and invertebrates. PG&E is also required to operate reservoirs and instream flow releases to maintain average daily water temperatures less than 20^0 C (68^0 F) year-round to protect cold-water habitat for trout at the following locations:

- Blue Creek between Upper Blue Lake Dam and Lower Blue Lake;
- Blue Creek between Lower Blue Lake Dam and Deer Creek;
- Meadow Creek between Meadow Lake Dam and North Fork Mokelumne River;
- Cole Creek between Bear River Tunnel Diversion and North Fork Mokelumne River;

- Bear River between Lower Bear River Reservoir Dam and North Fork Mokelumne River;
- Tiger Creek between Tiger Creek Regulator Dam and Tiger Creek Afterbay; and
- North Fork Mokelumne River between Salt Springs Reservoir Dam and Tiger Creek Afterbay.

Water temperatures in the upper watershed show a typical seasonal pattern with low temperatures in the winter and extending through the spring (e.g., June) in response to elevated runoff from snow melt, followed by warming during the late summer and early fall as streamflows decrease. Results of water temperature monitoring further downstream at Mokelumne Hill (inflow to Pardee Reservoir) show a similar seasonal pattern with declining temperatures during October-December in response to decreased air temperatures. Seasonal low temperatures occurred in January-February within a range from approximately $4^{\mathbf{0}}$-$8^{\mathbf{0}}$ C ($39^{\mathbf{0}}$-$46^{\mathbf{0}}$ F). Seasonal temperatures began to rise in March reaching a seasonal peak in August-September before declining starting in October. The peak average daily temperatures in August-September at Mokelumne Hill were typically in the range from $14^{\mathbf{0}}$-$19^{\mathbf{0}}$ C ($57^{\mathbf{0}}$-$66^{\mathbf{0}}$ F). Water temperature conditions in the upper watershed are typically within the range considered to be suitable for the mid-Sierra elevation fish community.

EBMUD manages water temperatures and dissolved oxygen levels in the lower river downstream of Camanche Dam. Dissolved oxygen concentrations in Camanche Reservoir are managed using a hypolimnion oxygenation system (HOS) to seasonally increase dissolved oxygen and reduce the risk of hydrogen sulfide production in the reservoir hypolimnion. Water temperatures are managed through cold water pool management in the reservoir and selective releases to the lower river using outlet valves at various reservoir elevations. Water temperatures are managed in the lower river seasonally to provide suitable habitat for various life stages of Chinook salmon and steelhead.

Fish Community

The fish community inhabiting the upper reaches of the watershed includes both native wild and hatchery produced rainbow trout, non-native brown trout, dace, and hitch in the riverine reaches; and kokanee primarily reside in the reservoirs. Aquatic insect production in the upper watershed provides a food resource for resident fish. The rainbow and brown trout support an active recreational fishery.

Further downstream in the reach between West Point Diversion Dam and Electra Powerhouse, as well as in Pardee and Camanche Reservoirs, water temperatures generally increase and there is a shift in species dominance from a cold water trout community to a greater number of warm water fish species including largemouth bass.

Recently, there has been growing interest in evaluating the feasibility of reintroducing anadromous fall-run Chinook salmon into the upper reaches of the watershed. A collaborative effort, known as MokeWISE, has begun with participation from a number of governmental agencies, local NGOs, EBMUD, CSPA, Trout Unlimited, and others to provide a forum for discussing future actions that could potentially be implemented in the upper watershed. As part of the process, a draft proposal has been developed to conduct a pilot level study of salmon reintroduction. The pilot study would include collection of adult fall-run Chinook salmon from the Mokelumne River Fish Hatchery, located downstream of Camanche Dam, so that fish can be trucked and released upstream of Pardee Reservoir. Spawning site selection, hatching success, juvenile rearing, and the ability to effectively capture juvenile salmon that could then be transported and released into the lower river are all proposed elements of the pilot study. Habitat mapping and a suitability assessment of the upper watershed have also been discussed.

The lower Mokelumne River, downstream of Camanche Dam, supports a diverse community of resident and migratory fish. Camanche Dam is a complete barrier to upstream migration by anadromous fish. The lower river provides habitat for approximately 35 species of fish including fall-run Chinook salmon, steelhead, resident rainbow trout, prickly sculpin, and Sacramento sucker (Merz 2002). The lower river is also habitat for a number of non-native fish including mosquitofish, largemouth bass, bluegill, and striped bass.

Hydrologic Modeling Results

Hydrologic simulation modelling conducted to assess the effects of the Proposed Project on instream flows (RMC 2016) included analyses of three model scenarios representing current diversions without the Proposed Project (baseline Case 1), maximum diversions without the Proposed Project (Case 2), and maximum diversions with the Proposed Project (Case 3). The annual water diversions included in the modelling for each of the three conditions, by agency, are summarized in Table 4.

Table 4. Diversions used for modeling cases.

Diverter	Current Diversion - Without Project (CASE 1)	Maximum Diversions - Without Project (CASE 2)[a]	Maximum Diversions - With Project (CASE 3)[a]
AWA CAWP	938[b]	1,150	2,200
AWA AWS	7,160[b]	15,000	15,000
CCWD [c]	159	2,030	2,030
CPUD	1,299	1,930[d]	1,930[d]
EBMUD[e]	241,920	257,800	257,800
JVID	3,850	3,850	2,800
NSJWCD	3,021	20,000	20,000
WID	72,000	72,000	72,000
TOTAL	**330,347**	**373,760**	**373,760**

(a) Aside from EBMUD, all maximum diversions assume full Mokelumne River right.
(b) From AWA data for 2010.
(c) From CCWD's 2010 UWMP, page 3-15; maximum diversions include 1,830 AFY Bear Creek right plus 200 AFY from CPUD.
(d) Total right is 2,130; this is reduced by 200 AFY, which is applied to CCWDs total per CCWD-CPUD agreement.
(e) Current diversions as used in Mokelumne Watershed Interregional Sustainability Evaluation (MokeWISE). Maximum diversions represent 2040 projected demand from EBMUD 2015 draft UWMP, page 56.

To assess effects of the Proposed Project on instream flows, results from Cases 2 and 3 were compared (maximum diversions with and without the Proposed Project). The incremental change in flows estimated to occur with the Proposed Project (Case 3), relative to maximum diversions without the Proposed Project (Case 2), were characterized using both the absolute average change in flow in cfs and the percentage change in river base flows at various locations in the upper watershed. Case 2 base flows used in the analysis are summarized in Table 5. Flows were evaluated at five locations, including the Pardee Inflow at Mokelumne Hill and four other Control Points (CP):

- Mokelumne Hill (Pardee Inflow)
- North Fork below Electra Diversion (Control Point 1)
- North Fork below Tiger Creek Afterbay Dam (Control Point 2)
- North Fork below Salt Springs Reservoir (Control Point 4)
- Bear River below Lower Bear River Reservoir (Control Point 5)

Table 5. Average flow in cfs by year type in Case 2 (Maximum Diversion Pre-Project).

Year Type	Mokelumne Hill (Pardee Inflow)	NF below Electra Diversion-CP1	NF below Tiger Cr. Afterbay-CP2	NF below Salt Springs Reservoir-CP4	Bear River below Lower Bear River Reservoir-CP5
Wet	1,594	472	641	429	241
Above Normal	1,130	226	329	232	203
Below Normal	826	131	186	156	169
Dry	611	50	60	56	128
Critically Dry	442	37	45	44	104

As discussed in RMC 2016, for the purposes of this analysis, any flow change of 1% or more is categorized as a change in flow. It was also assumed that any flow change less than 1 cfs is not considered measurable in the environment or substantially different between modeling scenarios, so in the case where 1% of flow is less than 1 cfs, 1 cfs was used as the threshold. For example, the Pardee Inflow threshold for a wet year is 16 cfs, which is 1% of the average 1,594 cfs flow in a wet year. If inflow to Pardee post-Project in a wet year changes by 5 cfs, the analysis registers no effective change; if flow changes by 20 cfs, the analysis captures the change in flow.

Results of the hydrologic simulation model analyses are summarized in Tables 6-10 for each of the five water-year types included in the analyses. Results of these analyses show that instream flow reductions associated with the Proposed Project operations, on average, ranged from -0.1 to -2 cfs. The percentage of days in the model simulation when instream flows were reduced from the baseline typically ranged from 1-2%, although the number of days that flows were predicted to be reduced was up to 5% for some conditions (e.g. North Fork Mokelumne River below Electra Diversion in a below normal water year).

Table 6 show results for wet years and indicates the average changes in flow and number of days that the flow changed from Case 2 to Case 3. At four of the five nodes, flows stayed the same in 99% of days falling within a wet year (7,303 days) and only decreased in 1% of days. At Control Point 5, Bear River below Lower Bear River Reservoir, flows stayed the same in 98% of days and decreased in 2% of days.

Table 6. Results for Wet Years

WET	Mokelumne Hill (Pardee Inflow)	NF below Electra Diversion-CP1	NF below Tiger Cr. Afterbay-CP2	NF below Salt Springs Reservoir-CP4	Bear River below Lower Bear River Reservoir-CP5
Average Change (cfs)	-1.6	-0.4	-0.9	0.0	-0.1
Number of Days Flow Increases (#)	4	0	1	0	17
Percent of Days Flow Increases (%)	0%	0%	0%	0%	0%
Number of Days Flow Decreases (#)	73	37	90	82	157
Percent of Days Flow Decreases (%)	1%	1%	1%	1%	2%
Number of Days Flow Does Not Change (#)	7,226	7,266	7,212	7,221	7,129
Percent of Days Flow Does Not Change (%)	99%	99%	99%	99%	98%

Table 7 shows results for above normal years and indicates the average changes in flow and number of days that the flow changed from Case 2 to Case 3. At two of the five nodes, flows stayed the same in 99% of the days falling within an above normal year (2,922 days) and only decreased in 1% of days. At Control Points 2, 4, and 5, flows stayed the same in 98% of days and decreased in 2% of days.

Table 7. Results for Above Normal Years

ABOVE NROMAL	Mokelumne Hill (Pardee Inflow)	NF below Electra Diversion -CP1	NF below Tiger Cr. Afterbay -CP2	NF below Salt Springs Reservoir -CP4	Bear River below Lower Bear River Reservoir -CP5
Average Change (cfs)	-1.4	-0.2	-0.6	-0.1	0.0
Number of Days Flow Increases (#)	0	0	0	5	0
Percent of Days Flow Increases (%)	0%	0%	0%	0%	0%
Number of Days Flow Decreases (#)	37	16	48	64	68
Percent of Days Flow Decreases (%)	1%	1%	2%	2%	2%
Number of Days Flow Does Not Change (#)	2,885	2,906	2,874	2,853	2,854
Percent of Days Flow Does Not Change (%)	99%	99%	98%	98%	98%

Table 8 shows results for below normal years and indicates the average changes in flow and number of days that the flow changed from Case 2 to Case 3. At three of the five nodes, flows stayed the same in 98% of the days within the period of record (2,920 days) and only decreased in 2% of days (percentages do not add up to 100% at Control Point 4 due to

rounding). At Control Point 1, North Fork below Electra Diversion, flows stayed the same in 95% of days and decreased in 5% of days. The average difference in flows post-project at Control Point 1 is a 0.1 cfs decrease. At Control Point 5, Bear River below Lower Bear River Reservoir, flows stayed the same in 97% of days, decreased in 2% of days, and increased in 1% of days. The increase in flow at Control Point 5 can be attributed to AWA's increased diversion; the model releases additional water from Lower Bear River Reservoir to meet this demand.

Table 8. Results for Below Normal Years.

BELOW NORMAL		Mokelumne Hill (Pardee Inflow)	NF below Electra Diversion -CP1	NF below Tiger Cr. Afterbay -CP2	NF below Salt Springs Reservoir -CP4	Bear River below Lower Bear River Reservoir-CP5
	Average Change (cfs)	-1.5	-0.1	-0.4	0.0	0.0
	Number of Days Flow Increases (#)	0	4	4	6	31
	Percent of Days Flow Increases (%)	0%	0%	0%	0%	1%
	Number of Days Flow Decreases (#)	68	142	52	40	68
	Percent of Days Flow Decreases (%)	2%	5%	2%	1%	2%
	Number of Days Flow Does Not Change (#)	2,852	2,774	2,864	2,874	2,821
	Percent of Days Flow Does Not Change (%)	98%	95%	98%	98%	97%

Table 9 shows results for dry years (with a period of record of 3,654 days) and indicates the average changes in flow and number of days that the flow changed from Case 2 to Case 3. In dry years, the largest decrease in flows is seen at Control Point 2 (North Fork below Tiger Creek Afterbay) and Control Point 5 (Bear River below Lower Bear River Reservoir), with decreases in 4% and 3% of days, respectively. The increase in flows at Control Points 4 and 5 can be attributed to AWA's increased diversion; the model releases additional water from Salt Springs and Lower Bear River Reservoirs to meet this demand.

Table 9. Results for Dry Years

DRY		Mokelumne Hill (Pardee Inflow)	NF below Electra Diversion-CP1	NF below Tiger Cr. Afterbay-CP2	NF below Salt Springs Reservoir-CP4	Bear River below Lower Bear River Reservoir-CP5
	Average Change (cfs)	-1.1	0.0	-0.1	0.0	0.1
	Number of Days Flow Increases (#)	1	0	0	332	40
	Percent of Days Flow Increases (%)	0%	0%	0%	9%	1%
	Number of Days Flow Decreases (#)	81	7	142	52	103
	Percent of Days Flow Decreases (%)	2%	0%	4%	1%	3%
	Number of Days Flow Does Not Change (#)	3,572	3,647	3,512	3,270	3,511
	Percent of Days Flow Does Not Change (%)	98%	100%	96%	89%	96%

Table 10 shows results for critically dry years (with a period of record of 4,749 days) and indicates the average changes in flow and number of days that the flow changed from Case 2 to Case 3. In critically dry years, the largest decrease in flows is seen at Mokelumne Hill (Pardee Inflow) and Control Point 5 (Bear River below Lower Bear River Reservoir), each with a decrease in flow 3% of days. The increase in flows at Control Points 4 and 5 can be attributed to AWA's increased diversion; the model releases additional water from Salt Springs and Lower Bear River Reservoirs to meet this demand.

Table 10. Results for Critically Dry Years

CRITICAL DRY		Mokelumne Hill (Pardee Inflow)	NF below Electra Diversion -CP1	NF below Tiger Cr. Afterbay -CP2	NF below Salt Springs Reservoir -CP4	Bear River below Lower Bear River Reservoir -CP5
	Average Change (cfs)	-1.3	0.0	-0.1	0.0	0.0
	Number of Days Flow Increases (#)	13	22	22	283	155
	Percent of Days Flow Increases (%)	0%	0%	0%	6%	3%
	Number of Days Flow Decreases (#)	159	41	117	39	138
	Percent of Days Flow Decreases (%)	3%	1%	2%	1%	3%
	Number of Days Flow Does Not Change (#)	4,577	4,686	4,610	4,427	4,456
	Percent of Days Flow Does Not Change (%)	96%	99%	97%	93%	94%

Effect on Fish and Aquatic Habitat

Results of the hydrologic simulation modelling show that the Proposed Project would result in average reductions in instream flows at four of the control points in the upper watershed (North Fork below Electra Diversion, North Fork below Tiger Creek Afterbay, North Fork below Salt Springs Reservoir, and Bear River below Lower Bear River Reservoir) that range from 0 to -0.9 cfs. Flow fluctuations of this magnitude are within the range of natural variability in the watershed, and given the magnitude of seasonal base flow, would not be expected to have a detectable effect on quality or availability of suitable habitat for trout or other fish.

As previously discussed, the settlement agreement associated with PG&E's FERC license requires PG&E to maintain minimum flows and provide pulse flows set forth in Tables 1 and 2, respectively, herein. Under Project conditions, PG&E would continue to manage its operations to account for AWA's Proposed Project diversions to avoid flow reductions below the required minimum bypass flows stipulated in the PG&E agreement and FERC license. PG&E would likewise manage its operations to avoid conditions that would violate the agreement and FERC license requirements to maintain water temperatures of less than 20º C (68º F) within the designated river reaches to provide suitable habitat for cold water fish such as rainbow trout. The Proposed Project does not require construction of any new infrastructure for diversion, conveyance or storage. Therefore, there would be no construction-related impacts.

The average flow reduction estimated for the Proposed Project operations for locations in the upper watershed, by water-year type, was evaluated as a percentage reduction in average baseflows presented in Table 5. The percentage reduction in average flow by water-year was calculated for the North Fork below Electra Diversion, North Fork below Salt Springs Reservoir, and Bear River below Lower Bear Reservoir locations and is shown in Tables 11 through 13.

Table 11. Change in flow at North Fork below Electra Diversion associated with proposed project diversions.

Year Type	Average North Fork below Electra Diversion flow (cfs)	Average flow reduction (cfs) from proposed project	Percentage reduction in average baseflow
Wet	472	0.4	0.08
Above Normal	226	0.2	0.09
Below Normal	131	0.1	0.08
Dry	50	0.0	0
Critically Dry	37	0.0	0

Table 12. Change in flow at North Fork below Salt Springs Reservoir associated with proposed project diversions.

Year Type	Average North Fork below Salt Springs Reservoir flow (cfs)	Average flow reduction (cfs) from proposed project	Percentage reduction in average baseflow
Wet	429	0.0	0
Above Normal	232	0.1	0.04
Below Normal	156	0.0	0
Dry	56	0.0	0
Critically Dry	44	0.0	0

Table 13. Change in flow at Bear River below Lower Bear River Reservoir associated with proposed project diversions.

Year Type	Average Bear River below Lower Bear River Reservoir flow (cfs)	Average flow reduction (cfs) from proposed project	Percentage reduction in average baseflow
Wet	241	0.1	0.04
Above Normal	203	0.0	0
Below Normal	169	0.0	0
Dry	128	0.1	0.08
Critically Dry	104	0.0	0

For the North Fork below Electra Diversion location, the percentage reduction in average base flows was 0.08% to 0.09% in wet, above normal years, and below normal years, and was 0% in dry years and critically dry water years. For the North Fork below Salt Springs Reservoir location, the percentage reduction in average base flows was 0% in wet, below normal, dry, and critically dry years and 0.04% in above normal years. For the Bear River below Lower Bear River Reservoir location, the percentage reduction in average base flows was 0% in above normal, below normal and critically dry water years, 0.04% in wet years, and 0.08% in dry water years. In all of these hydrologic modeling scenarios, the percentage reduction in average base flows was less than 0.1%. This small reduction in baseflows in the upper watershed would not be expected to result in a detectable reduction in quality or availability of suitable habitat, channel velocities, wetted channel width, or local seasonal water temperatures.

Information on the stage-discharge relationship from USGS gage calibration measurements was used for the North Fork Mokelumne River below Salt Springs Dam location to estimate the magnitude of change in water depth that would occur from Proposed Project diversions. Data were used for gage calibrations conducted between September 2011 and September 2015 over a range of river flows from 21.5 to 126 cfs to represent typical

summer flow conditions. Based on 9 measurements, the stage-discharge linear regression was highly significant, which means that depth of water can be very reliably predicted using flow data:

$$\text{Water depth (feet)} = 1.262 + (0.00925 * \text{flow})$$

$$\text{The adjusted } R^2 = 0.947 \text{ with } P<0.001$$

Using this relationship in a sensitivity analysis showed that a change in instream flows of 1 cfs did not result in a detectable change in predicted water depth. Information was not available to estimate how an average reduction in flow would affect water depths at other locations of interest, or how stream velocity or wetted width would be changed. Given the small magnitude of the predicted reduction in average instream flows of less than 1 cfs, and the estimate of no detectable change in water depths at the Salt Springs gage site, it is expected that the Proposed Project diversions would have no significant effect on river habitat for resident fish such as rainbow trout.

The estimated absolute magnitude of flow reduction associated with the Proposed Project operations at Mokelumne Hill was greater than at other locations and, on average, ranged from a reduction of 1.1 to 1.6 cfs. To put this instream flow reduction into perspective, the percentage reduction in average flow by water-year was calculated. Results of the comparison are summarized in Table 14. Results of these comparisons show that the effect of the Proposed Project on instream flows at Mokelumne Hill would, on average, range of 0.1 to 0.29%. A change in flow of less than 2 cfs from an average base flow ranging from 442 cfs (critically dry) to 1,594 cfs (wet) on quality of availability of river habitat for resident fish would not be detectable. The magnitude of instream flow reduction estimated for the Proposed Project would not be expected to result in significant adverse effects to water velocities, channel depth, channel wetted width, or water temperatures at Mokelumne Hill.

Table 14. Change in flow at Mokelumne Hill associated with proposed project diversions.

Year Type	Average Mokelumne Hill flow (cfs)	Average flow reduction (cfs) from proposed project	Percentage reduction in average baseflow
Wet	1,594	1.6	0.10
Above Normal	1,130	1.4	0.12
Below Normal	826	1.5	0.18
Dry	611	1.1	0.18
Critically Dry	442	1.3	0.29

The Proposed project would not increase maximum annual water diversions from the upper Mokelumne River (Table 4; Cases 2 and 3) and therefore there would be no effect on the annual volume of water downstream of Pardee Reservoir entering Camanche Reservoirs. The ability of EBMUD to meet downstream water temperatures and instream flows in accordance with the JSA, and the ability to provide suitable habitat for Chinook salmon, steelhead, and other fish inhabiting the lower river, would not be affected by the Proposed Project.

Findings

Based on results of the hydrologic simulation modeling it was concluded that AWA's Proposed Project would result in a small incremental reduction in average instream flows in the North Fork Mokelumne River and Bear River in reaches downstream of the proposed points of diversion. The magnitude of the estimated average reduction in instream flows was less than 0.25% at the upstream locations and less than 0.3% at Mokelumne Hill. The reduction in flows would not be expected to result in a detectable or significant reduction in aquatic habitat quality or availability, water velocities, channel depth, channel wetted width, or adversely affect seasonal water temperatures. No change in the volume of water downstream of Pardee reservoir entering Camanche Reservoirs would occur, and therefore, the Proposed Project would have no effect on aquatic habitat in the Camanche Reservoir or on EBMUD stream flow releases and water temperature management for salmonids under the JSA in the lower Mokelumne River. No construction would be required. Therefore, there would be no physical changes to existing aquatic habitat. The diversions would be operated in a manner that would avoid impacts to PG&E's ability to maintain minimum instream flows and water temperature management as required by the Settlement Agreement and FERC license. The Proposed Project would therefore have a less than significant adverse impact on fishery resources and aquatic habitat in the North Fork Mokelumne River and Bear River.

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