

INTEGRATED REGIONAL WATER MANAGEMENT PLAN

**A COLLABORATIVE EFFORT OF STAKEHOLDERS
WITHIN THE
KAWEAH RIVER BASIN**

FEBRUARY 2014



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KAWEAH DELTA WATER CONSERVATION DISTRICT

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CHAPTER 1

PLAN DOCUMENT DESCRIPTION

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

CHAPTER 1
PLAN DOCUMENT DESCRIPTION

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
KAWEAH DELTA WATER CONSERVATION DISTRICT

1.1 PURPOSE

The purpose of an Integrated Regional Water Management Plan (IRWMP) is to document and detail the approach of participants within a watershed as to their methodologies for coordinating and integrating management of available water resources. The IRWMP is to detail how an area's management methodologies will improve available water supplies, manage flood and drought related events, document existing water quality and methods to improve that water quality, conserve and enhance habitat and detail how efforts related to land use planning will be coordinated with water resources planning. In addition to providing written documentation of a region's water management goals and implementation procedures, the development of a written plan is in satisfaction of the requirements of funding programs which are designed to assist in the implementation of policies and projects seeking to improve water management.

This IRWMP is designed to address the need for a written document detailing an integrated approach to the management of water resources within the Kaweah River Basin. The IRWMP recognizes the interconnections between land uses, social systems, economic forces and water resources specific to the subject region. The history associated with water management within the Kaweah River Basin provides an example of how seemingly different interests can work together to improve water management to the degree that the end result is a series of process outcomes which are of benefit to these seemingly disparate interests. Efforts within the Kaweah River Basin to address water management issues from a single-purpose perspective have long been left by the wayside, replaced by a collaborative process which takes into account differing perspectives, over time, as additional participants have been added to the mix of parties interested in improving water management objectives. One of the principal purposes of the IRWMP is to provide a flexible water management system which takes into account the ever changing hydrologic and governance parameters within the Kaweah River Basin. These changes not only include periodic significant changes in cropping patterns, but also changes in water quality objectives, agricultural to urban development trends and regulatory and environmental changes impacting the quantities of available surface and groundwater supplies.

1.2 COOPERATING PARTNERS

While the Kaweah Delta Water Conservation District (KDWCD) has taken the lead role for a number of decades in Kaweah River Basin water management related activities, including acting as the lead member of the IRWM Stakeholder Advisory Group, a number of other entities that manage water have enrolled as members of the KDWCD IRWM Group. They have done so through execution of a Memorandum of Understanding, with participation of the majority of the entities taking place prior to any external funding project activities occurring related to IRWM activities. The members of the KDWCD IRWM Group currently include the County of Tulare, the Exeter Irrigation District, the City of Visalia, the City of Lindsay, the Lakeside Irrigation Water District, the Tulare Irrigation District, the City of Tulare and the City of Farmersville. The KDWCD is designated in the Memorandum of Understanding as the lead agency for purposes of developing the IRWMP.

A planning process of approximately four (4) years in length has occurred, coordinating each of the entities noted above, along with interested parties from a multiple number of disciplines. These have included representatives from Self-Help Enterprises, private non-profit groups representing disadvantaged communities, including the Community Water Center, Tulare Basin Wetlands Partners and representatives of multiple agencies of jurisdiction from both the

Federal and State levels. The representatives have formed an advisory group which has worked through the processes of governance, project submittal, project scoring, development of plan goals and objectives and defining purpose and needs. Agreement has been reached amongst all participants, on a consensus basis, with respect to the critical foundation issues related to the IRWM process.

1.3 ACKNOWLEDGEMENTS

The KDWCD wishes to acknowledge the countless hours invested by the Stakeholder Advisory Group in developing policies and procedures associated with expansion of area water management processes and procedures beyond those traditionally associated with management and delivery of water supplies for irrigated agriculture and urban consumption. It is with gratitude that the KDWCD acknowledges not only the number of hours which the representatives of the different interest groups and parties have dedicated to the process of the development of the outline of this written Plan, but also for having the patience and understanding to work through the various and disparate points of view which competing interests have when the topic of water management is at hand. By the very nature of the topics addressed in this IRWMP, the reader will soon appreciate the fact that the Plan addresses a number of issues, in detail, far beyond that of the typical agricultural or urban water management plan.

1.4 ACRONYMS/ABBREVIATIONS

AF – acre foot (of water)

AF/AC – acre-feet per acre

BMP – Best Management Practices

California/EPA – California Environmental Protection Agency

CD – Critically Dry (water year)

CDF – California Department of Forestry

CDFW – California Department of Fish and Wildlife

CFS – cubic feet (per second)

CERES – California Environmental Resource Evaluation System

CEQA – California Environmental Quality Act

CNDDDB – California Natural Diversity Database

CVP – Central Valley Project

CWA – Clean Water Act

DC – Disadvantaged Community

DFW – State Department of Fish and Wildlife

DWR – State of California Department of Water Resources

EIR – Environmental Protection Agency (also referred to as United States EPA)

ESA – Endangered Species Act

FERC – Federal Energy Regulatory Commission

FS – Forest Service (United States Department of Agriculture)

FWS – Fish and Wildlife Service (United States Department of Interior)

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
KAWEAH DELTA WATER CONSERVATION DISTRICT

GIS – Geographic Information System

HCP – Habitat Conservation Plan

IRWM – Integrated Regional Water Management

IRWMP – Integrated Regional Water Management Plan

JPA – Joint Powers Authority

K&SJRA – Kaweah and St. Johns Rivers Association

KDWCD – Kaweah Delta Water Conservation District

KW – kilowatt

LCMMP – Land Cover Mapping and Monitoring Program

LMIC – Land Management Information Center

MGD – million gallons per day

MHI – median household income

MOU – Memorandum of Understanding

MW – mega watts

NEPA – National Environmental Policy Act

NGO – Non-Governmental Organization

NHI – National Heritage Institute

NPDES – National Pollutant Discharge Elimination System

NPS – Nonpoint Source (Pollution)

PAEP – Performance Assessment and Evaluation Program

PGE – Pacific Gas and Electric Company

PME – Protection, Mitigation & Enhancement

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
KAWEAH DELTA WATER CONSERVATION DISTRICT

RCD – Resource Conservation District

ROD – Record of Decision

RWQCB – Regional Water Quality Control Board

SCE – Southern California Edison

SEIS – Supplemental Environmental Impact Statement

SHE – Self-Help Enterprises

SNC – Sierra Nevada Conservancy

SRT – Sequoia Riverlands Trust

SWAMP – California’s Surface Water Ambient Monitoring Program

SWP – State Water Resources Development System (State Water Project)

SWRCB – State Water Resources Control Board

USACOE – United States Army Corps of Engineers

USR – United States Bureau of Reclamation

USDA – United States Department of Agriculture

USFS – United States Forest Service

USFWS – United States Fish and Wildlife Service

USGS – United States Geological Survey

UWMP – Urban Water Management Plan

WTP – water treatment plant

CHAPTER 2

HISTORICAL PERSPECTIVE

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

CHAPTER 2
HISTORICAL PERSPECTIVE

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
KAWEAH DELTA WATER CONSERVATION DISTRICT

2.1 BACKGROUND OF THE KAWEAH RIVER BASIN IRWMP

2.1.1 Governance

The Kaweah Delta Water Conservation District (KDWCD) is a public agency covering approximately 340,000 acres in the Counties of Kings and Tulare. To date, KDWCD has acted as the lead agency in the coordinated management of water resources available to the Kaweah River Basin, particularly as they have applied to groundwater resources and flood and storm waters control. Joining together with multiple agencies for management of pre-1914 water rights purposes, groundwater management and development of a formalized Integrated Regional Water Management Plan (IRWMP) the KDWCD has directed water management activities undertaken by the cooperating agencies within the Kaweah River Basin. Joining together with other agencies with similar goals, the KDWCD has provided formal notice to the public and agencies of

jurisdiction of the preparation of an IRWMP. Based on the recent approval of the outcome of the Regional Acceptance Process by the Department of Water Resources of the State of California, this IRWMP has been prepared in parallel to a plan for the Tule River Basin with the governing bodies of the two (2) IRWM areas electing to share a common Stakeholders Advisory Group. Acting as the lead agency for a coordinated group of participants with specific proposed water management projects, the KDWCD has executed a contract requiring the development of this written IRWMP. The KDWCD accepted the requirement to prepare this formalized plan within a defined two (2) year period of time, following the execution of a grant agreement with DWR for Proposition 84-Round 1, Implementation Funds. It is the intent of this IRWMP to document, in detail, all of the existing relationships, policies, procedures and agreements which have both been historically in place, as well as in place at the time of the submission of this IRWMP to DWR for acceptance through the Plan Review Process of said agency.

The governance of this IRWMP resides with the Board of Directors of the KDWCD. The Board of Directors is comprised of seven (7) elected or appointed individuals with residency within specific divisions of the KDWCD. The Directors are elected for four (4) year terms. Actions taken by the governing Board of the KDWCD are done in conjunction with input from the Stakeholders Advisory Group, as well as from the entities which are signator to the restated MOU, dated November 30, 2010, with the KDWCD specifically related to IRWM matters.

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
KAWEAH DELTA WATER CONSERVATION DISTRICT

As a public agency within the State of California, the business of the KDWCD is conducted pursuant to the provisions of the Brown Act wherein specific notice of meetings, topics to be discussed and actions proposed to be taken are contained in a published agenda and conducted in open session which is subject to public comment during a general comment period, as well as when a particular item is specifically taken up by the Board of Directors. Rules and procedures have been developed for conduct of the public and input from the public and interested parties by the KDWCD. Meetings of the Board of Directors are held on a regular monthly basis, at a minimum, in a facility which is fully compliant with the Americans with Disabilities Act standards.

Minutes of prior meetings are available to the public, upon request, as well as relevant documents pursuant to the KDWCD's document request process. In addition, the KDWCD has a web site, maintained current with applicable information and with appropriate links to locations containing appurtenant support and related documents.

2.1.2 Historical Plan

It is the opinion of the KDWCD that they have acted as the lead agency in the development of IRWM policies and implementation of projects, in cooperation with other Kaweah River Basin partners, projects which have as their underlying nature, integrated regional water management. In the early 1990s, the District began to take steps to formally establish partnerships and develop procedures and projects in cooperation with

other participating water management agencies. A significant number of documents have been executed, over time, providing example of the integrated approach to water management within the Kaweah River Basin.

Presented, as Table 2-1, is the participation structure and elements of the current IRWMP. The information provided is segmented into the various elements of the coordinated efforts of parties actively involved in cooperatively managing water resources within the Kaweah River Basin. A graphic presentation of the myriad of relationships which currently exist is presented on Figure 2-1. Each of the agreements and elements detailed on the table and in the figure are current active components of the existing IRWMP. This formal written and adopted IRWMP is structured around these agreements and activities and is augmented by additional elements developed by the Stakeholders Advisory Committee of incorporation of efforts to address disadvantaged community needs and concerns into the KDWCD IRWM process, as well as project evaluation and scoring.

TABLE 2-1

PARTICIPATION STRUCTURE AND ELEMENTS

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
KAWEAH RIVER BASIN

SURFACE WATER ELEMENT

Kaweah and St. Johns Rivers Association Agreement

Kaweah River Association Agreement

St. Johns River Association Agreement

Friant Water Authority JPA

State Water Project Water Users JPA

City of Visalia – KDWCD Facilities O&M Agreement

Tulare I.D. – KDWCD Agreement

Tulare I.D. – City of Visalia Agreement

Tulare I.D. – City of Tulare Agreement

KDWCD/Ivanhoe I.D. Resources Exchange Agreement

USBR Water Management Plans

AB 3616 Water Management Plans

Lake Kaweah Initial and Expansion Storage Agreements

GROUNDWATER ELEMENT

Kings County Water District GWMP

KDWCD GWMP

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
KAWEAH DELTA WATER CONSERVATION DISTRICT

Tulare I.D. GWMP

Tulare Lake Basin Coordinated GWMP

Stakeholder MOUs

California Water Service Company

City of Farmersville

City of Lindsay

City of Tulare

City of Visalia

City of Woodlake

Consolidated Peoples Ditch Company

Kings County Water District (AB 3030 Plan)

Lakeside Ditch Company

Lakeside Irrigation Water District

St. Johns Water District

Stone Corral Irrigation District

Tulare Irrigation District (AB 255 Plan)

Ivanhoe Irrigation District

California Water Service Company Import Program

California Water Service Company Urban Water Conservation Plan

City of Tulare Development Impact Policy

City of Visalia Development Impact Policy

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
KAWEAH DELTA WATER CONSERVATION DISTRICT

Groundwater Model Elements

Master Basin Model

KDWCD/CWSCo/City of Visalia Upgrade

DCTRA Basin Model Intertie

STORM WATER ELEMENT

KDWCD/City of Visalia Agreements and Facilities

CPDCO/City of Exeter Agreements and Facilities

CPDCO/City of Farmersville Agreements and Facilities

Evans DCo/City of Visalia Agreement

Modoc DCo/City of Visalia Agreements

Persian-Watson DCo/City of Visalia Agreement

Tulare ICo/City of Visalia Agreement

KDWCD 404 Permit

KDWCD 1601 Permit

City of Visalia/KDWCD Management Committee

WATER QUALITY ELEMENT

Kaweah Sub-watershed Water Quality Coalition

Southern San Joaquin Valley Water Quality Coalition

City of Exeter WDRs

City of Farmersville WDRs

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
KAWEAH DELTA WATER CONSERVATION DISTRICT

City of Lindsay WDRs

City of Visalia WDRs/NPDES

City of Woodlake WDRs

Ivanhoe P.U.D. WDRs

County of Tulare Abandoned Well Program

ENDANGERED SPECIES RECOVERY/PROTECTION ELEMENT

KDWCD HCP/NCCP

Workplan Approval

Biological Inventories

City of Visalia Mini HCP

KDWCD/Sierra-Los Tulares Land Trust Projects (Sequoia Riverlands Trust)

Artesia Mining Site Restoration

Herbert Preserve

Kaweah Oaks Preserve

Paregien Parcel

GOVERNANCE ELEMENT

Surface Water

Multiple Water Management Agency Boards of Directors

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Multiple Water Management Agency Advisory Committees

Multiple Water Management Agency Technical Committees

Interbasin Water Management Coordinating Groups

Kings-Kaweah

Kaweah-Tule

Kaweah-Tulare Lake

Groundwater

GWMP Stakeholder Committees

KDWCD/City of Visalia Coordination Committee

KDWCD/Tulare I.D./City of Visalia Coordination Committee

Groundwater Model Technical Committee

Storm Water

KDWCD/City of Visalia Management Committee

KDWCD/City of Farmersville – Paregien Facilities

Endangered Species

Stakeholders Committee

Water Quality

Steering Committee

Technical Committee

Legal Committee

Proposition 84-IRWMP

Joint Efforts with the Tule River Basin Managers' Advisory Committee

2.1.3 Consistency with State of California Planning Efforts and Statutory Requirements

The “deemed equivalent” IRWMP of the KDWCD has been in effect for in excess of twenty years. The steps to memorialize this Plan in writing have been undertaken in a fashion to comply with the IRWM Plan Standards and are designed to fully comply with Part 2.2 of Division 6 of the California Water Code, commencing with Section 10530. This Plan will be submitted to DWR to be subjected to the 2012 IRWM Guidelines, including the Addendum to said guidelines issued in draft form in August, 2013. Specifically, the Plan Review Process detailed in Appendix H of said Guidelines was used as a cross-check instrument to ensure compliance with adopted IRWMP Guidelines.

2.2 DEVELOPMENT OF A FORMAL, WRITTEN PLAN

2.2.1 Stakeholders Advisory Group

As a part of the initial effort to expand the reach of the KDWCD IRWMP, the KDWCD expanded the number of parties invited to participate in the water management planning efforts within the Kaweah River Basin. A number of urban purveyors who had historically not participated in the planning efforts were invited, as well as a number of

stakeholders and representatives of disadvantaged community areas and rural hamlet areas, underserved from the perspective of both adequate water supply and inadequate water quality. The group was also expanded to include the County of Tulare, which had historically participated from a flood control standpoint, but parties were added to specifically address public health concerns, including well construction and well abandonment.

2.2.2 Memorandum of Understanding Group

In the late summer of 2007, discussions took place with a stakeholder's group surrounding steps to formally add additional parties of interest to the efforts of the KDWCD. Lengthy discussions of governance models took place at that time, including a form of governance which would have other than the KDWCD as the lead agency. Following a number of meetings and lengthy discussions, it was determined to leave the plan organization with KDWCD as the lead and to add additional parties to the effort utilizing a Memorandum of Understanding instrument. Work was completed on the initial draft of the Memorandum of Understanding on August 30, 2007. At that time, the signators were the County of Tulare, the Exeter Irrigation District, the City of Lindsay and KDWCD. A copy of the initial Memorandum of Understanding is enclosed herewith as Appendix B.

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The number of participants to the Memorandum of Understanding has increased since the initial signing. Current members of the KDWCD IRWM Group are:

County of Tulare

Exeter Irrigation District

Kaweah Delta Water Conservation District

Lakeside Irrigation Water District

Tulare Irrigation District

City of Farmersville

City of Lindsay

City of Tulare

City of Visalia

The City of Farmersville is the most recent addition to the Group.

2.2.3 Coordination with Tule River Basin Plan Development

For a number of years, the IRWMP Stakeholders Advisory Group has included at least one (1) representative from the Tule River Basin. At times, there has been more than one, depending on the issue at hand and the specific elements of coordination to be accomplished. The normal attending party has been a representative of the Deer Creek & Tule River Authority, with almost perfect attendance.

In addition to coordination with respect to water management issues, a principal matter of discussion has been the potential for merging the Tule River Basin into a single IRWM with the Kaweah River Basin. Consideration of this issue and the discussions and governing Board meetings surrounding the issue culminated in a decision to prepare separate plans, each paralleling the other with respect to process, procedure and goals and, most importantly, sharing a common Stakeholders Advisory Group. This process and the conclusions are discussed in greater detail in Chapter 9.

2.2.4 Coordination with Tulare Basin JPA Development

Based on a regional stakeholders meeting called by DWR and held at the office of the Semitropic Water Storage District, significant effort was put into the formation of a regional Joint Powers Authority. Meetings were initiated and have been held on a monthly basis since. These meetings are currently being held on the first Monday of each month in the offices of Provost & Pritchard Engineering Group in Visalia. Stakeholders from the region continue to attend with participation from the Kings River Basin, Kern County IRWM groups including the Poso IRWM, the Kaweah River Basin, the Tule River Basin and the Southern Sierra IRWM. There is periodic attendance from parties considering formation of an organization covering the Tulare Lake bed area.

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The initial efforts to form were pursued to the extent of developing a formal Joint Powers Authority with an outline for development of that Authority being developed and agreed to by the participants. A copy of that outline is presented in Appendix C.

This effort culminated in the preparation of a Joint Powers Agreement which was specific to Tulare Lake hydrologic region water-related entities. The initial formal parties to this agreement included the KDWCD, the Kings River Conservation District and the Semitropic Water Storage District. A copy of the subject JPA is included herewith as Appendix D.

Several parties having input to the participants to this proposed JPA have weighed the value of this broader regional effort and how it might improve, or reduce opportunities in the project evaluation process and whether it might pit one region within the JPA area against another. Formal action has been taken by some participants to memorialize this position, while still providing instruction to participate in regional JPA related activities. Movement beyond the ad-hoc level which currently exists will probably be dependent, to a significant degree, on state-wide related funding activities, principal of which are those administered by the State Department of Water Resources.

2.2.5 Coordination with Southern Sierra Plan Development

Initiated at a later point in time than the valley floor IRWM efforts, the organizational efforts of the Southern Sierra IRWM have nonetheless been coordinated with the efforts of the Kaweah River Basin and the Tule River Basin. In addition to providing support to the development of an IRWMP covering the upper foothill and mountain area portions of the Kaweah River and Tule River watersheds, specific coordination has occurred with respect to boundary issues and joint planning efforts. While far greater effort is directed at integrated water management between valley floor water managers than that associated with private stock ditch companies located above the area's flood control reservoirs, there are a number of areas where specific water management efforts have been appropriate. Included in this array of areas of concern have been water quality, sediment generation management and brush clearing efforts. While brush clearing efforts take place in the foothill and lower mountain areas specifically for fire related purposes, the efforts yield water supply otherwise consumed by non-beneficial vegetation which can most often be put to beneficial use on the valley floor.

As previously noted, the Southern Sierra IRWM group representatives attend the monthly JPA coordination meetings, as well as the KDWCD Stakeholders Advisory Group meetings. Encouragement for attendance and participation continues to date.

2.3 GOVERNANCE STRUCTURE

2.3.1 Memorandum of Understanding/Cooperative Agreements

The initial Memorandum of Understanding, previously introduced and a copy of which is presented in Appendix B, has been modified a number of times as additional parties have requested to be added. The most recent addition was based on the request of the City of Farmersville to participate as a full member and a copy of the current Memorandum of Understanding, with the latest participant addition, is presented in Appendix E.

As shown in Table 1 and on Figure 2-1, there are a significant number of cooperative agreements which are a part of the IRWM structure. For the sake of publication, copies of these agreements are not reproduced in this document, but are available from the KDWCD, upon request. These cooperative agreements are the heart of day-to-day activities related to water management within the Kaweah River Basin. The specifics of the water management strategies embodied in these agreements will be presented in greater detail in Chapter 9.

2.3.2 Governance Structure Evaluation

As discussed earlier in the introduction portion of this IRWMP, consideration of the continuation of the KDWCD as the lead agency for IRWMP purposes has been visited a number of times. A process has been agreed to by the MOU Participants and the Stakeholders Advisory Group. The process calls for the preparation and submittal of the formal IRWMP by KDWCD with KDWCD as the lead agency. Meetings of the IRWM Stakeholders Advisory Group will be held, as necessary, in order to provide input to the Board of Directors.

As part of the long-term planning process, the KDWCD applied for and has received confirmation of the award of a Round 2-Proposition 84 Planning Grant. The purpose of said grant will be to update this IRWMP in several specific areas. Foremost amongst those areas is a thorough review of the current governance structure and a detailed evaluation of the alternatives to the current structure. These alternatives include continuing with KDWCD as the lead agency, evaluation of other area water management entities assuming the lead role for the formation of a joint effort, such as under the umbrella of a Joint Powers Agreement, as constructive alternatives. The contract for the funding of the Round 2 Planning Grant effort is currently under negotiation with DWR.

2.3.3 Relationship to Future Tulare Basin Joint Powers Authority Governance Structure

The relationship of the KDWCD IRWMP efforts will continue to be coordinated with the balance of the area IRWM groups through the informal JPA organization which has been generated. The KDWCD continues to support the attendance and participation of all current entities attending the coordination meetings, with no change anticipated in the near-term with regard to pursuit of a formal JPA structure. The participation of the KDWCD in a formalized JPA structure will be addressed by the Board of Directors at such time as a change in direction necessitates revisiting the participation issue.

2.4 FUNDING

2.4.1 IRWMP Funding

To date and anticipated to be continued in the future, the majority of funding activities directly related to the IRWMP have been born by the KDWCD. Organizational efforts and costs related to same associated with the Stakeholders Advisory Group have been at the call of KDWCD, with meetings being held at the office of said entity. All costs related to the preparation costs of this IRWMP have been funded by KDWCD with the exception of \$3,000 each collected from each of the other eight (8) MOU Participants. For the near-term, no change is anticipated in the cost structure related to the IRWMP.

2.4.2 Funding of Project Applications

Specific water management project funding is dealt with in a separate fashion from the IRWMP funding. Applicants for specific funding programs are required to fund their pro-rata share of the cost of development of project specifics and project funding applications. Each of the participants in these efforts, over recent history, have benefitted by cost sharing a number of common elements of applications which have been shared on an equal division basis. Specific agreements for obligation to cover such costs have been developed on a funding effort-by-funding effort basis with this arrangement anticipated to continue into the future. Of significance in this regard, the funding activities of the Visalia Water Management Committee are noted. In this case funding of application costs is often to be of value to all projects within a given application with not just a project-by-project division of costs occurring.

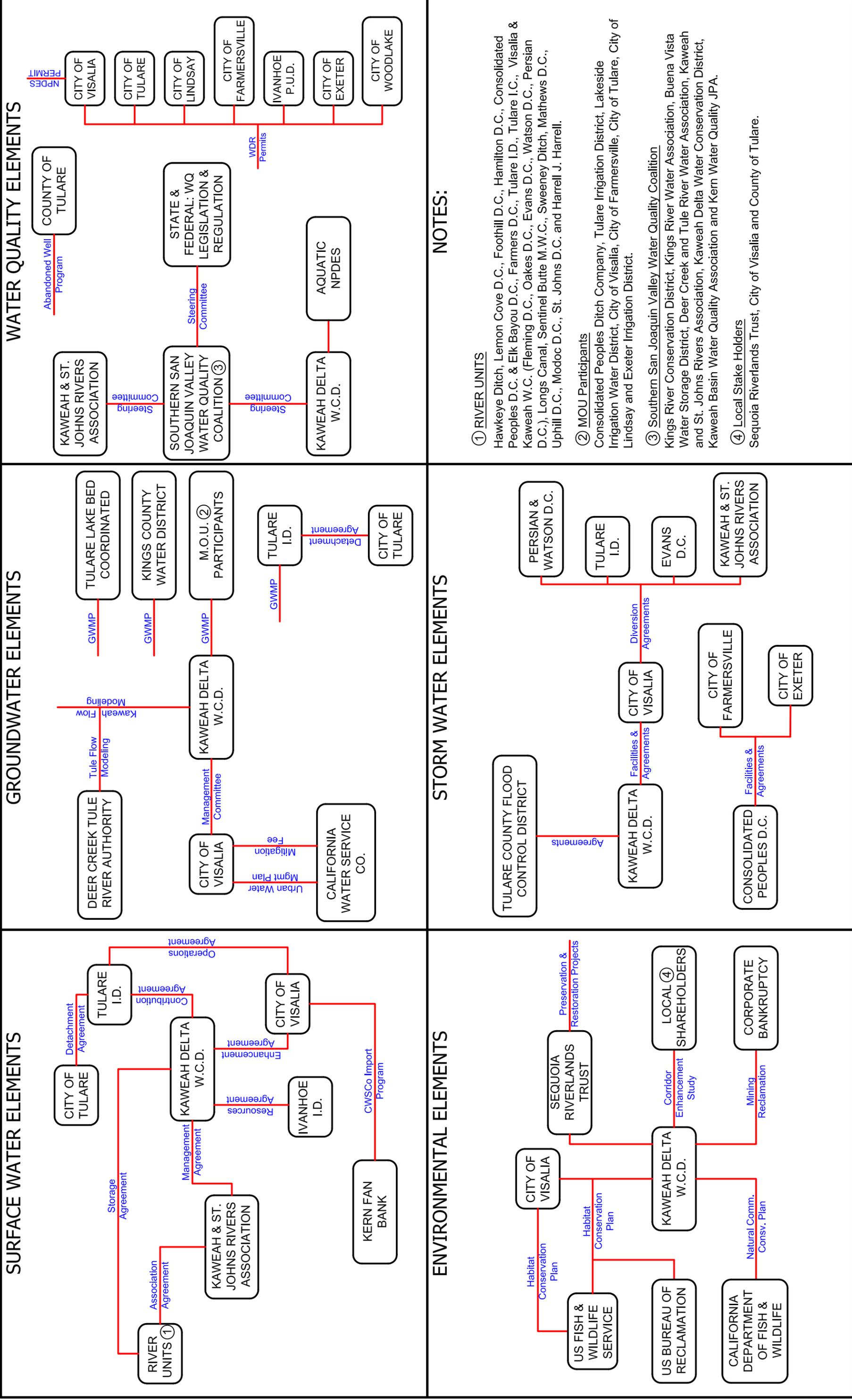
2.4.3 Projects Funding

On a parallel with project application funding, funding of the local matching share of individual projects has been a responsibility of the project advocate. In several cases, projects for which application has been made have more than one (1) beneficiary and, in such cases, a division of local share of costs occurs. The basis for this division of cost is founded in negotiations specific between the project advocates.

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KDWCD, as the lead applicant on behalf of other Memorandum of Understanding participants, has required financial assurance procedures prior to submittal of the funding application. In this fashion, both KDWCD, as the applicant agency and the body to which participation application is being made, can have reasonable assurance that the project applicant has the financial capability to satisfy the local share of funding requirements. The specifics of these funding procedures have been revisited on an application-by-application basis and it is anticipated that that procedure will continue into the future.

KAWEAH RIVER BASIN INTEGRATED REGIONAL WATER MANAGEMENT PLAN



CHAPTER 3

PLAN INTRODUCTION

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

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PLAN INTRODUCTION

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
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3.1 PLAN OBJECTIVES

The intent of this section is to specifically establish the intent of the Kaweah Delta Water Conservation District's (KDWCD) Integrated Regional Water Management Plan (IRWMP). The intent is to demonstrate to the interested public and to agencies of jurisdiction which regional water management issues the IRWMP is designed to address. The objectives for this IRWMP were formulated in the multiple meetings of the Kaweah River Basin IRWMP Stakeholders Advisory Group meetings. These objectives have been ratified, over time, by the Board of Directors of the KDWCD. Evidence of action with respect to these items is evident in the motions of the KDWCD Board of Directors, the annual budgets established by said Board of Directors and the nature of the projects undertaken within the IRWM planning area. These objectives were established independent of any specific project plans or plan related studies. Rather, the development basis is in conjunction with the underlying basis for water management projects and

studies leading to either the feasibility of or planning for water management projects. The objectives have not been established in any priority sequence, as flexibility has been demonstrated to need to exist between these items and issues based on either acknowledged current need for specific implementation of an element or a unique opportunity existing related to a particular objective such as a partnership opportunity or funding opportunity. In this random order, therefore, the objectives are set forth and described as follows, along with a specific example of the implemented objective:

3.1.1 Work Toward Achievement of Sustainable Balanced Surface and Groundwater Supplies

The issues of watershed conditions, water storage, water diversion, water delivery infrastructure and groundwater maintenance need to be addressed. As water demands are continuously evaluated, the need to augment naturally occurring groundwater recharge is evident and therefore additional water recharge capacity will be needed to meet future water demands. Existing diversion methodologies and delivery infrastructure will need to be as efficient as possible and balanced with conservation and recycling opportunities. Groundwater, the principal source of water supply for the entire Kaweah River Basin, is increasingly being pumped to meet agricultural, municipal and industrial demands. Included in this extraction process is that supply necessary to meet rural needs, both community and individual. Therefore, groundwater resources must be managed to ensure sustainability which is the expression of balance between extraction and recharge. As a

significant step in the pursuit of this objective, the KDWCD has developed and implemented a groundwater management plan which is SB1938 compliant.

3.1.2 Protect and Improve Water Resources through Land Use Practices

The nexus between land use planning, land use practices and water management, particularly with respect to water quality, is evident within the Kaweah River Basin. The issues of surface and groundwater contamination, flooding, groundwater overdraft, habitat alteration and erosion are all issues related directly to land use and land use planning. Pursuit of the objective to protect and improve water resources such as flows of the Kaweah River, sustaining historic levels of importation of Friant Division, CVP supplies, storm water and flood waters management, actions contrary to maintenance of the quality of ground and surface waters and decisions related to the location of housing stock are all of paramount importance. Improved land use practices, maintenance and enhancement of riparian habitats and farm practices and urban runoff practices which seek to minimize sedimentation associated with erosion, are elevated objectives. Sound land use planning which avoids placement of households and locations where the drinking water supply is known to be non-compliant with State and Federal drinking water standards is being highlighted as a land use practice which needs improved and more diligent implementation. Likewise, sound land use planning involves proper placement of industrial and commercial land uses that could jeopardize the viability of a currently compliant and viable water supply. In pursuit of this objective, land use

planning policies have been developed and included in the soon to be completed Tulare County Disadvantaged Communities Study, an effort covering the counties of Fresno, Kings, Kern and Tulare. The report effort has been supported by significant citizen input including individuals in both elected and appointed positions involving significant interface with land use policy development and enforcement.

3.1.3 Protection of Life, Structures, Equipment and Property from Flooding

While devastating flooding, as experienced in 1955, has a potential to be significantly reduced as the result of construction of both Terminus Dam and the groundwater recharge basins of KDWCD and other water management agencies within the IRWM boundary, the potential for flooding still exists. Issues related to flooding are damage to infrastructure, equipment and property from flood flows from uncontrolled channels such as Dry Creek and Lewis Creek and land and habitat alteration associated with those flood flows. While outside of the IRWM boundary, projects designed and managed to provide flood control to downstream landowners extending into the historic Tulare Lake bed, are of significance. The alteration of the spillway of Terminus Dam to incorporate spillgates, resulting in a significant increase in the flood storage capability of the reservoir is an example of the implementation of this objective.

3.1.4 Provide Multiple Benefits of Management of Water Resources and Related
Diversion and Conveyance Infrastructure

The involvement of KDWCD as the lead agency in both initial investigations of the Kaweah River Corridor enhancement procedures and, in recent history, development of specific projects designed to implement Corridor Study related objectives is a priority for KDWCD and its IRWM partners. The specific goals within the Kaweah River Corridor structure include water management, habitat restoration and storm water control. Pursuit of these goals in each project developed related to management of water resources is an objective of this IRWMP. The Paregien Basin Project, currently designed, funded and awaiting final permit authority from the U.S. Army Corps of Engineers implements each of the elements of this Plan objective.

3.1.5 Reduction of Contamination of Surface and Groundwater Resources

Reducing contaminants throughout the Kaweah River Basin will depend on improved methods of materials application and use of pesticides and herbicides, improved treatment and reuse of domestic and industrial wastewater from POTW systems and land use and development practices that incorporate Best Management Practices to deal with issues such as disposal of wastes from septic tank treatment systems and urban and roadside runoff. The KDWCD is a participant in the Southern San Joaquin Water Quality Coalition. The principal purpose of said Coalition is to identify

and either reduce below a harmful level or eliminate sources of contamination which jeopardize beneficial uses of both surface water and groundwater resources.

3.1.6 Meet Applicable Regional Water Quality Control Board Basin Plan Objectives

The numeric standards and the narrative objectives contained in the Basin Plan for Basin 5F are currently accorded significant status in project planning within the Kaweah River Basin. While all surface water directly diverted from the Kaweah River and its distributaries is diverted for beneficial purposes for either agricultural purposes or groundwater recharge, water quality parameters meeting beneficial use criteria are sought to be protected and enhanced by the water management planning activities conducted within the Kaweah River Basin. Improving and maintaining surface water quality requires coordination with procedures ongoing pursuant to the Irrigated Lands Regulatory Program of the Regional Water Quality Control Board and the implementation of Best Management Practices, both as they relate to irrigation related discharges and urban and County and State roadway systems related discharges. In addition, coordination with the County of Kings and the County of Tulare and the incorporated cities with respect to solid waste management is necessary in order to satisfy Basin Plan standards and objectives.

3.1.7 Management of Recreational Activities to Minimize Impacts on Water Resources

Recent water quality testing has demonstrated frequent, elevated and increasing occurrence of coliform contamination within the surface waters arriving at and coursing through the waterways within the IRWM planning area. While not of historic priority relative to planning activities, increased emphasis by regulatory agencies regarding coliform contamination is elevating the need to begin to address human related impacts, such as those related to recreation, on surface water quality. It is anticipated that future efforts related to this objective will focus on education. To this end, this topic has been added to the current educational outreach topics of the KDWCD.

3.1.8 Conserve, Enhance and Regenerate Riparian Habitats

One of the three (3) main objectives of the KDWCD's Corridor Enhancement process is to conserve, enhance and create native habitats. As such, each of the current projects under development by KDWCD has elements of conservation and enhancement of existing and development of new riparian habitats. Based on the KDWCD's development of a District-wide Habitat Conservation Plan and Natural Communities Conservation Plan, these objectives will continue to be in the forefront of the planning and construction activities related to water resources within the IRWMP planning area. The Work Plan documents related to both the Habitat Conservation Plan and the National Communities Conservation Plan and the Natural Communities Conservation Plan have

been approved by both the Federal Fish and Wildlife Service and the State Department of Fish and Wildlife. The KDWCD has currently budgeted \$1.5 million dollars of KDWCD funds to pursue completion of these plans.

3.1.9 Reduce Impacts and Optimize Benefits from Assisting Other Drought-Related Areas with Basin-to-Basin Transfers of Water

The KDWCD, as a member unit of the Kaweah & St. Johns Rivers Association (Association), is signator to a policy related to impact reduction resulting from out-of-basin water transfers. While it is the policy of the Board of Directors of KDWCD to assist other areas in need during times of extended drought, the District has executed the policy document of the Association related to mitigation of impacts and the approval process related to water transfers to out-of-basin entities. Adherence to this policy and ensuring that adequate facilities exist to accept return transfers in above-normal and wet conditions is and remains an objective of this IRWMP. In this year of extreme drought, a dry-year transfer of water program is being facilitated by the KDWCD. This program will benefit seven (7) Friant Division, CVP contract entities with a dry-year supplemental supply and will allow for the return of a multiple of the exchanged supply in future years, providing a supplemental benefit to the groundwater reservoir.

3.1.10 Evaluation of the Need for Supplemental Water Management Strategies Related to the Effects of Climate Change

The groundwater management efforts of the KDWCD are focused on the management of the variable flows from the Kaweah River watershed. These flows range from extreme drought conditions, such as that which existed in 1977, to extreme flood conditions such as that which existed in 1983. The objectives of the planning activities conducted by KDWCD and its partners under this IRWMP are examples of methodologies to deal with the variability of the Kaweah River hydrology, not respecting the basis. From its inception in 1927, to date, the KDWCD and its partnering entities have sought to implement projects which would augment groundwater supplies during less than normal to drought conditions and, in addition, to manage above-normal to extreme flood conditions which occur within the watershed. Whether the basis is climate change, or variability of the hydrology of the watershed, it is the objective of the KDWCD and its IRWM partners to manage to both of the extreme conditions, as well as the intervening conditions. The KDWCD currently has in excess of 5,000 acres of developed groundwater recharge basins and is working to develop another approximately 1,000 acres currently in owned inventory.

3.1.11 Optimize Efficient Use, Conservation and Recycling of Water Resources

Based on its enabling legislation, the KDWCD has sought to implement policies and procedures incorporating conservation as the main focus. Whether through education, demonstration such as xeriscape landscaping and objective groundwater recharge procedures, the District has sought out both policies and projects which optimize efficient use of available water resources, including conservation procedures. With respect to recycling, the KDWCD has and will continue to, pursue projects and programs with its partners and on behalf of its partners, which encourage recycling of both treated effluent and urban storm water related flow sources. As example, the KDWCD has developed and maintains the landscaping around the KDWCD office as a water efficient landscape example, educational tours are scheduled and conducted to provide interface opportunity to interested parties.

3.1.12 Identify and Promote Strategies for Hydroelectric Generation Facilities

The KDWCD, in partnership with the Tulare Irrigation District, has formed the Kaweah River Power Authority (KRPA). KRPA currently has one (1) generating unit off of Terminus Reservoir and is in the planning stages for a second unit. A copy of the most current study is available by contacting KRPA. While the hydroelectric facilities are mandated to run on irrigation release schedules, they nonetheless have the opportunity to generate electrical power based on the flow and head characteristics occurring on any

given day. KDWCD, as both an IRWM objective and as a partner in KRPA, will continue to explore opportunities to enhance the production of hydroelectric power while protecting the beneficial use of the water employed in generating such power. In addition, to the extent possible, KDWCD is looking to optimize power production through development and management of its storm water layoff and groundwater recharge facilities. It will be a continuing objective of KDWCD, through the implementation of the objectives contained in this IRWMP, to continue to seek those opportunities.

3.1.13 Evaluate and Modify Water Diversion and Conveyance Infrastructure

As an adjunct to one of its primary purposes of maintenance of natural channels for storm and flood waters conveyance capability, the KDWCD also looks for opportunity to improve the water conveyance infrastructure for member units of the Kaweah and St. Johns Rivers Association (Association) and for IRWM partners. It is an objective of this IRWMP to continue to seek out and implement such evaluation and improvement opportunities. As example, KDWCD manages its own Kaweah River and Friant Division, CVP water supplies and it also manages, under contract, the pre-1914 entitlements of the member units of the Association.

3.1.14 Promote City, Community and Regional Storm Water Management Plans

In cooperation with the Tulare County Flood Control District and the incorporated cities within its boundary, the KDWCD has as its objective the promotion of the creation and implementation of adequate storm water management plans. Directing agricultural, roadside and urban generated storm water flows to beneficial uses is an objective of this IRWMP. Planning related to evaluation of the impacts of pollutants carried with the storm waters is of ever increasing concern, particularly with respect to the potential beneficial use of the diversion of these waters for agricultural irrigation and also with regard to the impacts of the pollution on groundwater quality. It is an objective of this IRWMP to seek out reliable, cost-effective and pollution-reducing actions. The KDWCD has assisted in the preparation of several urban stormwater management plans. In particular, the KDWCD has contracted to develop Phase I of several such plans, dealing with water rights and flood release management issues, particularly release impacts on available channel capacity.

3.1.15 Increase Knowledge Regarding Groundwater Related Conditions and Establish Groundwater Management Practices

The KDWCD has an adopted Groundwater Management Plan (GWMP). In addition, the Tulare Irrigation District, wholly located within the KDWCD boundaries, has a separate Groundwater Management Plan, but is also signator to the KDWCD

GWMP. Both the KDWCD and the Tule River Basin have developed numeric groundwater models designed to offer a tool for management of water resources within each basin, to evaluate boundary conditions between the two (2) watersheds and to allow for specific impact analysis of proposed developments within the IRWMP boundary. It is an objective of KDWCD to work with its IRWM partners to further enhance understanding of groundwater and to further develop the tools necessary to improve that knowledge base. Ongoing activities with the City of Tulare and the City of Visalia, in conjunction with the California Water Service Company, are examples of opportunities to further enhance the groundwater modeling within the area, often specific to the land use and water planning efforts of IRWM partners. It is an objective of KDWCD to maintain their numeric groundwater model, its related database and to share same with water management partners within the Kaweah River Basin for the benefit of the groundwater resource.

3.1.16 Conserve and Restore Native Species and Related Habitats

As documented in Corridor Study related efforts of KDWCD, significant habitat alteration and loss of habitat has occurred, particularly along the corridor of the Kaweah River and its distributaries, over time. Distinct objectives have been established by Board of Directors of KDWCD and augmented in IRWM related partnerships with other signator entities to the IRWM Memorandum of Understanding to reverse this trend and incorporate into water management related projects, project elements to conserve,

enhance and generate new habitats. As a result, benefits are envisioned to accrue to species listed as both endangered and threatened as additional habitats will be developed, along with conserved areas for said species' use in both maintenance and augmentation of their levels of existence.

The established and operable Corridor Study objectives have three (3) principal components. These components build upon chosen property characteristics of being in the Kaweah River corridor, on soils with above-average to outstanding percolation characteristics and capable of diverting water from and returning water to the River or one of its tributaries. The components consist of the site functioning as a groundwater recharge site, a flood impact reduction site and a habitat restoration location. The flood impact reduction function principally involves urban and/or transportation facility flood/flood damage reduction capabilities. The initial site chosen to work through the issues related to development of such a site is the Oakes Basin.

3.1.17 Sustain Agricultural and Urban Viability through Effective Water Management

Given the significant competition for available surface and groundwater supplies, meeting of future water demands for both agricultural and urban uses will require changes in the existing water supply system. These changes potentially involve storage mechanisms, modifications of delivery infrastructure and improved on-farm and urban use efficiencies. It is the objective of this IRWMP to act as a catalyst for continued evaluation of the efficiencies of the storage and delivery systems and further to act in a

responsible agency role to encourage and implement improved on-farm and urban use efficiencies. As example, historical reclamation plans associated with sand and aggregate mine sites have focused on development of lakes. As the principal source of water supply for these impoundments is groundwater, the evaporative losses from the lake surface offsets other efforts of KDWCD to import and recharge water to the groundwater reservoir. Through the CEQA process associated with the issuance of permits applied for under the Surface Mining and Reclamation Act, KDWCD has been able to have these sites developed as “dry” sites, thus eliminating evaporative losses. In addition, the sites can then be utilized to capture non-storable storm and flood flows, detaining some until capacity develops in downstream recharge basins.

3.2 PLAN SCOPE

The purpose of this IRWMP is to delineate the pathways whereby potentially feasible opportunities, initiatives, programs or projects to improve water quality, augment water supply, conserve and improve habitat and deal with land use issues are presented in a fashion which represents the current manner in which these issues are being addressed. It is to further demonstrate the extent to which coordinated efforts take place in the implementation of local and State IRWMP goals and objectives.

The IRWMP further presents characteristics of the IRWMP area, its sub-watersheds, the geology and hydrogeology, the hydrology, the water storage and water

delivery components information related to water demands, water quality and the underlying nature of water rights. The IRWMP also presents the manner in which present and potential future policies, programs and projects are brought forward and evaluated and the relationship of these policies, programs and projects to the preservation and enhancement of the water resources available in the IRWMP area.

3.2.1 Water Resource Management Strategies

As the objective of the KDWCD Board of Directors is to continue to have the water management process be dynamic in nature, the water resource management strategies element of this IRWMP is designed to not only include those management strategies which are currently employed, but to look into the future as to both alternative and augmented strategies to optimize the management of available water resources. Specific details related to the vision for this process are as detailed in Chapter 9.

3.2.2 Evaluation of Water Supplies

The evaluation of water supplies takes on numerous forms within the IRWMP planning region. The KDWCD has an ongoing Kaweah River Basin-wide process, updated in approximate five-year increments, identified as its Water Resources Investigation. This process began in 1972 with an evaluation performed by Bookman-Edmonston Engineering and the current update is in the process of being prepared by the

KDWCD's geotechnical consultant, Fugro West, Inc. As will be detailed specifically later in this IRWMP, considerable attention has been given to the land use inventory element of the evaluation process which has resulted in improved accuracy of the water balance for the Kaweah River Basin. This updated land use instrument is currently being utilized by the consultant in the update to the Water Resources Investigation, improvements pursued in order to allow for more accurate determination of the water balance conditions existing within the Kaweah River Basin.

3.2.3 Water Quality Protection and Improvement

The KDWCD, in conjunction with the Association, are members of the Southern San Joaquin Water Quality Coalition (Coalition). The efforts of the Coalition are to track and provide comment with respect to regulations and legislation being generated related to both groundwater and surface water quality. In addition, the Association has been the lead agency in the implementation of the Irrigated Lands Regulatory Program which is in the process of being handed off to a newly formed non-profit corporation entitled the Kaweah Basin Water Quality Association. Said non-profit corporation is in the process of requesting acknowledgement as the third-party representative of the landowners/growers irrigating within the Kaweah River Basin and related upslope irrigated lands areas above the valley floor. This IRWMP will detail the efforts, goals and objectives of these parties as they pursue fulfilling their roles related to the various aspects of both surface and groundwater quality within the Kaweah River Basin.

3.2.4 Flood Control Planning

Along with groundwater management, a fundamental authorized activity of KDWCD is management of the flood channels within the KDWCD boundaries and acting as the principal in contracting for conservation space within Terminus Reservoir, which is principally a flood control facility. This IRWMP will detail the activities of the District with respect to its principal channel maintenance purpose, its ancillary activities related to both regulated and non-regulated storm and flood flows, as well as its involvement with the County of Tulare through the Tulare County Flood Control District. In addition, work with the incorporated cities within the KDWCD boundaries will be described, including those activities related to seeking to put to beneficial uses the waters generated in the form of urban storm water flows.

3.2.5 Planning Process, Public Education and Administration

Important to any regional water resources management structure are the considerations of the planning process, public education and plan administration. This IRWMP provides detail with respect to the planning process in a number of arenas. Be it adequacy of water supplies available to the Kaweah River Basin, both surface and groundwater related, processes related to land use planning or the planning of current and future activities, detail related to these activities are spelled out in specific sections of the

chapters of this IRWMP. Likewise, efforts related to public education, both in planning and implementation are detailed herein. As one of the principal functions of the KDWCD is education related to water management, it is relegated to a position of significance within this IRWMP.

3.3 REGIONAL PLANNING PROCESS

3.3.1 Resource Management Strategies

While normally exercised in an integrated fashion as a matter of practice within the KDWCD IRWMP area, the DWR IRWMP guidelines and Plan Review Process mandate visiting resource management strategies (RMS) as separate topics, prior to integration. As a result, the strategy specific to water management within the IRWM area will be visited within the IRWMP on both an individual, as well as integrated, basis. The RMS topics are structured by the referenced Guidelines around the California Water Plan Update. This IRWMP has been structured to satisfy the requirements of the referenced Guidelines with regard to the RMS, which are a part of current IRWMP activities.

3.3.2 Integration

Historically, the three (3) types of integration required by the IRWM Guidelines have existed within the conduct of the Kaweah River Basin IRWM structure.

Specifically, IRWMP elements, be they governance, stakeholder outreach, data management, project review or project selection, have been subjected to stakeholder and agencies of jurisdiction involvement, through a thorough dissection and summary of resources and project implementation. To date, the employed review and decision making processes are performed in accordance with the structure of the “deemed equivalent” IRWMP. Specifically, issues and items are brought to the table for discussion by KDWCD staff and consultants and IRWMP Stakeholders Advisory Group members, with the issues being addressed to a satisfactory conclusion. Recommendations then flow to the Board of Directors of KDWCD where adjustments to stakeholder and agency of jurisdiction inputs are considered in the IRWM structure and performance arenas. Similar pathways are established for issues related to RMS and project related funding and implementation procedures. It is the opinion of the Board of Directors of KDWCD that the IRWM Stakeholders Advisory Group continue forming, coordinating and integrating their separate positions and efforts to function in a unified basis in providing input and recommendation to KDWCD.

3.3.3 Study Grants

This IRWMP is being prepared by the KDWCD. It is being prepared in conjunction with a parallel plan for the Tule River Basin as many of the elements of the two (2) plans are common. Based on input from signator parties to the IRWM Memorandum of Understanding and with the recommendation of the Stakeholders

Advisory Group, a topic specific application was submitted for a planning grant under Round 2 of the Proposition 84 funding process. The KDWCD has received notice of award of said planning grant and is currently negotiating the contract related to same.

3.3.4 IRWMP's Relationship to Existing Water Management Plans

Additional coordination efforts take place on a frequent basis with the Kings River Basin group formed under a Joint Powers Authority agreement with their plan being identified as the Upper Kings Basin Integrated Regional Water Management Plan. Recent adjustments in boundaries are being discussed between the Upper Kings Basin IRWMP and the KDWCD IRWMP in order to address representation and project related concerns of participating entities in the IRWM process. Boundary adjustments have also occurred based on these specific areas where water management activities take place and, more particular, the specific source of the water being managed.

3.3.4 Consulting Team

Historically, review, modification and implementation of issues appurtenant to the KDWCD IRWMP have involved a number of consultants to KDWCD. The KDWCD's consulting geologist, Fugro West, Inc. plays a specific and significant role in the continued evaluation of Kaweah River Basin project related activities and maintains both the database associated with the numeric groundwater model and runs the numeric

groundwater model. Input from Provost & Pritchard Consulting Group and Keller/Wegley Engineering is employed on a regular basis, both with respect to policy development and input, as well as project development. Consulting activities are also undertaken by both firms with respect to KDWCD IRWMP activities and Tulare Basin JPA IRWM activities.

This documentation of the existing IRWM policies, procedures and actions was accomplished by Keller/Wegley Engineering. It should be noted that the preparation of this written plan involved only documentation of that which is currently of record. No additional policies or procedures have been generated as a result of the formal documentation of the KDWCD's "deemed equivalent" IRWMP.

3.3.6 Stakeholder Participation

As previously referenced earlier in this IRWMP and acknowledged with gratitude by the Board of Directors of KDWCD, literally hundreds of man hours have been invested by the IRWMP Stakeholders Advisory Group in addressing issues specific to the Kaweah River Basin and in developing, for consideration of action by the Board of Directors of KDWCD, draft policies and procedures, actions related to participation and funding and project evaluation and ranking.

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The standing KDWCD IRWMP Stakeholders Advisory Group consists of representatives from the following entities:

California Water Service Company
Center for Irrigation Technology, CSU-Fresno
City of Farmersville
City of Lindsay
City of Tulare (administrative and public works representatives)
City of Visalia (resource management and Engineering representatives)
City of Woodlake
Community Water Center
County of Tulare (Environmental Health, Executive Officer and Resource Management Agency representatives)
Deer Creek & Tule River Authority / Tule River Association
Department of Fish and Wildlife
Department of Water Resources
Exeter Irrigation District
Ivanhoe Public Utility District
Keller/Wegley Engineering
Kings County Water District
Provost & Pritchard Engineering Group
Quad-Knopf Engineering
Regional Water Quality Control Board
Santa Rosa Tachi Tribe
Sequoia Rivers Land Trust
Self-Help Enterprises
Tulare Basin Wildlife Partners
Tulare Irrigation District

3.4 REPORT ORGANIZATION

Utilizing a number of other IRWM prepared plans as a basis and the State IRWMP Guidelines wherein specific plan elements are prescribed and the evaluation of draft IRWMPs are outlined, a draft IRWMP Table of Contents was developed. Over the course of several meetings of the KDWCD IRWMP Stakeholders Advisory Group meetings, the Table of Contents was worked on and there was consensus reached with regard to same. The organization of this IRWMP is based upon that agreed to Table of Contents.

CHAPTER 4

DESCRIPTION OF PLAN AREA

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

CHAPTER 4
DESCRIPTION OF PLAN AREA

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
KAWEAH DELTA WATER CONSERVATION DISTRICT

4.1 GENERAL DESCRIPTION

The Kaweah Delta Water Conservation District (KDWCD) was formed in 1927 under provisions of the Water Conservation District Act of 1927. The purposes enumerated in the formation documents of KDWCD include conserving and storing waters of the Kaweah River and of conserving and protecting the underground waters of the Kaweah River delta.

KDWCD is located in the south-central portion of the San Joaquin Valley of California and, as shown on Figure 4-1, identified as the KDWCD Location Map, lies both in Tulare and Kings Counties. The total land surface area of the District is about 340,000 acres, with approximately 255,000 acres located in the valley floor portion of Tulare County and the balance, or about 82,000 acres, in the northeasterly corner of Kings County. The KDWCD boundaries are, for the most part, coincident with the

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Department of Water Resources Kaweah Sub-basin (Number 5-22.11) which is a subset of the larger San Joaquin Valley Hydrologic Unit. The Kaweah Basin groundwater unit boundaries are generally similar to the KDWCD boundaries, except for areas to the east and a small portion in the southwest corner near Corcoran, which falls within the Tulare Lake groundwater basin. It should be noted that the KDWCD boundaries are administrative and political in nature. They fall for the most part along township lines, county lines and adjacent surface water distribution entity boundaries. For the most part, they have no hydrogeologic significance. For purposes of this IRWMP, it should be noted that the IRWM functions are carried on outside of the boundaries of KDWCD, as certain of the Memorandum of Understanding signators, such as the City of Lindsay are external to the boundaries of the KDWCD. Figure 2 presents the current boundaries of the IRWMP and the boundaries of the adjacent IRWM entities.

Lands within the IRWMP boundary are primarily agricultural in nature, although the cities of Tulare and Visalia constitute significant areas of urbanization. Exeter, Farmersville, Lindsay and Woodlake are other incorporated areas. Smaller unincorporated rural communities include Goshen, Ivanhoe and Waukena. A high degree of development exists in the District with approximately 250,000 acres presently devoted to the production of a variety of irrigated crops and in excess of 46,000 acres of urbanized land.

U.S. Highway 99 is a principal traffic artery through the San Joaquin Valley. It crosses KDWCD in the middle in a north-south direction. The main line of the Union Pacific Railroad similarly crosses in a north-south direction, adjacent to Highway 99. The main line of the Atchison-Topeka and Santa Fe Railroad also traverses KDWCD in a north-south direction near its westerly boundary, as does State Highway 43.

The boundaries of KDWCD encompass the alluvial fan of the Kaweah River, extending about 40 miles in a southwesterly direction from the foothills of the Sierra Nevada Mountains on the east, to the central axis of the San Joaquin Valley, in the vicinity of the Tulare Lakebed on the west. The service area of the Kings County Water District lies at the west boundary of KDWCD and the Lower Tule River Irrigation District adjacent to the south. Its maximum dimension in the north-south direction is about 24 miles.

At McKay Point, a significant geographical feature immediately to the east of the eastern KDWCD boundary and about 1-1/2 miles west of the community of Lemon Cove, the Kaweah River divides into the St. Johns River and the Lower Kaweah River branches. It enters the KDWCD boundary as these two (2) channels. Within the KDWCD, the Lower Kaweah River branch divides into several distributaries. The main channel divides into Mill Creek and Packwood Creek just to the east of the City of Visalia easterly city limits.

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Numerous public and private entities within the KDWCD divert water for irrigation from the Kaweah River and its distributaries. About 250,000 acres within the KDWCD have access to surface water supplies from the river system and in excess of that acreage within the IRWMP boundary. Because of the erratic nature of flow within the Kaweah River, which varies substantially in magnitude from month to month and from year to year, nearly all of these lands obtain supplemental irrigation from groundwater. All municipal and industrial uses within the KDWCD are supplied solely from groundwater.

Terminus Dam and Reservoir, located on the Kaweah River about 3-1/2 miles to the east of the east boundary of the KDWCD, was completed in 1961 by the U.S. Corps of Engineers. This project was constructed for purposes of flood control just below the confluence of the middle, north and south forks of the Kaweah River with the East Fork feeding upstream into the Middle Fork. The reservoir does not include or receive water from the Dry Creek watershed which runs, uncontrolled, into the Kaweah River between Terminus Reservoir and McKay Point. The dam reservoir project also provides river control for irrigation purposes outside of the flood control months. The dam is an earth filled structure about 250 feet in height, with an initial reservoir capacity of about 142,500 acre-feet. KDWCD, acting as lead agency on behalf of the parties contracting for conservation space in the reservoir has satisfied a contract with the United States for repayment under Reclamation Law for the portion of the project costs allocated to conservation purposes. Fusegates were recently retrofitted into the Terminus Dam

spillway, enlarging the storage capability of Terminus Reservoir. The reservoir currently will hold approximately 186,500 acre-feet. The enlargement provides an estimated additional 8,500 acre-feet per year of irrigation water supply for the member units of the Kaweah & St. Johns Rivers Association.

The Friant-Kern Canal, a feature of the Federal Central Valley Project (CVP), traverses the easterly portion of KDWCD, delivering San Joaquin River water stored in Millerton Lake, located to the north. IRWM related entities which are contractors within the Friant Division, CVP include the KDWCD, the Exeter Irrigation District, the City of Lindsay and the Tulare Irrigation District. The City of Visalia also has the capability to receive delivery of water from the Friant-Kern Canal as a subcontractor to the County of Tulare. The County of Tulare is a contractor for an in-delta supply from the Sacramento-San Joaquin Rivers Delta, a portion of which can be delivered to the Cities of Visalia and Lindsay by means of an exchange agreement with the Arvin-Edison Water Storage District. This delivery is enabled by virtue of ownership of capacity in the Cross Valley Canal and by virtue of a wheeling agreement for the in-delta supply with DWR.

In common with other areas along the east side of the San Joaquin Valley, the lands within the IRWM boundary historically have experienced the anomaly of flood control problems, coupled with water deficiency. From time-to-time, flows in the Kaweah River reach damaging levels within the KDWCD boundaries, with substantial volumes of water escaping to flood vulnerable agricultural land in the Tulare Lake bed.

Since the construction of Terminus Reservoir, a high degree of river control has been achieved, thus substantially reducing the frequency of flood damage and by regulating seasonal runoff to satisfy peak summer irrigation demands. The recent addition to Terminus Reservoir improves the flood damage reduction capabilities, while improving the yield of the river for conservation purposes. The flood control system has yet, however, not been developed to a level where it will achieve a base 1 in 100 year return frequency level of protection.

4.2 RELATED COUNTY STUDY AREAS

For land use planning purposes, the County has developed several areas of differing geography for which they have developed land use plans. Two (2) of these areas interface with the KDWCD IRWM planning process. The first of these is the valley floor area which consists of the significant majority of the IRWMP area. This area includes all of the valley floor up to the 660 foot contour. The County of Tulare planning area immediately above the 660 foot contour is designated as the Foothill Growth Management Area. The County has prepared a specific land use plan with its own established set of rules and procedures to deal with land use proposals in these foothill areas. The KDWCD IRWMP does not contain any lands in planning areas other than these which are noted. The IRWMP for the Southern Sierra Nevada IRWM area interfaces with the balance of the land use planning instruments which the County has created and adopted.

4.3 BASIS FOR NON-AGRICULTURAL WATER DEMANDS

For purposes of this IRWMP, the basis of water demands remains identical to that developed by KDWCD for each of their adopted management plan elements. Whether the Groundwater Management Plan or the Water Resources Investigation, for example, is the plan-at-hand, the basis for non-agricultural water demands remains consistent.

This non-agricultural demand basis is divided into three (3) specific categories. It is noted here that each of these three (3) categories utilizes groundwater as either the sole, or principal source of supply. The first of these categories is urban demand. This demand has been defined as that which occurs in the incorporated cities of Exeter, Farmersville, Lindsay, Tulare, Visalia and Woodlake. The City of Lindsay is the only entity of these which incorporates treated surface water into their delivered supply.

The second category is that of public water system demand. The basis for the analysis of water demand for this category is the records of the Counties of Kings and Tulare and the State Department of Public Health. Each of the water purveyors in this category has a water supply permit from either a county jurisdiction or the State and is required to report total amounts of water produced from their various sources. With exception of the rural unincorporated community of Tonyville, each of these systems has groundwater as its sole source of supply. Tonyville is supplied with treated surface water from the Friant-Kern Canal, processed through a treatment facility owned by and

operated under State permit by the Lindsay-Strathmore Irrigation District. As with the urban water suppliers, detailed records are kept of water produced and delivered for each of these entities.

The balance of the non-agricultural demand falls into the category of rural domestic water demand. This demand consists of that from residences not served by a municipal connection, a mutual water company or another small public water system. Most such residences are served by small-capacity individual wells. Work has been accomplished, principally in the KDWCD Water Resources Investigation, to determine the number of rural residences in this category. While this work has resulted in an approximation of the water demand, work remains to be accomplished to refine this number to a level which can be considered to be an accurate estimate. At the current level of work accomplished, the information can, at best be categorized as satisfactory.

4.4 TOPOGRAPHY

The KDWCD IRWMP area is located on the east side of the south-central portion of the San Joaquin Valley. The area is characterized by low topographic relief, with variations rarely exceeding 10 feet except in stream channels. Elevations of the IRWMP area vary from about 800 feet above sea level at the boundary with the Southern Sierra Nevada IRWM planning area, to about 200 feet at the westerly boundary. Lands within

the IRWM planning area generally slope in a southwesterly direction at about 10 feet per mile, with this slope lessening as the westerly boundary is approached.

The southern end of the San Joaquin Valley, also identified as the Tulare Basin, is a closed feature without external surface drainage, except for extreme flood event occurrences. Tributary streams drain to depressions, the largest of which is the Tulare Lake bed, located west of the IRWMP boundary. The Kings, Kaweah and Tule Rivers and, on occasion, the Kern River discharge into Tulare Lake. These discharges occur at times when flows exceed the capacity of foothill reservoirs, the groundwater recharge basins and irrigation delivery systems and satisfaction of what irrigation demand exists during those event periods.

The east side of the San Joaquin Valley constitutes a broad plain formed by large coalescing alluvial fans of streams draining the western slope of the Sierra Nevada. The Kaweah River alluvial fan or delta, is separated from the large Kings River fan on the north by Cross Creek. On the south, Elk Bayou separates the Kaweah River fan from the Tule River fan. Cottonwood Creek, an intermediate stream between the Kings and Kaweah Rivers, discharges onto the inter-fan area of the Kings and Kaweah systems. The Kaweah River fan is characterized by a network of natural channels of the Kaweah River and its distributaries, as well as numerous canals constructed for irrigation purposes.

4.5 CLIMATE

The climate of the KDWCD IRWMP planning area is typical of the San Joaquin Valley, that being semi-arid and characterized by mild winters and hot, dry summers. Mean annual temperature for the City of Visalia is 62.5 degrees Fahrenheit. The average annual minimum and maximum temperatures are 50.3 and 75.5 degrees, respectively. For a central location within the IRWM planning area, such as the City of Visalia, the average yearly rainfall is 11.06 inches. Climate information appurtenant to the IRWMP is presented in Table 4-1.

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TABLE 4-1
CLIMATE DATA
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<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	<i>Annual</i>
2.10	2.09	1.87	0.92	0.39	0.14	0.01	0.04	0.22	0.59	1.22	1.47	11.06
45.8	51.4	55.9	60.9	67.8	74.7	79.3	77.9	73.1	64.9	53.0	45.2	62.5
54.7	61.6	67.3	73.9	82.0	89.7	94.6	93.1	87.8	78.7	62.6	54.7	75.3
38.4	41.9	45.6	49.1	54.9	60.8	65.3	64.1	59.5	52.1	41.6	37.3	51.0
0.76	1.67	2.88	4.15	5.75	7.01	8.07	7.19	5.05	3.30	1.78	0.78	48.39

Weather station ID 049367 *Data period: Year* 1971 *to Year* 2010 (1)
Visalia (86) Lindcove 1/05 12/10 (2)

Average wind velocity 7.5 *Average annual frost-free days:* 255
 (Ivanhoe Irrigation District, 2003)

4.6 LAND USE

Of significant value in water management planning, accurate data related to land use and, in particular, cropping types and number of crops per year are of extreme importance. Historically, the basis for computation of water demand for agricultural areas has been the information generated periodically by the Department of Water Resources (DWR). The last verified land use inventory for the KDWCD IRWMP planning area was accomplished in 2007. Presented, as Table 4-2, is a comparison of historical land use data for the KDWCD for a period beginning in 1958 and concluding with information for 2007. A more specific breakdown for the years 1981 and 2007 is presented in Table 4-3.

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TABLE 4-2
COMPARISON OF HISTORICAL LAND USE DATA
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KAWEAH DELTA WATER CONSERVATION DISTRICT

Land Use Category	1958 ⁽¹⁾	1968 ⁽²⁾	1981	1996	2007
	(acres)	(acres)	(acres)	(acres)	(acres)
Irrigated	224,800	255,900 ⁽³⁾	263,255	278,555	248,142
Idle or Fallow (including roads and canals)	39,100	27,900 ⁽³⁾	15,968	8,895	26,391
Urban	7,500	10,700	21,352	29,815	46,232
Farmsteads	3,500	4,500	10,397	12,008	10,730
Undeveloped	61,800	37,700	28,833	9,723	9,497
Totals:	336,700	336,700	341,786 ⁽⁴⁾	340,992 ⁽⁴⁾	340,992 ⁽⁴⁾

(1) By USBR and DWR.

(2) By KDWCD.

(3) Gross area; net cropped area is 245,680 acres.

(4) Total area based on GIS output does not equal calculated total. Difference is within 0.5%.

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TABLE 4-3
SUMMARY OF HISTORICAL LAND USAGE
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Category of Land Use	1981		2007	
	Acres	%	Acres	%
<u>Irrigated</u>				
Cotton	94,229	28%	19,048	6%
Alfalfa	33,977	10%	47,027	14%
Grain	65,062	19%	7,952	2%
Deciduous and Nuts	36,502	11%	57,747	17%
Pasture	8,873	3%	2,117	1%
Miscellaneous Field	2,911	1%	91,883	27%
Sugar Beets	1,869	1%	0	0%
Grapes	9,187	3%	6,742	2%
Citrus	6,337	2%	10,832	3%
Rice	313	0%	0	0%
Truck	3,995	1%	4,794	1%
Subtotal, Irrigated	263,255	79%	248,142	73%
<u>Non-Irrigated</u>				
Urban, Commercial and Industrial	21,352	6%	46,232	14%
Farmsteads, Dairies, Feed Lots	10,397	3%	10,730	3%
Idle (Fallow)	13,923	4%	20,906	6%
Roads, Channel and Canals	2,045	1%	5,485	1%
Undeveloped	28,833	8%	9,497	3%
Unknown	246	0%	0	0%
Subtotal, Non-Irrigated	76,796	23%	92,850	27%
Total	340,051		340,992	

Due to the importance of this information to an accurate determination of total irrigation demand and its related linkage to total groundwater extracted in satisfaction of that demand, the KDWCD recently undertook a sensitivity investigation principally dealing with field and row crops and a determination of the number of crops per year

grown of each type. This investigation has resulted in a determination that the historic basis of agricultural water demand computation utilizing of DWR land use data is not reflective of actual land use characteristics and is the principal reason for water demand computations not reflecting observed groundwater conditions within the IRWMP planning area. The sensitivity analysis procedures utilized satellite imagery, with a significant level of ground truthing, to determine if this alternative basis would result in a more accurate determination of agricultural demands and thus a more accurate determination of groundwater conditions within the KDWCD IRWMP area. This sensitivity analysis was completed in 2013 and resulted in additional work to determine if utilization of satellite imagery would result in more accurate information being available on a year-to-year basis, not just the single year which was initially evaluated. The conclusion of the second level of investigation was that it appeared that such accuracy and continuum of data would exist and the KDWCD Board of Directors has directed that this basis be utilized for the current update to the Water Resources Investigation. This update is currently in progress.

4.7 SUB-WATERSHEDS

While the Kaweah River and its distributaries are the dominant water feature in the KDWCD IRWM planning area, numerous sub-watersheds exist. Each of these sub-watersheds is located such that the fetch is exclusively in a rainfall area with snowfall typically not a regular occurrence and when occurring, limited to the upper several

hundred feet of the tops of the sub-watersheds. These sub-watersheds, listed north to south geographically include Cottonwood Creek, Dry Creek, Mehrten Creek, Yokohl Creek and Lewis Creek. The only sub-watershed with any appreciable annual flow is Dry Creek and the flows of said creek are added to the flows of Kaweah River in the apportionment of pre-1914 water rights to the member units of the Kaweah & St. Johns Rivers Association. While much less frequent in extending to any appreciable distance on the valley floor, flows of Cottonwood Creek which reach the confluence with the St. Johns River are also added to the Association's schedule and apportioned, but only to those member units downstream of what is referred to as the beginning of the "Cross Creek" segment of the river system.

4.8 GEOLOGY

The rocks that crop out in the KDWCD IRWMP planning area include a basement complex of pre-Tertiary age consisting of consolidated metamorphic and igneous rocks and unconsolidated deposits of Pliocene, Pleistocene and recent age, all of which contain fresh water. Consolidated marine rocks of Pliocene age and older do not crop out in this area, but are penetrated by wells in the subsurface. Because the water from these wells generally is brackish or salty, the marine rocks are not considered as part of the fresh-water reservoir and constitute the effective base of fresh water or, what is commonly referred to, as permeable sediments. Most of the groundwater pumped within the KDWCD IRWMP area is from the unconsolidated deposits.

Geologic units that affect the occurrence and movement of groundwater in the KDWCD IRWMP planning area are generally classified and described as follows:

1. Basement Rocks: Non-water bearing granitic and metamorphic rocks;
2. Marine Rocks: Non-water bearing marine sediments including the San Joaquin Formation;
3. Unconsolidated Deposits: Non-marine, water bearing material comprised of the Tulare Formation and equivalent units;
4. Alluvial Deposits: Coarse-grained, water bearing alluvial fan and stream deposits including older oxidized and reduced units and younger alluvium;
and
5. Lacustrine and Marsh Deposits: Fine-grain sediments representing a lake and marsh phase of equivalent continental and alluvial fan deposition.

A summary of the main geologic and hydrogeologic units adapted from a variety of sources is provided as Table 4-4.

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TABLE 4-4
Geologic and Hydrologic Units, San Joaquin Valley
Integrated Regional Water Management Plan
Kaweah Delta Water Conservation District

Generalized section of geologic units. Reported maximum thickness, in feet, is in parenthesis (adapted from Page 1986, table 2)		Hydrologic unit used in many reports such as Polan and Lofgren (1984)	Layers in digital flow model (Williamson and others, 1989)
Quarterly	Flood basin deposits (100) – Primarily clay, silt and some sand; include muck, peat and other organic soils in Delta area. Restrict yield to wells and impede vertical movement of water.	Upper water bearing zone ¹ ; unconfined to semiconfined	Layer 4 Many wells tap this layer; unconfined storage
	River deposits (100±) – Primarily gravel, sand, and silt; include minor amounts of clay. Among the more permeable deposits in valley.	Principal confining unit (modified E Clay) Absent	
Tertiary and Quarterly	Lacustrine and marsh deposits (3,600±) – Primarily clay and silt; include some sand. Thickest beneath Tulare Lake bed. Include three widespread clay units – A, C and modified E clay. Modified E clay includes the Corcoran Clay Member of the Tulare Formation. Impede vertical movement of water	Lower water-bearing zone semiconfined to confined. Extends to base of freshwater which is variable. Base of Freshwater	Layer 3 Many wells tap this layer; elastic and inelastic confined storage
	Continental rocks and deposits (15,000) – Heterogeneous mix of poorly sorted clay, silt, sand and gravel; includes some beds of mudstone, claystone, shale, siltstone and conglomerate. Form major aquifer system in valley.		Layer 2 Some wells tap this layer; elastic and inelastic confined storage
Tertiary	Marine rocks and deposits – Primarily sand, clay, silt, sandstone, shale, mudstone and siltstone. Locally yield fresh water to wells, mainly on the southeast side of the valley but also on the west side near Kettleman Hills.	Below the depth of water wells. In many areas, post-Eocene deposits contain saline water	Layer 1 No wells; elastic confined storage

¹The upper and lower water-bearing zones are undifferentiated where the modified E clay (includes Corcoran Clay Member of the Tulare Formation)

4.8.1 Basement Complex

The basement complex of the pre-Tertiary age consists of metamorphic and igneous rocks. They underlie the Sierra Nevada and occur as resistant inliers in the alluvium and as linear ridges in the foothills east of the IRWMP planning area. In the subsurface, they slope steeply westward from the Sierra Nevada beneath the deposits of Cretaceous age and younger rocks that compose the valley fill. Information in the GIS database indicating the altitude above or below sea level at which bedrock (presumably basement complex) has been reported by drillers or interpreted from electric logs. Additional database information indicates escarpments that are interpreted as buried fault scarps associated with the Rocky Hill fault. West of the escarpments, the slope of the basement complex steepens. In the Tulare Lake area, an oil-test well failed to penetrate the basement complex at 14,642 feet below sea level (Smith, 1964).

The basement complex is at shallow depths in the Lindsay, Strathmore and Ivanhoe areas and in the intermontane valleys where it is penetrated by many water wells. Near Farmersville and Exeter, the basement complex forms a broad, gently westward-sloping shelf overlain by 100 to 1,000 feet of unconsolidated deposits. In T17S/R24E (near Ivanhoe), the basement complex drops abruptly to about 2,000 feet below land surface, presumably due to faulting.

4.8.2 Marine Rocks

Along the east border of the San Joaquin Valley, Tertiary rocks, mainly of marine origin, overlap the basement complex and underlie the unconsolidated deposits. Croft (1968) suggests this unit may locally include beds of continental origin in the upper part. Inside the IRWMP boundary, the marine rocks do not crop out. The Tertiary marine rocks have locally been penetrated by oil- and gas-test wells in the east part of the planning area, range in age from Eocene to late Pliocene and consist of consolidated to semiconsolidated sandstone, siltstone and shale. They have traditionally been locally divided into several formations by geologist (Park and Weddle, 1959), but they generally contain brackish and saline connate or dilute connate water unsuitable for most uses.

4.8.3 Unconsolidated Deposits

The unconsolidated deposits in the IRWMP planning area are divided into several geologic units. In the Kettleman Hills, west of the KDWCD, Woodring et al. (1940) divided the unconsolidated deposits into the Tulare Formation and into older and younger alluvium. The Tulare Formation in the Kettleman Hills overlies the upper Mya zone (Woodring et al., 1940, p. 13), a fossil horizon at the top of the San Joaquin Formation. The Mya zone is reported in well logs beneath Tulare Lake bed and is a prominent marker bed outside of the KDWCD that separates the marine rocks from overlying continental deposits. The base of the unconsolidated deposits is projected by electric log

correlation from the upper Mya zone beneath Tulare Lake bed, eastward to the top of marine rocks. The unconsolidated deposits of this report are equivalent to the continental deposits from the Sierra Nevada of Klausning and Lohman (1964) and to the unconsolidated deposits as used by Hilton et al. (1963).

The unconsolidated deposits thicken from zero along the western front of the Sierra Nevada to a maximum of about 10,000 feet at the west boundary of the KDWCD. The unconsolidated deposits are divided into three (3) stratigraphic units: continental deposits, older alluvium and younger alluvium.

In the subsurface, the younger alluvium interfingers and/or grades laterally into the flood-basin deposits and into alluvium, undifferentiated. The older alluvium and continental deposits interfinger and/or grade laterally into the lacustrine and marsh deposits or into alluvium. In the subsurface, the older alluvium and continental deposits are also further subdivided into oxidized and reduced deposits on the basis of environment of deposition.

Unconsolidated deposits, which locally crop out at the IRWMP east boundary and extend beneath the valley floor, were eroded from the adjacent mountains, then transported by streams and mudflows and deposited in lakes, bogs, swamps or on alluvial fans. The lithologic and water-bearing characteristics of the deposits are dependent upon

several controlling factors, which include 1) environment of deposition, 2) the type of rock in the source area and 3) competence (or energy) of the streams.

According to Davis et al. (1957), oxidized deposits generally represent subaerial deposition and reduced deposits generally represent subaqueous deposition. Oxidized deposits are red, yellow and brown, consist of gravel, sand, silt and clay and generally have well-developed soil profiles. Reduced deposits are blue, green or gray, calcareous, and generally are finer grained than oxidized deposits and commonly have a higher organic content than the oxidized deposits. In some cases, the separation between the oxidized and reduced deposits can be identified on well logs based on lithologic color. Such delineation can of course be highly subjective. The coarsest grained reduced deposits were laid down in a flood plain or deltaic environment bordering lakes and swamps. Because of a high water-table in the east side of the IRWMP planning area, the sediments have not been exposed to subaerial weathering agents. The finest grained reduced deposits were mapped as flood basin, lacustrine and marsh deposits.

The oxidized deposits underlie the older and younger alluvium and throughout most of the KDWCD, the oxidized deposits are 200 to 500 feet thick. Based on work by Croft (1968), a structural contour map of the approximate base of the oxidized deposits has been prepared.

The oxidized deposits consist mainly of deeply weathered, reddish brown, calcareous sandy silt and clay and can, in most well completion reports, be readily identified when present. Beds of coarse sand and gravel are rare, but where present, they commonly contain significant silt and clay. The highly oxidized character of the deposits is the result of deep and prolonged weathering. Many of the easily weathered minerals presumably have altered to clay and, as such, are poorly permeable.

4.8.4 Lacustrine and Marsh Deposits

The lacustrine and marsh deposits of Pliocene and Pleistocene age consist of blue-green or gray gypsiferous silt, clay and fine sand that underlie the flood-basin deposits and conformably overlie the marine rocks of late Pliocene age. In the subsurface beneath parts of Tulare Lake bed, these beds extend to about 3,000 feet below land surface. Where the equivalent beds crop out in the Kettleman Hills on the west side of the valley, they were named the Tulare Formation by Anderson (1905, p. 181). The lacustrine beds and fossils of the Tulare Formation were mapped and described in detail by Woodring et al. (1940, p. 13-26) who considered the top of the Tulare Formation to be the uppermost deformed bed. Therefore, by this definition, all the deformed unconsolidated deposits would form the Tulare Formation.

In the subsurface around the margins of the Tulare Lake bed, the lacustrine and marsh deposits form several clay zones that interfinger with more permeable beds of the

continental deposits, alluvium, undifferentiated and older alluvium. Because of contained fossils and stratigraphic relations to adjacent deposits, these clays are considered to be principally of lacustrine origin. Clay zones are generally indicated by characteristic curves on electric logs and thereby facilitate some areal correlations between adjacent logs as shown in hydrogeologic cross sections. Although as many as six (6) laterally continuous clay zones have locally been defined in the southern San Joaquin Valley, only the most prominent of these clay zones known as the “E” Clay (or Corcoran Clay member) of the Tulare Formation is found within the IRWMP boundaries. Clay deposits are nearly impermeable and yield little water to wells and that which is obtained is generally of poor chemical quality.

The E Clay is one of the largest confining bodies in the area and underlies about 1,000 square miles west of U.S. Highway 99. The beds were deposited in a lake that occupied the San Joaquin Valley trough and which varied from 10 to 40 miles in width and was more than 200 miles in length (Davis et al., 1957). The first wide-scale correlation of the Corcoran Clay was made by Frink and Kues (1954).

The E Clay extends from Tulare Lake bed to U.S. Highway 99 and is vertically bifurcated near Goshen. It is about 140 feet thick near Corcoran and the average thickness is about 75 feet. The deposits near Corcoran are probably the thickest section in the San Joaquin Valley.

4.8.5 Reduced Older Alluvium

As previously mentioned, the reduced older alluvium is a moderately permeable arkosic deposit that is not exposed in the IRWMP planning area. It overlies the continental deposits, interfingers with lacustrine and marsh deposits beneath Tulare Lake bed and interfingers with alluvium, undifferentiated, north of Tulare Lake bed. Around the margin of Tulare Lake bed, the reduced older alluvium interfingers with lacustrine deposits.

The reduced older alluvium consists mainly of fine to coarse sand, silty sand and clay that were probably deposited in a flood plain or deltaic environment. Gravel that occurs in the oxidized older alluvium is generally absent. The deposits are sporadically cemented with calcium carbonate, according to logs of core holes made by geologists of the Bureau of Reclamation. Those descriptions imply, however, that the calcium carbonate is probably less abundant than in the underlying reduced continental deposits.

4.8.6 Oxidized Older Alluvium

The oxidized older alluvium unconformably overlies the continental deposits. The beds consist of fine to very coarse sand, gravel, silt and clay derived for the most part from granitic rocks of the Sierra Nevada. Beneath the channels of the Kaweah, Tule and Kings Rivers, electric logs indicate that the beds are very coarse. In the interfan areas,

metamorphic rocks and older sedimentary units locally contributed to the deposits and, in those areas, the beds are probably not as coarse as the beds beneath the Kaweah, Tule and Kings Rivers. Fine-grained deposits occur in the channel of Cross Creek.

East of U.S. Highway 99, the contact of the older alluvium with the underlying oxidized continental deposits is well defined in electric logs. Structure contours, based on electric log data, show the altitude above or below sea level of the base of the unit. The older alluvium thickens irregularly from east to west and probably has filled gorges cut by the ancient Tule River in the underlying oxidized continental deposits near Porterville. The base of the deposits occurs 195 feet below land surface near Exeter and declines to 430 feet below land surface near Visalia and Goshen.

4.8.7 Younger Alluvium

Younger alluvium consists of gravelly sand, silty sand, silt and clay deposited along stream channels and laterally away from the channels in the westerly portion of the KDWCD. Younger alluvium is relatively thin locally, reaching a maximum depth below ground surface of perhaps 100 feet. Except in the extreme easterly portion of the IRWMP area, it is generally above the water table and does not constitute a major water-bearing unit.

Soils developed on younger alluvium show little or no profile development and are generally free of underlying clay subsoil or hardpan. Because percolation rates through the younger alluvium are moderate to high, this deposit serves as a permeable conveyance system for recharge to underlying water-bearing materials.

4.9 GEOHYDROLOGY

In cooperation with the DWR, the KDWCD measures, tabulates and publishes water level data for as many as 400 water wells. Records for some wells extend back to the 1920s with most records for wells included in the KDWCD's groundwater monitoring program beginning in the 1950s. The quality of the data is considered excellent. From these data, changes in groundwater and storage can be estimated along with an analysis of water level conditions and trends within the KDWCD IRWM planning area. The KDWCD is divided into hydrologic units for ease in management of the data and analysis process which will be discussed later in this IRWMP.

A GIS database has been constructed, principally to be utilized in the operation of the KDWCD numeric groundwater model wherein calculations of storage changes and groundwater flow can be accomplished by integrating groundwater level elevation contour maps with specific yield data, aquifer properties and specific surface water delivery information by hydrologic unit area. A tabulation of the GIS layers is presented in Table 4-5. The KDWCD IRWMP benefits from a long-term water level measurement program of key wells in the IRWM planning area. Information from the KDWCD

monitoring program is provided to DWR for use in preparation of spring, unconfined aquifer system contour maps which are a routine DWR publication.

The water level database is posted on the DWR website and allows downloading of compiled hydrographs of key wells in the KDWCD IRWMP area for purposes of graphical display and analysis.

4.9.1 AQUIFER CHARACTERISTICS

4.9.1.1 Availability of Data

Hydrogeologic parameters of the aquifers and aquitards in the KDWCD IRWMP planning area include average specific yield values for the upper 200 feet of sediments and numerical values of transmissivity, hydraulic conductivity and specific capacity. For the most part, reliable coefficients of aquifer storage (storativity) can only be generated from controlled pumping tests with observation wells; few such data exist within the IRWMP boundaries.

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
 KAWEAH DELTA WATER CONSERVATION DISTRICT

Table 4-5
 Contents of GIS Database
Integrated Regional Water Management Plan
Kaweah Delta Water Conservation District

Theme	Source	Scale
County Boundary	USGS	1:100,000
Land Use ⁽¹⁾	CA DWR	1:24,000
District Boundary	KDWCD	Unknown
Urban Areas	TIGER ⁽³⁾	Varies
Roads	TIGER	Varies
Water Features (arc)	USGS	1:100,000
Water Features (poly)	USGS	1:100,000
Soils (STATSGO)	NRCS ⁽⁴⁾	1:250,000
Soil Survey Geographic Database (SSURGO)	NRCS	1:24,000
Precipitation	USGS et al.	1:1,000,000
Precipitation Stations	Fugro	1:1,000,000
Well Sites	CA DWR	Unknown
Wildcat Sites	Fugro	Unknown
Aerial Imagery	CA DWR/Fugro	N/A
Groundwater Basins	CA DWR	1:250,000
Cal Water Watersheds	CA DWR	1:24,000
Hydrologic Units	Fugro	1:220,000
Public Land Survey (sec)	CA DWR	1:100,000
Public Land Survey (t/r)	Fugro	1:100,000
Elevation	USGS/Fugro	1:24,000
Topographic Map	USGS	1:100,000
Topographic Map	USGS	1:250,000
Bovine Operations	Tulare County	Unknown
Poultry Operations	Tulare County	Unknown
Goat Operations	Tulare County	Unknown
Swine Operations	Tulare County	Unknown
Dairy Operations	Tulare County	Unknown
Dairy Operations ⁽²⁾	Kings County	N/A

- (1) Land use data available by county for several years
- (2) Kings County dairy data in image format
- (3) TIGER: United States Census Bureau TIGER file
- (4) NRCS: Natural Resources Conservation Service

Regional aquifer system numerical properties can be found in reports by Bertoldi et al. (1991), which provides average hydraulic conductivity values and storage coefficients for the entire Central (San Joaquin) Valley. For the most part, such data provide a broad range of aquifer numerical values that can be used for comparative purposes only. Within the KDWCD, focused studies at the Visalia Landfill (Malcolm Pirnie, Inc., 2001), for Tulare Irrigation District canal lining (B&E, 1997), for aggregate mining applications (Jones & Stokes Associates, Inc., 1997) and studies of the adjacent Tule Basin area (Naugle, 2001) provide a more applicable and narrower range of aquifer parameters. Harter (2002) also analyzed Southern California Edison (SCE) data (efficiency tests) for several hundred wells within the Tule and Kaweah River Basins and converted well-specific capacity data (typically based on a 1-hour pump test) to transmissivity using a conversion factor of 1,500 (Driscoll, 1987).

For purposes of calculating the seasonal volumes of subsurface groundwater flow within the IRWMP boundaries, the aquifer parameter of interest is that of horizontal hydraulic conductivity, typically expressed in feet per day (ft/day) or gallons per day per square foot (gpd/ft²). For an area as large as the IRWMP, which contains a heterogeneous mixture of aquifers, aquitards and aquicludes, the published values fall within several orders of magnitude (particularly considering the aquitard deposits). A summary of reference hydraulic

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
 KAWEAH DELTA WATER CONSERVATION DISTRICT

conductivity values (or permeability) is provided in 4-6 - Summary of Aquifer Hydraulic Conductivity Values.

Table 4-6
Summary of Aquifer Hydraulic Conductivity Values
Integrated Regional Water Management Plan
Kaweah Delta Water Conservation District

Reference	Aquifer System	Representative Horizontal Hydraulic Conductivity Values (gpd/ft ²)
CH2M Hill/Fugro West, Inc. (in Dames & Moore, 1999)	Semiconfined	750
Naugle (2001)	Alluvial unconfined Continental deposits, confined	70 to 1,000 7 to 80
Croft & Gordon (USGS, 1968)	Alluvial unconfined Continental deposits, confined	10 to 100 1 to 270
Alta Irrigation District Groundwater Model (Kings River Conservation District, 1992)	Semiconfined aquifer	80 to 1,270
USGS Central Valley Model (Bertoldi et al. 1991)	Confined aquifer	About 20
Ludorff & Scalmanini (in Jones & Stokes, 1997)	Alluvial unconfined	15 to 20
Schmidt (1994)	Semiconfined	10 to 200
Harter (2002)	Unconfined to Confined	1 to 750
Southern California Edison (July 2002)	Unconfined to Confined	About 100 to 1,000

As indicated in Table 4-6, the horizontal hydraulic conductivity values range from about 1 gpd/ft² for the confined aquifer found in hydrologic units west of U.S. Highway 99 to as high as 1,000 gpd/ft² in the easterly part of the IRWMP area. The published values are clearly gross estimates of this aquifer parameter.

Specific yield volumes for the KDWCD IRWMP area range from about 6.5 to as high as 13.7 percent. Calculations of the annual changes of groundwater in storage under the IRWMP planning area rely on these values. Estimates of the *total* volumes of groundwater in storage were similarly based on work by Davis, weighted according to the thickness and distribution of aquifers and aquitards

throughout the KDWCD. The application of such “average” values is considered an approximation only.

4.9.1.2 Aquifer Numerical Values

Most wells within the KDWCD’s water level measurement program provide excellent records of both Spring and Fall water level conditions and many contain measurements that extend back to the 1950s.

B&E (1972) provides some distinction between unconfined and confined water elevation surfaces within the KDWCD. The basis for such separation and which wells were used for contouring is not known. B&E also noted that “it was found that many of the wells measured drew from more than one aquifer system and water level measurements therein reflected a composite of the water levels.” As noted by Bertoldi et al. (1991), the regional groundwater flow pattern in the Central Valley is strongly influenced by numerous clay and silt lenses. Two concepts of flow are advanced that apply to the KDWCD. The concepts of flow consider: 1) an unconfined and confined aquifer system separated by a regional aquitards (such as the Corcoran clay) and 2) a flow system consisting of a single heterogeneous aquifer with varying vertical leakage. The latter concept is accepted to prevail based on the hydraulic response of the aquifers to pumping.

Many wells in the IRWMP boundary west of U.S. Highway 99 penetrate and perforate aquifers above and below the Corcoran clay and provide significant vertical leakage and hydraulic communication, which affects the pattern of groundwater movement and rates of regional recharge and discharge. An example of the significance of such direct leakage and communication between aquifers can be found in Malcolm Pirnie, Inc. (2001). The natural groundwater flow system has also been greatly altered by large-scale diversions and redistribution of surface water and conjunctive use programs.

For that portion of the KDWCD west of U.S. Highway 99, confined and semiconfined groundwater conditions also exist and, to the extent the piezometric surface in the confined aquifer (beneath the “E” clay or Corcoran clay) differs significantly from the unconfined water level surface, the total change of groundwater in storage considers storage changes in the confined (pressure) aquifer. The DWR prepared annual “pressure” system water level maps for the San Joaquin Valley through 1988. Pressure system contours were drawn by the DWR for the area surrounding and north of Corcoran; typically, only several pressure system contour lines were present for each year in this area. The KDWCD’s database information supports a more or less common water level between the two aquifer systems. Considerable interaquifer groundwater flow must occur between the two systems (via wells with perforations in both systems). Storage change calculations for the unconfined system is accepted as appropriate

for both systems and for the purpose of the water balance and perennial yield calculations.

4.9.1.3 Water Level Fluctuations

Specific to the KDWCD, aquifers occur in unconfined and confined states. Water levels in an unconfined aquifer system coincide with the top of the zone of saturation, where hydrostatic pressure is equal to atmospheric pressure. Seasonal water level variations in such systems are typically subdued. In confined or artesian aquifers, waterbearing materials are completely saturated and are overlain by confining materials of low permeability, such as clay and fine silt, and water within the aquifer is under hydrostatic pressure. The hydrostatic head, or pressure, in such an aquifer is reflected by the height above the confining stratum to which water will rise in a well drilled to the aquifer. With the exception of the eastern portion of the IRWMP area, water level variations display confined aquifer responses.

Because the alluvial and continental deposits in the KDWCD IRWMP area are characteristically heterogeneous in composition, containing individual strata of low permeability that generally exhibit little or no continuity, most aquifer systems are, in fact, semiconfined. Such aquifers respond to pressure

changes over short periods of time, but hydrostatic heads reach equilibrium with unconfined water table over extended periods of static, nonpumping conditions.

B&E (1972) provides a discussion of average coefficients of hydraulic conductivity values for “typical” aquifer systems in the KDWCD. These aquifer systems include the younger alluvium and older alluvial deposits associated with Kaweah River fan deposits and continental deposits both above and below the Corcoran clay (E-clay). Average coefficients of horizontal hydraulic conductivity in gpd/ft^2 were derived by B&E from a tabulation of pump test data from various sources including the USGS and from an independent review of SCE pump efficiency or hydraulic efficiency tests for about 200 wells in the KDWCD. The locations of such wells used by B&E are not provided. The USGS data referenced by B&E presumably derive from Croft and Gordon (1968). Aquifer parameter values used to evaluate subsurface flow are provided below in 4-7 – Aquifer Numerical Values.

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
 KAWEAH DELTA WATER CONSERVATION DISTRICT

Table 4-7
Aquifer Numerical Values
Kaweah River Basin
Integrated Regional Water Management Plan
Kaweah Delta Water Conservation District

KDWCD Hydrologic Unit No.	Aquifer System	Average Thickness of Saturated Aquifer (feet)	Average Coefficient of Permeability (gpd/ft²)
I	Older alluvium (oxidized)	150	750
	Older alluvium (residual)	50	500
II, III, IV	Older alluvium (oxidized)	250	500
	Older alluvium (residual)	250	250
	Younger continental deposits	150	150
	Older continental deposits	800	70
V	Older alluvial deposits	150	250
	Younger continental deposits	150	150
	Older continental deposits	800	70
VI	Older alluvial deposits	100	250
	Younger continental deposits	200	150
	Older continental deposits	1,000	70

The values above were used with the KDWCD GIS database to calculate volumes of subsurface flow.

4.10 ECOLOGICAL PROCESSES AND ENVIRONMENTAL RESOURCES

4.10.1 Aquatic Sensitive Species

As the Kaweah River system is an ephemeral system, no fishery of any type exists in the river system below Terminus Dam. As the upper boundary of the KDWCD IRWMP coincides with the axis of Terminus Dam, aquatic species are limited to invertebrates inhabiting the River system and the manmade water distribution systems existing on the valley floor. As a part of the Association's management of the requirements of the Irrigated Lands Regulatory Program, routine samples have been taken of sediments throughout the IRWMP area and tested for toxicity. While these invertebrate species can tolerate some degree of physical disturbance, they have a very low tolerance for chemical molestation which has generated the need for periodic toxicity testing.

Throughout the entire historical test period extending from July, 2004 to date, a single location within the entire River distributary system has been identified as to having had a toxicity problem effecting invertebrates. This location is identified as Cross Creek immediately west of Highway 99. It has been determined that the toxicity occurrences were not as a result of irrigated agriculture operations, but rather herbicide application programs related to either the State of California and/or the Union Pacific Railroad. Studies are ongoing with respect to the source(s) of the contamination.

4.10.2 Freshwater Habitats

As previously noted, the climate characteristics of the KDWCD IRWMP area are semi-arid. This fact, coupled with the ephemeral stream nature of the Kaweah River system, has led to freshwater habitats existing in only a few locations. In the easterly portion of the IRWMP area, sand, gravel and hard rock mine areas in their reclamation phase provide the most significant freshwater habitat. In these areas, groundwater flows into the prior mine site areas and creates the subject habitat. The acreage of this type of habitat is likely to stabilize at the current level moving forward in the future, as current reclamation plans call for mine sites to be configured in a “dry” condition in reclamation, principally to avoid the negative impact of the considerable evaporation of groundwater which occurs off of these water surfaces, in perpetuity. A number of mine sites either are currently planned with this “dry” form of reclamation or are being planned in that configuration.

The second form of freshwater habitat which exists within the KDWCD IRWMP area is that related to golf course water hazards. The acreage of these hazards is relatively small and in some cases, these hazards are dried up in all but wet years due to the cost of the water to place in the hazards, as well as being a Best Management Practice as delineated in a particular area’s Urban Water Management Plan.

4.10.3 Areas of Special Biological Significance

A few areas of special biological significance exist within the KDWCD IRWMP area. Notably amongst these is the 324 acre Kaweah Oaks Reserve, managed by the Sequoia Riverlands Trust. This area is a remaining remnant of the Valley Oak Riparian forest and is managed to be preserved in that state. Complimenting that area is an 80 acre parcel on the south side of State Highway 198 which is owned and managed by KDWCD. It also is a remnant of the Valley Oak Riparian Forest, however, a portion of said site has been historically farmed. Steps are currently underway to restore the farmed portion of the site back to a riparian condition with the site to be utilized as a groundwater recharge and flood management facility, specifically to benefit the downstream areas of the City of Farmersville and the Linnell Farm Labor Camp. To the northeast of the Kaweah Oaks Preserve, a 1,440 acre site owned by the Lindsay-Strathmore Irrigation District and identified as Kaweah de Ranchos is a similar remnant of the Valley Oak Riparian Forest. Utilized by said irrigation district historically as its well field where water was extracted for agricultural purposes in the Lindsay-Strathmore area, litigation over groundwater mining and export ceased that operation with the advent of the Friant Division of the Central Valley Project. The irrigation district continues to own the property, maintaining it in its riparian state where the only activities are grazing of cattle on native pasture and a small area recently planted to walnut trees.

In the easterly portion of the IRWMP area, a few small examples exist, on private property, of the historic hog wallow, or mima mound characteristics which were typical of that area prior to land grading operations associated with irrigated agriculture.

The final example of an area biological significance is the 725 acre J.K. Herbert Wetlands Prairie which is located south of the Tulare-Lindsay Highway and is also owned and maintained by the Sequoia Rivers Land Trust. This area is described as a Wetland Prairie Grassland Habitat which also contains, in the southeastern portion, a number of vernal pools.

4.11 NATURAL HAZARDS REQUIRING EMERGENCY PLANNING

4.11.1 Severe Storms and Flooding

Compared to the balance of the continental United States, the IRWMP area is blessed with few natural disaster based events. Flooding events, however, do occur and are attenuated through two (2) basic management techniques. The first of these is the construction and recent enlargement of Terminus Reservoir and its related dam which has reduced the flooding impact on the Kaweah River fan to an infrequent and reduced – damage basis. Uncontrolled stream group related flooding, such as occurs during significant rainfall events on the Dry Creek and Lewis Creek watersheds brings rise to the call for assistance from the State Office of Emergency Services coordinated with the like

services division of the counties of Kings and Tulare. The KDWCD is in alert mode during these events as the entity operates, under contract with the Association, the management of flows in the valley floor natural channel system.

4.11.2 Earthquakes

While the KDWCD IRWMP area experiences a periodic ground trembler, there are no identified active faults within the IRWMP boundary. Reliance on the early warning system and post-event notification process of the U.S. Geologic Survey is the most noted service related to earthquake based events. As with the flood events, emergency steps taken in response to damaging earthquakes would be coordinated through the Office of Emergency Services.

4.11.3 Fire

While the area easterly of the east boundary of the KDWCD IRWMP is subject to fire threat and periodic fires of both human and natural origin, the actual IRWM area sees household and business structure fires and a periodic stacked hay fire. These events are controllable without area-wide catastrophic effects as would be experienced if the area were forested. Services of both the County of Tulare and the County of Kings through

their county based systems, as well as the State of California through the CalFire Division are the principal responders for suppression of fires within the area.

4.11.4 Drought

As is currently being demonstrated, the only proactive responders to drought conditions, from a management perspective, are the local water management agencies. No assistance is provided to the IRWMP service area by any State agency, other than, based on the Governor's declaration of a drought situation, low interest loan financing for agricultural operations. The majority of drought related planning is the advance groundwater recharge efforts which are undertaken by the water management agencies within the IRWMP boundaries seeking to mitigate the effects of drought by having the maximum volumes of water in storage in the groundwater reservoirs during the drought condition period.

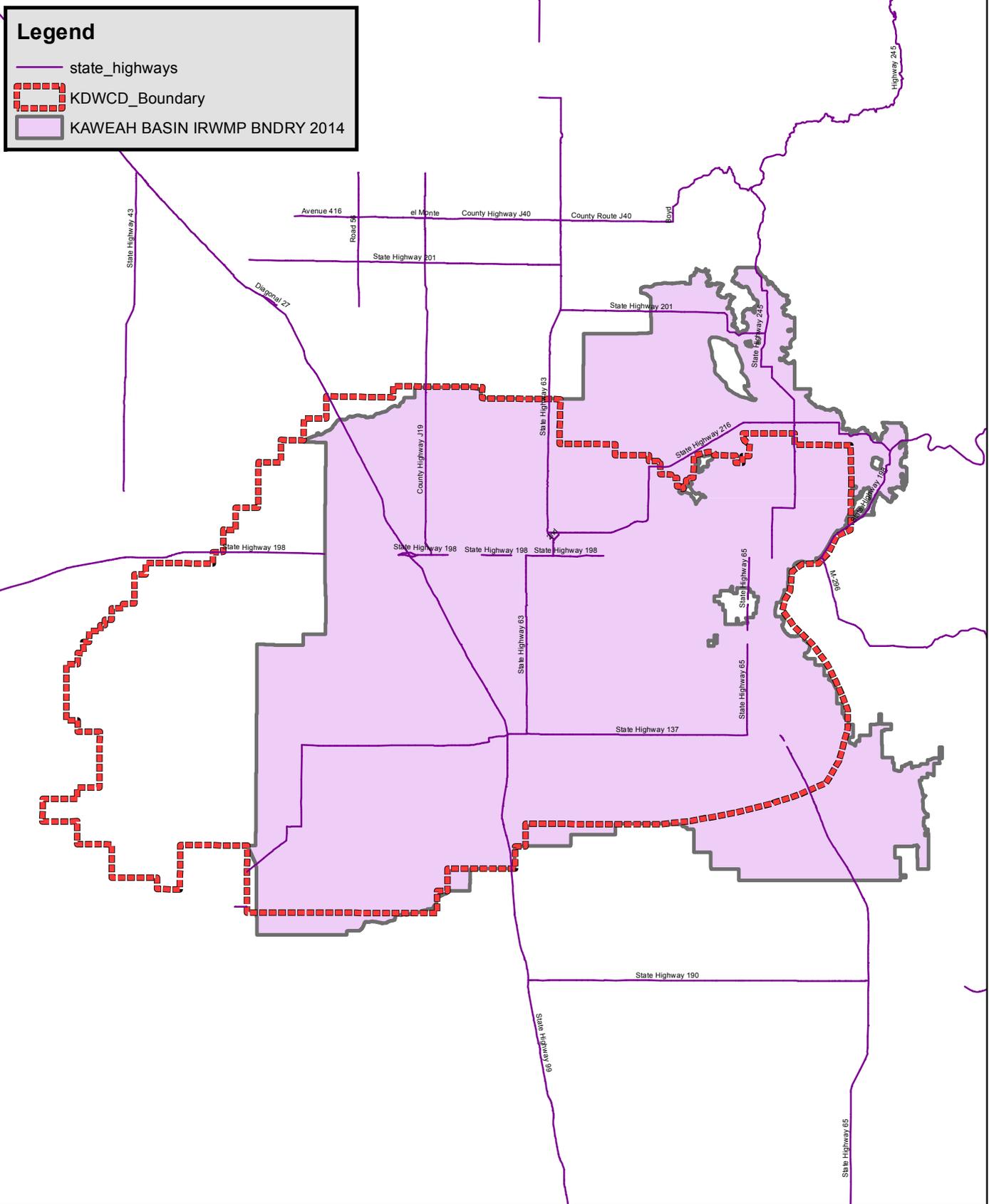
Consideration of lack of surface water supply is typically only taken into account with respect to the individual agricultural operator, as there is no land use planning in the agricultural segment by an agency of jurisdiction which considers the adequacy of water supply as a management consideration.

Only recently and based on invoking State-level legislation, has the issue of adequacy of water supply for subdivision, commercial and industrial development

proposals been a consideration. Current requirements call for indication to be given to land use planning decision makers with respect to the adequacy of water supplies for proposed developments, prior to development plan approval.

Instruments currently exist, thought to be of adequate capability, to be incorporated into local groundwater management plans to address water supply adequacy issues during drought conditions. It is only of late that serious discussion has taken place with regard to initiating an evaluation of the adequacy of the base from which groundwater control decisions would be made by local governing agencies. It is specifically for this reason that the KDWCD Board of Directors has embarked on improved methodologies for estimating water use and water balance within the Kaweah River Basin and look to provide additional information to water users within the Kaweah River Basin with respect to water use and water balance.

FIGURE 4-1



S:\KDWCD\IRWMP\Figure 4-1 District Boundary.mxd



DISTRICT BOUNDARY

KAWEAH RIVER INTEGRATED WATER MANAGEMENT PLAN

KAWEAH DELTA WATER CONSERVATION DISTRICT

KELLER/WEGLEY

CHAPTER 5

**HISTORY OF WATER AND
WASTEWATER MANAGEMENT**

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

CHAPTER 5
HISTORY OF WATER AND WASTEWATER MANAGEMENT

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
KAWEAH DELTA WATER CONSERVATION DISTRICT

5.1 KEY WATER MANAGEMENT MILESTONES

5.1.1 Terminus Reservoir

Lake Kaweah is located on the main branch of the Kaweah River about 20 miles east of Visalia. Terminus Dam, built in 1962 by the U.S. Army Corps of Engineers (USACOE), provides flood protection and irrigation water to downstream interests. The earthfill dam is 250 feet high and has a gross pool elevation of 694 feet mean sea level (m.s.l.), originally providing 142,000 acre-feet of storage capacity. Lake Kaweah inundated approximately 1,945 acres at maximum pool, flooded nearly 5 miles of river and varied from 700 to 9,000 feet wide.

The Southern California Edison Company owns and operates three (3) small hydroelectric plants upstream from Terminus Dam. In addition, the Kaweah River Power Authority operates a 17-megawatt hydroelectric power plant which was retrofitted to Terminus Dam in 1990.

Terminus Dam was authorized by the 1944 Flood Control Act. The total gross reservoir capacity at construction was 150,000 acre-feet with 142,000 acre-feet reserved for flood control and irrigation water supply and 8,000 acre-feet to store sediment. When constructed, the frequency of uncontrolled spills from Terminus Dam was at about a 60-year event. Revised hydrologic information, however, showed that the frequency of uncontrolled spills from the Dam was about a 46-year event.

As a result of that analysis, a project was undertaken, recently completed and now in operation which raised the water level of Lake Kaweah by 21 feet. This was accomplished by retrofitting the dam spillway with tilting concrete fusegates, six (6) in number. When flows cause the level of Lake Kaweah to rise to 715 feet m.s.l., the first fusegate tilts and is displaced from its position and swept downstream. In the process, the fusegate is destroyed, breaking up into smaller sections. Relief is provided to the dam by the increased area for flows to be directed. If flows continue to increase and the water elevation continues to rise, the remaining five (5) fusegates tilt and are displaced in a sequential fashion until the spillway is back to its original configuration.

As a result of the construction, total lands acquired were approximately 620 acres, including 370 acres which is inundated in the reservoir area. The Highway 198 bridge over Horse Creek was rebuilt at a higher elevation immediately upstream of the then existing bridge. Vault toilets were relocated, existing boat ramps extended and a new launching ramp area was created and constructed. Additional property related activities were undertaken including acquisitions, protection levees, road elevation increases and dwellings purchased and removed.

The project resulted in an additional gross storage increase of 42,600 acre-feet. Downstream flood protection levels were increased to above the 60-year event and an additional safe yield of 8,500 acre-feet was developed.

5.1.2 Friant Division, CVP

In 1933-34, when the State of California could not find enough takers to buy revenue bonds to complete the California Central Valley Project Act, it went to Washington seeking assistance. The passage of the Rivers and Harbors Act of 1935 by the Congress put funding under Federal direction and construction under the USACOE. By order of the President, \$20 million was transferred from the Emergency Relief Act Fund to the Department of the Interior, Bureau of Reclamation (Reclamation), for construction of Friant Dam and other initial features on September 10, 1935. The President signed the Act later that year.

Between 1935 and 1940, the population of the San Joaquin Valley exploded: Tulare County increased by 38.4 percent, Kings County by 38.5 percent and Kern County by 63.6 percent. Reacting to a wartime demand, cotton became California's outstanding crop by the mid- 1940s, displacing citrus. The lands of the Friant Division were no different, as cultivating and picking cotton drove each of the four counties' economies. Almost a half-century later, by the 1990s, approximately 15,000 small farms, averaging 63 acres each, were spread throughout the Friant Division.

Estimated cost of the Friant Dam and Reservoir came in at \$14 million, the Friant-Kern Canal came in at \$26 million and the Madera Canal was \$3 million. The Water Project Authority represented the State of California in negotiations with the Federal Government. In March, 1936, the Authority signed a cooperative agreement with the United States creating three (3) divisions, including Friant, for the Central Valley Project. Six (6) months later, the Authority approved Reclamation's prospective location of the Friant Dam and the Bureau's design of the dam and canals. Central Valley Project legislation was reauthorized as the Rivers and Harbors Act of 1937. Along with Friant Dam and the Friant-Kern and Madera Canals, initial major features authorized were Shasta and Keswick Dams, the Tracy Pumping Plant and the Delta-Mendota Canal. The amendment transferred a \$12 million authorization from the 1935 Rivers and Harbors Act earmarked for flood control and navigation to Department of the Interior. More importantly, the 1937 Act placed the CVP under Reclamation law. Additional funding

under the Rivers and Harbors Act of 1940 allowed for improvement of certain rivers and harbors in the interest of national defense.

To capture and control the San Joaquin River, Reclamation, in the mid- 1930s, designed a straight, 319-foot high concrete gravity dam that would impound a half-million acre-feet of flows from the river. The first surveys for the Friant Dam commenced in November 1935 and studies of where to excavate for two (2) delivery canals followed in early 1936.

Because of the dual complexities of moving water from one watershed to another and diverting the natural flow of the San Joaquin, a number of water rights claims had to be settled before construction progressed. California water law provides for riparian rights entitling a land owner on a stream to the full beneficial use of the stream's natural flow. Reclamation could not divert water away from a stream until it settled the question of downstream water rights. Reclamation settled negotiations with the holders of the largest water rights claims on the San Joaquin in the spring of 1939.

Friant Dam was located on the San Joaquin River, 25 miles northeast of Fresno, California. Completed in 1942, the dam is a concrete gravity structure, 319 feet high, with a crest length of 3,488 feet. The dam controls the San Joaquin River flows, provides downstream releases to meet requirements above Mendota Pool and provides flood control, conservation storage and diversion into the Madera and Friant-Kern Canals. It

allows for delivery of water to a million acres of agricultural land in Fresno, Kern, Madera and Tulare Counties in the San Joaquin Valley. The reservoir, Millerton Lake, first stored water on February 21, 1944. It has a total capacity of 520,528 acre-feet, a surface area of 4,900 acres and is approximately 15 miles long. The amount of flood control storage space is dictated by a USACOE Reservoir Regulation Manual.

In the Friant Division, there are three (3) separate river and canal outlets: the river outlet works, the Friant-Kern Canal and the Madera Canal. The river outlet works consist of four (4) 110-inch-diameter steel pipes through Friant Dam that are controlled by four (4) 96-inch-diameter hollow-jet valves at the outlet ends. The valves release water down a chute and into a stilling basin, which dissipates the water's energy. The capacity of the four (4) hollow-jet valves is 16,400 cfs, however, the flow through the valves seldom exceeds 100 cfs. Small releases to the River flow through two (2) 24-inch-diameter steel pipes branching from Penstocks 3 and 4. Releases are controlled by two (2) 18-inch-diameter needle valves at the outlet ends.

The Friant-Kern Canal outlet works are located on the left side of the spillway. They consist of a stilling basin and four (4) 110-inch steel pipes through the dam. These pipes are controlled by four (4) 96-inch-diameter hollow jet valves at the outlet ends. The hollow-jet valves release water down a chute and into a stilling basin, which dissipates the water's energy.

The Friant-Kern Canal carries water over 151.8 miles in a southerly direction from Millerton Lake to the Kern River, four (4) miles west of Bakersfield. The water is used for supplemental and new irrigation supplies in Fresno, Tulare and Kern Counties. Construction of the canal began in 1945 and was completed in 1951. The canal has an initial capacity of 5,000 cubic feet per second that gradually decreases to 2,000 cubic feet per second at its terminus in the Kern River.

More than 350 overhead and underground telephone lines, telegraph lines, power lines, and oil and gas lines were moved to higher elevations or relocated during construction of the Friant-Kern Canal. Heavy crawler tractors and bulldozers that were equipped with attachments to cut roots below the surface burrowed through vineyards and orchards. Along a 113-mile reach between the dam and the White River, more than 500 different structures, including overchutes, drainage inlets, irrigation crossings and turnouts were built. During construction, placement of concrete lining was aided by the use of a traveling gantry. Almost 85 percent of the canal is concrete-lined. In those sections, the canal's maximum top width is 128 feet, decreasing to a bottom width of 24 feet, with water depth dropping from 19.9 to 11 feet. In the earth-lined sections, water depth varies and the canal bottom width ranges from 64 to 40 feet.

5.1.3 State Water Project

The California State Water Project, commonly known as the SWP, is a state water management project under the supervision of the California Department of Water Resources (DWR). The SWP is the world's largest publicly built and operated water and power development and conveyance system. It provides water for drinking purposes to more than 23 million people and generates an average of 6.5 MWh of hydroelectricity annually. It is also the largest single consumer of power in the State with a net usage of 5.1 MWh.

The SWP collects water from rivers in Northern California and conveys it to water scarce, but populous areas to the south through a network of aqueducts, pumping stations and power plants. Approximately 70 percent of the water provided by the SWP is used for urban areas and industry and, Southern California and in the San Francisco Bay area. The remaining 30 percent is used for irrigation in the Central Valley and the Central Coastal Range. The SWP shares several facilities with the Federal CVP. Water is often interchanged between SWP and CVP facilities, as needed, to meet peak requirements for the separate project constituents.

With construction beginning in 1960, the SWP required the construction of 21 dams and more than 700 miles of canals, pipelines and tunnels. To date, the SWP has only delivered an average of 2.4 million acre-feet annually, as compared to total

contractual entitlements of 4.23 million acre-feet. Environmental concerns caused by the dry-season removal of water from the Sacramento-San Joaquin Rivers Delta have often led to further reductions in water delivery declarations.

In development for a number of years, ground was broken for Oroville Dam in 1961 and, in 1963 work began on the California Aqueduct and San Luis Reservoir. First deliveries to the South Bay area were made in 1962 with irrigation deliveries to the San Joaquin Valley by 1968. In 1973, the pumps and East and West branches of the California Aqueduct were completed and the first water delivered to Southern California. A Peripheral Canal which would have carried SWP water around the Sacramento-San Joaquin Rivers Delta, was rejected in 1982 by voters due to a combination of environmental and economic concerns. The Coastal branch was completed in 1997.

5.2 HISTORY OF WASTEWATER MANAGEMENT

5.2.1 Cities

In the late 1940s and early 1950s, population concentrations and single-family residential adjacencies worked to create a basis for review of use of septic tanks and subterranean disposal systems for the purpose of wastewater treatment and disposal. The primary agency of jurisdiction during the decade plus of initial planning was the Department of Public Health of the State of California. The agency acted in an advisory

and assistance role to bring about elimination of adverse contamination situations and, to a minor extent, the avoidance of new conditions of that type. Initial treatment processes utilized were typically primary in nature, with the majority employing Imhoff Tanks and ponding prior to either land spreading or discharge to adjacent waterways. The construction of collection systems associated with these treatment and disposal facilities were the primary objective as they conveyed sanitary sewerage and commercial wastewaters away from the sources of domestic supply which were predominantly individual groundwater extraction wells or small, stock mutual water companies. Groundwater levels, for the most part, were shallow with many individual wells being point driven, in lieu of being drilled. If sanitary seals existed, they were almost exclusively of the surface type. Both drinking water facilities and subterranean effluent disposal facilities were frequently subjected to inundation and saturation due to surface flood flows which occurred frequently during the winter months due to the concentration of housing along waterways and the lack of any storm or flood management capability.

Over time, these facilities began to be modified due to increased population and related connections. The water source orientation of the Department of Public Health was replaced with the pollution prevention and beneficial use protection orientation of the State Water Resources Control Board and its associated Regional Water Quality Control Boards. Staffing of the RWQCB was very limited into the middle 1970s with the Fresno office of the RWQCB having three (3) engineers on staff covering an area from Merced County south through Kern County and from the coast range to the Sierra Nevada's.

Introduction of objective standards and enforcement provisions embodied in waste discharge orders continued to take shape over time, bringing about changes in treatment methodologies which were utilized, curtailment of discharges to surface water bodies and brought the requirement and necessity for trained and experienced operators.

Availability of supplemental grant funding, beginning with Federal Public Law programs such as PL92-500 and supplemented with State grant funds, brought about an era of construction of treatment and disposal facilities not paralleled in any other time frame. In many cases, entities were able to secure funding for up to 97.5 percent of a total project's cost.

In addition to facilities planning, location planning also took a more prominent position beginning in the late 1970s. Facilities were located at a greater distance downslope from the city and/or community which they served in order to allow for growth between the population center and the treatment facilities. In some cases, this location was due to odor, fly and vector concerns which were all appurtenant to treatment and disposal facilities and their related operational procedures during this period of time. Over time, increased concern with respect to groundwater quality and receiving water quality has brought about improved treatment facilities, drastically altered facilities and procedures related to solids handling and disposal and the virtual elimination of discharge to receiving waters. In most cases, treated effluent is totally reused and put to beneficial use, in lieu of pumping groundwater.

This history applies to each of the cities within the Integrated Regional Water Management Plan (IRWMP) area of the Kaweah Delta Water Conservation District (KDWCD). Advanced secondary facilities now serve each of the cities within the IRWMP planning area including Exeter, Farmersville, Lindsay, Tulare, Visalia and Woodlake. Taking the next step forward, the City of Visalia has recently awarded contracts which will provide tertiary treatment to a portion of the existing plant inflow, will eliminate their discharge to the water body identified as Mill Creek and, in conjunction with the Tulare Irrigation District, will be constructing an intertie pipeline to put the treated effluent to direct use for agricultural crop irrigation and groundwater recharge. In exchange for this treated supply, the Tulare Irrigation District will be contractually assigning a portion of its rights to surface waters to the City to utilize for groundwater recharge purposes upslope of the City limits in order to offset a portion of the groundwater pumping which occurs as a result of the California Water Service Company's extraction of groundwater to meet the demands of the City residents.

5.2.2 Rural Areas

Paralleling the activities of cities within the IRWMP planning area, aggregations of houses and related commercial and industrial activities in the smaller unincorporated communities have followed suit with the cities. Treatment and disposal facilities were constructed beginning in the early 1950s which have been modestly upgraded since that

time. Qualified operational personnel are now a matter of fact, as is the relationship with the RWQCB with its related Waste Discharge Requirements. The facilities associated with these rural communities have been upgraded and enlarged on a much less frequent basis than the cities due, in large part, to the fact that most of the population growth has occurred within the cities. In some cases, the lack of size, but with adverse water quality issues to address, has brought rise to the County of Tulare constructing and operating facilities to the benefit of the residents of certain areas. The economics of these installations and of the dischargers is such that, however, the costs are currently being subsidized by the Tulare County General Fund, with costs reflecting the lack of economy of scale existing at either the city or larger special district operated systems level. At the current time, each of these systems is in compliance with the applicable orders which have been adopted governing both operational and discharge issues.

5.3 HISTORY OF INTEGRATED REGIONAL WATER RESOURCE MANAGEMENT

5.3.1 Interagency Planning and Integrated Water Supply Development

As introduced in Chapter 2 of this IRWMP, a significant level of cooperation, planning and joint water management exists. Many of the agreements which are in place call for routine meetings to take place, both of staff as well as of elected officials and adequately funded budgets accompany each of these efforts. As the current drought

situation is adequately demonstrating, the prominent position of water management of multiple types is front and center to parties such as elected officials, financing institutions, commercial and residential property developers and businesses looking to locate to or expand into the IRWMP planning area. As also discussed in Chapter 2, these efforts have been ongoing for decades and were not originally developed in an attempt to secure any available funding stream, but rather were constructed during a time when virtually no funds were available for water infrastructure development and local individuals felt that that paradigm was not going to change in the near-term. They proceeded to generate their own policies, procedures and efforts to implement structured water management within the IRWMP area. The same basis existed with respect to facilities construction with only those facilities related to flood control being funded by parties outside of the area. With respect to the development of facilities related to the availability of water from the San Joaquin River through the Friant Division of the CVP, significant debt was incurred by the property owners at the time when those contracts were signed. Now, some 60-70 years later, those debt instruments have been retired and new debt instruments are being generated as a result of the original infrastructure coming to the end of its useful life. Based on the critical nature of imported water supplies to the area, all elections to date to increase both land based assessments, and water based assessments pursuant to the implementing provisions of Proposition 218, have successfully passed providing a basis for development of adequate infrastructure in order to be able to enjoy the benefits of the imported water supply extending forward into the future.

5.3.2 Integrated Management of Resources and Operational Systems

As a result of costs associated with experienced personnel and, in some cases State licensed personnel, sharing of services is a routine matter, particularly with respect to the operations of many of the medium and small sized utilities. The cost of equipment and the proper maintenance of same has led to multiple sharing agreements wherein items of equipment such as sewer line cleaning machines, generators, backhoes and dump trucks are commonly shared between two (2) or more public agencies in order to have the equipment available, without the impact of having to bear the full cost.

Licensed operators, once solely dedicated to a single facility, now are being shared between facilities with several conducting ongoing education and experience programs in order to increase the number of operational personnel which are available.

A recent area of growth related to shared services is that associated with technology. Use of electricians experienced with the more sophisticated water pumping systems which are currently being installed, experienced machinists maintaining sophisticated metering equipment, cogeneration equipment and even in some cases, disinfection equipment, are significantly more common in recent years. The information technology segment exemplifies the most extreme of these situations wherein drastic changes have occurred in billing systems, accounting systems and human resources related systems, each of which is associated with software and hardware of varying

generations, but moving toward obsolescence over time. Sharing of expertise with respect to each of these systems is increasingly common amongst the water management agencies within the IRWMP area.

5.3.3 Integrated Management of Emergency Operations

Often led by management personnel of special districts or supervisorial personnel at the city levels, coordinated operations plans and agreements have been put into place with numerous agencies. Inventories of available equipment distinctly associated with each entity are shared so that each party is fully informed of the resources which are available and, in many cases, interagency cooperating agreements have been put into place, for the most part, to ensure priority to access emergency pooled equipment in the event of an emergency or disaster situation. Most of these agreements exist outside of structured emergency services coordinators which exist at both the County and State levels. The resources available to these entities are also tracked, but are supplemental to the local resources, in most cases.

5.3.4 Interagency Adaptive Management Response to Changing Circumstances

Previously noted was the current revamping of the City of Visalia wastewater treatment and disposal facilities and the relationship between the City of Visalia and Tulare Irrigation District. In determining to cease disposal of treated effluent into Mill

Creek, the City sought out a program which would not only help offset some of the increased costs associated with going to tertiary treatment and ceasing the surface water discharge, but also to effect an exchange whereby high quality surface water could be directed to recharge upslope of the City for beneficial recharge purposes.

In a similar fashion, the recently completed resource exchange agreement between the Ivanhoe Irrigation District and the KDWCD resulted in a multiple point resource exchange. Assignment of a portion of IID's Friant Division, CVP contract supply to KDWCD was accomplished, particularly the non-storable Class 2 supply. This supply is valuable to the KDWCD as one of its principal purposes is groundwater recharge and both the timing and cost associated with Class 2 supplies are in keeping with the financial capabilities of the KDWCD to continue these recharge efforts. In the exchange, IID received an assignment of a portion of KDWCD's storage rights in Terminus Reservoir, which they could utilize to store some of their entitlement from the Wutchumna Water Company, a supply which lacked capability to be stored from the springtime assignment of the entitlement until the summertime when growers preferred to take delivery of the supply to meet peak summertime demands. In addition, the high flow water right of the KDWCD and Longs Canal Company was assigned to IID to further improve their normal, below normal and dry year supplies. In all cases, the combination of the exchanged resources resulted in an improved dry year to normal year condition for IID and an improved groundwater augmentation position for KDWCD.

The circumstances which brought about these changes are very different in nature. On one hand, increasing regulatory requirements and associated cost were a prime set of factors in determining to eliminate the City of Visalia's discharge to Mill Creek. In the other case, impacts related to San Joaquin River Restoration, decreasing groundwater availability conditions and augmentation of dry year supplies were major factors in the IID/KDWCD resources exchange. It is a given that additional interagency efforts will be pursued in the future and like the two (2) referenced here, will have their own set of special circumstances bringing the parties together for joint benefit outcomes.

CHAPTER 6

**RESPONSIBLE ENTITIES, MAJOR
INFRASTRUCTURE AND WATER
SUPPLIES**

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

CHAPTER 6
RESPONSIBLE ENTITIES, MAJOR INFRASTRUCTURE AND WATER
SUPPLIES

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
KAWEAH DELTA WATER CONSERVATION DISTRICT

6.1 WATER SERVICE PROVIDERS

6.1.1 Domestic Water Service Providers

Based on the geographic coverage of the Integrated Regional Water Management Plan (IRWMP) of the Kaweah Delta Water Conservation District (KDWCD), there are numerous providers of domestic water service within the IRWMP area. The nature of these providers varies from municipal agencies to special districts to private stock mutual water companies to for-profit corporations.

Listed in Table 6-1 are the municipal suppliers and in Table 6-2 are the special district providers. In Table 6-3 the mutual water companies are presented and in Table 6-4 the for-profit corporations are listed. In each of these cases, the noted suppliers operate

under permit from either the county in which jurisdiction they lie or the State of California, Department of Public Health. Corporations have to address agency related issues for their water supply permit and the California Public Utilities Commission for their financial affairs and rates. The same is true of the private stock mutual water companies.

6.1.2 Irrigation Water Suppliers

As is the case with the domestic water suppliers, there are a myriad of entity types providing irrigation water. Some are public agencies and some are private stock mutual corporations. In the case of the private stock mutual, they are governed by their stockholders, however, are subject to the payment of both State and Federal taxes for profits gained as a result of the company operations. In some cases, private stock mutual corporations hold water rights directly and in others, hold water rights through an overlying mechanism, such as an association. Further, within the KDWCD IRWMP area, entities hold water rights on a pre-1914 basis to waters of the Kaweah River and/or have contractual rights to water made available through a contract with the United States for Central Valley Project water through the Friant Division. In addition, the City of Visalia is a subcontractor to the County of Tulare for water made available in the Sacramento-San Joaquin Rivers Delta which is exchanged into the area by virtue of the City's interest in the Cross Valley Canal.

Presented in Table 6-5 are the California Irrigation Districts, in Table 6-6 are the California Water Districts and in Table 6-7 are the mutual stock entities. The City of Visalia's position is not presented in tabular form as their delivered supply is to recharge in support of the systems operated by California Water Service Company.

6.1.3 Recreational Pools

As a part of the operations of both Terminus Reservoir and Success Reservoir, provision has been made for a portion of the conservation storage space to be assigned to a recreation pool designation. Water necessary to maintain each pool against evaporation losses is provided from the water rights held by the County of Tulare. While an in-depth presentation of current water rights is not an element of this IRWMP, the use of the County's rights for maintenance of these recreation pools is noted to be from rights which they hold which are of a pre-1914 nature. For the interested reader, the County of Tulare has previously directed the preparation of a water rights inventory detailing their contractual and river related rights, a copy of which can be obtained from the County.

6.2 OTHER WATER MANAGEMENT AGENCIES

6.2.1 Kaweah Delta Water Conservation District

As was noted in the introductory portion of this IRWMP, the KDWCD is the holder of a number of water rights, all of which are directed to the benefit of the groundwater underlying the KDWCD. The rights which the District holds are in the form of a Class 1 contract in the amount of 1,200 acre-feet and a Class 2 contract in the amount of 7,400 acre-feet. These contracts are with the United States through the U.S. Bureau of Reclamation for supply from the Friant Division of the CVP. The District is also a pre-1914 water right holder on the Kaweah River, having purchased the Lower River rights in the 1960s, with a perpetual payment due to Tulare Lake bed interests for that acquisition. The KDWCD has entitlement to all of the historic Lower River rights. This right is divided into both a lower Kaweah River right and the right from the St. Johns River.

6.2.2 County of Tulare

In addition to the referenced pre-1914 water rights held by the County of Tulare on both the Kaweah River as well as the Tule River, the County also plays separate water management roles. The first of these is acting in a master contract capacity for 5,309 acre-feet annually of CVP water supply in the Sacramento-San Joaquin Rivers Delta which is allocated entirely to subcontractors within the County. All of these subcontract assignments are permanent in nature, with exception of an allocation of 100 acre-feet annually which is temporarily assigned to the Saucelito Irrigation District. The County retains the conveyance rights in the Cross Valley Canal associated with this supply. The County is in the process of working with the U.S. Bureau of Reclamation (Reclamation) to permanently assign the subcontracted quantities on a permanent basis. The County would then withdraw from its contract position and each subcontractor would become a long-term contractor directly with Reclamation.

In addition, the County also acts in a role where they have worked to provide water supply, for domestic purposes, to specific disadvantaged rural areas. Within the KDWCD IRWMP area, the County performs this role for what is identified as the Wells Tract Zone of Benefit of County Service Area No. 1. This area is immediately easterly of the City of Woodlake and is provided with supply from said city. The responsibility, however, for maintenance of the distribution system and payment for the water supply, along with collection of monthly bills, has been assumed by the County. The County acts

in this capacity for a number of other disadvantaged community areas within the County, however, the balance of the areas receiving this service are outside of the subject IRWMP boundaries.

6.2.3 County of Kings

While not a direct player within the KDWCD IRWMP planning area, the County of Kings nonetheless performs a function which impacts water management within the IRWMP boundaries. Acting as a lead agency in the holding of contract water rights with the State of California, Department of Water Resources for State Water Project (SWP) supply, the County acts in an important position with respect to imported water. Groundwater conditions within the KDWCD IRWMP boundaries improved markedly post-1972 when the first Water Resources Investigation of KDWCD was performed. Deliveries of water to the SWP service area westerly of the IRWMP boundary bolstered the declining water levels in that area and thus retarded the outflow of groundwater from the IRWMP region to the west. This trend is now being reversed as the historical levels of entitlement have ceased to be made available to the County for delivery due to a myriad of conditions ranging from water quality to endangered species to drought. It remains to be seen whether or not historical delivery levels can ever be achieved again and to what extent the groundwater underlying the IRWMP boundaries are impacted.

6.2.4 Friant Water Authority

At the time of the development of the Friant Division, CVP by the United States, the operation of Millerton Reservoir and the Friant-Kern Canal were conducted by Reclamation. Based on policy directives generated by the federal government, and incorporated into the mission statement of Reclamation, private parties were sought out to take over the operation of federal facilities with the United States maintaining ownership. In the case of the Friant Division, the long-term contractors elected to form an organization specifically to contract for and deliver the administrative and operational functions associated with the operation of the canal and its related control facilities. The initial assumption of the Federal position was by the Friant Water Users Authority with the current organization, Friant Water Authority, being the successor organization. Under this paradigm, contractors have a direct relationship with the Friant Water Authority for day-to-day operations of the canal and the Authority has the day-to-day relationship with Reclamation. Reclamation continues to operate the Millerton facilities. A separate Authority has been formed by the Madera Irrigation District and the Chowchilla Water District to perform a similar function relative to the Madera Canal.

6.3 WASTEWATER SERVICE PROVIDERS

6.3.1 City Wastewater Systems

In a different fashion than a provision of domestic, commercial and industrial water supplies, the wastewater treatment and disposal facilities serving each of the cities within the IRWMP area are operated by these cities. In some cases, additional permits have been issued by the RWQCB for reclamation of treated effluent by individual parties acting under contract with a city for acceptance of treated wastewater for reclamation purposes. As detailed in Chapter 5 related to the history of wastewater systems development within the IRWMP area, these facilities are all under regulation of the RWQCB and are either of the secondary or advanced secondary treatment type, with the City of Visalia currently in the process of converting a portion of their facility to a tertiary level of treatment. In each case, the collection system serving the specific city is owned by the particular city and operated and maintained by their permanent staff.

6.3.2 Rural Wastewater Systems

Few rural wastewater collection, treatment and disposal systems exist within the IRWMP area. The Lemon Cove Sanitary District, the Ivanhoe Public Utility District and the Linnell Farm Labor Camp facility of the Tulare County Housing Authority are the principal systems in this category. In many cases, rural areas have been tied in with

municipal systems based on economic considerations, as well as staffing considerations. These areas include the El Rancho and Tonyville areas whose collection systems are tied into the City of Lindsay. The Goshen area is tied into the City of Visalia system with plans and studies underway related to other areas with this type of consolidation potential. The balance of the areas are on individual treatment and disposal systems, for the most part in the form of septic tanks and leach fields.

6.3.3 County-operated Wastewater Systems

The County of Tulare, as previously referenced with respect to providing governance for the Wells Tract area east of Woodlake in the form of County Service Area No. 2, operates a number of collection, treatment and disposal systems within the County. Among these systems, the system serving the hamlet of Tooleville, east of the City of Exeter, along with the sewer collection system of the Wells Tract area, tied to the City of Woodlake facilities, are administered by the County. Financial and day-to-day administrative duties are performed by County personnel, while field operations are performed under contract by for-profit licensed operators.

6.4 MAJOR INFRASTRUCTURE

6.4.1 Surface Water Storage Facilities and Associated Distribution Systems

The principal storage facility available to water rights holders within the KDWCD IRWMP area is Lake Kaweah. Impounded by Terminus Dam, this facility allows for conservation storage beginning with a ramp up period in March of each year and extending to full storage by April 1. The entire reservoir storage is available for conservation purposes from that date until November 1 of each year. Beginning November 1, the flood control diagram goes into effect and storage operations are at the direction of the U.S. Army Corps of Engineers. Significant coordination exists between said entity and the water rights holders, along with officials representing urbanized areas and landowners in the Tulare Lake bed.

With the recent modification of the spillway and the undertaking of the Lake Kaweah Enlargement Project, the reservoir now has the capability to store approximately 186,500 acre-feet, an increase of approximately 42,500 acre-feet over the prior storage capability.

Winter storage is a function of the watershed rainfall index with the available storage capped at 12,000 acre-feet, except as allowed by the U.S. Army Corps of Engineers. At times, encroachment into flood space is allowed if lack of rainfall and

snow accumulation dominate, with the capability to take the reservoir down to approximately 7,000 acre-feet in anticipation of extreme run-off conditions.

Additional storage is provided within the IRWMP planning area and certain identified basin facilities of water rights holders and in projects which are currently under construction. The capability to divert and temporarily retain flows has been mandated to be the reclamation plan for the Kaweah South Mining Project, the land title now having passed from private ownership to that of the KDWCD. Said project is located on the north side of the Kaweah River just to the east of State Highway 245.

Immediately to the south of said project on the other side of the Kaweah River, the KDWCD is constructing their Hannah Ranch Basin Project. Both of these facilities will have the capability to divert water from the Kaweah River and return said flows back to the river after a retention period. The entire diversion quantity to the Hannah Ranch Project site will be by gravity, with a portion of the Kaweah South site being able to be returned by gravity, with the balance having to be pumped back into the river, due to the depth to which the site will be mined.

The Tulare Irrigation District (TID) has incorporated balancing reservoirs into their system with the Creamline Basin being the principal facility. These basins are operated in conjunction with the KDWCD and also function as groundwater recharge basins. TID recently undertook expansion of this capability on in the form of the Plum

Basin site, which is immediately to the south of the Creamline Basin site. The Plum Basin Project was a cooperative project between TID and the City of Tulare as water recharge to the groundwater reservoir through said site accrues to the benefit of the City water supply wells.

Numerous other surface water entitlement holders within the IRWMP boundaries have small balancing basins which also act as groundwater recharge facilities. The volume of water retained/detained on these sites is small, as recapture for downstream irrigation deliveries is sought to be accomplished by gravity, eliminating the consumption of power associated with pumping for water supply retrieval.

A complex and extensive distribution network exists for delivery of accrued entitlement waters and purchased waters for import. This network also drafts supplies from the Friant-Kern Canal for contract holders within the IRWM area. A schematic of the surface water diversion and delivery system is presented on Figure 6-1. As can be seen from an examination of Figure 6-1, flows can be intercepted for delivery from controlled sources such as the Friant-Kern Canal and Lake Kaweah, but the delivery system also has the capability to intercept flows from unregulated sources such as Dry Creek, Yokohl Creek and Lewis Creek for delivery for beneficial purposes. This includes diversion into delivery systems for further diversion into groundwater recharge facilities whenever crop demands are insufficient to utilize all of the available supply.

As a final storage and distribution element, several of the local urban and rural unincorporated community storm drain basins have been retrofitted with recovery pumps. In addition to being able to allow for recharge of storm water runoff to the benefit of the groundwater reservoir, in certain locations, water can be recovered from these basin facilities and put to immediate beneficial use in assisting to meet on-farm demands. Where this recovery capability exists, it is appurtenant to a surface water delivery system either under control of a public agency surface water delivery entity, or a private stock mutual ditch company.

6.4.2 Flood Control Infrastructure

The flood control infrastructure within the KDWCD IRWMP area consists of two (2) principal components. The first of these is the stream groups component, of which the previously detailed Terminus Dam and Lake Kaweah are the principal components. The second component is channel capacity. As one of KDWCD's principal responsibilities includes maintenance of channel capacity of a number of the natural channels within the Kaweah River Basin, these waterways are integral to storm and flood waters management. For the most part, the maintenance activities are directed at maintaining channel capacity, eliminating interfering sediments and plant growth below the 50 percent depth of flow line, allowing flows to go further downstream. At that point, they are either available for diversion for beneficial use, or proceed to the Tulare Lake bed for storage until they can be retrieved for beneficial use. Long-term management of the

uncontrolled stream groups has brought about diversion of these channels into other facilities for purposes of beneficial use. Yokohl Creek flows, for instance, are diverted into the intake system of the Consolidated Peoples Ditch Company where they are diverted for satisfaction of crop demand, or placed in groundwater recharge basins allowing the water to percolate to the groundwater reservoir for beneficial uses of enhancement of the available supply and increased elevation of the water level, thus reducing extraction related power costs.

In rural unincorporated communities and throughout the urban areas, discharges of stormwater to natural channels are augmented by storm water basins which are of both the detention and retention type. In some cases, storm waters are placed into basins to retain them where they are later vacated from the basins, over time, by the combined effects of recharge and evaporation. In other cases, the waters are detained until they are displaced into an adjacent channel regaining the stormwater capacity of the subject basin.

Facilities of this type also exist within the IRWMP area associated with the roads and highways system. CalTrans has numerous basins within the area to which they discharge highway and freeway accumulated waters to direct them away from the highway environment for safety purposes. Likewise, in certain locals, the county roadway systems employ like basins where they receive water removed from county roadway environments, both for purposes of public safety and to extend the useful life of the associated roadway. In almost all cases, these roadway associated storm water basins are

of the retention type where the waters are not removed from the basin by any man-based action.

Another flood water associated vehicle which is in place within the KDWCD IRWMP area is the Warren Act Contract of Reclamation District No. 770. This contract is currently an annual contract between said reclamation district and Reclamation wherein waters which have been classified as damaging flood waters can be placed into the Friant-Kern Canal for delivery downstream to parties willing to accept said waters and put same to beneficial use. As the water rights subject to this removal from the Kaweah River Basin are those of KDWCD, their permission to pump these waters must be received, in addition to the consent of the Watermaster of the Kaweah River. Indication is to be given, by the Watermaster, that all beneficial uses within the Kaweah River Basin have been satisfied. Adjustments are included in the Warren Act Contract to compensate diverters from the Friant-Kern Canal for damages to groundwater recharge facilities if they are diverting for recharge purposes or compensation for increased treatment costs if a downstream contractor is diverting for purposes of treating water for drinking water deliveries. The current form of contract is being negotiated to move from a single-year contract to a 25-year contract. Considerable negotiation has surrounded this contract, principally due to water quality related concerns.

6.4.3 State Water Project Facilities

No facilities of the SWP are located within the boundaries of the IRWMP. The nearest facilities are on the west-side of the San Joaquin Valley with the nearest distribution system facilities being those of the Tulare Lake Basin Water Storage District. They are, nonetheless, of significant importance to the KDWCD IRWMP area as they provide the conveyance mechanism by which Feather River water is imported into the west-side of the Central Valley, offsetting the need to pump groundwater. Historical pumping in this area caused the condition of a strong groundwater gradient sloping to the west southwest, a condition which was abated when normal water deliveries were being made to the valley portion of the SWP service area. Recent curtailment of those deliveries has brought rise to increased west-side pumping again with results already coming to bear with respect to the return to aggravated groundwater slope conditions.

6.4.4 CVP Facilities

As shown on Figure 2-1, and schematically on Figure 6-1, the Friant-Kern Canal was constructed through the easterly portion of the IRWMP area. The highest percentages of annual delivery of San Joaquin River water are made into the contractor's service areas located within Tulare County. The KDWCD is one of these entities with the capability to divert at a number of locations. Approved locations for KDWCD diversions include Cottonwood Creek, the St. Johns River, the Kaweah River and Lewis Creek.

Facilities exist at each of these locations to allow the KDWCD to divert federal project waters at those locations.

A number of check facilities exist within the Friant-Kern Canal which assists with both in-canal storage operations, as well as diversions. These include the Dodge Avenue Check, the Kaweah Check and the 5th Avenue Check.

6.4.5 Water Treatment Facilities

Surface water treatment facilities exist in two (2) locations within the IRWMP area. The first of these serves the City of Lindsay and is a facility which has been in operation since the mid-1970s. The facility was constructed in three (3) stages with the first two (2) being filtration plants. Due to changes in the Surface Water Treatment Rule, a clarifier was subsequently added. Disinfection is accomplished by way of chlorination.

Over time, pockets of housing concentrations previously on non-compliant surface water and wells within the Lindsay-Strathmore Irrigation District have been added to this system. These include the Page-Moore Tract and the El Rancho area. These service extensions have eliminated two (2) non-compliant areas and now provide residents of these areas with water meeting State and Federal drinking water standards on a year-round basis. The second surface water treatment plant is located on the south side of the unincorporated community of Tonyville. This facility treats surface water off of the

Lindsay-Strathmore Irrigation District which is a pre-chlorinated supply to the facility. Due to DBP formation issues, studies are underway to either change the location of the source of supply for the treatment plant, or to abandon the treatment plant and construct a pipeline tying the area into the City of Lindsay facility.

A number of well-head treatment facilities exist within the IRWMP area. The majority of these are located in the City of Visalia and are a part of the California Water Service Company system serving the City. These facilities are primarily granulated activated carbon facilities designed to remove specific contaminants, such as remnants of dry cleaning fluid and pesticide and herbicide residuals resulting principally from urban storm water discharges.

With the anticipated establishment of a Maximum Contaminant Level for the contaminant 1,2,3-TCP, a number of other well-head treatment facilities will likely be constructed within the IRWMP planning area. Well facilities serving the Ivanhoe Public Utility District have been designed to avoid problems in the areas with nitrates, DBCP and EDB. Recent isolated aquifer construction designed to avoid these contaminants, however, was unsuccessful in avoiding contamination from 1,2,3-TCP. The most recent well site contains an adequate footprint to locate treatment vessels and litigation related to the presence of this material in groundwater is currently in process.

6.5 WATER SUPPLIES

The practice of conjunctive use is employed throughout the KDWCD IRWMP boundary. Groundwater is the principal source of supply for meeting all needs within the Kaweah River Basin, however, has been proven to be insufficient, over time, to satisfy all demands. The utilization of surface water flows from the Kaweah River to augment groundwater provides a substantial additional supply to the conjunctive use operations, however, has still proven to be insufficient to meet demands without overdrafting the groundwater supply. Within and immediately external to the IRWMP boundaries are a number of Federal contractors to the Friant Division, CVP system. The importation of contracted San Joaquin River water allowed the KDWCD to come within 18,000 acre-feet annually of being in balance when SWP deliveries were being made to what was considered to be at that time, a normal level. With the decline in the declarations of water supply to the west-side SWP contractors and the parallel condition for the west-side CVP contractors, it is anticipated that the westerly portion of the IRWMP area is now in a more significant overdraft condition. The commissioned KDWCD Water Resources Investigation update, currently in progress, will confirm the degree to which the overdraft conditions exist.

Described herein are the current sources of supply employed to meet demands within the Kaweah River Basin. They are presented in an order reflecting the quantities

supplied from each source in meeting the needs of water users within the IRWMP planning area.

6.5.1 Groundwater

Groundwater in all areas of the Kaweah River Basin represents the principal source of supply. Based on its fundamental charge, the principal activities of the KDWCD surround the groundwater conditions within the Kaweah River Basin and the augmentation, to the extent possible, of the groundwater reservoir.

In order to have a basis on which to properly evaluate groundwater conditions, KDWCD has historically divided the area within the KDWCD boundary into hydrologic units. Figure 6-2 presents the current divisions of the hydrologic units, which were modified in 2007. This modification was brought about by the input and output characteristics of the KDWCD numeric groundwater model and related database. The changes, for the most part, allow the hydrologic boundaries to follow the boundaries of surface water purveyors within the KDWCD and to be able to direct water entitlement and delivery information directly from the database into the model, by hydrologic unit.

In addition to the maintenance of the GIS database associated with the numeric groundwater model, the KDWCD conducts annual spring and fall groundwater measurements for a monitor well network covering the entire IRWMP area. Recently, the

area was expanded to the east and southeast as a result of cooperative work undertaken by the City of Lindsay, the State DWR and the KDWCD. Inventory work was accomplished on groundwater wells within the expanded area, including obtaining detailed well logs with sufficient lithology information to allow for expanded cell development within the model parameters. This effort not only resulted in the expansion of the capability to evaluate groundwater conditions, but also improved the boundary conditions associated with running the model to the east extending to the edge of the groundwater aquifer system. Wells have been added to the KDWCD's semiannual groundwater measurement effort and also to the State's CASGEM database.

The City Councils of both Tulare and Visalia have put into place policies dealing with the impacts on groundwater in agricultural to urban land use conversions. The majority of the lands surrounding both cities operate in a conjunctive use fashion and, when converted to urban development, change to exclusively being supplied by groundwater. While findings of both City Councils showed that the resulting per-acre water consumption is less in the urban configuration than the agricultural configuration, an impact nonetheless exists as the surface water is no longer delivered into the area. Impact fees, on a per-acre basis are now required at the time of annexation and are utilized by the cities to generate programs to construct facilities to introduce surface water into the groundwater in the impacted areas and to purchase surface water to introduce into these constructed facilities, along with natural waterways, if they exist in a location which impacts the developed area.

The already described project of the City of Visalia to exchange tertiary treated wastewater effluent with the Tulare Irrigation District for surface water entitlements to be recharged easterly of the City limits has been described, as has the programs of the City of Tulare to augment recharge east of the City in cooperation with TID.

As a demonstrable example of the extent to which conjunctive use is an important element within the Kaweah River Basin, the KDWCD currently has in excess of 5,000 acres of groundwater recharge capability. Not satisfied with that level of capability, the Board of Directors has purchased another approximately 1,000 acres and efforts are underway to develop said lands to recharge facilities to add those acres to the current 5,000 acre inventory. This acreage is exclusive of facilities of individual ditch companies and other surface water supply entities with regard to their specific recharge basins, unless they are joint operations with KDWCD. It also excludes urban and rural storm water control facilities which are used in the off-season as recharge facilities based on their availability, strategic location and soil characteristics.

6.5.2 Local Surface Water

The principal source of local surface water is directly from the Kaweah River. Added to the mean daily inflow of the Kaweah River in determining an allocation of daily entitlement, are flows of Dry Creek and Cottonwood Creek, if existing. The

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Kaweah River, as a designated tributary to the Tule River, has been declared to be fully appropriated by the State Water Resources Control Board. As such, unless a party can demonstrate the creation of new supply, the rights to the existing flow are held by the member units to the Kaweah & St. Johns Rivers Association and riparian landowners lying adjacent to the Kaweah River and its distributaries. As previously noted, the flows of Yokohl Creek, Lewis Creek and Mehrten Creek are all managed in a fashion whereby flows from these sources are incorporated into specific ditch company facilities and put to beneficial use. Except in extreme flood flow situations, no water is lost from the Kaweah River Basin and every drop is put to reasonable, beneficial use.

The entitlement to the flow of Kaweah River is allocated according to a schedule adopted by the member units of the Kaweah River Association and the St. Johns Rivers Association. Presented in Table 6-8 is a tabulation of the entitlement holders and the respective area which they serve by KDWCD hydrologic unit. As a note to the serious reader, the total of the acreage listed in this table exceeds the total acreage within the KDWCD. This is due to the fact that, in several instances, service areas of individual surface water providers have overlap based on growers having the capability to deliver surface water from more than the facility of a single special district and/or water company.

Other than the previously referenced treatment of Friant Division, CVP water by the City of Lindsay and the Lindsay-Strathmore Irrigation District, none of the

entitlement water of the local stream groups is made available for human consumption purposes. For the most part, this is due to the fact that the water is not available on a year-round basis and, in many cases, the flow of the river is for less than three (3) months and, periodically, even a shorter period of time. In its recent Master Plan Development, the California Water Service instructed the consideration of the inclusion of treated surface water as a potential source to meet future demands. It was concluded that, due to the distance from the Friant-Kern Canal to the City of Visalia and due to the lack of substantial volumes of water being available to satisfy even a six-month demand pattern, that surface water treatment was not a viable option.

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TABLE 6-8
HYDROLOGIC UNIT ENTITLEMENT HOLDERS
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Hydrologic Unit No.	Service Area Data	
	Entitlement Holder	Area (acres)
I (Eastern)	Exeter Irrigation District	565
	Hamilton Ditch Canal	348
	Ivanhoe Irrigation District	190
	Lindsay-Strathmore Irrigation District	1,043
	Longs Canal Area	948
	Sweeney Ditch Area	509
	Tulare Irrigation Company	371
	Unincorporated	11,430
	Wutchumna Water Company	930
	Unit I Total:	16,334
II (St. Johns)	Alta Irrigation District	2,045
	Goshen Ditch Canal	5,553
	Mathews Ditch Canal	1,824
	Modoc Ditch Canal	6,245
	St. Johns Water District	13,300
	Unincorporated Uphill Ditch	27,025
	Canal Wutchumna Water Company	1,812
	Unit II Total:	58,123
III (Visalia)	Evans Ditch Canal	3,975
	Fleming Ditch Canal	1,635
	Modoc Ditch Canal	214
	Oakes Ditch Canal	790
	Persian Ditch Canal	6,237
	Tulare Irrigation Company	4,447
	Unincorporated	19,177
	Watson Ditch Canal	3,308
	Unit III Total:	39,783
IV (Outside Creek)	Consolidated Peoples Ditch Canal	15,635
	Elk Bayou Ditch Canal	7,467
	Exeter Irrigation District	800
	Farmers Ditch Canal	12,329
	Lindsay-Strathmore Irrigation District	111
	Oakes Ditch Canal	309
	Tulare Irrigation District	420
	Tulare Irrigation Company	1,529
	Unincorporated	36,004
	Unit IV Total:	74,604
V (Tulare)	Elk Bayou Ditch Canal	1,825
	Evans Ditch Canal	377
	Tulare Irrigation District	69,732
	Tulare Irrigation Company	1,527
	Unincorporated	10,953
	Unit V Total:	84,414
VI (Western)	Alta Irrigation District	510
	Corcoran Irrigation District	10,220
	Kings County Water District	24,821
	Lakeside Irrigation Water District	32,147
	Melga Water District	3,298
	Salyer Water District	3,678
	Unincorporated	8,782
	Unit VI Total:	83,456
	Total Acres	356,714

6.5.3 Imported Surface Water

Recent adjustments to the KDWCD IRWMP boundary have resulted in the Lakeside Irrigation Water District being removed from this planning area to be included in the Kings River JPA IRWMP planning area. As that district receives delivery of both surface water supplies from the Kaweah River, as well as the Kings River, it leaves the balance of the entities within the KDWCD IRWMP being served with either only water from the Kaweah River or imported from the Friant Division, CVP.

Historically the KDWCD has been a short-term and temporary contractor to Reclamation for Friant Division, CVP supplies. With the Ivanhoe Irrigation District resource exchange, the KDWCD became a long-term Friant Division, CVP contractor for both Class 1 and Class 2 supplies. CVP contracting entities within the boundaries of the IRWMP include the Lewis Creek Water District, the Lindmore Irrigation District, the Lindsay-Strathmore Irrigation District, the City of Lindsay, the Tulare Irrigation District, the Exeter Irrigation District and the Ivanhoe Irrigation District. Deliveries are also made to immediately adjacent entities which include the Stone Corral Irrigation District and the Lower Tule River Irrigation District. Inputs of the imported water quantities are constructed into the GIS database for the numeric groundwater model of KDWCD. It should be noted and will be discussed in greater detail later in this IRWMP, the Tule River Basin has a parallel numeric groundwater model and companion GIS database. These models operate with a boundary condition appurtenant to each model between the

basins, with it being a long term objective to amend the model configurations to eliminate the problems associated with the boundary conditions.

6.5.4 Water Conservation

Water conservation measures undertaken within the KDWCD IRWMP area take various forms. These forms cross over the line of urban/agriculture and over the line of groundwater/surface water. Each is important in its own right and it would be difficult to characterize one form of conservation as being more important than another.

Principal among the efforts is the conversion of agricultural lands which are characterized as poor to marginal due to their high water demand characteristics. In many cases, these lands have been retired from agriculture and have become the sites upon which groundwater recharge facilities have been constructed. The nature of the soil type having the capability to consume large amounts of water and be in a geographic position to contribute supplied water to the groundwater reservoir is certainly a significant conservation measure. Where these facilities are able to capture nonstorable flood flows from the Kaweah River, from local stream groups or from the San Joaquin River, they all provide example of conserved supplies.

Competing with this effort are the efforts of individual farmers to modify their irrigation application methods, often at great personal expense, to improve application

efficiency. While this procedure has the parallel benefit of improving crop yield, which assists in paying for the system modifications, water conservation benefits are also demonstrated. In times of curtailed availability of surface supply, the ability to control the timing and amount of water application is critical to sustaining the investment in permanent plantings. While in many years, water conserved by virtue of the installation of the systems is dedicated to additional crop yield, and the fact that there is a resulting decrease in the leaching fraction contribution to groundwater, the overall conservation benefits are still apparent.

The third conservation component of significance is that of education. Programs of the KDWCD which reach out to schoolchildren, schoolteachers and water supply professionals offer opportunities to expand the knowledge base of those who have influence over water consumption habits and opportunities for water savings through conservation. Presented in Appendix F are the 2013 outreach efforts of the KDWCD in this regard. While these programs vary from time-to-time, they are nonetheless ongoing and are a critical element in the KDWCD program to optimize management of the groundwater reservoir.

As a companion program to the agricultural outreach programs, the urban and rural water purveyors are heavily invested in both conservation education and conservation procedures. Through the mechanisms of written education documents, water conservation retrofit kits and retrofit incentives for plumbing fixtures, urban water

suppliers are able to effect reductions in water use impacting not only groundwater extractions, but the economics associated with the production and delivery of water for human consumption.

6.5.5 Recycled Water

As noted under the prior discussions related to wastewater treatment and disposal, each of the permitted wastewater treatment and disposal facilities within the KDWCD IRWMP area recycle their entire treated discharge. While some of the recycling is accrual to the groundwater reservoir, most are in-lieu of groundwater pumping programs wherein treated effluent is delivered to satisfy crop evapotranspiration demand, in lieu of pumping groundwater. This leaves the groundwater supply in place, a procedure which not only conserves the groundwater supply in a usable position, but also avoids the costs associated with power to pump the groundwater to the surface. Modification of this program to include a surface water exchange with a relocated target area for the surface water will be a demonstrated alternative once the City of Visalia tertiary facilities are constructed and in operation with the associated delivery of the treated water to the TID.

6.5.6 Cloud Seeding

In an attempt to wring every drop of water out of passing storms prior to exiting the Kaweah River Basin, the KDWCD conducts a cloud seeding program with a private

operator based out of the Fresno Air Terminal. The contract for these services is reviewed continuously by the Board of Directors of the KDWCD, along with estimates prepared of the benefit of participation in the program. Similar programs are conducted on the San Joaquin River Basin by the Southern California Edison Company and periodically on the Kings River Watershed by Pacific Gas & Electric, often in concert with the Kings River Conservation District. Estimates of improved yield as a result of the cloud seeding program range from a low of two (2) percent to a high of five (5) percent.

6.5.7 Banking Programs

There are currently no banking programs which exist within the Kaweah River Basin. While the area has often been mentioned as having the potential for such participation, no long-term banks have been put into place.

At the current time, review is being conducted of the initial Banking Guidelines of Reclamation to determine if any potential exists for such banks within the IRWMP area. A significant number of questions have been raised and directed to the Regional Office of Reclamation with responses to those questions likely determining any interest in pursuing such arrangements in the future. One of the obstacles which has yet to be overcome is the value of timing of puts and takes to a given bank and, in particular, the exchange of winter supplies for summer supplies. Current guidelines call for a 1:1 exchange, with a small leave-behind to benefit the exchanging basin. This ratio basis, however, ignores the

significant value of exchanging a surface water supply available during peak summer months for a supply moved to groundwater storage during above-normal and wet winter months. Until understanding can be gained with those parties generating the guidelines for the use of, in particular, CVP supplies for banking, banking programs are not likely to be actively pursued.

6.6 HISTORICAL WATER DEMANDS

6.6.1 Agricultural Water Consumption

Agricultural water consumption within the KDWCD boundaries has been historically estimated based on land use information provided by the DWR. This land use data has been incorporated into each Water Resources Investigation that the KDWCD has completed, starting in 1972. Estimates of groundwater overdraft have been the principal motivating factor behind accomplishing each of the investigation updates and throughout the history of accomplishing the water balance computations, a difference has existed between observed conditions of depth to groundwater and computed depths to groundwater. This has been particularly true in the hydrologic units on the west side of KDWCD.

As a result of this continued differential computation, it was determined to undertake a sensitivity investigation related to several parameters in the computation

methodology, starting with the land use element. Determination was made that the sensitivity analysis should utilize a data stream which was available on a year-round basis, thus reflecting not only crop types, but also the number of crops planted in a given year. It was a known deficiency of the use of the DWR data that multiple cropping in a given time frame was not picked up by their surveys to the same extent that multiple crops were observed by local water distribution entities.

It was determined to use satellite based imagery as the trial basis to see if same would provide a more adequate foundation for a determination of demand than the DWR basis. The sensitivity analysis has now been completed with the conclusion being that the use of satellite imagery does provide a far more reliable basis than the DWR information and a report has now been completed providing an adequate land use base from which to conduct the current update to the Water Resources Investigation.

For purposes of this IRWMP, however, that update has only just begun and, as a result, the only demand information which currently exists for use herein is the last update to the Water Resources Investigation which did use the DWR land use data. It, therefore, has an inherent defect. The reader should understand that with respect to the consumptive use of applied water for the satisfaction of irrigation demands, the estimates are understated. Based on Kaweah River Basin balance calculations which were accomplished, this differential is at least on the order of 16,000 acre-feet per year.

Excerpted from the July, 2007 Water Resources Investigation, Table 6-10 provides a multiple year history of both the estimate of cropped acres and the gross and net applied water estimates. Caution is again noted with respect to the fact that the cropped acres are low, not reflecting as much multiple cropping as existing in several of the referenced years, thus resulting in both gross and net applied irrigation water estimates which are low. This fact is further born out in the gross applied water expressed in a per acre-foot per acre form. This figure would reflect a low level of double cropping with no triple or quadruple cropping. It is known that each of those cropping patterns existed during the years referenced in the table.

In the evaluation process of trying to determine why the empirical methodology was not resulting in a modeled outcome which was supported by actual depth-to-water measurements, water consumed by confined animals was determined to be a factor which should be considered. Steps were therefore undertaken to estimate the number of milking cows, replacement heifers, milk cow calves, goats and swine and to estimate the consumption of the animals. While the feed for same which was being grown within the KDWCD boundary had been taken into account, the actual animal consumption quantity had not. The modeling effort, therefore, took into account and continues to take into account animal unit counts and computations of annual quantities of water consumed for those demands. Just as a point of reference, for 1999 when there were an estimated 193,492 cows being milked within the boundaries of KDWCD, the water use per year

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was estimated to be 16,255 acre-feet. This demand is on the order of one-half of the municipal demand estimated to exist within the District.

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TABLE 6-10
CONSUMPTIVE USE OF APPLIED IRRIGATION WATER
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Calendar Year	Total Cropped Acreage (acres)	Total Crop Etc (af)	Total Rainfall (af)	Effective Rainfall (af)	Gross Applied Irrigation Water (af)	Percolation of Rainfall (af)	Percolation of Irrigation Water (af)	Net Applied Irrigation Water (af)	Gross Applied Irrigation Water (af/acre)
1981	263,255	674,778	165,783	63,621	872,475	60,062	217,694	654,781	3.314
1982	263,564	647,879	223,612	78,475	812,877	76,521	202,828	610,049	3.084
1983	263,866	605,706	322,939	108,048	710,434	149,523	177,254	533,180	2.692
1984	264,173	720,316	73,722	21,933	997,011	22,277	248,777	748,234	3.774
1985	264,478	678,322	136,761	47,651	900,352	55,922	224,664	675,688	3.404
1986	264,788	644,957	246,328	86,627	774,735	113,083	177,666	597,069	2.926
1987	265,090	686,343	190,169	73,471	850,387	77,853	194,996	655,391	3.208
1988	265,398	670,493	149,732	45,273	867,503	46,848	198,909	668,594	3.269
1989	265,702	674,160	154,346	51,473	864,008	53,749	198,120	665,888	3.252
1990	266,007	692,662	176,201	56,106	883,217	63,841	202,502	680,715	3.320
1991	266,313	690,165	177,700	64,257	844,462	83,412	176,331	668,131	3.171
1992	268,762	655,471	147,608	58,798	805,027	58,616	168,103	636,924	2.995
1993	271,211	657,074	258,222	85,570	771,034	134,701	160,978	610,056	2.843
1994	273,659	647,896	177,626	49,675	807,094	61,043	168,519	638,575	2.949
1995	276,108	629,361	339,431	104,140	708,547	172,165	147,898	560,649	2.566
1996	278,557	680,690	239,577	83,725	782,259	102,905	146,180	636,079	2.808
1997	281,005	661,555	150,407	49,552	801,882	83,612	149,781	652,101	2.854
1998	283,454	573,918	491,329	134,959	574,898	275,012	107,193	467,705	2.028
1999	285,900	648,194	263,793	79,449	744,883	136,898	138,894	605,989	2.605
Maximum	285,900	720,316	491,329	134,959	997,011	275,012	248,777	748,234	3.774
Minimum	263,255	573,918	73,722	21,933	574,898	22,277	107,193	467,705	2.028
Average	270,068	659,997	215,015	70,674	809,110	96,213	179,331	629,779	3.003

6.6.2 Urban and Rural Non-agricultural Water Consumption

In contrast, the estimates of urban and rural water demand have a far more adequate foundation. That being said, the total consumptive demands for municipal and industrial purposes, including rural household consumption, is much lower than the agricultural demand. Adequate records exist from each of the municipalities within the

IRWMP boundary, as well as the rural permitted systems within the same boundary, to accurately determine their annual consumption levels. Those figures also provide an improved basis for estimating the demands of the rural single-family homes which exist in the IRWMP planning area. It should be noted that the numbers which have been generated are for the entities within the boundaries of the KDWCD. These numbers do not reflect the demands associated with areas which have recently been added to the IRWMP boundary. This deficiency is, however, designed to be addressed in the current update to the KDWCD Water Resources Investigation. This inadequacy will, therefore, not be left to a remedial list of things to be done in this IRWMP, as steps are already being taken to address the issue.

Please refer to Table 6-11, Table 6-12 and Table 6-13 for the water system demands for urban areas, rural areas and small water systems, respectively. The years presented correspond to the years presented in Table 6-10, allowing for a direct additive process to secure a total for any given year.

6.6.3 Groundwater Extraction Estimate

With the caution again of the underestimating which was felt to exist as a result of the planting and harvest of multiple crops in a given year, computations have been made of estimates of groundwater extraction, for all uses. Based on the last update for KDWCD of their Water Resources Investigation, the average annual groundwater pumping totaled

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557,800 acre-feet. The minimum quantity estimated to have been pumped was for 1998 at a quantity of 176,447 acre-feet. In contrast, 1990, during an extended dry hydrologic period, the annual estimate was 827,200 acre-feet.

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TABLE 6-11
URBAN GROUNDWATER PUMPAGE INTEGRATED
REGIONAL WATER MANAGEMENT PLAN KAWEAH
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Calendar Year	Hydrologic Unit No. I	Hydrologic Unit No. II	Hydrologic Unit No. III	Hydrologic Unit No. IV	Hydrologic Unit No. V	Hydrologic Unit No. VI	Entire District
1981	325	2,305	12,294	1,717	7,525	0	24,167
1982	336	2,173	11,588	1,753	7,780	0	23,630
1983	347	2,288	12,201	1,891	8,036	0	24,762
1984	358	2,751	14,674	2,242	8,291	0	28,317
1985	369	2,720	14,506	2,128	8,547	0	28,270
1986	380	2,932	15,635	2,243	8,802	0	29,992
1987	391	3,046	16,246	2,405	9,058	0	31,146
1988	402	2,991	15,950	1,871	9,314	0	30,527
1989	699	2,953	15,748	2,495	9,370	0	31,265
1990	777	3,068	16,363	2,532	10,207	0	32,947
1991	235	2,881	15,366	2,416	10,747	0	31,646
1992	349	3,153	16,818	2,548	10,460	0	33,329
1993	676	3,185	16,984	2,692	10,011	0	33,547
1994	276	3,411	18,190	2,846	13,515	0	38,237
1995	210	3,552	18,943	2,685	11,470	0	36,860
1996	475	3,745	19,974	2,810	12,640	0	39,644
1997	653	3,897	20,786	2,951	12,995	0	41,283
1998	414	3,480	18,559	2,758	9,652	0	34,863
1999	415	3,977	21,208	2,947	13,912	0	42,458
Maximum	777	3,977	21,208	2,951	13,912	0	42,458
Minimum	210	2,173	11,588	1,717	7,525	0	23,630
Average	426	3,079	16,423	2,417	10,123	0	32,468

Note: Quantities in acre-feet per year.

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TABLE 6-12
SMALL WATER SYSTEM GROUNDWATER DEMAND
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
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Calendar Year	Hydrologic Unit No. I	Hydrologic Unit No. II	Hydrologic Unit No. III	Hydrologic Unit No. IV	Hydrologic Unit No. V	Hydrologic Unit No. VI	Entire District
1981	0	0	3,195	384	1,159	693	5,431
1982	0	0	3,279	394	1,189	711	5,573
1983	0	0	3,363	404	1,220	729	5,716
1984	0	0	3,447	414	1,250	747	5,858
1985	0	0	3,531	424	1,280	765	6,000
1986	0	0	3,614	434	1,311	783	6,142
1987	0	0	3,698	444	1,341	802	6,285
1988	0	0	3,782	454	1,372	820	6,428
1989	0	0	3,866	465	1,402	838	6,571
1990	0	0	3,950	475	1,432	856	6,713
1991	0	0	4,021	483	1,458	871	6,833
1992	0	0	4,092	492	1,484	887	6,955
1993	0	0	4,163	500	1,510	902	7,075
1994	0	0	4,234	509	1,535	918	7,196
1995	0	0	4,305	517	1,561	933	7,316
1996	0	0	4,376	526	1,587	948	7,437
1997	0	0	4,447	534	1,613	964	7,558
1998	0	0	4,518	543	1,638	979	7,678
1999	0	0	4,589	551	1,664	995	7,799
Maximum	0	0	4,589	551	1,664	995	7,799
Minimum	0	0	3,195	384	1,159	693	5,431
Average	0	0	3,919	471	1,421	850	6,661

TABLE 6-13
RURAL DOMESTIC GROUNDWATER DEMAND
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
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	Hydrologic Unit No. I	Hydrologic Unit No. II	Hydrologic Unit No. III	Hydrologic Unit No. IV	Hydrologic Unit No. V	Hydrologic Unit No. VI	Entire District
Houses Per Square Mile	7.81	1.70	2.60	1.92	1.70	1.80	2.27
Percentage of Total	45	10	15	11	10	10	100
Rural Domestic Demand Per Year (af)	835	182	278	205	182	193	1,876

6.7 COMPARISON OF WATER DEMAND AND SUPPLY

Without going through the exercise of computing the difference between supply and demand, the declining groundwater table within the KDWCD IRWMP area is demonstrative of demand exceeding supply. It should be noted that, however, while this is true on a District-wide basis, it is not true for all areas within the IRWMP area. The hydrologic units on the east side of KDWCD have been demonstrated to be in balance and, in a number of years, actually in a net gain position. Characteristics of this area are such that they enjoy a senior right to diversion of natural flows of the Kaweah River, are planted to permanent crops which have a modest seasonal irrigation demand and the vast majority of farms utilize the most current and sophisticated irrigation water application methods. Such is not the case across all of the hydrologic units. In addition, dramatic and pronounced effect occurs on the westerly portion of the IRWMP area due to problems with delta diversions associated with both the SWP and the CVP. As long as the response to reduced diversions from the delta is to pump groundwater to satisfy crop demand, the overdraft will continue to exist.

6.8 CLIMATE CHANGE

The topic of climate change has received considerable attention at the IRWM level, not in the context of whether it exists or not, but in the context of the hydrology which is currently experienced and what the potential responses from a water

management point of view, might be. For example, the hydrology already experienced within the Kaweah River Basin swings from critically dry years when runoff is less than thirty-three percent of normal to extreme wet conditions when runoff swings to in excess of 200 percent of normal. In addition, runoff comes into the IRWMP area in the form of rainfall runoff, snowmelt runoff and snowmelt runoff accelerated due to warm weather and rainfall conditions accelerating runoff. The Board of Directors of the KDWCD, its staff and its consultants have difficulty envisioning a broader set of circumstances to deal with unless there was a condition of no snowmelt runoff at all.

An additional factor of concern in dealing with this issue is the length of time necessary to transition from planning a water management project to its full implementation. A relatively simple project, at least in engineering terms, was the effort to raise the level of Lake Kaweah by 21 feet. There were no modifications to the dam, expendable fusegates were placed into the existing spillway and a modest level of property negotiations and peripheral site modifications were associated with the project. It nevertheless took in excess of 25 years from inception until completion, the final costs were more than double the initial cost estimate, and the environmental costs, at one point in time in the project development, exceeded the actual construction costs. Conceiving of a project of such magnitude to transition to a condition of little or no snow melt runoff is, as one Stakeholders Advisory Group member put it, “impossible to conceive.”

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In response more to current conditions, than anticipated conditions, the KDWCD has proceeded with developing the 5,000 acres of groundwater recharge facilities, with another 1,000 acres currently under development. Other surface water purveying entities, particularly those with Class 2 Friant Division, CVP contract supplies have likewise developed groundwater recharge areas and are continuing to expand on those areas. Local mutual stock ditch companies have also invested in water balancing and recharge facilities to benefit their stockholders and to deal with, in some cases, the lower elevation rainfall fed watersheds, runoff from which they intercept to bring into their systems for direct beneficial use and recharge.

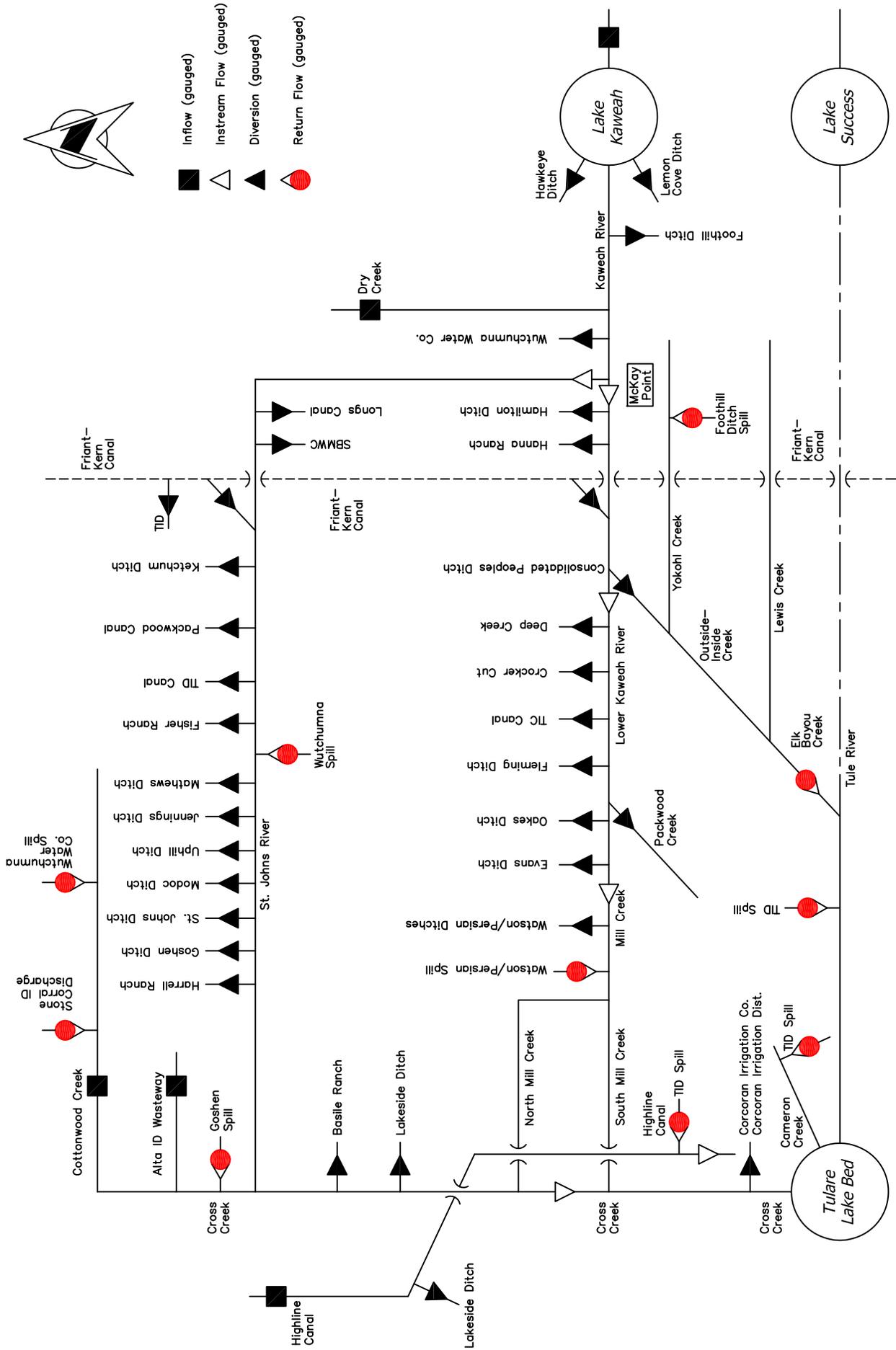
The public agencies within the KDWCD IRWMP area are subject to the air quality rules established by the San Joaquin Valley Air Pollution Control District. They continue to examine their equipment fleets to ensure that they are compliant with the latest rules established by said District, not only because it is required, but in reflection on doing their part to reduce contributions to atmospheric conditions which are contributory to increased air temperature patterns and the resulting impacts on being able to store water in the mountains in the form of snow and ice pack, in lieu of trying to manage the runoff from the precipitation if it fell in the form of rainfall.

In preparing to respond to the Tulare Lake Hydrologic Region Report volume of the California Water Plan Update of 2013, considerable attention was given to the segment on Climate Change beginning on page TL-59. The report concludes that

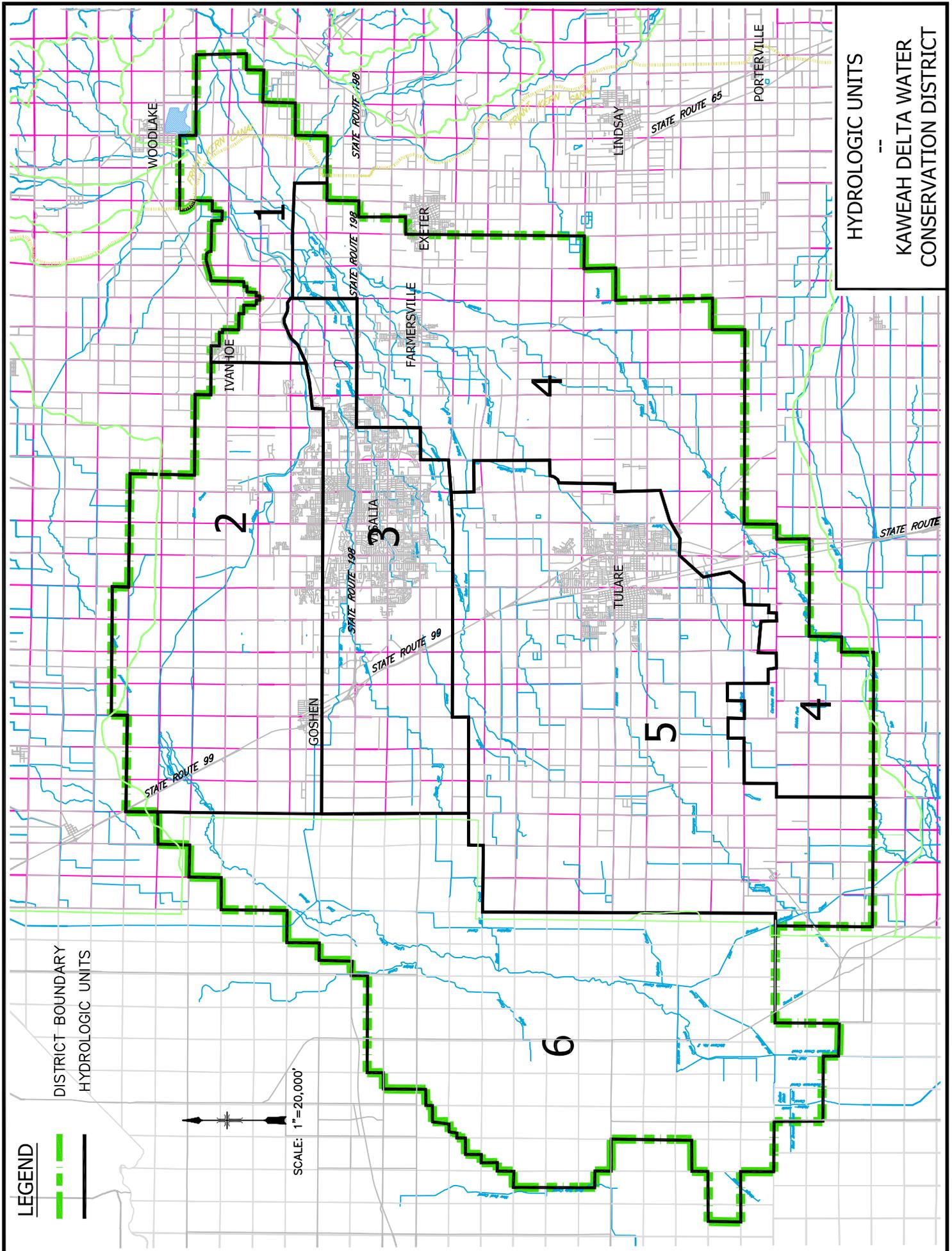
“enough data exists to warrant the importance of contingency plans, mitigation (reduction) of greenhouse gas (GHG) emissions, and incorporating adaption strategies; methodologies and infrastructure improvements that benefit the region at present and into the future.” The report goes on to state that there is a sufficient enough trend established that current levels of GHGs, already in the atmosphere, will continue to impact climate through the rest of the century. The IRWMP Stakeholders Advisory Group feels that steps currently being taken to expand groundwater recharge areas on the valley floor are part of the response to the observed increasing temperature trend. In addition, increased emphasis on flood plain mapping has drawn attention to the risks which currently exist relative to runoff patterns, providing a basis for further evaluation of flood impacts under warmer precipitation paradigms. It has been noted more than once, that the extreme peak flows experienced within the Kaweah River Basin have been as a result of warm precipitation conditions on a significant low-elevation snow pack. Whether those conditions would continue in an increased atmospheric temperature paradigm remains to be evaluated.

While climate change is currently a topic at both the Board of Directors of KDWCD and the IRWMP Stakeholders Advisory Group sessions, no project specific to mitigation of climate change impacts have been brought for discussion. While the current list of basin projects are complimentary to the need to address the climate change issue, their specific planning emphasis is toward management of existing water supplies and not in pursuit of a “no snowfall-all rain runoff” paradigm.

Recognizing this circumstance, the Round 2 – Proposition 84 Planning Grant Application specifically called out that an element of that planning endeavor would be related to addressing the climate change issue. The additional consideration which will need to be given attention with the modification to this IRWMP resulting from the Round 2 Planning Grant endeavors will be to address whether or not agriculture, in the form that it exists now, can continue to exist under a decreased snowfall/increased rainfall paradigm. The parallel to that issue from an urban perspective is whether or not the valley floor area can be sustained in its current structure and format under the decreased snowmelt/increased rainfall paradigm. The critical issue to be addressed in the analysis is whether or not the cost associated with continued existence of either the agricultural or urban structure under the change paradigm is within economic reason. If massive impoundment facilities are necessary to contain runoff and, for example, those facilities are primarily flood control in nature, is the current Federal and State financial pattern going to be available when virtually all of the State is facing a similar set of issues.



KAWEAH RIVER SYSTEM SCHEMATIC
KAWEAH DELTA WATER CONSERVATION DISTRICT



CHAPTER 7

WATER QUALITY

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WATER QUALITY

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7.1 GROUNDWATER QUALITY

Groundwater quality within the Kaweah Delta Water Conservation District (KDWCD) Integrated Regional Water Management Plan (IRWMP) area is generally considered in two (2) different contexts. The first of these is agriculture with the second being municipal and industrial. Of principal concern in the municipal and industrial category, the capability of the supply to satisfy State and Federal drinking water standards and, for industrial users, the capability to satisfy requirements for manufacturing and processing of related products.

Historically, pursuit of the evaluation of the quality capability of groundwater in a particular area to satisfy agricultural related needs has been left to individual landowners/growers. As there are no agricultural water delivery districts within the

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IRWMP area extracting groundwater for delivery to their landowners/growers, with the exception of the Lindsay-Strathmore Irrigation District, sampling and testing to determine suitability for agricultural purposes has been undertaken by the landowner/grower. In the case of the Lindsay-Strathmore Irrigation District, as their wells are utilized for incidental residential consumption during periods of time of outage of the Friant-Kern Canal, their wells are tested on a routine basis.

As a result of the pursuit of quality related information on an individual basis, a very minor amount of information exists in the public arena as to the general water quality of the area. Older studies by the U.S. Geological Survey provides some insight as to water quality parameters, however, many of the investigations performed by said agency were specifically targeted to either problem areas or problem constituents, such as Boron and Arsenic.

This trend will be soon reversed as the recently adopted Irrigated Lands Regulatory Program (ILRP) General Order has been adopted and brings with it a new groundwater water quality investigation and evaluation component. Very controversial in its nature, parties have applied to represent landowners within the RWQCB's jurisdiction and that is the case within the KDWCD IRWMP area. The Kaweah Basin Water Quality Association has applied for recognition by the RWQCB as the third-party representative of growers in the area. Initial steps required under the General Order include an initial Groundwater Assessment Report which is to be prepared with principal emphasis on the

vulnerability of the groundwater reservoir to impacts from agricultural related discharges. Of particular importance, nutrient related impacts and pesticide related impacts are of high significance.

In the current agricultural arena, efforts associated with the Dairy Industry General Order, also adopted by the RWQCB, has been in place for some time. The groundwater component associated with said order is specifically related to the private wells located on dairies and monitor wells designed and constructed in locations adjacent to sumps containing dairy waste prior to land application. A substantial amount of information is currently in inventory and, while significant in nature, is restricted to those areas where dairies exist.

In contrast to the agricultural areas, characterization of groundwater supplied for municipal and industrial and rural drinking water purposes has generated a significant quantity of information related to its quality related parameters. This data is available from the individual purveyors and is lodged, by electronic transmittal, by testing laboratories directly to the California Department of Public Health database. Public access to this database is available electronically, with the exception of well log information. For each agency to whom the California Department of Public Health has issued a water supply permit, they are required to issue, no later than July 1 of each year to each customer, a Consumer Confidence Report. Identified as the CCR, this document must meet specific format requirements and is designed to not only provide the drinking

water customer with specific information with regard to the numeric test results related to their drinking water, but also is to provide information with respect to allowable limits and potential health effects of certain contaminants. In some cases within the IRWMP area, this CCR is provided in a bilingual format.

Several different contaminants are present in the various municipal and industrial systems located within the IRWMP area. Contaminants which exceed established Maximum Contaminant Levels (MCL) include Nitrates, Coliform, DBCP, EDB and Perchlorate. Several areas are impacted by VOCs, principally from discharges associated with dry cleaning operations. While an MCL has yet to be established for 1,2,3 TCP, many areas have source waters which exceed the MCLG (MCL Goal) for this material.

7.2 SURFACE WATER QUALITY

In diametric opposition to groundwater quality, significant information exists with respect to surface water quality in the agricultural regions of the IRWMP area, with little information related to water quality associated with the urban and rural developed areas. What little storm water related water quality testing takes place, is frequently in concert with the agricultural related water quality program seeking to identify principally, any introduced contaminants from urban areas which may be identified otherwise as having agricultural origins.

The ILRP program of the RWQCB, prior to the recently adopted General Order,

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required a surface water quality oriented program for each watershed within its jurisdiction. For the Kaweah River Basin, this program was undertaken by the Kaweah & St. Johns Rivers Association and information related to surface water quality under this program has been developed over a period of time in excess of a decade. The data from this program is reported by each watershed to the RWQCB with test result information specifically transmitted to the State Water Resources Control Board database, which is electronically accessible to the public. Formatting requirements for information submittal have been changed from time-to-time related to this database and when those changes have been made, conversion requirements have existed to reformat prior information to satisfy the new format requirements.

In addition to submittal of the information to the SWRCB database, annual reports are prepared for each watershed which contain the specific test information generated over the subject year period of time and responses which were generated to observed water quality failures.

Specific to the KDWCD IRWMP area, the Association has identified core locations for sampling which are presented on Figure 7-1. The core sample locations indicated on Figure 7-1 are identified as “SP.” Sampling and testing at these sites has been consistent with the orders issued by the RWQCB since the inception of testing. Additional sites have been added over time based on either identified water quality concerns or seeking out clarity on whether or not contamination exists at those locations. On the subject figure, for the current testing period, the sites have identifiers that are

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other than “SP”, often an identifier associated with the surface water conveyance facility.

An example would be Foothill Ditch, identified as “FD.”

For the most part, surface water quality within the IRWMP area is of very high quality. Whether the source is the Kaweah River, a local stream group or the Friant-Kern Canal, water quality parameters not only indicate water of a high quality, but waters that are only slightly altered by the activities of man.

Where contamination has been shown to exist, steps have been taken to identify the source of the contamination and where found, to work with the landowner/grower(s) to initiate actions to bring about a change in discharge or the presence of adverse contaminants in the discharge.

Where water quality problems have been discovered and have not been quickly resolved, Management Plans have been generated to deal with the specific area where contamination was found and the specific contaminant. In some cases, where Management Plans have been developed, it has still not been determined if the contaminant source is from irrigated agriculture, household use of pesticides and herbicides, or commercial spraying operations such as those associated with State highways and county roads. In several cases, discoveries of contamination have been found to be associated with activities other than irrigated agriculture.

The conduct of this surface water program will transition to the newly formed

Kaweah Basin Water Quality Association upon acceptance of said entity by the RWQCB.

As the new General Order contains both a surface water element and groundwater element, it was determined by the Kaweah & St. Johns Rivers Association that they did not have the authority to conduct the groundwater portion of the program as required by the new General Order and, had they elected to do so, problems were identified that did not have resolution, such as those associated with the Internal Revenue Service.

7.3 POTENTIAL SOURCES OF CONTAMINATION

Several potential sources of contamination exist within the IRWMP area. For some of these potential sources, such as irrigated agriculture, programs are in place to not only identify contaminants and the source of contaminants and to work on cessation of discharge of such contaminants, but also have structured regulatory requirements associated with the efforts. For others, such as septic tanks and subterranean leach field systems, requirements exist in some areas for monitoring of the condition of the systems and remedying identified problems, while in other areas, such regulation is totally absent. In some of the potential contaminant arenas, such as abandoned wells, there is no organized program to abate the problems associated with the problem. The following is a discussion of each of the current identified potential sources of contamination within the KDWCD IRWMP area.

7.3.1 Failing Septic Systems

In certain areas of the IRWMP, such as Badger Hill Estates, the RWQCB has issued a specific order to deal with design, inspection and operational considerations related to the systems. The Badger Hill Association is required to report information from each homeowner related to the frequency of their septic tank pumping and, as dual leach field systems are required, the frequency of rotation between those systems.

The design of new systems is under the jurisdiction of the Counties of Kings and Tulare with soil percolation tests often required to accompany the design to ensure proper performance of the subterranean disposal system. Once installed, however, unless adverse conditions are noticed by an agency of jurisdiction, or complaints are received by same, no oversight exists with respect to these systems. In no cases within the IRWMP area have there been or are there studies related to the specific impacts of septic tank and subterranean disposal systems on the accumulation of contaminants to groundwater. Septic tanks are designed as biological reactors to reduce the pollution strength of certain contaminants within the waste stream delivered to the septic tank. They are not, however, designed to reduce nutrient loads, such as nitrates, which is a task often left to the soil structure which exists from the disposal area to first encountered groundwater. The adequacy of the soils to accomplish any degree of nitrate reduction is not an initial design consideration, nor are the programs to determine the efficiency of the systems in this regard. Thus, these systems have been identified as potential sources of contamination.

7.3.2 Abandoned Wells

Recent attention has been given to the issue of lack of destruction of abandoned wells within the KDWCD IRWMP. A current active project of the IRWMP, being conducted under a grant to the KDWCD and allocated to the County of Tulare, its design is to initiate a program of identification of areas where abandoned wells exist which place in jeopardy existing water production facilities and to take steps to properly destroy those wells in concert with applicable State and County ordinance requirements.

While the requirements of the State and of each county within the IRWMP area which have standards and ordinances related to well destruction, the standards are related to the abandonment procedure strictly and not to the identification of the location of these wells or conditions under which wells must be properly destroyed. Any number of circumstances can be referenced in which abandoned wells have been discovered in locations where proper destruction should have taken place, but did not. In addition, there is no identified program at any level of government to routinely seek out these locations and effect abandonment. For these reasons, abandoned wells have been identified as a potential source of contamination. These wells are of particular concern as they are drilled across water-bearing strata and act as a conduit to draw water from one aquifer to another, transporting with this water contaminants from one aquifer to another.

7.3.3 Landfills

Historically, dump operations were located with transport distance from the source to the repository being the principal locating factor. Dump closure, including landfill closures, were often conducted without consideration to downslope groundwater contamination. Brought about by regulatory change, investigations began to occur wherein it was required of dump and landfill owners to identify whether or not the subject facility was contributing to groundwater contamination. Where identified to be the case, clean-up operations were undertaken and continue to be undertaken to abate any further contribution to the groundwater reservoir of contaminants from the subject facilities. Of particular concern has been the migration from these facilities materials for which the soil mantle lacks the capability to provide reduction of the harmful effects of the material. In this family are materials such as pharmaceuticals and petroleum wastes, coupled with the household disposal of unwanted pesticide and herbicide materials. Disposal of these materials has led to Vadose Zone contamination downslope of the disposal facilities. Frequently observed at both closed sites and operating sites are extraction facilities designed to abate the effects of these contaminants. As considerable oversight exists from local, State and Federal regulatory levels, the KDWCD IRWMP does not call for an increased level of scrutiny and oversight with respect to this source of contamination.

7.3.4 LUFT

In a similar fashion to the landfill category, the program to abate the effects of leaking underground fuel storage tanks is well developed. A state-wide program, covered by a per-gallon fuel tax, collected at the pump, has been utilized successfully for several years in cleaning up and abating the effects of leaking underground fuel storage facilities. In addition to this successful program, new standards have been brought to bear for tank installations requiring double-walled tanks, sensors located between the tank walls to sense leaking from the first storage facility, elimination of underground tanks and movement to above-ground tanks and movement toward total containment systems wherein a leak is totally confined to a secondary area upon failure of the first. In many cases, these new regulations have eliminated the number of tanks which existed with farmsteads and individuals who previously had tanks for their use eliminating the option and fueling at commercial locations.

Based on the current State clean-up program and the current requirements related to new facility installation, this IRWMP does not call for additional oversight consideration related to fuel storage tanks.

7.3.5 Irrigated Agriculture

As previously noted in this Chapter, considerable attention has been given for some time to the potential contamination of groundwater and surface waters from sources

identified as being associated with irrigated agriculture. As programs are in place, in addition to regulatory and statutory requirements, it is accepted by this IRWMP that irrigated agriculture is a potential source of contamination. Efforts will continue to be expended to track the results of the ongoing programs, particularly as any adverse water quality occurrences may affect not only the beneficial use of available surface water and groundwater sources available to the IRWMP area, but may also affect land uses and land use planning.

7.3.6 Confined Animal Facilities

On a similar, but earlier pathway to the ILRP, the RWQCB identified confined animal facilities as potential sources of contamination affecting both surface water and groundwater. As a result, the RWQCB has placed confined animal facilities in a category to be regulated specific to certain findings of the RWQCB and with dedicated staff associated with oversight on the orders issued by the RWQCB. Unlike the General Order related to irrigated lands, the General Order related to confined animal facilities does not address representation by a third-party. Each individual operator has to respond to the General Order and while some monitoring is conducted on an area-wide or region-wide basis, reporting is still accomplished on a by-operator basis.

In addition to State oversight and regulation, the County of Kings and the County of Tulare both require Conditional Use Permits for confined animal facilities. The process of issuing these permits involves a significant degree of scrutiny and oversight

often requiring an in-depth and extensive environmental document which first must be considered, prior to any permit-related action.

As with the ILRP, it is a practice of the IRWMP process to track RWQCB actions related to confined animal facilities, county actions with regard to same and monitoring for trends the reported outcomes of groundwater sampling and testing. These activities of the IRWM are envisioned to continue with the same, or increased, oversight by KDWCD.

7.3.7 Publicly Owned Treatment Works

Wastewater treatment and disposal systems serving urban and rural areas are subject to the Waste Discharge Requirements process of the RWQCB. Discharges to surface water require not only that action, but an additional action of the issuance of a permit under the National Pollution Discharge Elimination System (NPDES) which, in California, allows for primacy to be exercised by the RWQCB under agreement with the Federal Environmental Protection Agency. As a part of adopted and issued permit processes for both Waste Discharge Requirements and NPDES permits, a substantial monitoring and reporting program is a part. In addition, the RWQCB has instituted a spill notification program associated with sanitary sewer collection systems which require monthly reporting, at a minimum and short-term reporting of any spill incident. In addition to written reports being required to be submitted to the RWQCB, monthly test result information is required to be submitted to the SWRCB database, which is accessible to the public electronically.

The siting of treatment and disposal facilities is a land use issue, not only for each of the counties of jurisdiction within the IRWMP, but also for the applicable Local Agency Formation Commissions. Issues related to spheres of influence, boundary expansions and types of development are given consideration in both the county arenas and those of their Local Agency Formation Commissions. A part of any of the major facility permit requirements is a Groundwater Monitoring Plan, with its separate requirements. Data from these programs is often required to be submitted monthly, and at most quarterly in order to allow for any adverse trends to be identified quickly and steps taken to identify and correct any adverse condition. At the current time, this information is not tracked, nor analyzed as a part of the IRWMP process.

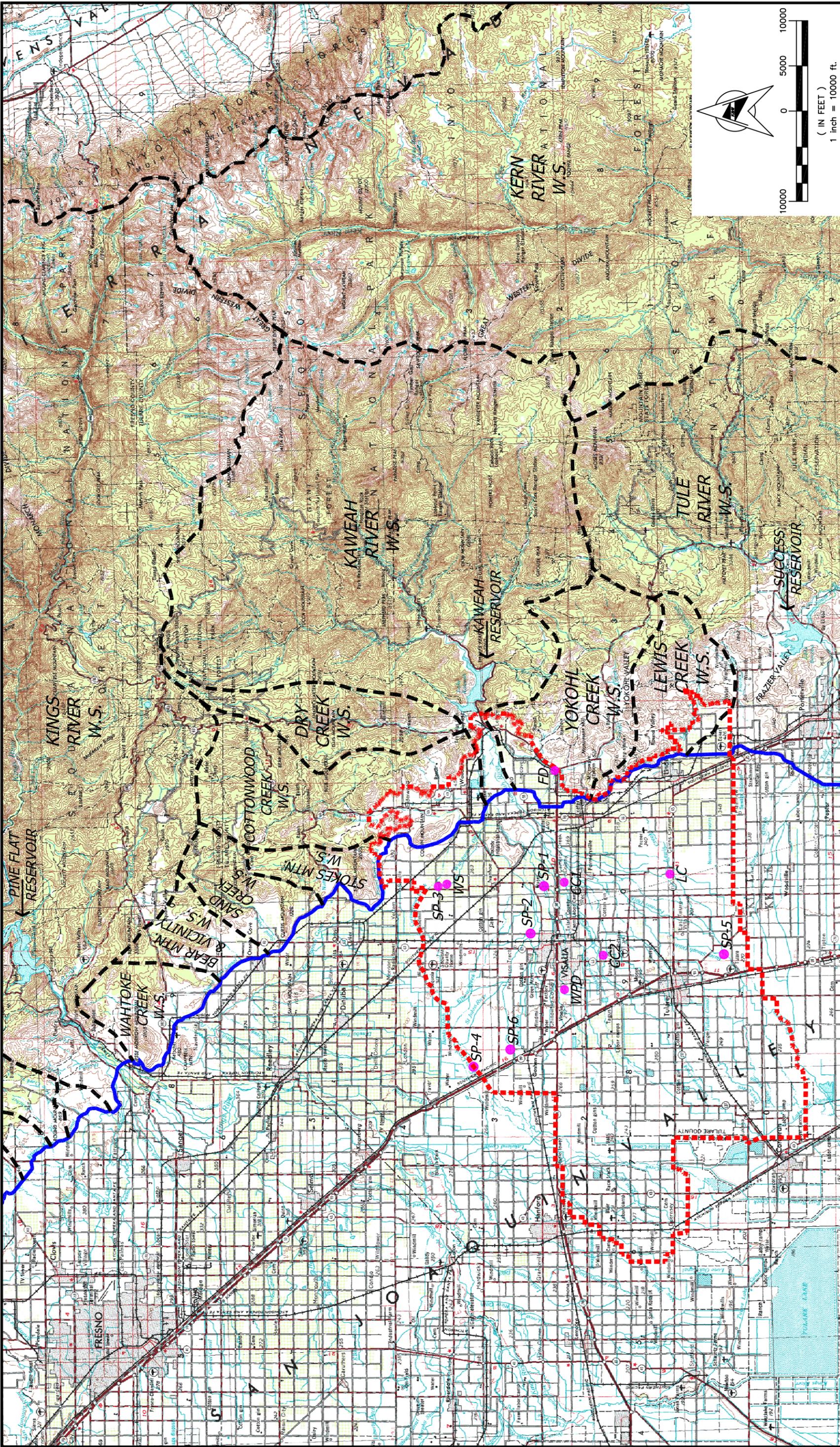
7.3.8 Storm Water Runoff

Storm water runoff is generated from a number of sources including native pasture and irrigated lands, county and state highway systems, developed rural and urban areas and isolated commercial and industrial processing facilities, including packing sheds and cold storage facilities. For areas subject to structurally intense development procedures, county permit requirements typically mandate retention basins be developed as a part of the development package. The design characteristics associated with these facilities are such that they address retention of storms to a defined frequency in the on-site facilities.

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KAWEAH DELTA WATER CONSERVATION DISTRICT

In a similar fashion, rural concentrated development and urban development is accompanied with the design and construction of storm water collection and detention facilities designed to what has been identified as a level where, for most precipitation conditions within the IRWMP area, are considered to be the dominant pattern. In some cases, storm water systems discharge to ditch company facilities by agreement and to natural stream systems in order to eliminate the need for the acquisition and development of land for the purpose of retention of the developed waters. With very few exceptions, mostly associated with the ILRP, testing of the quality of these waters is not accomplished, certainly not on a schedule driven basis. The water quality test results associated with storm water discharges incorporated into the ILRP are monitored by the KDWCD IRWMP as a normal activity of KDWCD staff and its consultants. As noted, beyond the ILRP efforts, and the aged efforts of the U.S. Geological Survey, water quality information associated with storm water discharges is virtually non-existent.

FIGURE 7-1



LEGEND

- FRIANT-KERN CANAL
- WATERSHED BOUNDARY
- SUB-WATERSHED BOUNDARY
- SAMPLE POINT

SAMPLING POINT LEGEND

- SP-1 KAWEAH RIVER
- SP-2 ST. JOHNS RIVER
- SP-3 STONE CORRAL I.D. DISCHARGE
- SP-4 CROSS CREEK @ HWY. 99
- SP-5 ELK BAYOU
- SP-6 GOSHEN DITCH

SOURCE:

U.S.G.S. 1"x2" SERIES QUAD
SHEET, FRESNO, CA 1962

Revision	Date	Description
3	06/20/12	Added Core Monitoring Sites
2	01/23/06	Added SP-5 and SP-6
1	08/10/05	Relocated SP-4 upstream of Hwy. 99/R.R.

SCALE

10000 0 5000 10000
(IN FEET)
1 inch = 10000 ft.

LEGEND

- FRIANT-KERN CANAL
- WATERSHED BOUNDARY
- SUB-WATERSHED BOUNDARY
- SAMPLE POINT

LEGEND

- SP-1 KAWEAH RIVER
- SP-2 ST. JOHNS RIVER
- SP-3 STONE CORRAL I.D. DISCHARGE
- SP-4 CROSS CREEK @ HWY. 99
- SP-5 ELK BAYOU
- SP-6 GOSHEN DITCH

CHAPTER 8

FLOOD CONTROL

INTEGRATED REGIONAL WATER
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KAWEAH DELTA WATER
CONSERVATION DISTRICT

CHAPTER 8
FLOOD CONTROL

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
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8.1 CURRENT FLOOD CONTROL PROGRAMS

8.1.1 Federal Flood Control Program

The administration of the elements of the Federal flood control program within the Kaweah Delta Water Conservation District (KDWCD) Integrated Regional Water Management Plan (IRWMP) area is administered by the Sacramento District of the U.S. Army Corps of Engineers. The Sacramento District is extensive, covering areas of eight (8) individual states. It covers the trough of the great Central Valley extending from above Lake Shasta on the north to the Tehachapi Mountains on the south and extending to the crest of the Sierra Nevada adjacent to the IRWMP area and northerly into the Klamath Basin in Oregon. Originally a part of the San Francisco District, it was formed in 1866 with boundaries including the rivers and waterways within areas drained by the

INTEGRATED REGIONAL WATER MANAGEMENT PLAN KAWEAH DELTA WATER CONSERVATION DISTRICT

Sacramento and San Joaquin Rivers extending to Suisun Bay. Reformed into the Sacramento District in 1968, it is the second largest district in the United States and has an area of coverage of 290,000 square miles.

The District is under military leadership, typically in the form of an Army Colonel, who carries the title of District Commander.

In the context of the IRWM, Terminus Dam was constructed under the jurisdiction of the U.S. Army Corps of Engineers and was completed in 1962. The recent reservoir enlargement project was also conducted under its jurisdiction. The USACE, as it's known, takes its direction from Congress, for example, utilize the authorization of Congress in the Flood Control Act of 1944 to build Terminus Dam. The USACE has day-to-day responsibility for the operations of the dam and Lake Kaweah, subject to local participant agreements, wherein non-federal flood control components are addressed as to their interface with the flood control aspects of a given project.

Utilizing single-purpose legislation, the USACE initiated studies in 1992 for the Lake Kaweah enlargement project which resulted principally in a spillway modification. Also operated under the umbrella of an agreement with the USACE is the hydroelectric generation facility of the Kaweah River Power Authority which has an intake penstock bored through Terminus Dam, a powerhouse on the downslope face and a discharge into the dam afterbay. Close and well-managed cooperation exists between the local water

supply and power generation entities, including that of the Watermaster of the Kaweah & St. Johns Rivers Association.

8.1.2 State Flood Control Program

The State of California Flood Control Program is managed under the guidance of the Central Valley Flood Protection Board. Previously known as the California State Reclamation Board, regulatory authority for the Board's business and actions were first authorized in 1911 and were intended to reduce the risk of flooding within California's Central Valley. The Board was restructured in both 2007 and in 2009 and has as its current principal task, the review, update and adoption of the Central Valley Flood Protection Plan.

Acting in a similar fashion to the KDWCD IRWMP, the Central Valley Flood Protection Board now evaluates water issues, not just from a flood protection perspective, but also by including water management programs that combine flood management, ecosystem enhancement, water supply and land planning actions in an attempt to deliver multiple benefits, in lieu of a single flood protection benefit.

In 2013, the agency initiated a strategic planning process resulting in the adoption, in mid-year, 2013, of Governance Principals and a Strategic Plan. The Strategic Plan calls for the Central Valley Flood Protection Board to seek out new and innovative ways of

managing flood risks, while at the same time attempting to reduce cost and maximize the per-dollar spent impact.

Within the IRWM area, the interface with the Central Valley Flood Protection Board is as the State participant in flood control projects such as the recent enlargement of Lake Kaweah and issues related to floodway designation and floodway management on the Kaweah River and defined distributaries.

8.1.3 Tulare County Flood Control Program

Within the Tulare County portion of the KDWCD IRWMP, local flood control issues in non-urban areas are under the jurisdiction of a special district identified as the Tulare County Flood Control District. While often confused as a function of the County of Tulare, as it is frequently staffed by County employees, it is nonetheless a special district, separate and apart from the County of Tulare.

A principal function of the District is to work on local flood control projects within the County and, at the current time, all of the projects which the District is working on are in the Tule River and White River watersheds. The District played a role in the recent enlargement of Lake Kaweah representing those property owners in the rural unincorporated areas potentially affected by flooding related to the Kaweah River.

Principal in their current functions is their part in the National Flood Insurance Program which has required the County of Tulare to agree to manage flood hazard areas by actively adopting minimum regulatory standards as set forth by the Federal Emergency Management Agency. Through this program, individuals are eligible to obtain flood insurance. The District is heavily involved with the Map Modernization Project of the Federal Emergency Management Agency and, since 2009, has adopted the new Digital Flood Insurance Rate Maps as a part of the flood insurance program. The District maintains a current and interactive website which is utilized principally in the map related programs.

8.1.4 City Flood Control Programs

For the most part, the storm water programs of the cities located within the IRWM boundaries are engaged in storm water management, in lieu of flood management. Due to its location associated with the westerly termination of the Kaweah River and the adjacent St. Johns River, the City of Visalia was a direct participant in the Lake Kaweah Enlargement Program. In a similar fashion, following the devastating flood of Christmas of 1955, the City and a number of influential City residents were the main drivers in succeeding to achieve the financing and construction of Terminus Dam. At the current time, the City is heavily engaged with the federal government in their floodway mapping programs and seeks to stabilize that program and make meaningful changes to the

manner in which policies are established and enforced relative to flood map generation and flood zone determination.

The City of Farmersville has been a supporting agency in the KDWCD Paregien Basin Project, a major element of which is to attenuate the flood flows of Deep Creek and reduce the flooding impact on the City resulting from non-attenuated Deep Creek flows. These flows have as their origins, principally the unregulated Dry Creek watershed. While not a financial participant in said project, the City's status as a disadvantaged community and the support of the City administration and City Council were instrumental in securing funding for project construction.

8.2 FLOODING PLANNING ISSUES

A number of flood planning issues are currently in the forefront in the KDWCD IRWMP implementation process. Beginning with the USACE dam seepage and seismic evaluation issues related to Terminus Dam, IRWMP stakeholders are heavily involved in the issues and potential outcomes of both of these issues. The outcomes will dictate whether or not Terminus Reservoir is allowed to operate at full storage, suffers restrictions for defined reasons or is to be modified physically. In addition, as a principal function of KDWCD is channel maintenance, maintenance of the flood channels downstream of Terminus Dam are an everyday occurrence. Whether in planning or implementation, manpower, equipment and expense is continually directed at these

channel maintenance activities. The activities are carried out under permit authorities granted relative to the Federal 404 permit process and the State of California, Department of Fish & Wildlife 1601 permit process.

Activities related to the sufficiency of levees constructed years ago along principally the St. Johns River are at the forefront, particularly with respect to flood mapping issues. These levees were apparently built, for the most part, without engineering design and related geotechnical studies. A recent policy adopted by the Federal Emergency Management Agency, sets forth that such levees are to be discounted as nonexistent in flood mapping procedures. This decision has led to a significant change of who is or who is not within a defined flood plain. Work continues on this issue at this time.

In discussion form, issues related to climate change and flood control concerns are beginning to take shape. As flood damage is envisioned to be at its greatest within the IRWMP area based on rainfall events on unregulated watersheds and on high-elevation warm rainfall on top of significant snow pack, climate change intensifies one of these paradigms and drastically alters the other. It is envisioned that discussion will continue relative to this issue until sufficient direction is generated with respect to potential projects which can be designed and implemented to alter the effects of climate change and to address a change in runoff configuration from predominantly snowmelt to a mix of snowmelt and rainfall. It is envisioned that a paradigm shift completely to a rainfall

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pattern is of such draconian proportion so as not to be in the realm of reasonable discussion at the current time.

CHAPTER 9

**KEY ISSUES, REGIONAL PRIORITIES
AND WATER MANAGEMENT
STRATEGIES**

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

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CHAPTER 9
KEY ISSUES, REGIONAL PRIORITIES AND
WATER MANAGEMENT STRATEGIES

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
KAWEAH DELTA WATER CONSERVATION DISTRICT

9.1 KEY REGION WIDE AND WATERSHED-SPECIFIC ISSUES

9.1.1 Overview

A number of issues are of key position within the Kaweah River watershed and a significantly reduced number at the region wide level. Of principal magnitude, is the governance leadership role associated with the IRWMP. Beginning in the early 1990s, coordinated water management became the focused issue of the KDWCD Board of Directors and management. It was envisioned that far greater strides could be made with respect to program and project implementation if partnerships were forged between willing parties, than could be accomplished if individual parties pursued like issues on their own. Agreements and projects began to fall into with place with this changed

paradigm of thinking which has resulted in the relationship between IRWM participants and stakeholders that exist today. The leadership position of KDWCD has been discussed over the years between participants with no other contenders or viable options being placed before the participating entities at any time.

With the advent of the State of California recognizing the value of water management integration and structuring allocation of bond funds around integrated regional management concepts, interest in the governance issue and, in particular, the governance leadership model, has been rekindled. As to whether this interest is driven by water management related interests or project funding interests, the issue probably remains unanswered until a point in time when funding of projects falls once again to the local participants without any assistance from State and/or federal agencies.

To demonstrate the gravity of this issue, the topic is one of the paramount topics to be evaluated in the consideration of the modifications to this IRWMP utilizing Round 2 – Proposition 84 funds. Subsidiary issues to the governance issue deal with the IRWMP itself. Issues as to what type of plan it is, whose plan it is and the plan maintenance are specific issues. In particular, debate will certainly exist at some point in time over issues introduced into the IRWMP as a result of IRWMP plan review and approval guidelines established by the State Department of Water Resources (DWR). A number of issues which have been introduced into the IRWMP structure as a result of the DWR review and approval process are not felt to be applicable water management elements in the Kaweah

River Basin. Of particular note is the degree of required attention and response to the issue of climate change and the response to climate change from a water management standpoint. While there is little debate within the Kaweah River Basin with respect to whether climate change exists or not, considerable debate exists as to the extent that time should be spent trying to develop plans to respond to the issue, as compared to the historic IRWMP planning process that is complementary to the impacts expected with climate change. Given the recent 20 year plus experience related to the project to add 21 feet to Terminus Reservoir and increasing the yield to the Kaweah River Basin by 8,500 acre-feet, along with a significant improvement in flood control benefits, brings rise to the question of how quickly water development projects can be created and implemented which are of any sufficient magnitude. Whether or not the topic of planning for a climate change shift of predominantly rainfall runoff as compared to snowmelt runoff can be sustained over the near term remains to be seen, as does the response of land use planners to a situation wherein either considerable more storage infrastructure would have to be developed or considerably more land will experience flooding conditions than currently exists. The role which the U.S. Army Corps of Engineers has is major in this regard and the and the degree of which they respond will define the responsibility of others relative to climate change.

It remains to be seen whether the Whose Plan? issue becomes one which pits agricultural water users, who have rights to the majority of the surface water rights in the Kaweah River Basin against rural and urban water users whose sole source of supply

currently is groundwater. A high level of cooperation exists today between these disparate interests based on what is viewed as common interests. Whether time and declining groundwater conditions modify that relationship remains to be seen.

The final overview issue is related to the relationship between water quality and land use planning. Even today, confrontation is beginning to develop over approval of land uses in locations where the end use being planned for necessitates a water supply which is compliant with state and federal drinking water standards. Approval of land uses in deference to water quality are continuing to proceed with the end result being the unavailability of compliant water quality sources to the end users, oftentimes not realized by end users until significant economic decisions have been made. Considerable improvement relative to this issue is being requested by a number of parties, not only from the discussion standpoint, but also from the implementation standpoint.

9.1.2 Region-wide Issues

In addition to the overview issues presented in 9.1.1, a number of other issues are at hand. Leading these issues are the conditions of the groundwater reservoir underlying the lands within the ILRP, the cost to extract water as groundwater levels decline and changes in water quality associated with both legacy land uses and current land use practices. The role of Groundwater Management Plans is likely to change in the future with the possibility existing that local control of groundwater could become centered in a

state-wide system such as that headed by a state engineer, where local input is directed through the veins of public comment, political comment and judicial related actions. Accompanying those changes are very active programs related to Basin Plan water quality objective changes, impacts related to implementation of the San Joaquin River Restoration, destruction/restoration of threatened and endangered species habitats, along with the recovery programs associated with threatened and endangered species, and, as previously mentioned, the interface between current water managers, principally in the agricultural realm and water managers in the urban setting, particularly those who are in declining groundwater areas.

The final issue deals with that of disadvantaged communities. While the IRWMP planning area consists of predominantly agricultural land and urbanized areas, a number of population concentrations and rural residences exist for which the economic base of the home unit is considered to be disadvantaged. In a recent application submitted by KDWCD, as an approved IRWMP project, information was generated detailing how 51 percent of the population within the IRWMP area is considered disadvantaged. Therefore, approximately one-half of the population of the IRWMP area falls into the disadvantaged definition but, more importantly, a significantly high percentage of that population falls into the severely disadvantaged category. As will be discussed later in this chapter, response to this issue, in earnest, began several years ago with processes and procedures being agreed upon to initiate a proactive approach to resolving water management problems related to this disadvantaged segment of the IRWMP population.

Through the course of the last 25 years, progress has been made through the IRWM process in addressing issues such as surface water export and groundwater mining and export. As an example of the types of policies which are developed on an integrated water management based approach, the basin policy of the Kaweah & St. Johns Rivers Association is offered. A copy of this policy is contained in Appendix G. This policy was adopted in the early years of the approach to integrated water management and was based on the intent of the parties to the policy to retain waters of the Kaweah River and its tributaries within the Kaweah River hydrologic surface basin, now referred to simply as the “Basin.” Boundaries as to use of Kaweah River water were agreed upon, as were specific water management procedures, such as allowing water to leave the Kaweah River Basin during dry and critically dry situations. Such transfers were based in allowing relief to growers/landowners and urban users in other areas which do not enjoy the same conjunctive use capability as exists within the Kaweah River Basin.

As a dynamic planning document, this IRWMP is designed as a document to be flexible enough to deal with the fact that some of these issues will find resolution, while other issues will be brought to the table to be dealt with from the interactive process that exists between the Board of Directors of the KDWCD, its staff and consultants and the individuals participating in the Stakeholders Advisory Group. As always, public participation and public comment will be an integral element in the functioning of the IRWMP.

9.2 REGIONAL ACCEPTANCE PROCESS

In 2009, the KDWCD was invited to participate in a review process, utilizing guidelines developed by DWR, for what was designated as the Regional Acceptance Process (RAP). At that time, the DWR had previously found that the planning effort and the geographical boundaries of the KDWCD IRWMP to be a “deemed acceptable” plan covering the Kaweah River Basin. Documents were submitted at that time in support of concurrence by DWR of the KDWCD position relative to the RAP process.

For an approximately two (2) year period of time prior to the RAP application being submitted, the Stakeholders Advisory Group had been meeting to deal with a number of issues, particularly those related to water quality and water quantity issues. The process was designed to address those topics, whether the subject water user was agricultural in nature or was a domestic consumer. Coming out of the process were a number of conclusions and agreement as to processes which could be followed to change the circumstance, for instance, of a community with a water quality problem, no governance structure and a need to address the deficient quality conditions.

This information was provided to DWR who scheduled a formal review process with KDWCD and members of the Stakeholders Advisory Group. Coming out of this process, the DWR determined that all aspects of the IRWMP planning process were adequate, with one (1) exception, and that the KDWCD plan was confirmed to be a

“deemed equivalent” plan. Further, that KDWCD was an eligible applicant to apply for Round 1 implementation funding made available through the passage of Proposition 84.

The one (1) exception which the DWR desired to be pursued further was the potential integration of the IRWM efforts in the Kaweah River Basin with those in the Tule River Basin. Substantial confusion over the exact directive from the DWR over the RAP condition existed for a significant length of time. The matter was finally clarified when DWR issued language indicating that “the Kaweah River Basin and the Tule River IRWM regions must explore options on how best to structure the regional boundaries in this area.” With that clarification, intense effort began between the governing boards of the KDWCD and the Deer Creek & Tule River Authority to address the issue. Joint and independent work sessions were set with the governing boards with a joint meeting of the respective boards occurring where draft alternative positions were presented for consideration and instruction. Policy direction was given to staff and consultants to draft a formal position for consideration for adoption by both governing boards. An evaluation process occurred, culminating in a formal joint decision being made by both governing boards. A copy of the overview of the decision which was before the governing boards is attached hereto as Appendix H. In addition, Appendix H also contains a copy of the staff recommendation which was generated as a result of the joint board efforts. The recommended actions from the staff report were adopted in July, 2013, by both governing boards.

9.2.1 Recommended Response to RAP Process Recommendation

Ratified by both the governing boards of KDWCD and the Deer Creek & Tule River Authority, the following five (5) recommendations were instructed to be adopted. The adoption was as policy instruction and is as follows:

1. The Kaweah River Basin and the Tule River Basin would continue their existing Integrated Regional Water Management procedures and implementation of related policies as they apply to each specific basin;
2. That the IRWM Plan structures be developed on a DWR acceptable format specific to each river basin;
3. That the existing Kaweah River Basin Advisory Group be retained and expanded to include Tule River Basin membership. The Advisory Group meeting location would be rotated between the basins so as to encourage participation by water management entities and disadvantaged communities specific to each basin. A specific task given to the Advisory Group would be to address the project evaluation process and, in particular, the evaluation of projects from the perspective of improvement if projects were designed on a multi-basin format, in lieu of just a single basin format;
4. That specific steps be taken to update and expand the prior activity of the DCTRA to delineate needs and capabilities within the participating entities between both Plan areas; and

5. This structure should be reviewed in no more than five (5) years to allow for the opportunity of strengthening, confirmation or modification of the policies and procedures based on the success of implementation.

The policies instructed to be put into place as of the date of final Board action have been put into effect. Written plan development for the Kaweah River Basin is evidenced by this document and a parallel document is being completed which will be considered by the Deer Creek & Tule River Authority in the spring of 2014. Conformation of the acceptance of the actions of the governing boards relative to the integration considerations were formally accepted by the DWR. The letter evidencing that acceptance is also a part of Appendix H.

9.3 REGIONAL PRIORITIES

9.3.1 Short-Term Priorities

Within the KDWCD IRWMP process, short-term priorities have been defined as those which can be implemented within a five (5) year time frame. In a review of the list of projects submitted to the Stakeholders Advisory Group for consideration for ranking for project funding, the priorities fall into three (3) focused areas. The first of these is addressing drinking water quality issues, on a basis that covers the entire IRWMP area. This includes urban suppliers, rural water suppliers and individual rural water systems.

The second priorities fall into the category of water supply reliability and the priority is effective for both agricultural suppliers, as well as municipal and industrial suppliers. It is acknowledged that a declining groundwater reservoir, expressed in terms of both elevation and storage volume, is not in the best interest of any type of supplier. The third category is related to improved water management. Expressions of these priorities are related to control systems, replacement of older and deteriorated distribution facilities and pumping facilities and improved coordination between water rights holders in the Kaweah River Basin. It is acknowledged that it is the latter category that has the most chance of success, however, recent changes at the State level related to the drinking water program, have generated expressed hope from disadvantaged community representatives that projects can be designed and implemented for the benefit of those with less than adequate quantity and/or quality within the five (5) year horizon.

Additional priorities for the five (5) year term include completing the updates to the Water Resources Investigation and the Groundwater Management Plan of the KDWCD, further defining the role of urban water suppliers utilizing groundwater in the Kaweah River Basin groundwater management activities and completing the update to this IRWMP as contractually will be required by the Round 2 – Proposition 84 grant agreement.

9.3.2 Long-Term Priorities

In the planning horizon of five (5) to 20 years, the priorities turn to larger-scale items such as retarding the decline of groundwater elevations within the central and westerly portion of the IRWMP area. Central to this issue is participating in the resolution of a much larger issue, that being conveyance of water from Northern California river systems through the Sacramento-San Joaquin Rivers Delta and south to both State Water Project and Central Valley Project contractors. As is being demonstrated in the current paradigm, solution impact also extends to the San Joaquin River exchange contractors and the importance of making water available south of the delta for protection of the Friant Division, CVP supplies. Lacking a resolution to this problem on a 20-year horizon will change the groundwater dynamic within the KDWCD IRWMP considerably. There is an insufficient supply, under any hydrologic conditions, when coupled with storage and conveyance capacity restrictions on the east side of the valley to overcome the impact on the Kaweah River Basin groundwater to the degree necessary to prevent wholesale cropping and land development changes within the IRWMP planning area.

An additional long-term goal will be the determination of the success of the proposed pilot program within the KDWCD IRWMP area of providing assistance to those who have either inadequate drinking water quality or quantity and lack the sufficient resources to implement programs to effect changes in either parameter. This

program will be described in greater depth later in this chapter, but is an integral component of the value of IRWM planning. Coupled with this issue will be the demonstrated success or failure to deal with land use policies such that developments, of any size, cease to be approved to be placed in locations with known water quality failure problems. The loop which is currently in evidence within the IRWMP area of creating drinking water problems faster than they are solved, will either be overcome or not in this planning horizon.

It is not envisioned that any major structural changes will occur within the IRWMP area in this planning horizon with respect to either flood control related issues, or structural considerations designed to specifically address climate change in and of itself.

9.4 WATER MANAGEMENT STRATEGIES

The California Water Plan update of 2009 identified a litany of issues identified as Resource Management Strategies (RMS). Considerable attention is given in the IRWMP evaluation guidelines to the degree to which these RMS issues are addressed, both as separate topics, as well as integrated topics. While a few of the RMS topics are outside of the scope of this IRWMP, such as enhanced surface storage under CALFED, the majority of the RMS topics are embodied in everyday water management decisions and strategy developments within the IRWM planning structure for the KDWCD. The

specific delineation of RMS strategies as a separate and divided portion of the IRWMP document structure is to be addressed in a supplemental fashion to this document in Round 2 planning efforts.

Considered to be of significantly more importance by the Board of Directors of KDWCD and the Stakeholders Advisory Group is the matter of dealing with water quality/water quantity related issues for rural unincorporated communities and aggregations of single-family residences identified in current context as “hamlets.” For several years, the Stakeholders Advisory Group worked on structural, political and management procedures related to addressing these water quality/water quantity issues. The issue was pursued to the extent that process and procedures were identified for both entities where a local governance structure existed and for those where it did not. As one would expect, the IRWM process was interjected into the solution set resulting in a process which is expressed graphically in two (2) process diagrams which are presented here as Figures 9-1 and 9-2. Figure 9-1 presents the scenario where there is initially no identified lead agency to address the problem. The process follows from initial problem identification and definition through project completion and implementation. “Go-no go” points are incorporated, indicating where the willingness of the local beneficiary to engage becomes the critical element in the success of the particular project to proceed from initial identification and description to completion and implementation. Paralleling this process, but for those situations where there is an identified lead agency, Figure 9-2 presents the pathway for a process from problem identification and definition again to

completion and implementation. The process, in this case, only ceases if there is no identified feasible solution. It should be noted with the advent of Proposition 218, this process diagram may need to be modified to reflect the support, in general for the project, but an unwillingness to fund the level necessary to achieve project implementation.

As the lead agency in the IRWM process for the Kaweah River Basin, this process has become a priority item for the Board of Directors of KDWCD. Based on opinions which exist with respect to the capability of the Regional Water Quality Control Board's recently adopted Irrigated Lands Regulatory Program General Order to succeed in any reasonable time frame with respect to addressing groundwater quality improvements, the Board of Directors has instructed engagement of staff and consultants in the pursuit of the process generated by the Stakeholders Advisory Group. At the current time, outlines are being prepared of policies and procedures to implement the process and to further expand the process into non-traditional arenas for the KDWCD. As an example, the Board of Directors has suggested that a potential arena for IRWM activities related to disadvantaged area drinking water activities is related to technical assistance. This technical assistance comes in numerous forms including management assistance, governance assistance, outreach assistance, operations related assistance and projects funding and construction plans and specifications preparation assistance. In demonstration of one of the elements of this consideration, there is contained in Appendix I, a memorandum in which is summarized training and technical assistance

activities which have application to areas within the Kaweah River Basin for which the KDWCD has elected to engage.

In addition to this process, the County of Tulare is in the process of completing a report specifically oriented to the various issues outlined in the Appendix I memorandum with specific emphasis on four (4) specific concerns. The first of these is the arena of management and financial activities, the second addressing water supply and water supply augmentation issues, the third dealing with technical issues related to water and wastewater systems and the fourth related to individual water and wastewater systems. Recommendations forthcoming out of the report have application at the individual level, the community level and at the community governance level. Most importantly, recommendations are forthcoming with respect to actions which county, state and federal governments can take to improve the drinking water and wastewater conditions which exist for individuals living within the Fresno, Kings, Tulare and Kern County region, but with application likely nation-wide for a similar population. In particular, the report is charged to address obstacles which can be removed from delivery of service at the local, state and federal governmental levels and steps which can be taken to enhance the current process and procedures related to such delivery of service. The report is scheduled for draft release in September, 2014.

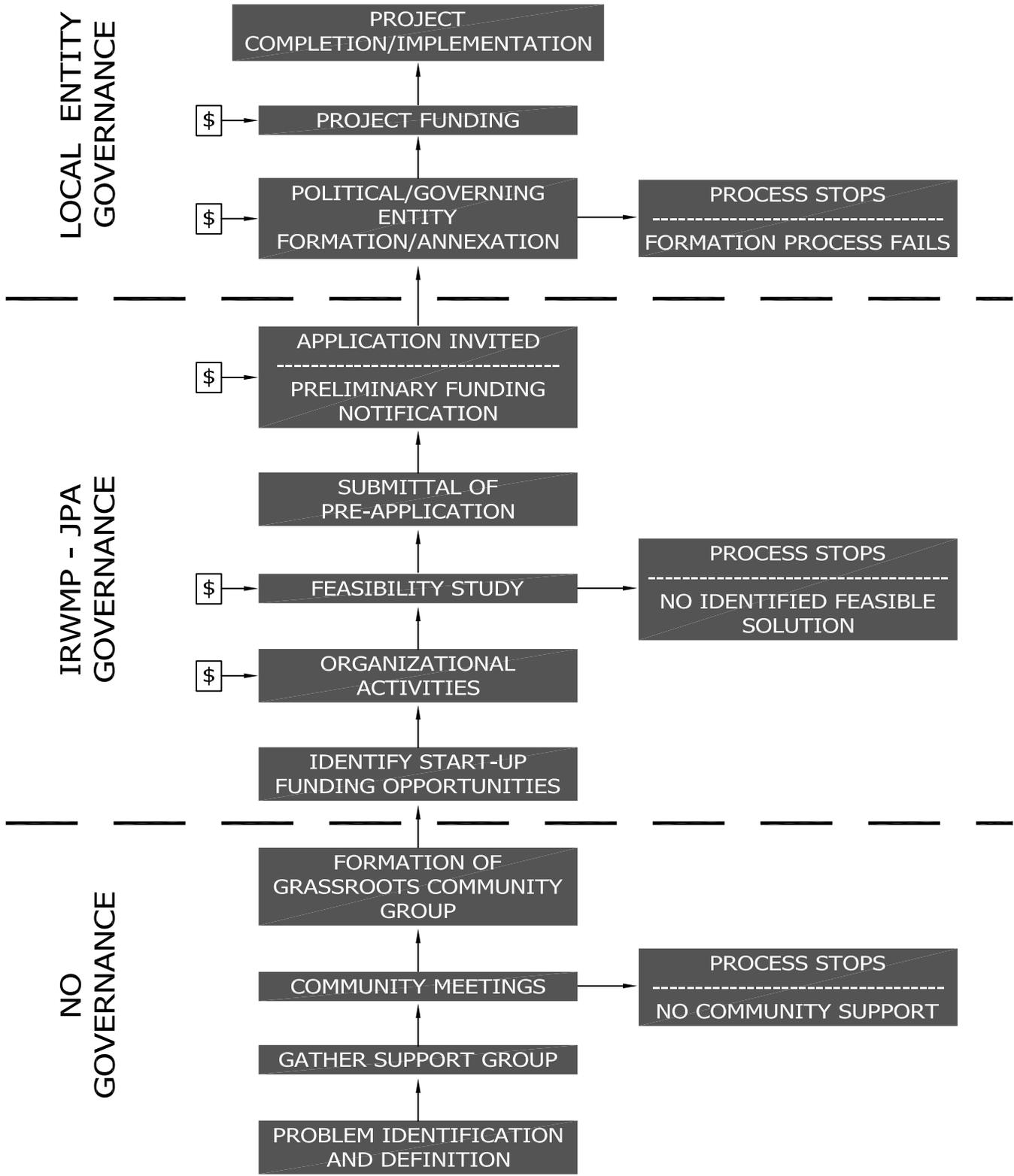
9.5 INTEGRATION OF STRATEGIES WITH BASIN PLAN OBJECTIVES

Table 9-1 presents the surface water beneficial uses which are adopted into the Basin Plan by the RWQCB for both the Kaweah River and the Tule River. From a water management planning perspective, the Basin Plan has always been considered the primary and governing document in this regard. The beneficial uses listed in the table are those which the RWQCB has chosen to be protected by activities taking place within the respective basins. Activities involving discharge to waters which have established beneficial use criteria are enjoined from degrading the potential for said waters to be utilized for those purposes. It is reinforced in this IRWMP document that the Basin Plan Objectives are of paramount significance and deserve the position which they have been accorded by action of the RWQCB in establishing said protective standards.

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TABLE 9-1
SURFACE WATER BENEFICIAL USES
TULARE LAKE BASIN
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KAWEAH DELTA WATER CONSERVATION DISTRICT

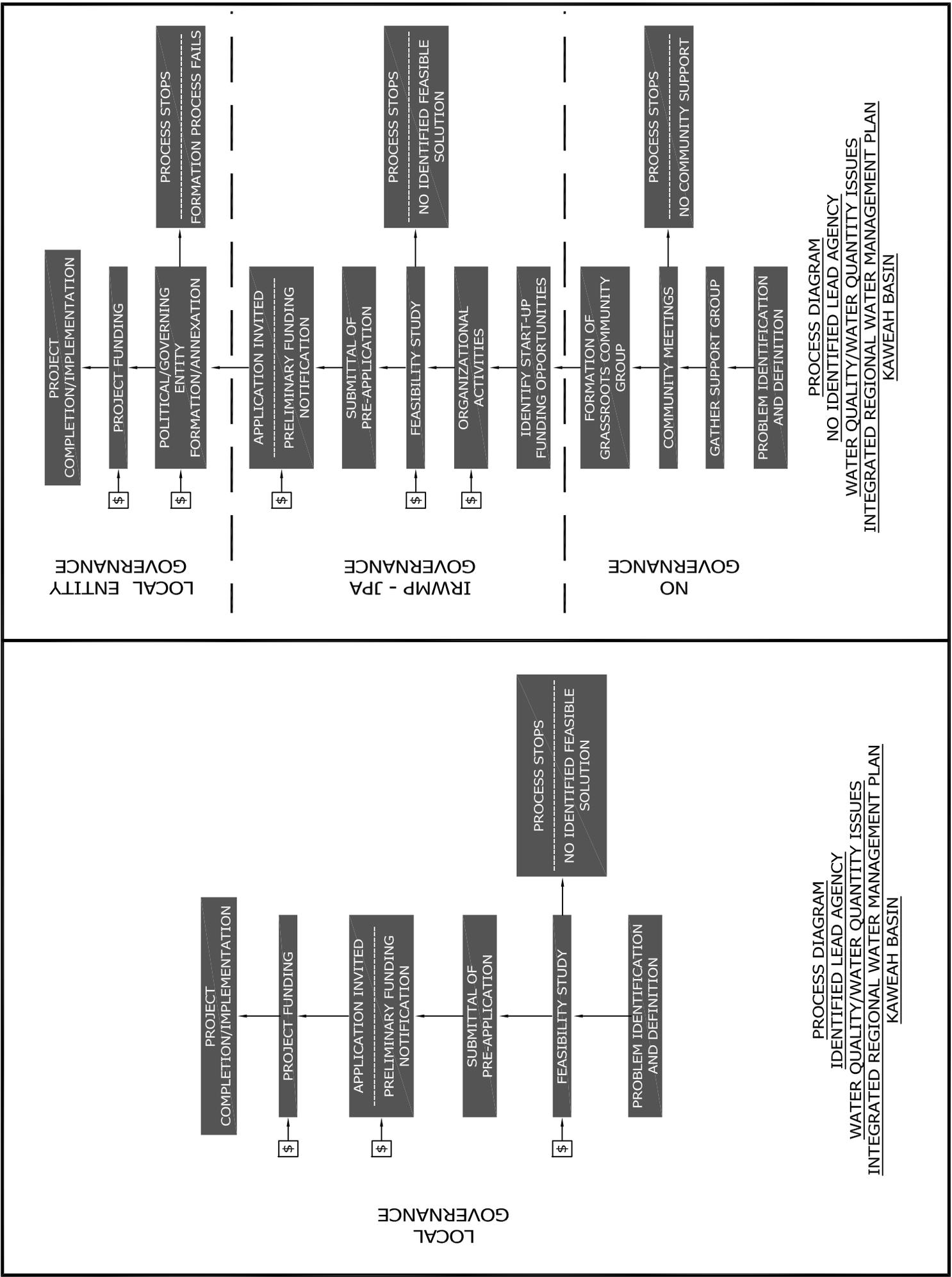
Stream	MUN	AGR	IND	PRO	POW	REC-1	REC-2	WARM	COLD	WILD	RARE	SPWN	GWR	FRSH
553,558 Kaweah River														
Above Lake Kaweah	•				•	•	•	•	•	•	•	•		•
Lake Kaweah					•	•	•	•		•				•
Below Lake Kaweah	•	•	•	•		•	•	•		•			•	
555,558 Tule River														
Above Lake Success	•	•			•	•	•	•	•	•	•	•		•
Lake Success		•			•	•	•	•		•				•
Below Lake Success	•	•	•	•		•	•	•		•			•	
552,553, 554, 555 Other East Side Streams	•	•				•	•	•	•	•			•	
551,557, 558, Valley Floor Waters		•	•	•		•	•	•		•	•		•	



PROCESS DIAGRAM
NO IDENTIFIED LEAD AGENCY
WATER QUALITY/WATER QUANTITY ISSUES
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
KAWEAH BASIN

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CHAPTER 10

**WATER RESOURCES
MANAGEMENT OPPORTUNITIES**

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

CHAPTER 10
WATER RESOURCES MANAGEMENT OPPORTUNITIES
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10.1 PARTNERSHIP FORMAT

While not discouraging the individual entity approach to water management and development of water management projects, the Kaweah Delta Water Conservation District's (KDWCD) Integrated Regional Water Management Plan (IRWMP) is designed to foster and encourage a partnership based approach to project evaluation and development. When viewed from a single-entity approach, projects are not allowed to achieve their maximum potential. Only when evaluated by multiple stakeholders potentially affected by results of a project and given a chance to change their project elements to be incorporated with the proposal of another entity, can optimum results be assured of being achieved. It is this partnership type approach that has been a part of the KDWCD IRWMP for in excess of two (2) decades. It is the intent of the Board of Directors of the KDWCD to continue to encourage this basis of approach to project development and water resources management into the future. The current approach to

the IRWMP structure with participant Memorandums of Understanding and an open Stakeholders Advisory Group process ensures that the Board of Directors' directive has a chance of succeeding.

10.1.1 Water Supply Augmentation Measures

There are a number of water supply augmentation measures which are currently being contemplated. Amongst these are programs which are appurtenant to other organizations or are partially driven by regulations and guidelines either in place, or in the process of development. As is the case with the IRWMP area, these programs have somewhat of a division between municipal and industrial water management issues and those of the agricultural community.

Augmentation measures related to municipal and industrial uses include putting shuttered groundwater extraction facilities back into operation with the assistance of treatment methodologies. As shuttering wells from systems due to contamination often causes a skew within the groundwater reservoir, problems associated with mounding and over-drafting can be partially addressed with a more even distribution of water extraction made available by utilizing mechanisms such as well head treatment.

A water supply augmentation methodology currently in use in the Deer Creek & Tule River Authority area is that of the Lower Tule River Irrigation District. Elements of

their program call for partners receiving surface water during below normal and dry years from the supply of the LTRID to participate in the construction of groundwater banking facilities and to participate in the purchase of above-normal and wet year supplies to deliver in-lieu quantities to agricultural users and to populate the groundwater recharge facilities for purposes of augmenting the groundwater reservoir. Such a program does not currently exist within the KDWCD IRWMP area, but would be a mechanism by means of which water supply augmentation for municipal and industrial needs could be addressed.

With respect to agricultural water supply augmentation, several opportunities exist, some of which are available programs, some in the process of being developed and others in the concept stage. Amongst the developed programs, attention is currently being given to those related to the San Joaquin River Restoration Settlement actions. This program, in the early stages of implementation, offers funding assistance for programs which are designed to replace the water supply lost as a result of release of heretofore allocated project yield from the San Joaquin River to the river below Millerton Reservoir for purposes of reintroduction and maintenance of anadromous fishery. The KDWCD, as a Friant Division, CVP contractor, is affected by the Settlement action and is therefore eligible to participate in the program to mitigate the effects of Settlement implementation.

In progress in the development phase, is the concept of a surface water distribution system in the westerly portion of the KDWCD service area. While this would be a paradigm shift for the KDWCD to deliver water directly to landowners/growers, the

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Board of Directors is considering this program due to the declining levels of groundwater in the subject area, principally due to the curtailments in the deliveries of water from the Sacramento-San Joaquin Rivers Delta by the State Water Project and the San Luis Unit CVP. KDWCD would utilize its Friant Division, CVP contracts as the principal mechanism to provide water to these facilities, augmented by its pre-1914 water rights from the Kaweah River.

Additional programs which have been discussed which could provide augmentation would be delivery of water to concentrated water use areas, such as Monrovia Nursery. Augmentation of the groundwater extractions in this area would allow for existing groundwater conditions to remain, to the extent that demand could be offset by an imported supply, in lieu of groundwater pumping, while this program would be of benefit in a localized area of the KDWCD, it nonetheless is an augmentation measure which would have benefits to both a portion of the agricultural community within the KDWCD, as well as to downstream municipal and industrial users, such as the City of Visalia through its service provider, California Water Service Company.

Another opportunity which exists for augmentation is the conversion of current played-out mine sites developed for purposes of obtaining sand and gravel supplies for construction related activities. In reclamation, these facilities have been approved to be in a lake/pond form, however, in that form, groundwater is the source of supply which fills the excavated basins and considerable evaporation results from this reclamation activity,

with the backfill again being provided by groundwater. Recent action to replace this procedure with a “dry pit” concept eliminates the exposure of groundwater to potential adverse contaminant introduction, plus virtually eliminates the evaporation impact.

Two (2) types of projects which are currently in the planning/development phase include the Hannah Ranch project of KDWCD and the McKay Point project of the Consolidated Peoples Ditch Company, the Tulare Irrigation District and the Visalia-Kaweah Water Company. Both of these facilities are designed to act as re-regulation facilities below Terminus Dam, re-regulating flows for the benefit of peak power production, as well as allowing for introduction of currently non-storable flows lost to the basin and released downstream for groundwater recharge purposes based on the availability of recharge capability in existing basins.

Programs based on cooperative partnerships such as the City of Visalia/Tulare Irrigation District tertiary treated effluent – Kaweah Water Exchange and the groundwater recharge basin development east of the City of Tulare, in partnership with the Tulare Irrigation District are examples of partnerships wherein groundwater supply augmentation for municipal and industrial purposes are in the process of taking place.

Banking programs are currently being developed between partners within the Kaweah River Basin which will call for normal, above-normal and wet year puts into ditch company service areas, in exchange for yielding dry year, low flow, high priority

Kaweah River entitlement for the prior puts. These puts are at ratios to the extraction quantities reflecting the higher value of the dry year surface water entitlement.

10.1.2 Water Demand Reduction Measures

A number of water demand reduction measures are already in effect within the KDWCD IRWM area. Principal amongst these are the utilization of rate structures associated with metered deliveries for domestic, commercial and industrial consumption with accompanying rate structures which can be varied to encourage conservation. In addition, household plumbing retrofits and installation of improved technology, low-flow plumbing devices are mandated to be installed in new construction, as well as retrofits requiring a building permit.

On the agricultural use side, considerable improvement in agricultural irrigation delivery efficiency has been accomplished over the last several decades. Often at considerable economic expense, complete conversions of fields from furrow and flood irrigation to low-volume micro sprinkler and drip irrigation has occurred. Such conversions are extensive and common place within the permanent plantings areas of IRWMP area. The greatest opportunity for demand reduction, however, is that associated with elimination of multi-cropping in a single year. Double cropping in certain parts of the IRWMP area is common as the growing season is year-round and readily accommodates both a summer, as well as a winter crop. In some cases, adjustment of

crop types and the nature of the harvest has allowed for both triple-cropping and quadruple-cropping. The impacts on the groundwater reservoir when these cropping choices are made absent a plentiful surface water supply are beginning to be understood. It is likely that demand reduction procedures undertaken in the future will call for the reduction and/or elimination of a significant portion of this multiple-cropping if declining groundwater level trends are to be abated.

10.1.3 Flood Control Projects and Programs

Flood control facilities have been given development potential planning consideration on Dry Creek, Lewis Creek and Cottonwood Creek. An alternative evaluated for Lake Kaweah enlargement was the inclusion of a dam on Dry Creek, but due to the adverse impact of the elimination of one of the largest riparian sycamore corridors still in existence eliminated this alternative from consideration. In addition, off-stream storage related to the Friant-Kern Canal and its relationship to flood flows on the San Joaquin River has given rise to the evaluation of Yokohl Valley as a potential off-stream storage site. This concept was included in the proposed East Side Division, CVP, planning which was abandoned by the U.S. Bureau of Reclamation. Given the current desire of the major landowner in Yokohl Valley to plan for urban development in that area, it is not likely that the off-stream storage proposal will be pursued in the near future. To date, projects on Mehrten Creek have not been given consideration, due to the low-volume discharges from these facilities, the fact that water is currently diverted for

beneficial use in the majority of storm-water related events and flood related events on both of these streams are so infrequent as to eliminate the economic viability of current flood control project types. Whether this remains the situation for the future is yet to be determined.

10.2 WATER QUALITY IMPROVEMENT OPPORTUNITIES

The most significant future opportunities for groundwater quality improvement lie in outreach education and employment of Best Management Practices related to application of pesticides and herbicides. This educational component applies to both the urban and rural development regions of the IRWM area, as well as the agricultural areas. Both areas are potential sources of contamination leading to the degradation of groundwater supplies and avoidance of contamination is the strongest methodology for assuring future beneficial use capability of existing surface and groundwater supplies.

The pilot disadvantaged community drinking water outreach program currently being developed by KDWCD will hopefully identify additional water quality improvement opportunities. It is acknowledged that most water quality improvements within the KDWCD IRWMP area will be oriented to human consumption purposes. Levels of constituents such as nitrates are of benefit to irrigated agricultural and are not considered to be adverse, as they are with respect to human consumption. Likewise, pumping groundwater with residual quantities of DBCP and 1,2,3-TCP are not adverse to

agricultural operations and allow for reduction in the level of these contaminants in the environment through volatilization associated with pumping and exposure to sunlight when applied for irrigation application purposes. The pursuit of the implementation of this pilot program is currently a priority of KDWCD and, to date, has received a positive response from the representatives of potential beneficiaries of this process.

10.3 OTHER WATER MANAGEMENT MEASURES

10.3.1 Land Use Policies

Of critical importance in the water resources management opportunities which exist within the KDWCD IRWMP area, is the matter of improved land use policy decisions. Currently, most land use policy decisions, particularly those which allow for the placement of developed subdivisions and farmworker housing installations in areas with known groundwater contamination, occur without thought to that existing contamination. It is a goal of the KDWCD IRWMP to intensify discussions with land use policy decision makers, bringing attention to the gravity of this situation and providing input as to how their land use planning policies could avoid many of the adverse drinking water situations which are being developed. If the resolution of providing high quality drinking water to rural residents is to be properly addressed, the land use policy decision making process is the first and foremost arena in which attention to improvement needs to be given.

10.3.2 Water Supplies for New Development

Assuming the addressing of proper placement of new development with respect to groundwater quality issues, sufficient quantity then becomes the principal issue. Policies such as have been developed for the City of Visalia and the City of Tulare, wherein evaluations have taken place of agricultural to urban development and displacement of previously delivered surface water supplies and their relationship to water balance, will need to be evaluated for other areas. These policies have resulted in the implementation of impact fees designed to at least generate a cash flow position wherein water can be acquired and delivered to offset the impacts of the development based land conversion and the modification of the water supply delivery sources. Additional policy considerations, such as those associated with the City of Porterville will also need to be given in the future. Their recent policy, calling for maintaining a position of only extracting water from the groundwater reservoir where said extractions are within the safe yield of the groundwater structure will bring about a myriad of changes in lifestyle. In particular, landscaping considerations under this type of policy adoption would be considerably different than those which currently exist. High volume demands for landscaping during summer months would virtually need to be eliminated. In addition, conservation practices would need to be employed, such as the rural practice of utilizing water supplies to introduce moisture into the dirt for dust abatement and atmospheric cooling conditions. In an over-drafted groundwater basin, it is envisioned that future policies will be directed principally at these two (2) related urban water uses. New

developments will lead the way with landscaping requirements and provisions for dust control built into project development considerations. Eventually, it is envisioned that the policies and procedures which are generated as a result of application to new development will roll over into existing rural development related ordinance restrictions. It is acknowledged that the current groundwater declining trends cannot be sustained into the future with water uses remaining status quo.

10.3.3 Agricultural Crop Water Management Measures

Previously noted, water demand reduction measures potentially exist where multiple cropping patterns contribute directly to significant reductions in the available amount of groundwater in storage and to resulting declines in both static and groundwater pumping levels. In addition to exacerbating water quality related concerns, additional impacts associated with over-drafting include increased power consumption related to pumping, the need to develop additional power grid improvements to accommodate increases in power demand, falling groundwater conditions which both reduce the useful life of the pumping unit and entrain air into delivered domestic supplies creating adverse conditions from an aesthetic perspective with these deliveries.

Already existing, but in somewhat an abated condition is the matter of subsidence. The importation of water, both on the east and west sides of the IRWMP area has led to groundwater extractions over-drafting principally sand and gravel aquifers, in lieu of

pulling water from the clay lenses in groundwater wells. Over-draft conditions which are currently beginning to be seen in areas of the IRWMP will likely result in pulling of water molecules out of the clay lenses which virtually instantly lose the support structure offered by the water molecules and collapse instantly due to the loss of structural support. This water storage capability is then permanently lost due to the weight of the overburden on the clay lens and results in the development of reflective subsidence which ultimately manifests itself at the ground surface. In addition to interference with the gravity delivery of surface water, numerous structural problems associated with roadways, drainage systems and constructed buildings, including single-family residences, occur. Evidence of this subsidence accelerating beyond historic levels is beginning to be documented. An element of the KDWCD Groundwater Management Plan is associated with documentation of this occurrence and the degree to which it exists. Improvements and a more significant outreach in this regard are anticipated to be incorporated into the next update to the KDWCD Groundwater Management Plan, which is currently in progress.

10.3.4 County Systems Infrastructure Improvements

As the County of Tulare has elected to act in the role as lead agency for several rural hamlet water systems, monthly costs associated with the operation and maintenance of these systems has been observed to be a major issue. At the current time, many of these systems are having their costs subsidized by the General Fund of the County of Tulare and several attempts to correct this trend through Proposition 218 related

procedures have met with failure. It should be recognized that this situation will intensify in the future as these systems become older and both maintenance costs increase, as well as the systems facing costs associated with replacement of obsolete and deteriorated facilities. The affordability characteristics of delivery of drinking water supplies meeting applicable state and federal drinking water standards are again, a reason why land use planning must become a critical element in water management planning. Systems deterioration and systems abandonment due to the lack of proper financial planning and land use planning are situations which are to be avoided based on policies and procedures associated with this IRWMP.

10.3.5 Pilot Studies

In an attempt to begin to address the issues related to disadvantaged community water supply and water quality related issues, the County of Tulare is acting as lead agency for a four (4) county effort addressing water and wastewater related issues for the disadvantaged communities within the four (4) county region, which includes the areas of the Counties of Kings and Tulare within the KDWCD IRWMP area. The pilot studies address issues not only related to water quality, water supply and their related technical issues, but also administrative, managerial and finance issues critical to the maintenance and well-being of rural water supply systems.

10.3.6 SCADA Expansion

Another water management measure which is increasing in its importance to optimized water management is the installation and maintenance of Supervisory, Control and Data Acquisition Systems. Otherwise known as SCADA Systems, installation of same allows for remote monitoring and remote control of water management related facilities. Whether these facilities are surface water oriented, groundwater oriented or in response to power production, significant efficiencies can be achieved through the utilization of this equipment and its related software systems. Consideration of increased design, installation and maintenance of these systems within the IRWMP area is encouraged and offers opportunity for improved management of available water supply resources.

CHAPTER 11

**WATER RESOURCES
MANAGEMENT FRAMEWORK
COMPONENTS**

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

CHAPTER 11
WATER RESOURCES MANAGEMENT FRAMEWORK COMPONENTS

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11.1 PLANNING FRAMEWORK

In addition to the traditional water management planning tools, as have been outlined in the chapters previous to this chapter, there are a number of other planning instruments which are critical elements to proper water management planning. Reference has already been made to land use planning and its relationship to delivery of potable and standards compliant drinking water supplies, particularly to hamlet and individual rural housing units. Supporting those land use policies are general plans and their related elements and a number of other formally adopted, publicly vetted plans. While these plans do not have as their basic underpinnings the broad water management related issues of this Integrated Regional Water Management Plan (IRWMP), they nevertheless have a direct nexus to the water management planning process. These plans are described herein in general context, but, as they are adopted plans and in the public domain, will not be described in detail in this IRWMP.

11.1.1 County and City General Plans

Both the County of Kings and the County of Tulare have adopted General Plans. That of the County of Tulare was recently adopted with at least a portion of said plan currently subject to a legal challenge. These general plans have elements related to infrastructure development, with particular emphasis on the provision of water supply to community areas, with specific emphasis on water supply for areas subject to development. In recognition of the significance of surface water supply to both counties, reference is made to surface water supply related issues. The County of Tulare General Plan, in particular, has a special section related to water supply based on the early recognition by the Board of Supervisors that water plays a critical role in the economic well-being of the County. It was the understanding of the Board of Supervisors that the authors of various components of the General Plan took into consideration the water supply information which was made available prior to the development of policy issues which are embodied in the adopted General Plan.

It is the goal of the Board of Directors of the Kaweah Delta Water Conservation District (KDWCD) to work with both counties with respect to the issues of land use planning and land use actions as they relate, in particular, to water quality and, to a lesser extent, water quantity. The need to cease approval of land division maps and permits

which allow development to occur in locations where the drinking water supply is out of compliance with state and federal drinking water standards is increasingly apparent.

11.1.2 National Forest Land Management Plan

While the KDWCD IRWMP has an easterly boundary that extends only up to approximately the 660 foot contour, actions which take place higher in the Kaweah River watershed have an impact on beneficial uses within the IRWMP planning area. In particular, sedimentation reduction is a major issue, particularly as it affects storage capability behind Terminus Dam. In addition, uncontrolled stream systems feeding into the IRWMP area are sensitive to and impacted by adverse volume sediment loads. The recharge capability of the Kaweah River and its distributaries and the uncontrolled stream system beds are the principal locations where effective recharge of runoff to the groundwater reservoir occurs. Accumulation of sediments in these channels is adverse to the effective percolation capability of same.

In addition, coliform contamination is an objective water quality standard in both the Basin Plan for the Tulare Lake Basin and within the adopted General Order related to the Irrigated Lands Regulatory Program. The actions of parties in their utilization of natural forest and park lands contributory to the stream groups is currently exhibiting an adverse level of coliform presence and the matter is rising on the radar of the Regional Water Quality Control Board as an issue to be dealt with. As preliminary indications are

that the source of this contamination is not from irrigated agricultural, attention of the Regional Water Quality Control Board will be turned away from irrigated agricultural to other potential sources once they feel that sufficient justification exists of the source not being irrigated agricultural. Coordination with the National Forest Land Management Plan and with U.S. Forest Service personnel will obviously be required to address each of these and potentially additional, water quality related issues.

11.1.3 Urban Water Management Plans

Urban Water Management Plans are currently current and in place for the City of Lindsay, the City of Tulare and the City of Visalia. The plan covering the City of Visalia was prepared by the water service provider for the City, California Water Service Company. Each of these plans deals with existing and forecasted future conditions, particularly with regard to land use considerations. In response to projected demands, forecasts are made of future requirements for supply, with additional segments dealing with water quality related issues. In addition, due to declining water levels, both static and pumping, each of these plans deals with issues related to power required for extraction and the costs related to same. Additional considerations are given to water quality issues and historical and projected impacts on water quality parameters. Interface between elements of these plans and this IRWMP will obviously take place in the future and the guidance provided by each of these plans will be employed by those parties who are charged with dealing with the particular matter at hand. Within the KDWCD IRWM

planning structure, including the Stakeholders Advisory Group, participation from each of the urban water suppliers already exists and attendance is regular for each of the representatives. Adequate knowledge sharing as to elements of each of the plans will be of necessity moving forward with the formal adoption of this IRWMP.

11.1.4 Groundwater Management Plans

The KDWCD has in place, an SB1938 compliant Groundwater Management Plan. This plan was prepared pursuant to the statutes related to implementing AB 3030 and is currently in the process of its first update since the update bringing the plan SB1938 compliant. There are a multiple number of signatories to the KDWCD Groundwater Management Plan, including the Tulare Irrigation District (TID). In addition to being signator to the KDWCD Groundwater Management Plan, TID has their own Groundwater Management Plan prepared pursuant to AB 255 implementing statues. Said plan was recently brought SB1938 compliant with both plans addressing complimentary and coordinating issues.

Based on the parties signator to the KDWCD Groundwater Management Plan Memorandum of Understanding, the jurisdiction of said Groundwater Management Plan extends beyond the boundaries of KDWCD. In fact, based on the Memorandum of Understanding participants, the area covered by said plan extends beyond the boundary of the IRWMP. To date, steps taken to update the policy provisions of both the KDWCD

and TID Groundwater Management Plans have taken into consideration IRWM principals and it is anticipated that that degree of cooperation and coordination will remain in the future.

11.1.5 Water Shortage Contingency Plans

At the current time, there is a single identified water shortage contingency plan in place within the KDWCD IRWM planning area. This plan is in the form of a written agreement between the Lindsay-Strathmore Irrigation District (LSID) and TID. Principal features of this plan call for entitlement to Friant Division, CVP supplies of LSID and Wutchumna Water Company entitlement of LSID to be made available to TID when the demands of LSID have been met, in any given year. In a reciprocal fashion, in below-normal and dry year conditions, the Kaweah River entitlement supplies of TID, in addition to their available declared Friant Division, CVP supplies are first dedicated to LSID to meet their in-lieu domestic, domestic and agricultural demands. Supplies above that level are available to TID to use at their direction. While there are other informal water shortage contingency plans, there are no others that exist in written form that apply on a long-term basis. To the degree that such plans may be developed in the future, policies such as those of the Kaweah & St. Johns Rivers Association relative to out-of-basin transfers will need to be taken into consideration as they are principally focused on water balance conditions within the Kaweah River Basin. Likewise, any future negotiations related to water banking where such banking will call for exportation of

water from the Kaweah River Basin will need to take into account existing adopted policies with respect to out-of-basin transfers.

11.1.6 Capital Improvement Plans/Master Plans

For many of the public agencies and California Public Utility Commission governed utilities, capital improvement plans and/or master plans are in place. Many of the public district surface water suppliers also have in place either complete or equipment and distribution system oriented capital expenditure plans.

Based on the requirements of the implementing legislation of Proposition 218 and multiple court related decisions based on litigation surrounding compliance with the legislation implementing Proposition 218, future water management planning will need to take into consideration the economic constraints imposed by existing adopted elements of Budgets, Improvement Plans and/or Master Plans. Water supply and water supply infrastructure projects developed as a result of the IRWMP process and participation, have already had to take into account financial constraints imposed by both economic conditions within the IRWM planning area, as well as the constraints imposed by the implementing legislation associated with Proposition 218. This will continue to be of necessary concern in future planning efforts.

11.1.7 San Joaquin River Restoration

An important element of San Joaquin River Restoration Settlement legislation and the underpinning Settlement Agreement, calls for funding and project assistance and priority for restoring back to the Friant Division, CVP contractors that element of water supply estimated to be taken from their declared basis by virtue of Settlement. Based on the position of the number of Friant Division, CVP contractors within and adjacent to the IRWM boundary, attention to and participation in San Joaquin River Restoration activities will be paramount, particularly those dealing with water supply restoration. A portion of the Round 2 Planning Grant is also designed to address this issue.

11.2 WATER MANAGEMENT AND MONITORING PROGRAMS

The IRWMP project evaluation and scoring criteria take into account compliance with elements of adopted water management and monitoring programs in their evaluation and scoring processes. Outlined as follows are several topics related to water management and monitoring which are incorporated in this evaluation and scoring process. Updates to this IRWMP will need to consider the addition and/or deletion of programs from this inventory.

11.2.1 Groundwater Measurement Programs

The KDWCD, throughout its history as well as Friant Division, CVP contractors have historically engaged in a process of groundwater measurement which occurs in both the spring and fall months of each year. Data from these measurements is fed to the U.S. Bureau of Reclamation who published documents up to 1992 with said information. The information is also supplied to the State Department of Water Resources (DWR) who historically published maps of both confined and unconfined lines of equal elevation on both a spring and fall basis. That mapping procedure has now been reduced by DWR to publication in the spring only of the unconfined lines of equal elevation of water and wells.

Complimentary to these programs, both the Kaweah River Basin urban and rural domestic water purveyors also conduct depth to groundwater measurement procedures. While driven principally by the economic factors of power consumption and capability of current pumping equipment to satisfactorily perform within the observed groundwater conditions, the information is nonetheless available in the public arena and can be utilized for project planning and impact analysis purposes. Based on the importance of this information to IRWM based water planning, it is envisioned that these efforts by local agencies will continue into the future and be available as a planning tool to IRWMP participants and the associated Stakeholders Advisory Group.

11.2.2 Stormwater Management Programs

A number of stormwater management programs exist within the IRWMP area. Historically, stormwater master plans were associated with these programs, however, these plans were not referenced in 11.1 of this IRWMP as each of these plans is currently considerably out of date. The programs, however, are functioning programs and are documented whether they are at the State, County or local levels. Coordination with the implemented elements of these programs, as they are documented, can be taken into consideration in the IRWM planning process. Attention will also need to be given to the fact that while the overall stormwater master plans are not being brought current, planning related to additions to the current system elements still is ongoing and these peripheral planning efforts will need to be taken into account in coordinating IRWM plans and project proposals which involve storm drainage elements.

11.2.3 Water Quality Monitoring Programs

As previously introduced, a considerable program, both in terms of scope and cost exist with respect to surface water quality. An extensive inventory of surface water quality test results associated with agricultural delivery systems exists and is database accessible, both at the local, as well as at the State level. With the expansion of the Irrigated Lands Regulatory Program into groundwater, it will not be long until an expanded amount of information is available with respect to groundwater quality which,

at the current time, is restricted principally to the domestic water purveyors' service areas and the Dairy Order Monitoring Program. While this information is available through the databases of the Department of Public Health and the RWQCB, and published by each water purveyor and transmitted annually to their customers, the same level of quality information does not exist in the rural unincorporated areas not covered by a permitted domestic water supplier. Deliverables which are in the near-term, time wise, are required as a part of the newly adopted General Order under the Irrigated Lands Regulatory Program with respect to groundwater. As time passes, additional information will be available through this monitoring program to be utilized as another tool in the IRWM planning process.

11.2.4 Water Quality Improvement Programs

Associated with the activity to determine surface and groundwater quality, are required management plans where water quality failures are observed. Whether these failures are toxicity related or simply elevated levels of contaminants, two (2) occurrences within a three (3) year period at the same sampling locations triggers a management plan requirement. At the current time, there are eight (8) Management Plans which have been prepared and are in effect within the Kaweah River Basin. Each of these Management Plans is designed to work to eliminate the source of the contamination and to improve water quality in the area of the observed water quality objectives failure.

11.2.5 Conservation Programs

An extensive number of conservation programs are in effect within the IRWMP area. Whether these are required elements, such as those of the Friant Division, CVP or in Water Management Plans required to be prepared on a 5-year basis and updated annually, or are conservation elements of Urban Water Management Plans, the plans are in evidence. Each of these plans brings with it either Best Management Practices or conservation procedures designed to conserve the available ground and surface water supplies and to improve the efficiency of the use of same. These conservation programs and their related plans play an important role in Kaweah River Basin water management given the difference between the level of demand and the available supply to satisfy that demand.

11.2.6 Weed Management Programs

Weed management programs are of importance to planning within the IRWMP area for several reasons. These include control, from a contamination point of view, of the application of herbicides and the need to do so in a fashion which does not result in contamination of runoff or reaching surface water sources or, accruing, through percolation, to reach usable groundwater. These programs from a public agency and water purveyor standpoint relate principally to water conveyance facilities maintenance, well site maintenance and reservoir and recharge basin maintenance. Increased usage

begins to be evident when road and highway weed abatement procedures are taken into consideration, along with railroad related weed abatement procedures, which are principally designed to reduce the potential for spark-induced fires. The two (2) most significant areas where weed abatement programs exist are in the agricultural arena, where materials application is typically under a jurisdiction of licensed professional advice and restricted materials registration and application constraints and homeowner related applications where no controls exist, except for what material may be available for over-the-counter purchase. To the extent that these programs interface with other management programs, be they surface water related or groundwater related, the programs will need to be taken into consideration in the planning process.

11.2.7 Vector Control Programs

Active within the KDWCD IRWMP area are a multiple number of vector control related entities. Considerable cooperation exists at the current time with these agencies and such coordination is anticipated in the future. Coordination takes place on the level of the types of materials which are allowed to be applied and where they can be applied, including water supply conveyance facilities, water management and recharge related basins and stormwater collection and disposal facilities. Additional interface takes place related to on-farm facilities including dairy waste related impoundments and tailwater return sumps. Additional coordination takes place with respect to wastewater treatment and disposal facilities, particularly as it related to treated effluent storage and discharge

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for recycling/reuse. To a lesser extent, coordination exists with school districts and municipal agencies related to parks and grounds watering. Future water management planning activities will need to recognize the degree to which coordination currently exists with vector control agencies and to incorporate their thoughts and recommendations into future water related planning efforts and related construction details, where applicable.

CHAPTER 12

**STAKEHOLDER INVOLVEMENT
AND COORDINATION**

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KAWEAH DELTA WATER CONSERVATION DISTRICT

12.1 INTRODUCTION

As has been the case through history of water management planning in the Kaweah River Basin, interested parties have gathered together in a number of venues to evaluate common goals and objectives and to formulate plans to cooperatively implement projects and coordinate management of water supplies. At times, these gathered groups have been the governing boards of the water management agencies, while more often, they have been the staffs and consultants to the governing boards. Beginning in the early 1980s, a number of other parties began to meet with the water managers and staffs as it became apparent that water and the management thereof, was going to be a critical element in the maintenance and potential growth within the here and now identified as Kaweah Delta Water Conservation District (KDWCD) Integrated Regional Water Management Plan (IRWMP) area. Representatives of electric utility services, city and

county regional planning staff members, staff of Self-Help Enterprises, leadership out of the County Agricultural Commissioner's Office and the head of the University of California, Cooperative Extension have all been involved for more than three (3) decades in the issues related to water management on the IRWM level.

With the formal actions taken by the KDWCD in the early 1990s, this group became more formally organized and the KDWCD Board of Directors accepted the group as advisory to the Board. With the development of the Memorandum of Understanding process which allowed direct participants in the IRWMP and with the involvement of Self-Help Enterprises, the group became more formally organized and rather than meeting at disparate places within the County of Tulare, began meeting on a more regular basis of the office of KDWCD. An improved notification process as to meetings of the group began to develop. During those years, the Department of Fish & Game had a resident biologist in the Visalia area. While she was in fairly regular attendance, representatives of other agencies outside of the Department and the County were infrequent and were often specifically invited for input on a particular matter.

12.2 COOPERATING PARTNERS INVOLVEMENT

As earlier outlined in this IRWM document, a process evolved whereby interested agencies could become signator to a Memorandum of Understanding with the KDWCD. These participation documents became the basis for coordinated efforts with respect to

input to state and federal agencies, water related plan documents issued by agencies of both the state and federal government in applications for funding of specific water resources oriented procedures and projects and in the joint funding of local projects for which there was no state or federal funding available. Steps to formally identify these water management relationships began to develop with the periodic availability of funding at both the state and federal levels.

12.3 STAKEHOLDERS ADVISORY GROUP

While the interested parties group advisory to the Board of Directors has had different informal titles over time, it has now been formally organized and recognized in procedural documents as the KDWCD IRWMP Stakeholders Advisory Group. A list of current participants is presented in Appendix J.

12.4 PUBLIC STAKEHOLDER OUTREACH

As the “deemed equivalent” IRWM process of the KDWCD became the formally organized and identified mechanism by which regional water management plan efforts were coordinated, parties outside of the framework looked to join the framework to begin to address their specific issues related to water management. To date, no party requesting participation has been denied. The basis for participation has been other than just general public interest in the topic. The outreach effort is specifically designed to deal with

interested parties issues for which either they are the stakeholder or the representative of a stakeholder segment of the water management world.

12.4.1 Stakeholder Outreach Meetings

For some length of time, an intense series of meetings were held, over a two (2) plus year period of time, to deal with the framework of project planning and project evaluation and with the issue of the mechanisms by which disadvantaged communities and/or disadvantaged community representatives could participate. Meetings are currently being held on an on-call basis surrounding activities at the KDWCD level, activities within the Kaweah River Basin and activities driven by funding programs, currently those specific to the Department of Water Resources (DWR). Recent meetings have surrounded policy issues related to the Regional Acceptance Process (RAP), meetings to work through RAP driven issues and meetings related to policy development specific to this IRWMP. In all cases, these meetings have included the IRWMP Stakeholders Advisory Group and, where appropriate, the Boards of Directors of the KDWCD and the Deer Creek & Tule River Authority. In the future, Stakeholder Advisory Group meetings are anticipated to be held on an as-needed basis with the exception being during the project layout, project evaluation, project coordination and project ranking process. That process is anticipated to be energized and de-energized based on available funding opportunities.

12.4.2 Electronic Outreach

The sole mechanism which exists at the current time to communicate with the Stakeholders Advisory Group is by electronic outreach. A copy of the current Kaweah River IRWMP Stakeholders Advisory Group contact list was noted to be presented in Appendix J.

12.4.3 Web Site

At the direction of the Board of Directors of KDWCD, a web site for the KDWCD was created and has been maintained current since.

The web site is identified as www.kdwcd.com and, in addition to being currently maintained, is maintained with links to applicable water management agencies and topics which may be of interest to the party looking for information in greater detail than offered through the web site.

Contained on the web site is information related to the IRWMP process and with the development of this formally written IRWMP, same will be added to the web site.

As a water conservation instrument and an education instrument, the District publishes a newsletter, on a quarterly basis minimum, with each of these newsletters

being posted on the web site in addition to being mailed to a list of interested parties which has been developed over time. KDWCD management is constantly looking for comment with respect to the web site, and constructive suggestions on how it may be improved to the benefit of water management within the IRWMP planning area.

12.4.4 Targeted Outreach

Within the conduct of the IRWMP Stakeholders Advisory Group, it is acknowledged that certain topics brought to the Group and to the KDWCD would benefit from input from parties with expertise who do not routinely attend the Stakeholders Advisory Group meetings. When that need is recognized, specific outreach from the KDWCD is made to specific individuals and/or entities which are felt to potentially be of assistance to the Stakeholders Advisory Group in formulating a position relative to the then current topic.

In addition to such supplemental targeted outreach efforts, additional outreach efforts are also incorporated into the project development process. Stakeholder invitations are extended when specific projects have been identified for pursuit and input is requested from parties in both the impacted and benefitted environments. With the reforming of the Water Commissions by both the County of Kings and the County of Tulare, additional targeted outreach potential exists within the appointed members to those groups. The Commissions bring to the table a different perspective as land use, a

broader basis of political representation and disparate water related interests are present within the make-up of the appointed commissioners.

With the creation of the new disadvantaged communities assistance program by KDWCD, a new outreach effort will need to be created. As parties experienced with project definition and creation have learned by experience, the strongest projects are those which have the wholehearted support of the affected stakeholders. As work begins in areas which currently have no defined governance structure on which to develop water quality and water supply related projects, stakeholder outreach efforts will occur and be actively pursued in order to ensure that support for project development and project handoff at implementation occurs with the support of and with the actions of the directly affected parties.

12.4.5 Cooperation and Coordination with State and Federal Agencies

Coordination between parties associated with the KDWCD IRWMP are in a continuous mode of coordination with state and federal agency management and staff. Virtually no element of water management within the Kaweah River Basin takes place without the involvement of representatives from these agencies. Whether it is day-to-day coordination with the U.S. Army Corps of Engineers relative to storage in Lake Kaweah, or releases from Terminus Dam, to an ongoing series of projects developed in

cooperation with and funded by the Bureau of Reclamation and/or the DWR, constant communication and meeting takes place.

The development of the KDWCD Habitat Conservation Plan and Natural Communities Conservation Plan has expanded the family of coordinating parties for the KDWCD beyond the normal water management related agencies. Development of specific habitat, preservation of specific habitats and management of these developed habitats requires coordination with the State Department of Fish & Wildlife and with the U.S. Fish & Wildlife Service. While relationships with administrators and staff members within these agencies have existed from a project perspective, over time, the pursuit of elements of projects specifically for habitat conservation and development has brought about a different relationship with these agencies, as has the development and pursuit of the referenced habitat conservation plans.

From a flood control standpoint, the relationships with the U.S. Army Corps of Engineers and state agencies including the State Lands Commission and the Central Valley Flood Protection Board, are necessary and important to achieve optimum coordination. These efforts are related to both maintenance and project planning and development as related to storm water control and flood protection procedures and projects.

12.4.6 Outreach to Other Regions

Being prepared on a parallel basis to this IRWMP is an IRWMP document for the Tule River Basin. In addition to the policy decision to share a common Stakeholders Advisory Group for their respective IRWMP, the Deer Creek & Tule River Authority Board of Directors has indicated a desire to have their IRWMP prepared on a parallel format to that for the KDWCD. In this fashion, should it appear to be appropriate at some point in time in the future to combine the two (2) IRWM areas into a single plan area, the transition will be much easier, as the majority of the IRWMP related work will be simply merging of documents in the policy arena in particular, in lieu of creating new documents which would require extensive overhaul in order to allow for the merging to occur.

As shown on Figure 4-2, the KDWCD IRWMP boundary also abuts that of the Kings River Joint Powers Authority IRWM to both the north and the west. A considerable degree of cooperation exists between the two IRWM groups and, on numerous previous occasions, the entities have conducted joint project evaluations to determine if a strengthening of projects could occur as a result of simply evaluating the nature of particular projects and their particular advantages and disadvantages. It is a goal of the Board of Directors of KDWCD to continue this coordination, which is partially based on the recognition that water deliveries into the western portion of the KDWCD have a joint source basis of the Kaweah River and the Kings River. In addition,

groundwater issues are common between the Kings River service area and that of the KDWCD service area.

12.4.7 Outreach to Disadvantaged Communities

Based on the decision to create a new outreach program specifically designed to address water quality issues related to disadvantaged communities and aggregation of single-family residences in a disadvantaged hamlet setting, the recognition exists that a different outreach methodology will need to be generated, at least as to the efforts of the IRWMP.

Mapping is currently being completed of each of the concentrations of households within the IRWMP boundary in excess of six (6) single-family units. From this basis, work will begin with respect to the drinking water quality of each of those areas, followed by the development of a program for assistance to the identified areas. In some cases, this outreach will be oriented toward development of a water distribution system and the extension of an adjacent water purveyor, meeting current state and federal drinking water standards, as the methodology to supply the now non-compliant area with an adequate drinking water supply. In other areas, where consolidation is not an option, pursuit of a step-by-step process as was outlined in Chapter 9, will be undertaken by KDWCD. Throughout this process, an outreach to the effected homeowners and to

representatives of environmental justice concerns will be made in order to ensure that all possible steps are taken to remedy the drinking water quantity/quality deficiency.

While the IRWMP process adequately addresses the intent to incorporate stakeholders and potential beneficiaries in the service areas into the process, more specific work needs to be undertaken to address the project development and, more importantly, the government's development steps which are associated with generating solutions to rural drinking water related problems.

12.4.8 Outreach to Native American Tribal Communities

The KDWCD has a longstanding relationship with tribal community representatives in the area. Consultations take place on any project which is in the development process or, more importantly, at the threshold of construction process, to ensure coordination with tribal group representatives and to ensure protection of antiquities, sacred sites and burial sites.

As an example of this coordination, the KDWCD has in design, the development of the Paregien Basin Project. Elements of this project involve excavation in areas where the potential existed for historic activity by tribal members. In addition to a library-based research effort, initial consultations occurred with tribal representatives which resulted in limited on-site excavations by qualified archeologists. As a result of this effort, a

complete geo-archeological study was undertaken on the project site to ensure that there was no evidence of prior activity wherein artifacts or burial sites would be encountered. With the completion of the geo-archeological study, it was concluded that the risk of finding any artifacts and/or burial sites was remote. Nevertheless, the KDWCD is currently preparing a Memorandum of Understanding with tribal group representatives which will call for immediate cessation of project activities if any antiquities or evidence of burial are discovered in the construction process. At that time, consultation will occur with tribal group representatives to determine next steps, which could possibly include the re-design of the project in order to avoid disturbance of a specific area. It is a goal of the KDWCD Board of Directors, staff and consultants to maintain this relationship.

CHAPTER 13

PROJECT DEVELOPMENT PROCESS

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

CHAPTER 13
PROJECT DEVELOPMENT PROCEDURES

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
KAWEAH DELTA WATER CONSERVATION DISTRICT

13.1 PROCEDURES APPROACH

While a considerable amount of effort goes into integrated regional water management procedures and processes associated with the preparation of existing water management elements and the evaluation of procedures, methodologies and structures associated with the improvement of the management process, another integrated approach, separate from that of operation and maintenance exists. Conceiving of new projects and procedures designed to improve water management within the Kaweah Delta Water Conservation District (KDWCD) Integrated Regional Water Management Plan (IRWMP) area has received separate consideration with respect to policies and procedures. Extending back 30-40 years in history, coordinated operations on the purchase of property and the development of water management facilities, including groundwater recharge facilities, occurred on a joint and cooperative basis. Oftentimes, basins were developed with underlying fee being held by a special district or private

stock mutual water company with KDWCD contributing equipment and manpower to maintain the basins, in exchange for utilization of the basins in which to place KDWCD entitlement waters for groundwater recharge purposes. In some cases, roles have been reversed where the property purchase was by KDWCD with either joint maintenance or maintenance by the local water supply/delivery entity. In a limited number of cases, maintenance is performed on a fee basis, in lieu of an exchange benefits basis. These cases are extremely limited, however. In the 1980s, projects began to be developed pursuant to formal partnership arrangements where cost sharing occurred relative to land purchase, property development and operation and maintenance considerations. As property has increased as a percentage of total project cost and where specific items of construction equipment have been purchased by various water management agencies, project development and implementation has taken several forms depending on the circumstances of the participating parties. A number of parties with specific water management needs have remained outside of the project development process due to both initial funding and operation and maintenance funding constraints.

This process changed again as the Memorandum of Understanding Process was strengthened in the early 1990s. Projects with significant land, development and sophisticated operational constraints were developed, with most projects addressing a multi-party cooperation basis. This process remains in place to date, notwithstanding the availability of funding from federal and state water management related programs. With only local entities involved in project development and implementation and with the

utilization of their own revenues, the process of project selection and development only required a winnowing process elected to be utilized by the participants.

With the advent of the availability of state and federal funding to assist in the development of projects, a separate process was needed to address project development, structure and coordination in order, principally, to ensure that only the best projects were being put forth for funding consideration.

It was at this time that the IRWMP Stakeholders Advisory Group engaged in a process of project development, project evaluation and scoring and project funding submittal coordination. Literally hundreds of hours were invested in the development of the process. A primary goal of the process was to ensure that it was flexible enough to respond to funding opportunities for all aspects of water management. This included surface water related projects for both irrigation and flood water control, groundwater related projects, water supply project types, as well as water quality project types. Expansion of the typical IRWMP area projects from being irrigation supply oriented to being inclusive of urban and rural community needs has also been addressed. The outcome is a process which was reached by consensus between parties with disparate interests and with often seemingly disconnected goals. The process is now in place, functioning and is folded into the IRWM planning process by action of the Board of Directors of the KDWCD. As with all processes associated with the KDWCD IRWMP,

the process remains open for modification based on the circumstances of time, participants and funding agency criteria.

13.2 Project Solicitation and Prioritization

On a periodic basis and sufficiently in advance of the announcement of any funding opportunity, solicitation of projects is sought from both MOU participants, as well as other potential participating parties within the IRWMP area. In the initial stages of project request, the submittals are framed with sufficient information to determine if the project reasonably complies with criteria which will be utilized to determine the competitive nature of the proposed project relative to the funding invitation.

If projects successfully pass this initial screening, then the project advocate is requested to begin development of project related documents dealing specifically with a number of issues. These issues, at a minimum include the following filters:

1. Total Project Cost;
2. Total Project Cost in Comparison to Proposed Cost Sharing Amount;
3. Project Objectives Including a Determination of the Independent Value of the Project;
4. Yield Benefit, if any;
5. Water supply Benefit;
6. Water Quality Benefit;

7. Groundwater Benefit;
8. Climate Change Relationship;
9. Sacramento San Joaquin Rivers Delta Nexus;
10. Administrative Requirements and Benefits;
11. Readiness to Proceed; and
12. An Initial Evaluation of Integration Potential with Other Identified Perspective Projects.

The submitted prospective project information is then evaluated by the IRWMP Stakeholders Advisory Group, typically with a scoring effort against the scoring associated with the funding agency's process, typically taking a very conservative viewpoint of how a funding agency may score the subject project.

Following this process, projects which survive the evaluation process are critiqued for weak areas, along with the potential to be coordinated with other competing projects. A rear-looking view is also taken relative to the project with other projects, previously submitted, which either did not succeed in prior funding cycles, or whose project configuration may be strengthened when put in combination with the current subject project.

Following this iterative process, the resulting project descriptions and structures are subjected to an internal scoring procedure developed specifically for the KDWCD

IRWMP. The criteria and related point system were developed by the IRWMP Stakeholders Advisory Group and have been approved for use by the Board of Directors of the KDWCD. The process has been utilized for both Round 1 and Round 2 of the DWR Proposition 84 Implementation Grants round and for the Round 2 Planning Grant round of DWR. The IRWMP scoring criteria is set forth in Appendix K. Particular attention is called to the sub-scoring categories of 19 through 23. These subcategories are used, in particular, where applications are oriented to a specific nature. For instance, project applications which are flood control oriented only would have specific emphasis placed on Criteria 22 and weighted accordingly.

13.3 Current High Priority Projects

As would be expected with any active IRWMP group, projects are continuously being conceived and evaluated. In addition, it is the desire of the IRWMP group to maintain a current list of projects for two (2) specific purposes. The first, an entity proposing a project can look at other projects on an IRWMP generated list and see if there is any potential for integration of projects or, just as importantly, to see if projects are competing for management of the same segment of the available water supply within the IRWMP planning area. In addition, looking at the scope of other projects and the evaluation associated with other projects gives rise to either dismissal of a project at onset or advancing a particular project concept.

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Presented, as Table 13-1, is a current presentation of the Project Submittal List. As of the date of this IRWMP, project proponents are working on their proposals for U.S. Bureau of Reclamation WaterSMART Grants, Round 3 of the implementation grants associated with Proposition 84 and projects for submittal to the U.S. Bureau of Reclamation in response to the loss of Project water related to the San Joaquin River Restoration Settlement Agreement.

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TABLE 13-1
CURRENT PROJECTS LIST
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Submitting Entity	Project	Project Description Summary	Total Project Cost
Lakeside Irrigation Water District	Hanford Wastewater Reclamation Project	Proposes construction of two deep wells and a blending structure to enable full utilization/reclamation of wastewater from the Hanford treatment plant for use on non-edible crops.	\$962,500
County of Tulare	Well Nitrate Contamination Study	Proposes designing and implementing a sampling program to identify the type and age of nitrate contamination in wells that exceed nitrate MCL's.	\$500,000
County of Tulare	Tulare County Well Maintenance & Abandonment Project	Proposes to administer a voluntary compliance program for owner/operators of private wells in high risk areas. This will also involve an education element (will most likely be multiple projects).	\$500,000
Tulare Irrigation District	Demaree Check Structure Modification	Proposes to continue distribution system modifications by installing additional Supervisory Control Acquisition and Data Analysis (SCADA) to increase the efficiency of water delivery.	\$800,000
Kaweah Delta Water Conservation District	Construct New Groundwater Monitoring Wells	Proposes to modify existing structure to improve flood control ability.	\$350,000
Kaweah Delta Water Conservation District	Construct New Drinking Water Well #9	Proposes to identify areas within the existing monitoring well network that are lacking proper coverage and construct monitoring wells in those voids to improve the evaluation of groundwater conditions	\$500,000
Ivanhoe Public Utility District	Well Head Treatment Project	Proposes the drilling, casing and installation of appurtenances to develop groundwater from the underlying groundwater reservoir to compensate for wells lost for constituents above MCLs.	\$750,000
City of Lindsay	Reclaimed Water Use Project	Proposes to reduce electrical conductivity at a well site.	?
City of Lindsay	Canal Storage/Cross Exchange Project	Proposes to extend the "Well Head Treatment Project" to utilize treated water as a surface water supply for agricultural.	?
City of Lindsay		Proposes to improve year to year water supply reliability to the City by initiating either storage or a water exchange.	?
City of Visalia		Interconnection of existing storm water basins, parks and school turf to surface water ditch distribution system.	\$2,500,000
City of Visalia		Enhanced water conservation program: Alternative landscape (xeriscape), grey water reuse, low flow toilets, etc.	\$1,250,000
City of Visalia		Investigation/construction of groundwater recharge sites in and around the City.	\$4,125,000
City of Visalia		Investigation of effective recharge rates for various waterways traversing the City including existing storm water basins.	\$350,000

CHAPTER 14

**COMPLIANCE, BENEFITS AND
IMPACTS RESULTING FROM
IRWMP IMPLEMENTATION**

INTEGRATED REGIONAL WATER
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CHAPTER 14
COMPLIANCE, BENEFITS AND IMPACTS RESULTING FROM IRWMP
IMPLEMENTATION

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
KAWEAH DELTA WATER CONSERVATION DISTRICT

14.1 OVERALL BENEFITS OF THE IRWMP

14.1.1 Development of Policies and Processes

Based on the objectives set forth for the Kaweah Delta Water Conservation District's (KDWCD) Integrated Regional Water Management Plan (IRWMP), the governance structure which currently exists offers the opportunity to establish and put into effect policies and procedures related to water management. These policies and procedures are related to a number of specific areas of interest which were discussed principally in Chapter 10. Running the gauntlet from water supply augmentation through water quality and into land use policies, there is a wide breadth of subjects that fall under the category of water management policies and procedures. What the IRWM structure offers, as compared to either no structure or alternative structures, is the chance to work

on the issues in a joint fashion, taking into account disparate interests, along with like interests, working toward the goal of improving management related procedures, along with relevant projects.

While simple partnerships offer some similar benefits, the expansion of those partnerships to the degree offered and experienced by the KDWCD IRWMP Stakeholders Advisory Group is of substantial advantage. Representation exists of a myriad of interests, sometimes seeming as though there is no common thread. But when all is said and done, the topics, opinions and constructive suggestions all circle back around to the goal of improving IRWMP planning area efficiencies related to water management. Another concept has yet to be developed which replaces this model with the chance of improved outcomes. The fact is exemplified in the KDWCD case, as in one form or another, the model has functioned for in excess of four (4) decades. Whether the IRWM structure exists in the formal, written format required by agencies in exercising jurisdiction over allocation of project funds, or in demonstrated partnership actions requiring little more than a handshake, is not material. The fact that individuals and representatives of entities come together under one structure or the other is not the significant issue. The fact that they do and that the outcome is expressed in improved water management procedures and the development and implementation of water management facilities is the critical issue.

14.1.2 Development of Projects

In the development of projects, the IRWM process demonstrates its unique characteristic. Being able to identify projects and to describe those projects is a process familiar to all in the water management arena. Being able to bring projects to the table where they are dissected, criticized, stripped and rebuilt with the intended goal of improvement is unique. The true uniqueness comes about, however, in the form of viewing projects in the context of other projects. Projects, which on a singular basis may not appear to have characteristics which would lead to their eventual implementation, are put in the context, however, of being strengthened and augmented by another project or having the capability to have that effect on yet another project. This is a unique characteristic of the IRWM process. Sentiment has even been expressed regarding the process that being forced to work outside of the “box” or outside of one’s comfort zone, as is often required by state and federal imposed guidelines, is not all that bad and often results in an improved outcome. This applies both in the arena of policy and procedure development, as well as project development. Very little of this critiquing capability exists outside of the process, other than internally within some consulting firms. In the latter case, however, the parties at the table engaged in the critiquing process do not offer the width and breadth of basic interests that the IRWM process does.

14.1.3 Impact on Costs

If it is agreed that the IRWM process results in outcomes which are improved over that which exists when exercising other procedures, then it should be agreed that the economic side of the project development issue should result in like benefits. Whether in the vein of initial capital cost, or in long-term operation and maintenance costs, intense scrutiny of a project by separate parties with differing interests results in an improved analysis. Improved analysis results in an improved project, or the elimination of a project, either case resulting in an improved financial picture for any proposed project.

14.1.4 Potential Beneficiaries

The simplistic response to the analysis of who the potential beneficiaries are of the IRWM process is “all.” Maybe not all at the same time, maybe not for every policy, procedure or project, but given the involvement of water and the life of each individual within the IRWMP area, the process eventually is of benefit to all individuals. One only has to look at the benefits of the outcome of various projects, whether water supply, water quality or flood control, for instance, to see the width and breadth of the impact on people that these types of projects have.

14.2 COMPLIANCE WITH STATEWIDE PRIORITIES

Statewide priorities, at least as to topic, are embodied within the Resource Management Strategies topics associated with the California Water Plan Update. While there are a few of these Resource Management Strategies that have been deferred to a Round 2 Planning Grant funded update to this IRWMP, the vast majority of the strategies are addressed. Given that these Resource Management Strategies, are those that establish the priorities for the plan for the State's water management objectives, leads to the conclusion in this IRWMP that statewide priorities are addressed. It is envisioned with impacts related to population changes, changes in locations of populations within the geography of the State, changes driven by elected officials and associated politics and paradigm shifts such as may be associated with climate change will bring about modest changes to the current state-listed Resource Management Strategies. The goal of this IRWMP is to remain flexible, with the ability to visit issues from a different perspective or from a changed base. It is the opinion of the Board of Directors of KDWCD that such has been the case over recent history and with a simple reduction of their IRWM efforts summarized in a written plan form, that they do not envision that flexibility to be diminished.

14.3 PROJECT PLANNING/IMPLEMENTATION IMPACTS PERSPECTIVES

In order to provide overall IRWMP guidance to efforts such as existed with the Stakeholders Advisory Group in development of project evaluation criteria and scoring, the IRWMP at this juncture, sets forth a minimum set of resource-specific impacts which are to be considered in project development. Similar in approach to the checklist orientation of an Environmental Assessment related to the California Environmental Quality Act, setting forth these specific areas of potential impact which must be evaluated ultimately on water management projects is felt to be a necessary component of this IRWMP. Set forth as follows are the current resource specific impacts which have been established by KDWCD, which list was developed by the Stakeholder Advisory Group:

- 14.3.1 Aesthetic/Visual Resources
- 14.3.2 Agricultural Resources
- 14.3.3 Air Quality
- 14.3.4 Biological Resources
- 14.3.5 Cultural Resources
- 14.3.6 Environmental Justice/Disadvantaged Communities
- 14.3.7 Geology and Soils
- 14.3.8 Hazards and Hazardous Materials
- 14.3.9 Hydrology and Water Quality
- 14.3.10 Land Use and Planning

14.3.11 Noise

14.3.12 Population and Housing

14.3.13 Public Services

14.3.14 Recreation

14.3.15 Transportation and Circulation

14.3.16 Utilities/Service Systems

14.4 IRWMP IMPLEMENTATION

14.4.1 Obstacles

As the IRWM process has been in place within the Kaweah River Basin for a number of decades and formalized by agreement for in excess of 20 years, there are no obstacles to its implementation, as it already has been implemented. There are, however, obstacles which could arise which would derail the effort. For example, withdrawal of a number of parties from the process and, in particular, the Stakeholders Advisory Group would deal a damaging blow to IRWM planning efforts. Likewise, the lack of a coordinated review of projects and critical critiques of the advantages and disadvantages of combining projects would result in a similar outcome.

Other potential scenarios also exist, but of a far greater draconian nature. An overhaul of California water rights could cause a shift from an emphasis of local

management of available water resources to a state level. This action could result in situations where parties now at the table on a cooperative basis would be across the table fighting over specific allocations and their related process and procedures. The displacement of guiding water management plans from the local level to the state level would have a like effect. One only has to look at states with groundwater under the control of a state designated engineer to determine that the process of integrated regional water management involving local stakeholders is not the same as the current IRWMP structure. As no direction from the governing board of the KDWCD exists to evaluate potential outcomes under these types of scenarios, same are not laid out in this IRWMP. Suffice it to say, however, that there is potential to provide sufficient obstacles to cease the IRWM process.

14.4.2 Ongoing Support and Financing

On a brighter note, the KDWCD IRWMP is supported by the participants within the IRWMP area. Whether it is in the form of attendance, document generation, document review and comment, project generation, project evaluation, local share funding or funding of application costs, support has been proven to exist. Financing cost related to IRWMP activities are divided with the principal burden of the cost being assumed related to the IRWMP itself by KDWCD. This is felt to be appropriate by the Board of Directors as they are the lead agency for the Kaweah River Basin relative to satisfaction of the IRWM Guidelines. When it comes to application and project related

costs, however, a shift in this cost share occurs. Participants in applications for funding have, to date, shared the cost on an equal basis, for certain applications, notwithstanding the estimated cost of a project's differential. In others, the majority of the application cost has been borne by a single applicant. As project proponents are required to bring to the table documents related to their project ready to be inserted into a project application, these costs are felt to be appropriately divided on an equal basis. With respect to the local cost share component of projects, project applicants determine what their capability is to participate in structuring their individual project. One of the harsher evaluation steps which is taken at the Stakeholders Advisory Group level is the points spread which is estimated to exist based on the level of financial participation in any given project. The pressure and the evaluation procedures are even more critical when the viewpoint is what an underfunding of a particular project does to the prospect of the total application succeeding when against other like project applications from competing IRWM groups.

14.5 IRWMP'S ROLE IN THE FUTURE

In their assessment of the preparation of this formalized, written IRWMP, the Board of Directors of the KDWCD, as well as the Stakeholders Advisory Committee, evaluated where they thought the IRWM process was headed in the long-term. Their conclusion was that, given the strength of the process, particularly as compared against alternatives, a strong argument exists for it being the principal mechanism for development of guidance related to water management and development of water

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management related projects. Their review of actions at the State level, including those of the Governor's office, the agencies of jurisdiction and the staff of the various agencies all contributed to the thought that the IRWM process was, at least for the near term, going to be the vehicle of choice for creation of water management policies and procedures and for the development and vetting out of water management related projects. In short, the IRWM process is where it's at with respect to water management planning efforts.

CHAPTER 15

**PLAN PERFORMANCE, DATA
MANAGEMENT AND ONGOING
COORDINATION**

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

CHAPTER 15
PLAN PERFORMANCE, DATA MANAGEMENT
AND ONGOING COORDINATION

INTEGRATED REGIONAL WATER MANAGEMENT PLAN
KAWEAH DELTA WATER CONSERVATION DISTRICT

15.1 TECHNICAL ANALYSIS AND PLAN PERFORMANCE EVALUATION

15.1.1 Performance Measures and Monitoring Methods

Historically, the Kaweah Delta Water Conservation District (KDWCD) Integrated Regional Water Management Plan (IRWMP) has been evaluated against three (3) principal factors. The first of these is the adequacy of the IRWMP structure to perform as envisioned by the stakeholders and as ultimately judged by the Board of Directors of KDWCD. The second basis is the ability of the IRWMP to respond to the water management needs of the IRWMP planning area and last, but not the least, the ability of the programs that are generated on a collective, integrated basis between the partners to achieve the water management efficiencies desired by the Memorandum of Understanding (MOU) signators and the participants in the IRWMP Stakeholders

Advisory Committee. Failure to perform in any of these arenas has brought rise to discussion with respect to the need to modify an element or elements of the integrated approach which has existed within the Kaweah River Basin to date and to succeed in the implementation of projects which address water management needs within the Kaweah River Basin.

Current discussions evolve around the development of performance measures for the IRWMP in addition to those which currently exist. Suggestions which have been made for consideration include performance monitoring which would have subcategories of efficiency of administration measurement parameters, process output indicators and, most important, process outcome indicators. While not envisioned to be numeric in construction, the measurements would nevertheless need to be more than subjective and would need to conclude with a basis of either progress with respect to the indicator, standstill and/or progress with respect to the indicator. The second performance measure which has been suggested is that associated with respect to systems monitoring. The conditions of the systems related to water management within the Kaweah River Basin would be indexed initially in the pursuit of the construct of this measurement indicator. Definition of the basis for conditions would be established, such as volume of water in storage within the groundwater reservoir, in order to provide a control set for the condition performance evaluations which would need to periodically take place.

If the condition indicators suggested that positive, neutral or negative trends were occurring, planned responses would be evaluated under the current IRWMP structure and a determination made as to whether the structure and procedures being followed pursuant to the structure were adequate and in need of modification and/or replacement.

If it is elected to introduce condition monitoring as a performance measure, it would likely need to be divided into the elements associated with Resource Management Strategies and, in particular, those related to water quality, reliability or inadequacy of water supply, land use planning and permitting, conservation and enhancement of habitat and adherence of entities with water management responsibilities within the Kaweah River Basin to procedures to effectively manage the assets to which they have been entrusted. With respect to measurement indicators for administrative related issues, simple items such as the number of meetings held, the attendance at meetings and the desire to add in to the process would be basic factors. Output indicators would likely be related to projects wherein indicators such as number of acres of recharge basins constructed, efficiencies of water management facilities related to conveyance losses, evaporation of groundwater in areas where groundwater is invited to be exposed and delivery of full contract entitlements and full river entitlements would be potential indicators. Outcome indicators would then be utilized to measure the impacts of these projects using devices such as number of acre-feet of new water recharged, acre-feet of water previously assigned to a particular beneficial use which, due to conservation efforts, are now released for other beneficial uses and deficiencies gained in terms of

surface water delivered, in lieu of groundwater pumping as a result of entity partnership arrangements.

It is anticipated that once this IRWMP is approved by the California Department of Water Resources, the basis will exist for development and implementation of these plan performance evaluation procedures.

15.1.2 Evaluation of Capacity to Evaluate and Implement Projects

The project development process, culminating in project evaluation using the adopted criteria and scoring system currently in place, is designed to be periodically reviewed. This review process includes not only the response of the scoring criteria and scoring system to funding offer guidelines, but also with respect to the quality of the projects being proposed and, most importantly from an IRWMP perspective, the degree to which efforts were undertaken to integrate projects together for improved efficiencies, reduced capital and operation and maintenance costs, or both. It remains to be determined by the Board of Directors of KDWCD as to whether this evaluation will be placed on a routine calendar schedule, similar to other plan review processes which are in place within KDWCD, or will remain on an “as-needed” basis.

15.2 DATA MANAGEMENT

15.2.1 Current Database

The KDWCD currently maintains an extensive database in which is contained information necessary to support operating the numeric groundwater model and in preparation of the various reports which it currently publishes including the Annual Groundwater Management Reports, the annual update to and five-year Water Management Plan required under its contract with the U.S. Bureau of Reclamation for its Friant Division, CVP water repayment contracts and publication of the various reports associated with the Kaweah & St. Johns Rivers Association. An overall summary of the data which is maintained is contained in Table 15-1.

In addition to this database, a complete water quality database related to surface water is maintained. Constituents monitored within that program are as shown in Table 15-2. Both the contents of and the parameters contained within these databases are updated frequently. Water level information, for instance, is updated at least semiannually and water quality information is updated monthly, when flows are present at the monitoring locations.

15.2.2 Data Collection

Data is generated from a number of sources. Those sources include the KDWCD itself, the Kaweah & St. Johns Rivers Association, the Friant Water Authority, the Kaweah Basin Water Quality Association and numerous state and federal agencies with whom the KDWCD has cooperative data sharing agreements. In addition, the KDWCD has an informational sharing arrangement with both the County of Kings and the County of Tulare with respect to information available in both of their ArcView databases and, to a certain extent, in their AutoCAD databases.

15.2.3 Database Maintenance

At the current time, with the governance of the IRWMP residing with KDWCD, KDWCD assumes the responsibility and lead role position of maintaining their database. Transition is occurring between the Kaweah & St. Johns Rivers Association with respect to the maintenance of the water quality database. Upon acceptance of the Kaweah Basin Water Quality Association by the Regional Water Quality Control Board, the water quality database will be maintained by the Kaweah Basin Water Quality Association. In addition, this database will be expanded from its current format of being the repository for surface water quality data and will expand to include groundwater quality data.

15.2.4 Data Sharing

In addition to responding to Public Records Act requests, the KDWCD routinely shares all of its information with parties, upon request. Numerous requests for water level information, water management information and project related performance measurements are shared, upon request.

15.2.5 Interface with State Database Systems

Data is currently automatically uploaded to State databases such as the California Environmental Resources Evaluation System (CERES), to CEDEN, the Water Data Library (WDL), CASGEM, of which the KDWCD is a signator participant and the California Environmental Information Catalog (CEIC). Water quality data is currently entered into the Groundwater Ambient Monitoring and Assessment Program (GAMA) of the State Water Resources Control Board and into the Surface Water Ambient Monitoring Program (SWAMP) of the same agency. The KDWCD has long transmitted both spring and summer groundwater elevation readings to the State Department of Water Resources, with additional readings now being introduced on a separate basis into the California Statewide Groundwater Elevation Monitoring Program (CASGEM).

15.3 PLAN UPDATES

15.3.1 Interim Updates

Not having had the IRWMP in a written formal format has allowed the KDWCD and interested stakeholders the flexibility to modify elements of the IRWMP on almost an instantaneous basis. Obviously, modification of a formal written document will need to take on expression in a process which will yield a written modification to the IRWMP, thus necessitating the ability to readily amend the plan and to reflect those amendments in an accessible form.

As a matter of current policy, the KDWCD routinely updates its plans in five (5) year increments. This applies currently to its Groundwater Management Plan and its Water Resources Investigation, for example. If this length of examination and rewrite was established by the Board of Directors, the need would exist for interim updates to the IRWMP and a methodology to associate the amendments with the proper section(s) of the IRWMP. Where elimination of certain policies and procedures have been caused by the interim modification, a reasonable way to note that a particular segment or segments of the previously adopted IRWMP is no longer valid would need to be created. To date, this process has not been devised, as previously noted, the plan was in a more flexible position to be amended in interim form in its prior “deemed equivalent” state.

15.3.2 Formal Plan Changes

Given that the Board of Directors of the KDWCD has chosen to select an interval for review and update of other plans created and maintained under the jurisdiction of the KDWCD, action to establish a review and update period can be assumed to be taken soon for this IRWMP. At the time of the establishment of that interval, the update format policy will also be established by the Board of Directors. Looking again to existing plan update policies, formal plan updates are usually accompanied with a complete replacement of the plan document. It has been proven in other cases to not be as efficient to issue amendment additions to critical plans, thus causing a party utilizing the particular plan to circuit back and forth between an auxiliary amendment documents and the principal plan document. The authority to effect this policy resides currently with the KDWCD Board of Directors.

15.3.3 Round 2 Planning Grant Topics

Several topics have been highlighted for consideration for either replacing elements of this IRWMP or augmenting that which currently exists. The current list of issues to be evaluated in greater depth include the following:

1. Governance structure, including lead agency designation;
2. Expansion of the climate change/global warming section;

3. Regional boundary considerations;
4. The Sacramento-San Joaquin Rivers Delta nexus; and
5. Priorities of IRWMP objectives and residual Resource Management Strategies which are either determined by the Stakeholders Advisory Group action to be in need of additional work with respect to integration issues or a determination of same by DWR.

APPENDIX A

REFERENCES

INTEGRATED REGIONAL
WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

REFERENCES

APPENDIX A

INTEGRATED REGIONAL WATER MANAGEMENT PLAN

KAWEAH DELTA WATER CONSERVATION DISTRICT

1. *California Water Plan Update 2013*; Department of Water Resources, State of California; 2012.
2. *Groundwater Management Plan Update*; Kaweah Delta Water Conservation District; 2007.
3. *Groundwater Quality Protection Strategy*; Regional Water Quality Control Board, 2010.
4. *Time Series Evapotranspiration and Applied Water Estimates from Remote Sensing*; Kaweah Delta Water Conservation District; Davids Engineering, Inc.; 2013.
5. *Tulare County General Plan 2030*; County of Tulare, State of California; 2012.
6. *Water Resources Investigation of the Kaweah Delta Water Conservation District*; Fugro West, Inc.; 2003.

APPENDIX B

INITIAL MEMORANDUM OF
UNDERSTANDING

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

MEMORANDUM OF UNDERSTANDING

THIS MEMORANDUM OF UNDERSTANDING ("MOU"), effective this _____ day of _____, 2007, by and between the COUNTY OF TULARE ("County"), the EXETER IRRIGATION DISTRICT ("EID"), the CITY OF LINDSAY ("LINDSAY"), and the KAWEAH DELTA WATER CONSERVATION DISTRICT ("KDWCD"), is made in light of the following:

RECITALS:

WHEREAS, both the Integrated Regional Water Management Planning Act of 2002, found in Division 6, Part 2.2 of the California Water Code, and the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002, found in Division 26.5 of the California Water Code, authorize and encourage public entities to develop an integrated regional water management plan ("IRWMP");

WHEREAS, KDWCD has created and the State of California has recognized KDWCD as having a "substantially equivalent" IRWMP for the Kaweah River Basin, known as the "Kaweah River Basin Integrated Water Management Plan";

WHEREAS, it is in the interest of the County, KDWCD, EID, and LINDSAY, (hereinafter collectively "Parties" and individually "Party"), and the region served by the Parties, to have the water resources of each Party responsibly managed, protected and conserved to the extent feasible;

WHEREAS, the Parties desire to form a regional water management group, as defined in California Water Code §10537, to take the steps outlined in the Integrated Regional Water Management Planning Act of 2002 to determine whether to prepare an IRWMP for the Kaweah River Delta Basin ("KAWEAH BASIN") in accordance with the provisions of said Act; and

WHEREAS, the creation of a new IRWMP for the KAWEAH BASIN may subsume the aforementioned Kaweah River Basin Integrated Water Management Plan,

NOW, THEREFORE, it is mutually understood and agreed as follows:

Section 1: Definitions

1.1 "KAWEAH BASIN" shall mean the basin generally comprised of all of the lands on which is situated any of the following: (a) the KDWCD; (b) portions of the County in which is located any part of Dry Creek, Yokohl Creek or Cottonwood Creek; and (c) any portion of the Kaweah River or its distributaries located below Terminus Dam.

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1.2 "Lead Party" shall mean KDWCD.

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1.3 "KAWEAH BASIN IRWMP" shall be the initial name for the IRWMP, the preparation of which is the objective of this MOU.

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Section 2: Purposes and Goals

2.1 The parties desire to coordinate their efforts to do the following:

2.1.1 Prepare this MOU.

2.1.2 Follow the notice, hearing and other procedures outlined in California Water Code §10541, paragraphs (a) and (b), together with all other applicable law, to determine whether to prepare the KAWEAH BASIN IRWMP.

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2.1.3 Apply for and obtain a grant of funds necessary to pay the costs of preparing the KAWEAH BASIN IRWMP.

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2.1.4 Use any grant funds obtained by the Parties, to timely prepare the KAWEAH BASIN IRWMP and adopt said IRWMP, all in accordance with the provisions of California Water Code §10541, paragraphs (c) and (d), together with all other applicable law.

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Section 3: Cost Sharing

3.1. Each Party agrees to pay its equal share of the costs to accomplish the purposes and goals identified above in sections 2.1.1, 2.1.2 and 2.1.3.

3.2 The Parties do not agree to share the costs of actually preparing the KAWEAH BASIN IRWMP, but intend to use grant funds to pay for such work. If no grant funds are obtained for the preparation of the KAWEAH BASIN IRWMP, the Parties will not perform such work, without a further written agreement regarding the costs for the same.

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3.3 The Lead Party shall be the recipient of all bills incurred in connection with the work authorized by this MOU. Further, the Lead Party shall be responsible for notifying the other Parties of such bills. Each of the Parties shall pay its respective share of each bill within forty-five (45) days of notification of the same by the Lead Party. The Lead Party shall keep an accurate accounting of the bills it receives and all monies received for the payment of same. Each of the Parties shall be entitled to inspect the records of the Lead Party with respect to the matters described in this Section 3.

Section 4: Authority of Lead Party

4.1 The Lead Party shall be authorized to prepare and publish the notice referred to in California Water Code §10541, paragraph (a). Further, the Lead Party shall have the authority to hold the public hearing described in California Water Code §10541, paragraph (b).

4.2 After the aforementioned public hearing, the Lead Party shall poll the other Parties to determine whether they are still in favor of proceeding towards the preparation of a KAW ~~EAH BASIN~~ IRWMP. If all of the Parties are still in agreement with the Parties proceeding to prepare a KAW ~~EAH BASIN~~ IRWMP, then Lead Party is hereby authorized to retain Dennis R. Keller, Consulting Engineer, on behalf of the Parties, to prepare the application for a grant to fund the costs of preparing the KAW ~~EAH BASIN~~ IRWMP.

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Section 5. General Provisions

5.1. Term. This MOU shall become effective on the date first above written and shall terminate one year thereafter, unless the parties have obtained the grant providing the funds necessary to pay for the costs of preparing the KAW ~~EAH BASIN~~ IRWMP. Any Party may terminate its participation in this MOU upon 60 days notice to the remaining Parties; provided, however, any Party so terminating its participation in this MOU shall be responsible for its share of the costs incurred by the Parties through the date of said notice.

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5.2 Additional Parties. Upon written approval of all of the Parties, other local public agencies, as defined in California Water Code §10533, may become parties to this MOU.

5.3 Construction of Terms. This MOU is for the sole benefit of the Parties and shall not be construed as granting rights to any person other than the Parties, or imposing obligations on a party to any person other than another Party.

5.4 Good Faith. Each Party shall use its best efforts and work in good faith for the expeditious completion of the purposes and goals of this MOU and the satisfactory performance of its terms.

5.5 Rights of the Parties and Constituencies. This MOU does not contemplate the Parties taking any action that would:

5.5.1 Adversely affect the rights of any of the Parties; or

5.5.2 Adversely affect the constituencies of any of the Parties.

5.6 Execution. This MOU may be executed in counterparts and the signed counterparts shall constitute a single instrument. The signatories to this MOU represent that they have the authority to sign to bind the Party for whom they are signing this MOU.

IN WITNESS WHEREOF, the Parties hereto have executed this Memorandum of Understanding to be effective as of the date first above written.

Dated: _____

County:

COUNTY OF TULARE

By _____

Title: _____

Dated: _____

Approved as to form:

TULARE COUNTY Counsel

EID:

EXETER IRRIGATION DISTRICT

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By _____

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Attorney for EID

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LINDSAY;

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CITY OF LINDSAY

Dated: _____

By _____

Title: _____

Approved as to form:

Dated: _____

Attorney for LINDSAY,

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KDWCD:

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**KAWEAH DELTA WATER
CONSERVATION DISTRICT**

Dated: _____

By _____

Title: _____

Approved as to form:

Dated: _____

Attorney for KAWEAH DELTA WATER
CONSERVATION DISTRICT

_____:

Dated: _____

By _____

Title: _____

Approved as to form:

Dated: _____

Attorney for _____

Subj: **(no subject)**
Date: 8/31/2007 11:33:27 A.M. Pacific Daylight Time
From: Zsmith@visalialaw.com
To: kelweg1@aol.com
CC: bgeorge@kdwcd.com, mlarsen@kdwcd.com

Dennis,

Attached please find the Memorandum of Understanding, that you faxed to us a few days ago, on which I have now shown, as marked-up changes, the modifications that you have requested.

Please let me know if you would like further changes to the document.

Zack

D. Zackary Smith
Ruddell, Cochran, Stanton, Smith, Bixler & Wisehart, LLP
E-mail: zsmith@visalialaw.com
Telephone: (559) 733-5770

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APPENDIX C

OUTLINE – TULARE BASIN WATER
AUTHORITY

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

Outline for Development of the **Tulare Basin Water Authority**

The following is the beginnings of a concept paper that would outline why and how we could put together an organization charged with coordinating the development of a Tulare Basin-wide regional water planning effort. The first step is to “outline the outline” to make sure we are providing the right background and informational setting as well as addressing the right questions. The next step would be to “flesh out” the outline into a conceptual paper.

1) Background:

- a) Local planning efforts;
- b) Costa planning effort;
- c) The Governor’s SJV Partnership Initiative;
- d) The SJV Blue Print effort;
- e) San Joaquin Valley Water Coalition;
- f) Coordination/interface with the San Joaquin River Region;

2) Purposes:

- a) To be complimentary to existing planning efforts which are primarily being done on a watershed basis...not to replace them;
- b) To accommodate the areas where existing plans don’t address known water management needs:
 - i) From a geographic perspective;
 - ii) From the kind of need;
- c) To provide a certain degree of coordination between the existing planning efforts;
- d) To increase the likelihood and “reasonableness” of state and federal grant and loan funding by having a coordinated program to address the Region’s needs;
- e) To provide a framework for inter-regional cooperation on projects/programs of mutual benefit.

3) State and Federal Funding Opportunities (discussion of state and federal preference/desires relative to regional planning efforts, moneys available, etc.)

a) **State Funding:**

i) Prop 13;

ii) Prop 50;

(1) IRWMP Program:

(a) Planning grants;

(b) Implementation grants;

iii) Prop 84;

iv) Prop 1E;

v) AB 303;

vi) Partnership monies.

b) Federal monies.

4) Potential Membership/Involvement:

a) Those actively planning:

i) Those that have prepared Integrated Regional Plans:

(1) Upper Kings;

(2) Poso Creek;

(3) San Luis and Delta Mendota Water Authority;

b) Those that are intending to prepare Integrated Regional Plans:

c) Those that are planning water resource activities under other authority:

i) Kaweah Delta WCD;

ii) Deer Creek and Tule River Authority;

iii) Kern County Water Agency;

iv) Friant Water Authority;

v) Tulare Lake Basin WSD;

d) Those entities/needs that logically fit under the auspices of an existing local planning effort but have not been invited or for other reasons are on the sidelines;

- e) Those entities/needs that don't logically fit under the auspices of an existing local planning effort but are still within the Tulare Basin Region;
- f) Involvement of County governments;
- g) Involvement of incorporated cities (use of COGs or CAGs?);
- h) Involvement of environmental interests/needs;

5) How the TBWA Would Interact with Existing Planning efforts:

- a) Existing planning efforts would be acknowledged as part of organizational framework...interaction would be described in detail in organizational creation documents.
- b) Description of interaction would include mechanism for deciding when a project falls under the auspices of one of the existing planning efforts or under the auspices of the new organization (TBWA).

6) Potential Organization Forms and Governance:

- a) Degree of organization formalization needed?
 - i) Being able to accept funding and grant accountability;
 - ii) Being able to make decisions and set priorities;
 - iii) Having the proper authorities relative to planning, construction (?) other authorities (?)
- b) Does it need to be a public agency?
- c) Who would sit as the governing body?
- d) How would voting be done?
- e) How would the general public be involved?
- f) Discuss alternative organizational formats that could meet the agreed-to requirements – plusses and minuses (once we have answers to the above questions);
- g) Operational funding requirements and sources;
- h) Staffing.

7) Timelines – What Controls?

a) To be effective in dictating the allocation of the Prop 84 - \$60 million earmarked for the Tulare Basin. Required milestones:

i) (list dates and events)

ii)

b) To meet the Governor's Partnership water planning element needs – Required milestones:

i) (list dates and events)

ii)

c) To meet Costa Planning effort needs – Required Milestones:

i) (list dates and events)

ii)

8) Frequently Asked Questions: (start a list)

9) Who to Contact:

APPENDIX D

JPA-TULARE LAKE HYDROLOGIC REGION
WATER-RELATED ENTITIES

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

**JOINT POWERS AGREEMENT
FOR
TULARE LAKE HYDROLOGIC REGION WATER-RELATED ENTITIES**

THIS JOINT POWERS AGREEMENT (hereinafter referred to as the "Agreement") is made this ____ day of _____, 2007, by and between the KAWEAH DELTA WATER CONSERVATION DISTRICT (hereinafter "KDWCD"), KINGS RIVER CONSERVATION DISTRICT (hereinafter "KRCD"), SEMITROPIC WATER STORAGE DISTRICT (hereinafter "STWSD") and the other undersigned signatories (hereinafter individually referred to as "Party" and collectively as "Parties").

RECITALS

A. WHEREAS, KDWCD is a water conservation district formed pursuant to the Water Conservation Act of 1927 located in the western portion of Tulare County and the eastern portion of Kings County; and

B. WHEREAS, KRCD is a conservation district formed pursuant to the Kings River Conservation District Act of 1951; and

C. WHEREAS, STWSD is a water storage district formed pursuant to the California Water Storage District Act; and

D. WHEREAS, a portion or all of each of the Parties is located in a hydrologic region sometimes referred to as the "Tulare Lake Hydrologic Basin" (hereinafter "Basin"), the general locale of the Basin being outlined in red on the map attached hereto as Exhibit A;

E. WHEREAS, each of the parties is either a public entity with authority to manage water resources in the Basin and managing such resources or a mutual water company that provides water service in the Basin; and

F. WHEREAS, it is in the interest of the Parties, and the region served by them for the water resources of the Basin to be responsibly developed, managed, protected and conserved to the extent feasible; and

G. WHEREAS, both the Integrated Regional Water Management Planning Act of 2002, Division 6, Part 2.2 of the California Water Code, and the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002, Division 26.5 of the California Water Code, authorize and encourage public entities to develop an integrated regional water management plan ("IRWMP"); and

H. WHEREAS, KDWCD, representing a substantial number of other water-related entities, has created and the State of California has recognized the Kaweah River Basin Integrated Water Management Plan; and

I. WHEREAS, KRCD and STWSD, each acting as the lead agency for a substantial number of other water-related entities, have already initiated the process to create separate IRWMPs for other parts of the Basin not covered by the Kaweah River Basin Integrated Water Management Plan; and

J. WHEREAS, the Parties desire to improve the integration of programs and strategies among the municipal, industrial, agricultural and environmental uses of water in the Basin: and

K. WHEREAS, the Parties desire to form a regional water management group, as defined in California Water Code §10537, to take the steps outlined in the Integrated Regional Water Management Planning Act of 2002, to work towards the preparation of a comprehensive IRWMP for the Basin; and

L. WHEREAS, the preparation of such a comprehensive IRWMP for the Basin will likely take many months to complete; and

M. WHEREAS, pursuant to the Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002 (hereinafter referred to as "Proposition 50"), and the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (hereinafter referred to as "Proposition "84"), certain grant monies may be made available by the State of California for water-related projects in the Basin prior to the completion of a comprehensive IRWMP for the Basin; and

N. WHEREAS, other monies may be made available to the Parties by the United States of America and from other sources for water-related projects in the Basin; and

O. WHEREAS, the Parties desire to enter into this Agreement, pursuant to California Government Code §§6500 et seq., in order to further their efforts to develop, manage, protect and conserve the water resources of the Basin whether or not they are able to complete the development of an IRWMP for the Basin,

NOW, THEREFORE, in and for consideration of the mutual covenants, conditions and promises hereinafter set forth, the Parties hereby agree as follows:

1.0 Purposes and Goals

1.1 Objectives. The Parties desire to work together to accomplish the following:

a. To facilitate the integration of programs and strategies among municipal, industrial, agricultural and environmental users for enhancing the water supply, water quality and watershed management of the Basin;

- b. To improve the reliability of the imported and local water supplies of the Basin;
- c. To protect and enhance the viability of the watersheds of the Basin;
- d. To seek, obtain, administer and distribute grant and/or loan funds from the State of California, the United States of America or other sources for qualifying water-related projects in the Basin; and
- e. To create an IRWMP for the Basin.

1.2 Combined Efforts. The Parties believe that by executing this Agreement and coordinating and combining their respective resources, they will be able to better and sooner achieve the aforementioned objectives for a substantial number of water-related entities located within the Basin, by acting as designated lead agencies with respect to this Agreement and their effort to establish an IRWMP, both for their regional areas and for the Basin. Attached hereto as Exhibit B is a listing of the other aforementioned water-related entities and a brief description of their IRWMP-related involvement with the Parties.

1.3 Immediate Collaboration. The Parties agree that once KDWCD, KRCD and STWSD have duly approved and signed this Agreement, they will immediately cease efforts to separately obtain or compete against each other for Proposition 50 and Proposition 84 grant funds (hereinafter referred to as "Grant Funds") and will commence to collaborate and cooperate to achieve the purposes and goals described in this Section 1, including, but not limited to their objective to seek and obtain Grant Funds for qualifying water-related projects in the Basin. The aforementioned collaboration and cooperation shall commence with each Party immediately designating a representative and an alternate representative to attend monthly meetings, to share all relevant information and documents and to coordinate their efforts to collaborate as described in this Section 1.3. Further, each Party will make a good faith effort to cooperate in every reasonable way towards the expeditious accomplishment of the purposes and goals described in this Section 1.

2.0 Management of Funds

2.1. Deposit of Funds. The Parties hereby authorize the State of California to distribute Proposition 50 and Proposition 84 Grant Funds to KDWCD to be held by it in its own name and distributed for use pursuant to the provisions of this Agreement. All Grant Funds received by KDWCD on behalf of it and the Parties shall be held by it in one of two designated and separate accounts. One account shall be an interest-bearing account with the State of California Local Agency Investment Fund and the other account shall be an interest-bearing or non-interest bearing checking account with a federally-insured financial institution (hereinafter collectively "Accounts"). The only monies deposited into the Accounts by KDWCD shall be Grant Funds and other funds,

of any type, if related to the achievement of the purposes and goals set forth in Section 1 of this Agreement.

2.2. Designated Officials. Pursuant to Government Code section 6505.1, KDWCD shall designate a minimum of two individuals (hereinafter referred to as the "Designated Officials") employed by it who will have charge of, handle and have access to the Grant Funds held in the Accounts. The names of the Designated Officials shall be provided to the Parties, once said individuals are designated by KDWCD. Should any of the Designated Officials change, KDWCD shall so notify the Parties of the same.

2.3. Bond. Pursuant to Government Code Section 6505.1, KDWCD shall obtain a surety bond for each of the Designated Officials. Such bonds shall provide coverage in the amount of \$250,000 for the theft or other malfeasance by the Designated Officials related to the Accounts. The premiums for said bonds shall be paid from funds held in the Accounts.

2.4. Accounting Records. KDWCD shall keep precise and accurate records of all deposits and disbursements from the Accounts, including the current balance in the Accounts. The aforementioned records shall include all interest accrued on the monies deposited in the Accounts.

2.5. Access to Accounting Records. Any current party to this Agreement shall be allowed to review the records of the Accounts and obtain copies of the same from KDWCD, upon 72-hours written notice to KDWCD.

2.6. Audits. KDWCD shall be responsible for the performance of all audits of the Accounts required by law. KDWCD may hire any qualified accounting or auditing firm to perform any required audit of the Accounts. The costs of the aforementioned audits may be paid for by funds held in the Accounts.

3.0 Availability of Grant Funds

3.1. Distribution from the Accounts. Subject to the limitations set forth in this section, Grant Funds will be available to the Parties as determined by the provisions of this Agreement, the terms of any grant, together with any amendments to either.

3.2. Limitation on IRWMP Grants. No more than \$500,000 will be distributed to any entity for the development of an IRWMP. Any proposed IRWMP must be for an area located within the Basin.

4.0 Selection of Proposals

4.1. Solicitation Notice. KDWCD will solicit grant applications for Grant Funds within 30 days after this Agreement is signed by KDWCD, KRCD and STWSD.

4.2. Project Proposals. All applications for Grant Funds shall be submitted to KDWCD in a format to be determined by the Parties. Within 10 days thereafter, KDWCD shall distribute a copy of any submitted applications to all of the Parties, together with a score sheet for each.

4.3. Voting. Each Party with an IRWMP approved by the State of California Department of Water Resources shall be entitled to score each application. Additionally, all other Parties shall be entitled to together, acting as one, score each application, with such scoring to be accomplished in accordance with a procedure established by a majority vote of such other Parties. The scores received for each application shall be submitted to KDWCD and tallied by KDWCD for each application. Such scoring shall be deemed completed 45 days after the date KDWCD distributes the application for scoring. As to any decision to be made by the Parties that do not involve the scoring of applications, a majority vote of the Parties shall govern.

4.4. Scoring. Each application shall be scored by the Parties entitled to do so, pursuant to section 4.3 above, using the State of California Department of Water Resources statewide priorities and eligibility criteria or other priorities and criteria established by written agreement of a majority of the Parties, which may also be modified by such a majority. The Parties shall each review the priorities and eligibility criteria for each application, prior to scoring such application.

4.5. Results. Within 60 days of its mailing out any application to the Parties, KDWCD shall notify the Parties of the scoring tallies for such application.

4.6. Verification of Need. The records of each entity submitting an application shall be subject to review in order to verify that the proposed project described in an application is among the highest ranking needs of the submitting entity in accordance with the requirements of the State of California.

5.0 Reimbursement of Costs

5.1. Costs. KDWCD will be reimbursed for its actual costs in acting as lead agency under this Agreement. KDWCD shall be entitled to reimburse itself for such costs by distributions from the Accounts.

5.2. Other Parties. Any other Party that incurs a cost in connection with the performance of a duly authorized duty arising under this Agreement shall be entitled to reimbursement for its costs from the Grant Funds in the Accounts, within 45 days of submission of a written request for reimbursement to KDWCD. KDWCD may request documentation sufficient to substantiate any request for funds.

5.3 Financial Statements. A summary of revenues and expenses, including beginning and ending cash balances in the Accounts, shall be prepared annually and submitted to the Parties by KDWCD.

6.0 Governance

6.1 Decision Making. Except as otherwise specified in part 4.0 of this Agreement, all decisions made by the Parties to this Agreement shall be made by a majority vote of those present at a duly called, noticed and convened meeting.

6.2 Call of Meetings. A meeting may called by any two Parties.

6.3 Notice of Meetings. Except in emergency situations, written notice of all duly called meetings shall be provided to all Parties at least ten (10) days prior to any meeting so called.

6.4 Convened Meeting. A duly called and noticed meeting shall be convened, if a majority of the Parties are present at the time, on the date and at the location where the meeting was noticed to occur.

6.5 Conduct of Meetings. All meetings of the Parties, regarding the subject matter of this Agreement, shall comply, in all respects, with the provisions of the Ralph M. Brown Act, currently found in California Government Code Sections 54950, *et seq.*, or any replacement legislation, except as to meetings that are exempted by law from such compliance.

6.6 Public Forum. Persons and entities that are not Parties shall have the right to speak and otherwise comment on all actions at any meeting of the Parties or by a writing submitted to the Parties and mailed to KDWCD.

7.0 Termination

7.1 Withdrawal by Party. Any Party may terminate its participation in this Agreement, without cause, by providing the other Parties with ten (10) days written notice.

7.2 Termination of a Party. Any Party that fails to sufficiently participate in the activities of the Parties pursuant to this Agreement may, at the sole discretion of the other Parties, be terminated as a party to this Agreement by a vote of a majority of the Parties.

7.3 Notice to Cure. Prior to the termination of any Party pursuant to Section 7.2 of this Agreement, KDWCD shall provide such Party with a notice to cure such Party's deficiencies within ten (10) days from the time of such notice or be subject to being terminated as a party to this Agreement as allowed in said Section.

7.4. Termination of this Agreement. This Agreement may be terminated by a written agreement signed by a majority of the Parties to the Agreement.

8.0 General Provisions

8.1. New Parties. Any public agency and any mutual water company that has the authority or right to manage water resources in the Basin, or any part of it, may, with the written consent of a majority of the Parties, become a Party by signing this Agreement and providing all of the other Parties with a copy of such signed Agreement. Any new Party shall be subject to this Agreement, together with all rules, regulations and separate agreements promulgated by or entered into by the Parties as part of or in relation to this Agreement.

8.2. Construction of Terms. This Agreement is for the sole benefit of the Parties. It shall not be construed as granting rights to any person other than the Parties, or imposing obligations on any person or entity other than another Party.

8.3. Good Faith. Each Party shall use its best efforts and work in good faith for the expeditious completion of the purposes and goals of the Agreement and the satisfactory performance of its terms.

8.4. Execution. This Agreement may be executed in counterparts and the signed counterparts shall constitute a single instrument. The signatories to this Agreement represent that they have the authority to sign to bind the entity for whom they are signing this Agreement.

8.5 Amendment. This Agreement may only be amended by a written amendment signed by a majority of the Parties.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement on the date first above written.

Date: _____

KDWCD:

KAWEAH DELTA WATER
CONSERVATION DISTRICT

By: _____

Date: _____

KRCD:

KINGS RIVER CONSERVATION
DISTRICT

By: _____

Date: _____

STWSD:

SEMITROPIC WATER STORAGE
DISTRICT

By: _____

PARTIES:

Date: _____

By: _____

APPENDIX E

CURRENT PARTICIPANT MOU

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

**UNANIMOUS WRITTEN CONSENT FOR A LOCAL PUBLIC AGENCY
TO BECOME A PARTY TO A MEMORANDUM OF UNDERSTANDING**

THIS AGREEMENT ("Agreement"), effective this 11th day of December, 2013, by and between the undersigned entities, is made in light of the following:

RECITALS:

WHEREAS, on or about November 8, 2007, COUNTY OF TULARE ("County"), EXETER IRRIGATION DISTRICT ("Exeter"), CITY OF VISALIA ("Visalia"), CITY OF LINDSAY ("Lindsay"), and KAWEAH DELTA WATER CONSERVATION DISTRICT ("District") entered into a Memorandum of Understanding ("MOU");

WHEREAS, on or about November 30, 2010, County, Exeter, Visalia, Lindsay, and District, entered into a Restated Memorandum of Understanding ("Restated MOU"), which, among other things, added LAKESIDE IRRIGATION WATER DISTRICT ("LIWD"), TULARE IRRIGATION DISTRICT ("TID") and CITY OF TULARE ("Tulare") as additional parties to the Restated MOU;

WHEREAS, Section 5.2 of the Restated MOU allows other local public agencies to become parties to the Restated MOU, upon written approval of all of the parties to the document; and

WHEREAS, the parties to the Restated MOU are agreeable to having CITY OF FARMERSVILLE ("Farmersville") become a party to the Restated MOU,

NOW, THEREFORE, it is mutually understood and agreed as follows:

1. **Approval.** The undersigned, being all of the current parties to the Restated MOU, hereby approve Farmersville to become a party to the Restated MOU.

2. **Agreement of Farmersville.** Farmersville agrees to become a party to the Restated MOU and be bound by all of the provisions of the document. Farmersville hereby accepts all of the duties and responsibilities

agreed to by the parties in the Restated MOU.

3. Counterpart Copies. This document may be executed in two or more counterparts, which shall, in the aggregate, be signed by all parties. Each counterpart shall be deemed to be an original against any party who has signed it.

IN WITNESS WHEREOF, the parties hereto have executed this document on the date first above written.

County:

COUNTY OF TULARE

Dated: April 30, 2013

By 

Title: CHAIRMAN, BOARD OF SUPERVISORS

Approved as to form:

Dated: _____

TULARE COUNTY Counsel

Exeter:

EXETER IRRIGATION DISTRICT

Dated: _____

By _____

Title: _____

Approved as to form:

Dated: _____

Attorney for EXETER IRRIGATION DISTRICT

BEFORE THE BOARD OF SUPERVISORS COUNTY OF TULARE, STATE OF CALIFORNIA

IN THE MATTER OF CONSENT TO ADD)
 FARMERSVILLE AS PARTY TO THE)
 KAWEAH RIVER BASIN INTEGRATED) Resolution No. 2013-0252
 WATER MANAGEMENT GROUP) Agreement No. 23353-A & 23353-B
 RESTATED MEMORANDUM OF)
 UNDERSTANDING)

UPON MOTION OF SUPERVISOR WORTHLEY, SECONDED BY SUPERVISOR ENNIS, THE FOLLOWING WAS ADOPTED BY THE BOARD OF SUPERVISORS, AT AN OFFICIAL MEETING HELD APRIL 30, 2013, BY THE FOLLOWING VOTE:

AYES: SUPERVISORS ISHIDA, VANDER POEL, COX, WORTHLEY, AND ENNIS
 NOES: NONE
 ABSTAIN: NONE
 ABSENT: NONE



ATTEST: JEAN M. ROUSSEAU
 COUNTY ADMINISTRATIVE OFFICER/
 CLERK, BOARD OF SUPERVISORS

BY:

Russell A. Ybana
 Deputy Clerk

1. Rescinded Tulare County Board Agreement No. 24790 and approve Amendment One to Tulare County Board Agreement No. 23353 for the Restated Memorandum of Understanding with Exeter Irrigation District, City of Visalia, City of Lindsay, Kaweah Delta Water Conservation District, Lakeside Irrigation Water District, Tulare Irrigation District, City of Tulare, and the County of Tulare for the preparation of an Integrated Regional Water Management Plan for the Kaweah River Basin for \$3,000 and an estimated \$6,000 for grant application preparation fees, retroactive to November 30, 2010.
2. Found that the Board had authority to enter into the proposed amendment as of November 30, 2010 and that it was in the County's best interest to enter into the amendment on that date.
3. Approved Amendment Two to Tulare County Board Agreement No. 23353 allowing the City of Farmersville to Become Party to the Kaweah River Basin Integrated Regional Water Management Plan Group Restated Memorandum of Understanding.
4. Authorized the Chairman to sign three copies of the Unanimous Written Consent For a Local Public Agency to Become Party to a Memorandum of Understanding.

CAO
 Auditor
 Co. Counsel

DAY
 4/30/13

UNANIMOUS WRITTEN CONSENT FOR A LOCAL PUBLIC AGENCY TO BECOME A PARTY TO A MEMORANDUM OF UNDERSTANDING

THIS AGREEMENT ("Agreement"), effective this 30th day of April, 2013, by and between the undersigned entities, is made in light of the following:

RECITALS:

WHEREAS, on or about November 8, 2007, COUNTY OF TULARE ("County"), EXETER IRRIGATION DISTRICT ("Exeter"), CITY OF VISALIA ("Visalia"), CITY OF LINDSAY ("Lindsay"), and KAWEAH DELTA WATER CONSERVATION DISTRICT ("District") entered into a Memorandum of Understanding ("MOU");

WHEREAS, on or about November 30, 2010, County, Exeter, Visalia, Lindsay, and District, entered into a Restated Memorandum of Understanding ("Restated MOU"), which, among other things, added LAKESIDE IRRIGATION WATER DISTRICT ("LIWD"), TULARE IRRIGATION DISTRICT ("TID") and CITY OF TULARE ("Tulare") as additional parties to the Restated MOU;

WHEREAS, Section 5.2 of the Restated MOU allows other local public agencies to become parties to the Restated MOU, upon written approval of all of the parties to the document; and

WHEREAS, the parties to the Restated MOU are agreeable to having CITY OF FARMERSVILLE ("Farmersville") become a party to the Restated MOU,

NOW, THEREFORE, it is mutually understood and agreed as follows:

1. **Approval.** The undersigned, being all of the current parties to the Restated MOU, hereby approve Farmersville to become a party to the Restated MOU.
2. **Agreement of Farmersville.** Farmersville agrees to become a party to the Restated MOU and be bound by all of the provisions of the document. Farmersville hereby accepts all of the duties and responsibilities

agreed to by the parties in the Restated MOU.

3. Counterpart Copies. This document may be executed in two or more counterparts, which shall, in the aggregate, be signed by all parties. Each counterpart shall be deemed to be an original against any party who has signed it.

IN WITNESS WHEREOF, the parties hereto have executed this document on the date first above written.

County:

COUNTY OF TULARE

Dated: _____

By _____

Title: _____

Approved as to form:

Dated: _____

TULARE COUNTY Counsel

Exeter:

EXETER IRRIGATION DISTRICT

Dated: 11/13/13

By [Signature]

Title: GENERAL MANAGER

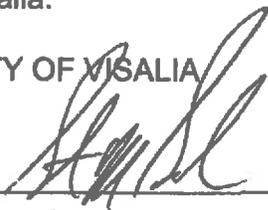
Approved as to form:

Dated: 8/13/13

[Signature]
Attorney for EXETER IRRIGATION DISTRICT

Visalia:

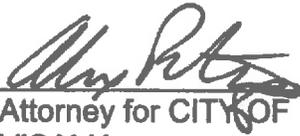
CITY OF VISALIA

By 

Title: City Manager

Dated: 2/15/13

Approved as to form:


Attorney for CITY OF
VISALIA _____

Dated: 2/12/13

Lindsay:

CITY OF LINDSAY

By _____

Title: _____

Dated: _____

Approved as to form:

Attorney for CITY OF LINDSAY

Dated: _____

Visalia:

CITY OF VISALIA

Dated: _____

By _____

Title: _____

Approved as to form:

Dated: _____

Attorney for CITY OF
VISALIA _____

Lindsay:

CITY OF LINDSAY

Dated: 1/28/2013 _____

By Ramona Villanueva Padilla

Title: City Mayor

Approved as to form:

Dated: 2/26/2013 _____

Julia M. Law
Attorney for CITY OF LINDSAY

District:

**KAWEAH DELTA WATER
CONSERVATION DISTRICT**

By _____

Dated: _____

Title: _____

Approved as to form:

Dated: _____

Attorney for KAWEAH DELTA WATER
CONSERVATION DISTRICT

LIWD:

**LAKESIDE IRRIGATION WATER
DISTRICT**

Dated: 12-11-13

By 

Title: Secretary - Manager

Approved as to form:

Dated: 12-11-13


Attorney for LAKESIDE IRRIGATION
WATER DISTRICT

TID:

TULARE IRRIGATION DISTRICT

Dated: 4/15/13

By J. Paul Hendrix

Title: General Manager

Approved as to form:

Dated: 4/17/13

[Signature]
Attorney for TULARE IRRIGATION DISTRICT

Tulare:

CITY OF TULARE

Dated: _____

By _____

Title: _____

Approved as to form:

Dated: _____

Attorney for CITY OF TULARE

TID:

TULARE IRRIGATION DISTRICT

Dated: _____

By _____

Title: _____

Approved as to form:

Dated: _____

Attorney for TULARE IRRIGATION DISTRICT

Tulare:

CITY OF TULARE

Dated: 5/7/2013

By Don Dolmen

Title: City Manager

Approved as to form:

Dated: 05.07.13

[Signature]
Attorney for CITY OF TULARE

APPENDIX F

2013 EDUCATIONAL OUTREACH
PROGRAMS

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

APPENDIX F
EDUCATIONAL PROGRAMS KDWCD SUPPORTED OR PARTICIPATED IN – 2013
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
KAWEAH DELTA WATER CONSERVATION DISTRICT

1. Water Education Central Valley Water Tour
2. Sequoia for Youth Program – 3 sessions
3. Central Valley Christian High School Agricultural Group – Terminus Dam Tour
4. KDWCD/TID Groundwater Symposium - + 300 participants
5. Mark Larsen Elected to the Water Education Foundation BOD

APPENDIX G

STATEMENT OF POLICY REGARDING
WATER TRANSFERS AND EXCHANGES

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

**STATEMENT OF POLICY RE WATER
TRANSFERS AND EXCHANGES
September 8, 1994**

The purpose of this policy statement is to confirm the intent of the Association to retain waters of the Kaweah River and its tributaries in the Kaweah River hydrologic surface basin ("Basin") for beneficial use therein. The boundaries of the Basin are set forth on Exhibit A, appended hereto and made a part of this statement.

Each of the Member Units shall retain the right and privilege alter, amend, change or modify their respective service areas, without notice to or consent of the Association, provided that the expanded service area of the Member Unit does not extend beyond the boundary of the historical Basin. Should a Member Unit make such an adjustment to its service area, it shall so notify the Watermaster. Documentation shall be provided by the Member Unit, to the Watermaster, adequate to demonstrate that the expanded service area is within the Basin.

Water to which Member Units are entitled shall be utilized only within said Basin boundary except as provided hereinafter for periods of flood release. Transfer(s) of entitlement waters shall be allowed within the Basin upon proper notification to the Watermaster of such impending transfer(s). The Watermaster shall provide notification to the Board of Directors of any such transfer(s). Approval of the Board of Directors shall not be required for any transfer within the Basin. It is acknowledged that under certain flood release conditions, after irrigation and spreading demands have been fully satisfied and the capability of the Basin to retain flood release water has been fulfilled, flood water flows naturally to the historic Tulare Bed which lies within the Basin.

Member Units may enter into water exchange agreements which call for no net loss to the Basin or to any in-Basin water rights holder, subject to administrative rules and regulations adopted by the Board of Directors.

Transfer(s) of riparian waters or waters resulting from settlement of riparian entitlement negotiations shall not be allowed. Transfers of water received under contracts for water made available through the State Water Project, the Federal Central Valley Project or the Cross Valley Canal Exchange Program shall not be subject to these provisions.

This policy shall be implemented by the following additions to the rules and regulations effective upon adoption of the policy by the Board of Directors:

Transfers of water shall be allowed between entities for use within the Basin. Notice of an impending transfer shall be provided to the Watermaster in writing.

Exchanges of water out of the Basin shall be subject to approval of the Board of Directors. Such exchanges shall only be considered when the recipient of the water can demonstrate, to the satisfaction of the Board of Directors, that a hardship situation exists. The required information associated with the documentation of the hardship situation shall be established by the Board of Directors on a case by case basis.

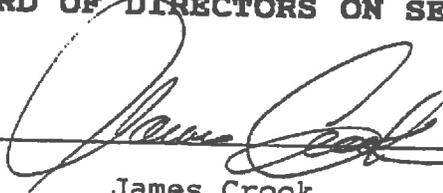
An out-of-Basin water exchange agreement may be entered into by a member unit subject to approval of the Association Board of Directors. Any exchange approved by the Board of Directors shall be conditioned on the full execution of an exchange/return agreement submitted with the petition for approval. Such agreement(s) shall call for no net loss to the Basin or to any in-Basin water rights holder.

To this end, exchanges shall call for channel loss water to be withheld from the total quantity of water available for exchange in the year of the exchange.

The total quantity of water exchanged shall be returned to the Basin for further diversion to a headgate designated by the exchanger subject to coordination with the Watermaster.

To compliment the Terminus and in-Basin storage capabilities available to members of the Association, temporary out-of-Basin storage historically has been permitted on a case-by-case basis and may be permitted in the future. Authority to grant permission to store out-of-Basin shall reside with the Watermaster, subject to appeal to the Board of Directors. Permission shall be predicated on the ability of the requesting entity to demonstrate the eventual delivery within the Basin of waters temporarily stored out-of-Basin. Following removal from storage, documentation shall be provided that the water, less the normal losses, was delivered within the Basin.

**APPROVED BY THE KAWEAH AND ST. JOHNS RIVERS ASSOCIATION
BOARD OF DIRECTORS ON SEPTEMBER 8, 1994.**



James Crook
Manager/Secretary

APPENDIX H

REGIONAL ACCEPTANCE PROCESS
DOCUMENTS

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

REGIONAL ACCEPTANCE PROCESS
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
KAWEAH RIVER BASIN/TULE RIVER BASIN

INTRODUCTION

The development and management of comprehensive regional water management activities has been coordinated over the last several decades in both the Kaweah River Basin and the Tule River Basin. Leadership activities, including development of Integrated Regional Water Management Plan elements have been conducted under governance provided by the Kaweah Delta Water Conservation District (KDWCD) in the Kaweah River Basin and by the Deer Creek and Tule River Authority (DCTRA) in the Tule River Basin.

With the passage of bond propositions by the California electorate, state leadership with respect to IRWM activities has been directed by the Resources Agency to the Department of Water Resources (DWR). DWR has developed IRWM guidelines addressing numerous planning issues including issues such as Plan formatting, stakeholder development and participation guidelines and solicitations for and criteria for evaluation proposals for the funding of capital projects designed to enhance integrated water management.

As a part of the determination of the adequacy of local efforts to address IRWM planning goals and criteria, DWR embarked on a process identified as the Regional Acceptance Process or RAP for short. As a part of the RAP, DWR conducted interviews of IRWM lead agencies and participants and provided recommendations and opinions, particularly as they applied to SBXX1 funds. As a part of the RAP for the Kaweah River Basin, interview conclusions were prepared containing the conclusions and recommendations of DWR.

For a period of time, the efforts of the KDWCD and DCTRA were oriented toward the interview conclusions which were received at the close of the RAP process which stated, "...the Kaweah River Basin RWMG must consolidate their IRWM planning efforts with the Tule River RWMG. The Kaweah River Basin and Tule River IRWM Regions must explore options on how best to structure the regional boundaries in this area." Several meetings with DWR have occurred over time attempting to clarify the intent of this instruction and to determine if the RAP condition could be agreed upon by the IRWM areas and, if so, how the coordinated structure would be developed. Additional light was shed on the subject when the RAP summary was posted to the DWR website. A copy of this summary is included herewith as Appendix A.

This document clarified that for funding eligibility in subsequent rounds, "...the Kaweah River Basin and Tule River IRWM Regions must explore options on how best to structure the regional boundaries in this area. DWR's intent is to facilitate future communication and cooperation between the Kaweah River Basin and Tule River IRWM Regions, to develop a single IRWM Region that fosters integration and cooperation, and does not result in overlapping and competing planning efforts." Significant discussions have reinforced this conclusion between the General Manager of KDWCD and the IRWM program management of DWR. It is the purpose of this document to place before the governing boards of KDWCD and DCTRA the request of DWR as expressed in the RAP documents and to have both governing entities provide policy direction with regard to the IRWM structure for each river basin.

CURRENT STATUS

There are currently three (3) critical status elements that exist which are related to the IRWM process. The first of these is the integrated regional water management elements which exist within each river basin and which are currently functional. On an every-day basis, water

management occurs in each of the basins, both with respect to the local Kaweah River and Tule River supplies, as well as the Friant Division, CVP supply. In addition, both KDWCD and DCTRA have adopted Groundwater Management Plans with current annual updates.

Specific IRWM planning efforts began in the Kaweah Basin in 1992 and are based in a Memorandum of Understanding which includes the County of Tulare, four (4) cities, three (3) irrigation districts and KDWCD. DCTRA was formed specifically for IRWM purposes with the agreement forming the Authority specifically detailing the integrated regional water management elements.

Second in the status of issues is that of a plan acceptable to DWR. For KDWCD, DWR has determined that KDWCD has a “Deemed Equivalent” Plan. DWR has determined the eligibility of KDWCD for Round 1 and Round 2 funding with a plan reformatted to DWR criteria currently being prepared in order to satisfy Round 3 eligibility requirements. For the Tule River Basin, efforts are currently underway, a portion of which is this RAP related exercise, leading to a written plan for the Tule River Basin.

The third element is that related to the advisory committee function of an IRWM area. The KDWCD has a functioning Advisory Committee through which membership issues, disadvantaged community issues, project planning functions, project evaluation functions and funding applications are directed. From its inception, DCTRA has participated in these efforts with at least one (1) if not more, representatives of the Tule River Basin area attending for input and coordination purposes.

As a fourth and adjunct venue, both KDWCD and DCTRA participate in the overall Tulare Lake Basin Joint Powers Group which meets on a monthly basis. The Group has taken steps to officially form, however, has been advised that such step was premature and the

formation and functional implementation of separate advisory groups. The only point of coordination in satisfaction of the DWR requirement to coordinate planning efforts would be that related to project evaluations. At properly timed intervals, projects which have been developed, initially scored and prepared for application would be placed before the individual advisory groups and then the governing boards for both IRWM Plan areas. The project elements would be analyzed from the standpoint of improvement due to coordinated efforts between the Kaweah River Basin and the Tule River Basin. The principal basis for this coordination would be improvement of water management capability, with a shadow justification of improved capability to compete for available funding in a Tulare Lake Basin-wide competition, or even a state-wide competition arena. All other activities undertaken within the purview of an IRWM Plan area would be conducted by that area and with that area principally in mind, expanding the planning activities only with respect to project development opportunities.

Separate IRWM Plans/Single Advisory Group

The second alternative would involve creation of separate IRWM Plans with the formation of a single advisory group which would offer expanded coordination capability for planning purposes beyond that of the first option, which is directed solely at project development. At the current time, the Kaweah River Basin IRWM has a functioning advisory group which meets on a regular basis and includes representatives from all affected, impacted and regulatory groups within the Basin. Attending on a regular basis and providing input from the perspective of the Tule River Basin has been the DCTRA's secretary, along with periodic attendance from public agency managers which are member agencies to DCTRA. The expansion of this advisory group to contain member agency representation on a regular basis would satisfy

this option, as the representatives of the County, the regulatory agencies and the disadvantaged communities are common to both the Kaweah River Basin and the Tule River Basin.

Policy input and specific project development input could be provided to advisory group participant members in separate individual basin settings where strategies, project goals and financial issues could initially be worked out and direction provided prior to vetting at the advisory group level. It would appear that this option would lead to coordination between the basins on more than just a project development level, with only time telling whether separate advisory groups coordinated together as described in the separate advisory group option would be superior.

Joint IRWM Plan/Joint Advisory Group

The last of what appears to be the currently viable options would call for the creation of a joint IRWM Plan with a single advisory group. This option would necessitate the current governing entities to embark on an evaluation of governance options which would be viable for a combined basin effort and which would provide for a structure which would adequately address the individual needs of the basins. The goal would be to function on a completely coordinated, single-source planned basis yet addressing the needs of the individual basins. From a planning coordination perspective, this option allows for the most complete integration of the project development, project optimization and funding competition perspectives. The governing boards will have to determine, however, if this planning advantage allows for the capability to properly address the fact that actual water management activities do not currently take place on an integrated basis, most times not on even a coordinated basis. Project planning, financing and implementation are but an element of integrated water management with principal daily activities

No. 14 - Kaweah River Basin Integrated Regional Water Management Region

Region Acceptance Process Summary

General Description of Region

The Kaweah River Basin Integrated Regional Water Management (IRWM) Region is comprised of approximately 340,000 acres in the counties of Tulare and Kings. This Region is within the Tulare Lake Hydrologic Unit. This Region is defined primarily by hydrologic boundaries, except the southern boundary which is defined by the Tule River IRWM Region. Kaweah River Basin IRWM Region boundaries follow the watershed boundary formed by in-part by Cottonwood Creek to the north. However, this creates a small overlap with the Upper Kings Water Forum IRWM Region's southern boundary. Also, small islands of non-participation within the proposed Kaweah River Basin Region exist, such as the City of Exeter.

The Kaweah Delta Water Conservation District (KDWCD) has acted as the lead agency in the management of water resources available to the Kaweah River Basin, particularly as they have applied to groundwater resources and flood and storm water control.

Several agencies have executed a Memorandum of Understanding (MOU) and include KDWCD, Exeter Irrigation District, and the City of Lindsay. Several petitions also have been recently submitted to join in the MOU, including the City of Visalia, the County of Tulare, the Tulare Irrigation District, the City of Tulare, the Ivanhoe Irrigation District, and the St. Johns Water District. Principal water management activities undertaken by the cooperating agencies within the Kaweah River Basin have joined together with multiple agencies for management of pre-1914 water rights, groundwater management, and development of a formal IRWM Plan. The Kaweah River Basin IRWM Region has a functionally equivalent plan. This IRWM Region has indicated that there is ongoing coordination and cooperation with neighboring IRWM Regions, in particular with the Tule River IRWM Region.

Interview Conclusions- Conditional Approval for SBXX1 Funds

DWR approves the Kaweah River Basin IRWM Region to allow this Region to complete for planning and implementation funding from Senate Bill XX1 (Perata, Stats. 2008, Ch. 1), California Water Code §83000-

September 2009 RAP Cycle

83002.7. However, for subsequent funding rounds, the Kaweah River Basin and Tule River IRWM Regions must explore options on how best to structure the regional boundaries in this area. DWR's intent is to facilitate future communication and cooperation between the Kaweah River Basin and Tule River IRWM Regions, to develop a single IRWM Region that fosters integration and cooperation, and does not result in overlapping and competing planning efforts. Nearby "gap" areas, not covered by the Kern County, Poso Creek, Tule River, Kaweah River, or Southern Sierra IRWM Regions should also be considered for inclusion in the IRWM planning effort.

The stated communication and cooperation, region boundary structure, as well as inclusion of "gap" areas, will be considered when determining future region approval and eligibility for subsequent funding rounds.

STAFF RECOMMENDATION
REGIONAL ACCEPTANCE PROCESS
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
KAWEAH RIVER BASIN/TULE RIVER BASIN

JOINT BOARD MEETING

On Friday, June 21, 2013, the governing Boards of the Kaweah Delta Water Conservation District and the Deer Creek and Tule River Authority (DCTRA) met in joint session. The purpose of the meeting was to review a document related to the Regional Acceptance Process (RAP), in preparation for separate board meetings to be held in July, 2013. Prior to the end of July, 2013, the objective is to provide direction with respect to the implementation procedures which the governing boards desire to see included in the Integrated Regional Water Management (IRWM) planning process, including preparation of Plans formatted to meet the requirements of the State Department of Water Resources (DWR).

At the conclusion of the joint meeting of the Boards, the following were observations made by those present:

- It was the feeling of all present that the coordination which DWR desired to see in place between the Kaweah River Basin and the Tule River Basin was already in place and functioning.
- The Board members pointed to a number of specific coordination issues, including water exchanges, which have and continue to take place between the basins in response to the variable hydrology within the two (2) basins and out of the San Joaquin River. It was noted that there were participants from the Tule River Basin which were the recipients of water from two (2) different programs being implemented this year with Kaweah River water leaving the Kaweah River Basin to assist farmers outside of said basin.
- Board members noted that the Stone Corral Irrigation District was a member of DCTRA and had participated in the construction of the DCTRA recharge ponds and could enjoy the benefits of puts and takes from banking programs involving said ponds.
- In addition, the Stone Corral Irrigation District had participated in the DCTRA exercise which set the stage for many of the current DCTRA based programs wherein assets and needs of the member agencies were delineated and program matches were identified.
- The Boards further noted the coordination which occurs at the Friant Water Authority level based on the number of Friant Division, CVP contractors existing within each of the subject river basins. It was noted that this coordination extended beyond just project development coordination into significant policy and legislation arenas.

- As a final item, the Boards noted that the Tule River Basin has been participating in the IRWM Advisory Group formed for the Kaweah River Basin and has been treated as a member of said Advisory Group with specific coordination taking place on a number of levels between the river basins as a result of that participation. It was further noted that agencies such as Tulare County and disadvantaged community participants had parallel interests in both basins and coordination of issues related to Tule River Basin issues had and would continue to occur as a result of the open-door policy which exists with respect to the Advisory Group structure and participation rules.

The Board members and staff who were present noted that the extension of the current efforts to include a thorough vetting of proposed projects would be relatively easy to add to the existing process and that it appeared that a common Advisory Group orientation would satisfy the basis for this coordination to occur. It was noted that projects such as the merging of the current individual basin groundwater models and evaluation of the needs and capabilities of each of the existing water management entities within the Tule Basin could be expanded to include entities within both basins. In addition, the expansion of the Advisory Group membership to include additional Tule River Basin members beyond that which currently exist could be implemented readily.

RECOMMENDED ACTION

The meeting concluded with instruction being given to staff and consultants to formulate a recommendation based on the conclusions of the governing boards as of the date of their joint meeting and to provide recommendations prior to the July, 2013, meetings for consideration for policy instruction adoption by the governing boards.

It is therefore the recommendation of the participating member staffs and consultants for both river basins that the following policy instruction be ratified by each of the governing boards:

1. The Kaweah River Basin and the Tule River Basin would continue their existing Integrated Regional Water Management procedures and implementation of related policies as they apply to each specific basin;
2. That the IRWM Plan structures be developed on a DWR acceptable format specific to each river basin;
3. That the existing Kaweah River Basin Advisory Group be retained and expanded to include Tule River Basin membership. The Advisory Group meeting location would be rotated between the basins so as to encourage participation by water management entities and disadvantaged communities specific to each basin. A specific task being given to the Advisory Group would be to address the project evaluation process and, in particular, the evaluation of projects from the perspective of improvement if projects were designed on a multi-basin format, in lieu of just a single basin format;

4. That specific steps be taken to update and expand the prior activity of the DCTRA to delineate needs and capabilities within the participating entities between both Plan areas; and
5. The structure should be reviewed in no more than five (5) years to allow for the opportunity of strengthening, confirmation or modification of the policies and procedures based on the success of implementation.

DEPARTMENT OF WATER RESOURCES

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January 22, 2014

Mr. Mark Larsen
General Manager
Kaweah Delta Water Conservation District
2975 North Farmersville Boulevard
Farmersville, California 93233

Dear Mr. Larsen:

The purpose of this letter is to express concerns the Department of Water Resources' (DWR) has regarding communication with and timely action by Kaweah Delta Water Conservation District (KDWCD) by the Round 2 Planning grant agreement. The initial planning grant award was made over a year ago (November 29, 2012); DWR is still waiting for information from KDWCD so that the agreement can be drafted. Due to the length of time between the grant award and today, I had my staff review communications (letters, emails) that occurred over the past year regarding the planning grant. This review revealed two items of interest, one is that DWR was remiss on finishing the Region Acceptance Process (RAP) with KDWCD and that there seems to be long running confusion between our agencies regarding the planning grant.

Regarding the RAP, on July 23, 2013, KDWCD sent an email to DWR containing documentation supporting the consideration and ultimate decision by KDWCD and the Deer Creek and Tule River Association that the Kaweah and Tule IRWM regions remain separate and requesting a meeting to discuss the material. On August 23, 2013, I sent an email to you stating we did not need to meet. DWR should have formally acknowledged at that point the September 2009 RAP conditions were satisfied. DWR regrets the time it took to formalize this decision and has removed your conditional RAP acceptance and updated our website to reflect this decision. This letter serves as your official notice that the RAP condition has been satisfied and Kaweah and Tule IRWMs are fully accepted regions.

Regarding activity on the planning grant, when we met January 2013, you mentioned that a portion of the plan was already drafted. Our intent for asking to see the plan was so we could ensure the planning grant scope was complementary to the current plan status. To date our requests to view the plan so we could draft the scope of the grant have been continually delayed. The following is a brief overview of events related to the plan development.

- The planning grant award was made on November 29, 2012.
- In a letter to DWR dated January 16, 2013, you indicated that the draft IRWM plan was scheduled to be released in August of 2013 and adopted in October of 2013.
- In DWR's planning grant commitment letter dated February 7, 2013, DWR requested that a meeting be held prior to February 19, 2013 to discuss how the scope of the planning grant supplements the draft IRWM plan, and that the most recent draft of the IRWM plan was to be provided to DWR prior to this meeting.
- In an email dated February 27, 2013, KDWCDC indicated that plan was not in readable format.
- In an email dated March 6, 2013, DWR clarified that our request was not related to distributing the draft plan to stakeholders for comment, and that we were asking KDWCDC to share with DWR the current version of the plan to support agreement development.
- In a June 25, 2013 email, DWR stressed the need to review the draft IRWM plan prior to executing the agreement.
- On December 8, 2013 email from your staff to DWR included an attached schedule that appears to indicate that work on the draft IRWM plan has actually been ongoing and that the draft IRWM plan will be provided to DWR and stakeholders on February 4, 2014, and considered for adoption March 4, 2014.

It is interesting to note the timing of recent plan activities (release of draft to stakeholders) seems to coincide with the Round 2 Planning Grant Application schedule. This seems to indicate that KDWCDC has proceeded with drafting a plan without use of the planning grant funding. The planning grant award is intended to aid IRWM practitioners in developing their plans. Therefore DWR is not certain if the grant is needed or if DWR can support the work of drafting the plan that is now scheduled for release in February. It is important that we meet to discuss the lack of progress on the planning grant agreement in light of the status of the draft IRWM plan and to discuss whether the grant is still viable. One of my staff will be contacting you to set a meeting.

Mr. Mark Larsen
January 22, 2014
Page 3

If you have any questions, please contact Joe Yun at (916) 651-9222 or
Joe.Yun@water.ca.gov.
Sincerely,



Tracie Billington, P.E., Chief
Financial Assistance Branch
Division of Integrated Water Management

cc: Mr. Don Mills
President
Kaweah Delta Water conservation District
2975 North Farmersville Boulevard
Farmersville, California 93233

Mr. Shane Smith
Projects/Administrative Manager
Kaweah Delta Water Conservation District
2975 North Farmersville Boulevard
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APPENDIX I

OUTLINE OF POTENTIAL TRAINING AND
TECHNICAL ASSISTANCE

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

DENNIS R. KELLER
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MEMORANDUM

DATE: August 23, 2013

TO: Mark Larsen

FROM: Dennis Keller

SUBJECT: OUTLINE OF POTENTIAL TRAINING AND TECHNICAL ASSISTANCE
ACTIVITIES - KAWEAH DELTA WATER CONSERVATION DISTRICT

A potential arena for IRWM activities related to disadvantaged area drinking water activities is that of technical assistance. The U.S. Environmental Protection Agency, Office of Water, Office of Groundwater and Drinking Water current funding opportunity entitled "Training and Technical Assistance to Improve Water Quality and Enable Small Public Water Systems to Provide Safe Drinking Water" provides an outline of training and technical assistance activities that are segregated into four (4) National Priority Areas. Summarized below are the training and technical assistance activities which fall under each of those areas which may have application to the Kaweah River Basin:

1. Training and Technical Assistance for Small Public Water Systems to Achieve and Maintain Compliance with the Safe Drinking Water Act:
 - Provide operator training and technical assistance on how to comply with the SDWA, with emphasis on regulatory requirements which present a particular challenge for small systems;
 - Provide training to decision makers and board members regarding SDWA requirements;
 - Provide training/technical assistance to diagnose and trouble-shoot system operational and compliance-related problems and identify solutions;
 - Provide training/technical assistance and solutions to address microbial, nitrate/nitrite and disinfection byproducts contamination;
 - Provide training and technical assistance to systems to help develop and implement source water protection plans;

- Conduct preliminary engineering evaluations to assess treatment, storage and distribution system issues and identify low-cost alternative technology and management techniques; and/or
 - Provide training for operator certification and continuing education (CEU). Applicants should describe how they would obtain state approval for CEU credits for their training courses.
2. **Training and Technical Assistance to Improve Financial and Managerial Capacity and Enable Small Water Systems to Provide Safe Drinking Water:**
- Provide training and technical assistance to improve the knowledge and skill competency of drinking water system personnel in the areas of managerial and financial capacity;
 - Provide training sessions for water system managers and board members in asset management, fiscal planning and other sustainable management topics;
 - Provide training and technical assistance in asset management program implementation;
 - Provide training and technical assistance to develop financial assessments and rate analyses;
 - Conduct energy audits and water loss analyses to determine potential energy and water efficiencies and cost savings;
 - Work with systems to conduct analyses on the potential benefits of partnerships and collaboration with other systems, including shared operators and treatment, restructuring and consolidation, thereby enabling them to become financially sustainable and to provide safe and affordable water to their communities; and/or
 - Assist systems to access and manage multiple infrastructure funding sources to address public health risks and achieve compliance.
3. **Training and Technical Assistance for Small Publicly-Owned Wastewater Systems and On-Site/Decentralized Wastewater Systems to help improve water quality:**
- Preliminary needs analysis;
 - Consideration of alternatives for treatment options, including advanced treatment, nutrient control, low impact development and other green infrastructure practices;
 - Project planning and design;
 - Development of maintenance schedules;

- Assistance identifying and applying for funding sources;
 - Assistance forming responsible management entities (RMEs) and supporting the development of a long-term business plan;
 - Training of community leaders, service providers and regulatory officials to assist in consideration of alternatives, highlight the importance of management, facilitate certification of installers and operators;
 - Outreach to individual system owners and the general public during the planning process to gain trust and support for solutions; and/or
 - Outreach to individual system owners and the general public on proper maintenance techniques.
4. Training and Technical Assistance for Private Homeowners to Help Improve Water Quality:
- Developing and/or providing online and hard copy information and materials on topics of interest to private well owners, such as well construction, well maintenance and operation, well testing, groundwater quality and protection, state regulations impacting private wells, water rights, and how to respond to well contamination emergencies;
 - Providing information, technical assistance and training to other organizations with activities that affect private well owners;
 - Adequately maintaining a hotline with a toll-free number for private well owners to call or timely assistance and advice on private well matters;
 - Providing electronic newsletters or using social media to provide topical or emergency information quickly to private well owners with internet access; and/or
 - Educating private well owners through face-to-face visits regarding potential or actual threats to their wells and whom to contact for help.

We have started to watch for funding opportunities for this approach to the water quality issue. We will not pursue any pathway related to this approach to the alternative ILRP process without specific direction from either you or the Board.

APPENDIX J

KDWCD STAKEHOLDERS ADVISORY
GROUP

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

KAWEAH RIVER IRWMP STAKEHOLDER GROUP

MAILING LIST

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APPENDIX K

KDWCD IRWMP SCORING CRITERIA

INTEGRATED REGIONAL WATER
MANAGEMENT PLAN

KAWEAH DELTA WATER
CONSERVATION DISTRICT

KAWEAH RIVER BASIN IRWMP PROJECT SUB-SCORING

Proposed DAC Scoring Criteria for IRWMP Projects

Each project in the plan will be scored using the following criteria:

Definitions

- **Disadvantaged Community (DAC):** Community Median Household Income (MHI) is 80% of statewide MHI.
- **Severely Disadvantaged Community (SDAC):** Community MHI is 60% of statewide MHI.
- **Negative Impacts** – includes, but is not limited to, emissions from stationary or mobile sources, discharges from project site that reduce area water quality, or water supply, increased likelihood of flooding, increase traffic, and noise.

Points Awarded for Projects Benefiting DACs

- **+1 - Generalized Benefit:** The project alleviates a general regional problem that is also experienced by DACs, but will not address a DAC-specific priority; ex. open space/natural restoration opportunities are near community, but not readily accessible; increases groundwater supply generally, but doesn't secure water supply for a DAC experiencing supply problems.
- **+2 – Measurable Benefit to at least one DAC with no formal DAC participation:** The project directly benefits a DAC (ex. community drinking water quality or supply, wastewater or flooding problem) but the project does not include DAC representation and consultation during the entire course of project planning, design, and development, as well as DAC representation and consultation during project implementation and monitoring.
- **+3 – Measurable Benefit to at least one DAC with DAC participation:** The project directly benefits a DAC (ex. community drinking water quality or supply, wastewater or flooding problem) and the project includes DAC representation and consultation during the entire course of project planning, design, and development, as well as DAC representation and consultation during project implementation and monitoring.
- **+4 – Alleviates a public health & safety problem in at least one DAC with DAC participation:** The project directly alleviates a priority public health and safety water problem in at least one DAC (ex. community drinking water quality or supply, wastewater or flooding problem) and the project includes DAC representation and consultation during the entire course of project planning, design, and development, as well as DAC representation and consultation during project implementation and monitoring.

- **+5 – Alleviates a public health & safety problem in at least one SDAC with SDAC participation:** The project directly alleviates priority public health and safety water problem in at least one SDAC (ex. community drinking water quality or supply, wastewater or flooding problem) and the project includes SDAC representation and consultation during the entire course of project planning, design, and development, as well as SDAC representation and consultation during project implementation and monitoring.

No project will be approved if it may negatively impact a disadvantaged community or a community already impacted by environmental health hazards.

○

Water Quality Proposed Scoring Criteria for IRWMP

+1 Indirect impact

- Project has positive effect although it wasn't part of the project's vision
- Although the project is not to improve water quality it has an indirect affect such as increasing quantity
 - Increases amount of surface water available which has an impact on quality
 - Reduces the amount of pumping required
 - Flood control
 - Conservation/water use efficiency
 - Education/ BMP*

+2 Indirect impact

- Project has positive effect and it is part of the project's vision
- Mitigates by dilution - Recharge projects
 - Urban runoff management
 - Matching quality to use
 - Education/ BMP*

+3 Direct impact

- Project would address sources of potential pollution
- Recharge areas protection from contamination
 - Education/ BMP*

+4 Direct impact

- Project addresses public drinking water systems and private domestic wells directly - Secondary contaminants
- Education/ BMP*

+5 Direct impact

- Project mitigates or improves quality by addressing sources of pollution
- Protect Water Quality
 - Remediate surface and groundwater contaminants
 - Properly destroy abandoned wells
- Project addresses drinking water and domestic wells directly - access to SDW
- Addresses Primary Drinking Water contaminants such as nitrate, DBCP, arsenic, radiological and bacteriological
 - Addresses salinity
 - Education/ BMP*

TO BE CONSIDERED:

- Time duration of value of action would effect scoring.
- Education/ BMP* could fit into any of these categories but should be scored based on impact and effectiveness
- Ranking would vary if project is in a vulnerable or non-vulnerable area
- **Projects that have a negative impact on water quality would not be recommended for funding**

Proposed Natural Resource Conservation and Restoration NRC&R) Scoring Criteria for IRWMP Projects

Prepared by Tulare Basin Wildlife Partners:
Revised: 9 March 2009

The primary environmental goals for the Tulare Basin are: (1) protection and restoration of riparian habitats; (2) protection and restoration of wetland habitats; (3) protection and restoration of upland habitats, corridors and linkages; 4) protection and restoration of natural habitat heterogeneity; (5) protection and restoration of functioning landscape-level ecological processes; and (6) protection and restoration of key ecosystem structures appropriate for the habitat.

The Environmental Scoring Matrix presented in Table 1 shows these goals or desired outcomes that can be applied to specific projects. It also shows tools that can be used to attain these desired outcomes. The scores in this matrix are above and beyond any habitat mitigation that state or federal agencies might require to fund a given project.

Table 1. Environmental Scoring Matrix for IRWMP

Desired Outcomes	Tools				Unweighted Total	Weighted Total
	Protect Existing Habitat	Create New Habitat	Develop and Use Best Management Practices	Develop and Implement Adaptive Management Plan		
Riparian Habitat	4	4	1	1	0-10	0-30
Wetland Habitat	4	4	1	1	0-10	0-30
Habitat Heterogeneity	4	4	1	1	0-10	0-30
Upland Habitat	4	4	1	1	0-10	0-10
Functioning Landscape Processes	4	4	1	1	0-10	0-10
Key Ecosystem Structures Appropriate for Habitat	4	4	1	1	0-10	0-10
Total	24	24	6	6	0-60*	0-120

* The total score can be apportioned so as to be proportionate to the maximum score that may be available for a given IRWMP category in any of the various IRWMP planning

efforts. Under the Kaweah Plan, for example (where there are a total of 5 IRWMP Environmental Scoring Points available), 12 Environmental Criteria Points are equal to 1 IRWMP Scoring Point.

Description of Desired Outcomes

Riparian Habitat - Stream-side or pond-side vegetation that is dominated by willows, cottonwoods, button willow, valley oak, or other native moisture-dependent vegetation. Riparian corridors and linkages are vitally important to the long-term sustainability of plant and animal populations. This is especially important in long-term planning for the effects of climate change.

Wetland Habitat - Areas that support native marsh or vernal pool vegetation (and wildlife that are dependent on these habitats). Wetlands can include areas that are managed for wintering waterfowl, summer breeding habitat, migratory shorebirds (including mudflat areas) or are year-round (permanent) wetlands.

Habitat Heterogeneity – Natural Tulare Basin landscapes tend to have relatively high habitat heterogeneity. Uplands grade into wetlands, often with a change of only a few feet in elevation.

Upland Habitat – Upland habitat is not dependent on stream-flow or surface runoff. Upland habitats in the Tulare Basin are chiefly grasslands, scrub habitats, and oak woodland. Upland habitat corridors and linkages are vitally important to the long-term sustainability of plant and animal populations. This is especially important in long-term planning for the effects of climate change.

Functioning Landscape Processes – These processes include fires (and their frequency), floods (and their frequency), type of grazing, and erosion (or lack thereof). Some of these processes provide society with vital ecological services such as purification of water or reduction of air pollution.

Key Ecosystem Structures Appropriate for Habitat – These ecosystem structures are important micro-habitats that could include nesting island in wetlands, micro-topography in valley uplands, cliffs in foothill or mountain areas, and old-growth trees and snags in forested areas.

Description of Point system

Protect Existing Habitat (0-4 scale)

In the following four categories, “protection” assumes that the land area under consideration (whether it is existing habitat, restored/created habitat, or is intended for ecological restoration/creation) has already been purchased in fee title or is covered by an appropriate easement (a conservation easement, a management easement, or an agricultural easement) in perpetuity. Points should be allocated according to the following guidelines:

1. **Strict Nature Reserve:** protected area managed mainly for science. A Strict Nature Reserve is an area of land and/or water possessing some outstanding or representative ecosystems, geological or physiological features and/or species, available primarily for scientific research and/or environmental monitoring. These areas have a management plan operation to maintain a natural state within which disturbance events (of natural type, frequency, and intensity) are allowed to proceed without interference or are mimicked through management (Example: A nature reserve used exclusively for scientific research and/or environmental monitoring). Lands managed as Strict Nature Reserves earn the maximum score (4 points) in the *Protect Existing Habitat* column.
2. **Habitat/Species Management Area:** protected area managed mainly for conservation through management intervention. A Habitat/Species Management Area is an area of land and/or water subject to active intervention for management purposes so as to ensure the maintenance of habitats and/or to meet the requirements of specific species. Habitat/Species Management Areas have a mandated management plan operation to maintain a primarily natural state, but which may receive use or management practices that degrade the quality of existing natural communities (Example: National Parks). Habitat/Species Management Areas earn 3 points in the *Protect Existing Habitat* column.
3. **Managed Resource Protected Area:** protected area managed mainly for the sustainable use of natural ecosystems. A Managed Resource Protected Area is an area containing predominantly unmodified natural systems, managed to ensure long term protection and maintenance of biological diversity, while providing at the same time a sustainable flow of natural products and services to meet community needs. Managed Resource Protected Areas are subject to extractive uses of either a broad, low-intensity type or localized intense type. These areas also confer protection to federally listed endangered and threatened species throughout the area (Example: National Forests). Managed Resource Protected Areas earn 2 points in the *Protect Existing Habitat* column.
4. **Protected Landscape:** protected area managed mainly for landscape conservation and recreation. A Protected Landscape is an area of land and/or water, where the interaction of people and nature over time has produced an area of distinct character with significant aesthetic, ecological, recreation, and/or cultural value, and often with high biological diversity. Protected Landscapes allow for intensive use throughout the tract, or existence of such restrictions is unknown (Examples: County Parks and grazing easements on private land). Lands managed as protected landscapes earn 1 point in the *Protect Existing Habitat* column.

Create New Habitat (0-4 scale)

Projects that ‘Create New Habitat’ are assumed to include active intervention to improve highly degraded, severely damaged, or destroyed ecosystems. Points in this category should be allocated according to the following four guidelines.

NB: Any project that creates new habitat earns a minimum of 2 points; if this tool is not utilized, 0 points should be given.

1. **Restoration** – Ecological restoration can be defined as “an intentional activity that initiates or accelerates the recovery of an ecosystem with respect to its health, integrity and sustainability” (SER 2004). Ecological restoration usually has an end goal of establishing an ecological condition which closely approximates the pre-disturbance condition. This may include, to the greatest practicable extent, returning an ecosystem to its original community structure, restoring natural ecosystem processes, and reestablishing key indigenous species. The practice of ecological restoration includes a wide scope of projects including, but not limited to: erosion control, reforestation, removal of non-native species and weeds, revegetation of disturbed areas, daylighting streams, reintroduction of native species, as well as habitat and range improvement for targeted species. Ideally, the restored ecosystem should be self sufficient and adequately resilient to endure the normal periodic stress events in the local environment that serve to maintain the integrity of the ecosystem (SER 2004). Ecosystem restoration projects earn 4 points in the *Create New Habitat* column.
2. **Reclamation** – to return an ecosystem to a useful state. Reclamation may include the establishment of a functional vegetative composition different than the pre-disturbance condition, but consistent with the native vegetation for the region and regional habitat goals. Reclamation often includes the stabilization of the terrain, aesthetic improvement, and the reinstatement of productive or useable habitat. Reclamation may return an area to a more natural state after, for example, pollution, desertification or salination have made it unusable. Reclamation projects earn 3 points in the *Create New Habitat* column.
3. **Remediation** – to remove an undesirable condition from an ecosystem. Environmental remediation deals with the removal of pollution or contaminants from soil, groundwater, sediments, or surface water for the general protection of human health and the environment. Sometimes, due to fundamental changes to environmental conditions, an ecosystem cannot be restored and a new ecosystem will need to be created; this is remediation (New South Wales Department of Infrastructure, Planning and Natural Resources 2004). Remediation projects earn 2 point in the *Create New Habitat* column.

Best Management Practices (0-1 scale)

Best management practices (BMPs) are guidelines that show the best way to manage each habitat (after acquisition and/or restoration) to provide the benefit or outcome that is desired. If the goal is to manage for special status species (any species that is listed as Threatened, Endangered, Sensitive, Species of Special Concern, Rare, etc) such as Tipton kangaroo rats or blunt-nosed leopard lizards, intensive grazing of the habitat might be necessary. If high native plant diversity is the goal, lighter, rotational grazing might be prescribed. If BMPs are applied to a project, that project earns a point under the BMP column.

Adaptive Management Plan – (0-1 scale)

An adaptive management plan provides for monitoring to determine whether or not the desired outcomes are being met. This monitoring takes place over an appropriate timescale to determine these outcomes. If the desired outcome is not being achieved, the

monitoring data will be used to develop new management practices that will successfully lead to the desired outcome. Projects with adaptive management plans earn a point in the Adaptive Management Plan column.

Weighting Points According to Project Size

Larger protected areas typically support a greater diversity and abundance of plants and animals and are generally able to sustain more natural ecosystem processes than smaller areas. Larger protected areas also tend to contain a greater diversity of habitats, allowing greater populations of species to persist over time (Environmental Law Institute 2003). Correspondingly, projects that restore or protect large intact areas, or projects that supplement or connect existing critical habitat areas should be prioritized over smaller and more isolated projects.

The following guide will provide multipliers with which to ‘weight’ a given project based on size. Critical or beneficial threshold sizes differ for different habitats; the guidelines below and habitat descriptions on page 2 should be used to apply the appropriate weight to a given project. The weighting factor should be multiplied times the row total for the appropriate desired outcome. These weights may only be applied to projects containing Riparian Habitat, Wetland Habitat, and/or Upland Habitat.

If a project covers multiple habitats, weight the row total appropriately for each habitat type encompassed within the project area.

If a project connects, or is contiguous to an existing protected area *add* three points to the final project score.

An example is given on page 7.

Upland habitat:

- Less than 80 acres: Weighting Factor = 1
- 80 – 320 acres: Weighting Factor = 2
- Greater than 320 acres: Weighting Factor = 3

Riparian habitat

- Less than 1000 feet in length and less than 100 feet wide for at least 75% of the stretch: Weighting Factor = 1
- 1000 feet to 1 mile in length and 100 feet to 300 feet wide for at least 75% of the stretch: Weighting Factor = 2
- Greater than 1 mile in length and greater than 300 feet wide for at least 75% of the stretch: Weighting Factor = 3

Wetland habitat

- Less than 10 acres: Weighting Factor = 1
- 10-50 acres: Weighting Factor = 2
- Greater than 50 acres: Weighting Factor = 3

References:

1. New South Wales Department of Infrastructure, Planning and Natural Resources. 2004. *Georges River Catchment: Guidelines for Better Foreshore Works*. http://www.planning.nsw.gov.au/plansforaction/pdf/grc_better_practice_guideline.pdf
2. Environmental Law Institute. 2003. *Conservation Thresholds for Land Use Planners*. <http://www.seagrant.noaa.gov/focus/documents/SCD/ConservationThresholdsforLandUsePlanners.pdf>
3. Society for Ecological Restoration International Science & Policy Working Group. 2004. *International Primer on Ecological Restoration*. www.ser.org & Tucson: Society for Ecological Restoration International

Table 2. Project X will protect and reclaim 25 acres of wetland habitat adjacent to a 400-acre upland wildlife refuge. Project X will be subsequently maintained as a Managed Resource Protected Area. Waterfowl hunting will be allowed. Managers will use best management practices for targeted special status species and develop and adaptive management plan.

Desired Outcomes	Tools				Unweighted Total	Weighted Total & Additional Points
	Protect Existing Habitat	Create New Habitat	Develop and Use Best Management Practices	Develop and Implement Adaptive Management Plan		
Riparian Habitat	0	0	0	0	0	0
Wetland Habitat	2	3	1	1	7	14
Habitat Heterogeneity	2	3	1	1	7	7
Upland Habitat	0	0	0	0	0	0
Functioning Landscape Processes	2	3	1	1	7	7
Key Ecosystem Structures Appropriate for Habitat	2	3	1	1	7	7
Total	8	12	4	4	28	38

Water Supply Scoring Items

WATER SUPPLY SCORING

DESIRED OUTCOMES	TOOLS				Total
	SURFACE WATER STORAGE	GROUNDWATER	CONVEYANCE	SUPPLY	
QUANTITY	0 - 3	0 - 3	0 - 3	0 - 3	0 - 12
RELIABILITY	0 - 1	0 - 1	0 - 1	0 - 1	0 - 4
FLEXIBILITY	0 - 1	0 - 1	0 - 1	0 - 1	0 - 4
Total					0 - 20

QUANTITY:

- Does the project increase surface water storage? An increase of 0 acre-feet = 0 points, up to 200 acre-feet = 1 point, +200 - 4000 acre-feet = 2 points, +4000 acre-feet = 3 points.
- Does the project involve percolation to groundwater? A soil percolation of 0" inches per day = 0 points, up to 3" inches per day = 1 point, +3" - 6" = 2 points, +6" inches per day = 3 points.
- Does the project increase the amount of water that can be conveyed? 0 cfs increase = 0 points, up to 50 cfs = 1 point, +50 - 250 cfs = 2 points, +250 cfs = 3 points.
- Does the project increase the water supply to the area? 0 acre-feet increase = 0 points, up to 1000 acre-feet = 1 point, +1000 - 2500 acre-feet = 2 points, +2500 acre-feet = 3 points.

RELIABILITY: (No = 0 points, Yes = 1 point.)

- Does the project increase the reliability of the surface water storage in the area? For example: Will this additional storage improve the ability to distribute water according to demand?
- Does the project increase the reliability of groundwater in the area? For example: Will the increased ability to manage groundwater supplies reduce overdraft or increase safe yield?
- Does the project increase the reliability of the conveyance system in the area? For example: Will the project improve the ability of the conveyance system to be able to convey water when needed?
- Does the project increase the reliability of water supply to the area? For example: Will the project increase the firmness of the water supply?

FLEXIBILITY: (No = 0 points, Yes = 1 point.)

- Does the project increase flexibility to the area in regards to surface water storage? For example: Will the additional storage be a multiple use facility for recharge, and re-regulation, or is it a single use facility?
- Does the project increase flexibility to manage groundwater? For example: Will the additional groundwater recharge/extraction ability increase the ability to develop or utilize groundwater?
- Does the project increase flexibility to convey water in the area? For example: Will the addition of conveyance facilities allow more options for water distribution?
- Does the project increase flexibility to manage water supply? For example: Will the addition of the water supply to the area expanded the water management options through timing, place of use, or other options?

Flood Control Scoring Items

Flood Control Scoring Criteria

The following are criteria to be considered when evaluating/comparing the benefits of potential projects that portend to have a flood control function as part of an overall program of project evaluation for projects to be part of the Kaweah River Integrated Regional Water Management Plan. This criteria is not to be used for projects that have flood control as their primary function:

- (1) Are there any flood control benefits to be provided by the subject project?
 - Yes - 1 point;
 - No – 0 points.

- (2) Is life being protected as a result of the flood control aspects of the subject project (the flood control aspects of the project significantly reduce the depth of water to an area with a population of 50 persons or more)?
 - Yes - 1 point;
 - No – 0 points.

- (3) The balance of the total of five points used to differentiate the flood control aspects of projects are all based around the benefit/cost ratio and the size of the project; where BC equals the dollar amount of the flood control benefit provided by the project divided by the incremental costs associated with providing just the flood control aspects of the project.
 - If the magnitude of the annual flood control benefit is in excess of \$1 million per year then:
 - For BCs of 1.0 to 2.0 – 1 point;
 - For BCs of 2.0 to 3.0 – 2 points;
 - For BCs of 3.0 or more – 3 points.
 - If the magnitude of the annual flood control benefit is less than \$1 million per year then:
 - For BCs of 2.0 to 3.0 – 1 points;
 - For BCs of 3.0 or more – 2 points.

There was also discussion of if a project has flood control aspects that result in adverse impacts being redirected to other areas whether the project should warrant being included in an integrated regional water management plan at all. Additionally, where there already exists storm water or flood control planning documents that call for certain projects or actions, that if a project is reflected in these planning documents it should be awarded higher consideration, similar to if a project is included in a groundwater management plan or an ag/urban water conservation plan.