KLAMATH WATER AND POWER AGENCY

Klamath Water and Power Agency KWAPA

OPPortunities

Bringing You the Latest News on the OPP

Volume I, Issue 3

Welcome to OPPortunities!

You are reading the third edition of a series of newsletters that will be issued periodically over the course of the next two years.

The focus will be exclusively on providing updates on how the On-Project Plan (OPP) is coming together.

Inside this issue:

What is NEPA?

The National Environmental Policy Act (NEPA) is a federal environmental law that establishes procedural requirements for all federal government agencies to prepare documents that identify the environmental effects of proposed federal agency actions.

What is CEQA?

CEQA, or the California Environmental Quality Act, is a statute that requires California state and local agencies to identify the significant environmental impacts of new projects and to avoid or mitigate those impacts, if feasible.

OPPAC Meets to Review and Finalize Two Important TMs

The On-Project Plan Advisory Committee (OPPAC) met in Klamath Falls March 22 to provide an opportunity for local water managers to review and finalize two important technical memos (TMs) that will form a solid basis of understanding from which stakeholders can move forward.

The OPP consultant team has nearly completed TM 2 and TM 3, which were presented to the OPPAC on March 22. OPPAC representatives came prepared and offered invaluable "ground-truthing"- based on their real-life experiences - of the draft materials discussed.

"The meeting was well-attended, and the OPPAC members were engaged," said Marc Van Camp, the leader of the OPP consulting team. "There was a lot of knowledge in that room, which our final TMs will reflect."

The Klamath On-Project Plan Advisory Committee (OPPAC) is made of representatives from Klamath Irrigation Project irrigation districts, improvement districts and water companies. OPPAC assists with the development of the OPP using an open, transparent, and collaborative inter-district approach.

TM 2 and TM 3 are detailed further in this edition of "OPPortunties", starting on pages 2 and 6, respectively.

"Tech Memo" Approach to Developing the OPP

The On-Project Plan (OPP) is being developed on a "build-as-you-go" approach to accommodate input from its irrigation constituents, partners, and OPP stakeholders. To support this, the OPP is being developed through a series of Technical Memorandums (TMs) that will build upon one another and culminate in a summary document.

From a communications perspective, the TM-based approach provides a useful tool to generate consistent, timely and focused updates to stakeholders on progress being made on the OPP.

The OPP Work Group last fall completed TM 1, which was unanimously approved by the On-Project Plan Advisory Committee (OPPAC) in September. TM 2 and TM 3 were reviewed by OPPAC on March 22 and are now finalized. OPPAC members are listed in the inset box on Page 6 of this newsletter. You can see TMs 1, 2 and 3 in their entirety by going to www.kwapa.org.

OPP Progress Update

The development of the OPP is divided into four distinct phases to assist in the overall planning and resource allocation effort. Phase I - the preparation of TM 1 – was completed last fall. Phase 2 includes the work necessary to complete the foundational TM 2 and TM 3 documents, as well as TM 4 – Supplemental Water Needs of the On-Project Plan Area (OPPA). This phase also includes the initial efforts for developing TM 5 – OPPA Water Need and Water Flow Path and TM 8 – NEPA/CEQA Compliance Plan. Incorporated into the development of TM 8 will be ongoing efforts to assess the level of detail and complexity of NEPA/CEQA compliance with Reclamation to implement the OPP *(see inset box, this page, for more on NEPA/CEQA)*. Also, as an ongoing effort, Phase 2 includes outreach efforts and implementation of an agreed upon communication plan. Phase 3 began this month and key technical work is scheduled to be complete by the end of 2012. Phase 4 is scheduled to start in January 2013 and finish in July 2013.

The OPP Work Group

Hollie Cannon (KWAPA)
Greg Addington (KWUA)
Julie Matthews (KWAPA)
Ed Bair (KWAPA and Klamath Basin Improvement District)
John Crawford (Tulelake Irrigation District)
Bill Ganong (KWAPA Legal Counsel)
Paul Simmons (KWUA Legal Counsel)
Marc Van Camp (Consultant Team—MBK Engineers)
Mark Deutschman (Consultant Team—Houston Engineering, Inc.)
Dan Keppen (Consultant Team—Dan Keppen & Associates, Inc.)
Mark Oliver (Consultant Team—CH2M Hill)

TM 2 describes the water supply and operations for the On-Project Plan Area. It will form the basis for the development of the implementation actions that will be developed in the OPP.

TM 2—Past & Recent Klamath Project Water Operations and Supply Contracts, Water Rights, and Project Operations

TM 2 describes the water supply and operations for the On-Project Plan Area.

"In addition to forming the basis for the development of the implementation actions be developed in the OPP, it also provides a useful source of information for anyone interested in learning more about the Klamath Project," said Hollie Cannon (KWAPA executive director).

TM 2 provides background information on:

- Klamath Project History
- On-Project Plan
- Adjudication and Reclamation Contracts
- Klamath Basin Hydrology
- Water Quality
- Water Supply & Facilities
- Operations Relative to the OPPA
- Groundwater Resources
- Water Supply and Demand Reduction Options

The background and development of the Klamath Basin Restoration Agreement (KBRA), together with the need for the OPP, are summarized in TM 1, which was finalized late last year.

History of the Klamath Project

TM 2 summarizes the development of the Klamath Reclamation Project, from its authorization following the passage of the federal Reclamation Act of 1902, through the development of the Klamath Basin Compact in the 1950's, to the recent signing of the Klamath Basin Restoration and Klamath Hydroelectric settlement agreements.

Klamath Adjudication & Reclamation Contracts

Adjudication is a legal process by which the state determines and quantifies rights for the use of water appropriated in Oregon before the adoption of the state's Water Code. Oregon developed its Water Code in 1909, after the United States filed a notice with the state of Oregon claiming water in the Upper Basin. Other water rights initiated before 1909 were acquired to benefit the Project. The Klamath River Adjudication will quantify and document the OPPA water rights for water from UKL and the Klamath River.

The Klamath River Adjudication began in 1975, and an "Order of Determination" is expected this year. Ultimately, a circuit court judge will enter a Decree resolving the challenges to the Order and determining the pre-1909 Klamath River water rights.

"It is not possible to estimate the likely date that a final Decree will be entered," said Bill Ganong, a Klamath Falls attorney who serves as council for KWAPA.

The enforcement of the Order may have an impact on the amount of water available to the Klamath Project because of their senior water right relative to junior holders and changes in river flows resulting from tribal water rights.
TM 2 describes adjudication in greater detail, and also discusses the priority and development of the 165,000 acres covered by Reclamation contracts in the On-Project Plan Area.

Water Quality

The OPP is not expressly concerned with water quality. However, water quality issues could be relevant to the OPP.

"The water used in the OPPA must be of suitable quality for irrigation," said Mark Deutschman, of Houston Engineering.

Other surface water quality concerns within the OPPA include Total Maximum Daily Load requirements overseen by the Oregon Department of Environmental Quality and the quality of irrigation water return flows to the Klamath and Lost Rivers from the Klamath Project.

"Ongoing regulatory processes may identify or lead to management activities in the OPPA to improve water quality," said Mr. Deutschman. "Development of the OPPA will seek to avoid actions that will interfere with foreseeable water quality management actions or have significant adverse impacts on water quality."

The amount of groundwater quality data for the study area is generally limited. However, review of the available data and historical use of both surface and groundwater supplies generally indicate that the groundwater is suitable for irrigation purposes in terms of water quality. **- Cont'd on Pg 3 -**

TM 2: Summary of OPPA Water Supply and Operations

Basis For OPP Implementation (Continued from Page 2)

Klamath Reclamation Project Water Supply and Facilities

The Klamath Project provides irrigation water for both agricultural and national wildlife refuge lands in the Klamath Basin of south-central Oregon and north-central California, and also provides flood control along the Lost and Klamath Rivers in and downstream of the Project area. TM 2 details the water supply sources available to Klamath Reclamation Project water users within the OPPA, including Upper Klamath Lake, Klamath River, Lost River, various springs and other streams, precipitation and related available soil moisture, groundwater, and reuse.

Facilities providing water to the OPPA consist of many diversions and flow-regulating structures; pumps; and hundreds of miles of irrigation canals, laterals, ditches, and drains. TM 2, wherever possible, identifies approximate capacities of these facilities, based on data obtained from Reclamation and the districts that operate the various facilities. The delivery systems identified for the OPP and that are hydrologically connected within the OPPA include the following:

- KID-TID delivery system;
- KDD delivery system;
- Other delivery systems.

These three delivery systems provide delivery of Klamath River water to multiple landowners.

Operations Relative to the OPPA

Klamath Project operations, relative to the Settlement Points of Diversion and water supply provided to the OPPA, are documented in TM 2 (see inset box, this page, for further explanation). This summary of operations and water supply are provided for two periods, summer (March through October) and winter (November through February), consistent with the KBRA (see Figure 1).

Water supply and operations are described in context of two specific periods: the "past" (1986 through 2000) and "recent" (2001 through 2010).

"Summary of past supply operations provides for an understanding of operations prior to significant constraints placed on the Klamath project due to the full implementation of the ESA," says Mr. Van Camp.

The "past" also includes 2 years (1992 and 1994) that would have been declared Extreme Drought years pursuant to the Drought Plan of the KBRA.

The "recent' period incorporates operations and water user actions taken with regard to the Water Bank Program that was developed to address

…..Continued on Page 4

Settlement Points of Diversion

As defined in the KBRA, Settlement Points of Diversion are specific points at which water from Upper Klamath Lake (UKL) or the Klamath River is diverted to beneficial use. They include A-Canal on UKL, specified structures on the Lost River Diversion Channel, and specified structures on the Klamath River and Lake Ewauna.

Operations Relative to the OPPA

"Past" (1986-2000) **"Recent" (2001-2010)**

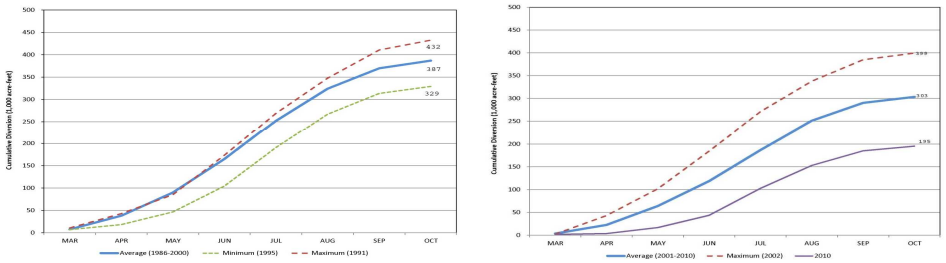


FIGURE 1 -Operations Relative to the OPPP. *Each curve in these figures shows maximum (top), average (middle) and minimum (bottom) cumulative March-October Project irrigation diversions. From 1986 to 2000, diversions were demand-driven and were not limited by fish protections, except for some limited constraints that arose toward the end of the irrigation season in Extreme Drought Years (1992, 1994). The second figure shows much greater variability (which translates to uncertainty) in agricultural diversions from 2001-2010. Hydrologic uncertainty, together with strict operating criteria, have resulted in reduced reliability relative to Klamath water supplies available for irrigation.*

OPP Mission Statement

Develop, through an open, transparent, and collaborative interdistrict approach, an integrated plan that provides a strategy with various options for aligning water supply and demand consistent with the KBRA to preserve the On Project Plan Area agricultural, industrial, and municipal economies, and environmental resources.

TM 2—Past & Recent Klamath Project Water Operations (Cont'd from Pg 3)

the ESA and associated climatic conditions. Implementation of the ESA, in conjunction with numerous dry years in the recent period, has resulted in some years of comparatively less surface supplies in relation to the past period. TM 2 notes that the recent period has also been characterized by water banks or similar programs and by a higher degree of groundwater development.

Groundwater Resources

Changes in water management and environmental restrictions resulting in unreliable surface water supplies over the last decade in the Klamath Project have increased interest in the use of groundwater resources. TM 2 outlines the general characteristics of the groundwater within the Upper Klamath Basin, and summarizes past and recent groundwater use.

The volcanic aquifers within the basin are capable of providing a substantial quantity of groundwater to supplement surface water supplies, because of their high permeability and vast area extent. High-yielding wells, located in the basalt aquifers throughout the groundwater basin, are screened from less than 100 feet to greater than 2000 feet in depth below the ground. High-yielding wells in the groundwater basin are located where groundwater is needed for irrigation and do not necessarily indicate specific areas of high aquifer productivity.

Historical observations of groundwater levels in response to various pumping regimes provide insight into the potential sustainability of groundwater withdrawal from the Upper Klamath Basin aquifer system.

Groundwater production rates that occurred prior to 2000 within the groundwater basin appeared to result in little to no appreciable long-term drawdown, except in areas near Bonanza, just northeast of the OPPA. Groundwater production rates increased with the water bank activities between 2001 and 2011. This increase in groundwater production, as welll as reduced rainfall during drought years, resulted in seasonal decreases in groundwater levels of 10 to 20 feet, with a total drawdown from 2001 to 2008 of approximately 15 feet (see Figure 2, page 5).

"A quantitative assessment of groundwater use is necessary to confirm whether these levels of pumping are sustainable and how these pumping rates may need to be modified in response to changing climatic conditions within the Upper Basin," says Peter Lawson, the principal hydrologist for CH2M Hill (Redding, CA).

Such an assessment by the U.S. Geological Survey (USGS) is forthcoming, and it will be incorporated into the development of the OPP.

"The release of the USGS groundwater model will represent a powerful new tool to evaluate supply," says Lawson.

This model can be used to evaluate sustainable pumping level with consideration of hydrologic influences, quantify impacts to springs and streams, assess various pumping locations and spatial distribution of pumping impacts, and support analysis of supply strategies.

"The groundwater model will provide for a more comprehensive evaluation of long-term groundwater pumping sustainability, leading to a better understanding of the relationship between yield of the groundwater basin and climatic conditions," Lawson predicts.

Recent History of Groundwater Use and Impacts of Water Bank Pumping

Historical Period	Groundwater Use History	Impacts to Groundwater
Pre-2000	No Water Bank activities	Existing pumping rates appeared to result in little to no appreciable long-term drawdown
2001-2007	Water Bank Years; multi-year drought led to increased GW production rates	WB Pumping Rates ~ 40,000 to 70,000 af/yr Seasonal drawdowns of 10-20 feet and long-term lowering of the water table of approximately 15 feet
2008 & 2009	No Water Bank activities	Short-term stabilization of the groundwater levels; no recovery to pre-2000 levels
2010	Very dry year, Water Bank relied heavily on GW to supplement the curtailed project water deliveries	WB Pumping Rates ~ 100,000 af/yr Seasonal drawdowns of 20-30 feet and long-term lowering of the water table of approximately 20 feet

TM 2: Water Supply and Demand Reduction Options *(Cont'd from Page 4)*

Water Supply and Demand Reduction Options

To address the desires of KWAPA, TM 2 developed an initial list of potential water supply and demand reduction options for evaluation and consideration as part of the OPP.

"It is critical to recognize the primary purpose of the development of the OPP and associated management options to align water supply with demand, as needed," said Mr. Van Camp. Four categories of potential water supply and demand reduction options are identified by TM 2:

- Water conservation and efficiency improvements;
- Storage;
- Groundwater/ conjunctive water management
- Demand Reduction

Numerous studies and reports have been prepared that suggest or conclude that the Klamath Project is highly efficient when viewed as a project-wide system.

"This suggests that there is little room for reducing diversions from the Klamath River or Upper Klamath Lake without reducing consumptive use, replacing surface water with groundwater, or increasing surface storage," said Mr. Van Camp. "However, an improvement action that reduces irrecoverable loss, such as evaporation or non-productive riparian vegetation that also results in a reduction of diversions from the river or lake, would assist in meeting OPP goals."

Additionally, a water conservation measure that reduces deep percolation to the usable groundwater basin may or may not be viewed as beneficial, Mr. Van Camp adds.

New storage reservoirs throughout the Klamath Basin have been investigated by Reclamation. While new water storage could increase the amount of water available for diversion during the irrigation season by creating a new source under a new water right, larger storage reservoir projects are likely outside the financial means of KWAPA and the OPP. As part of the OPP, KWAPA will review a 2011 storage report prepared by Reclamation to address this issue more thoroughly.

It is expected that the local groundwater resource will continue to be the most viable and primary option for aligning supply and demand. However, this resource must be managed in a long-term sustainable manner. KWAPA will use the USGS groundwater model to better understand the groundwater resource and to develop a long-term, sustainable plan for groundwater use. KWAPA also undertook the Groundwater Efficiency Use Analysis (GEUA) Project in June 2011, and is currently reviewing the final draft memoranda providing the products and findings, which will be useful in addressing the technical, regulatory, policy, financial, and implementation considerations.

According to KWAPA's goals and objectives, demand reduction would be implemented only if or to the extent that other options do not provide adequate results to align supply and demand.

"The frequency of this occurrence is not known at this time," said Van Camp. "This is the purpose of subsequent TMs".

Options for demand management actions include payment to forbear from later irrigations within a given irrigation season; payment to substitute a lower water using crop for a higher water-using crop; and payment for future years crop idling. OPPAC will develop and evaluate a consistent approach to implement these types of actions, either through some type of lease arrangement, conservation easement, forbearance agreement, water acquisition, or other voluntary transaction. Various business arrangements will need to be identified and evaluated to provide flexibility within the local agribusiness community.

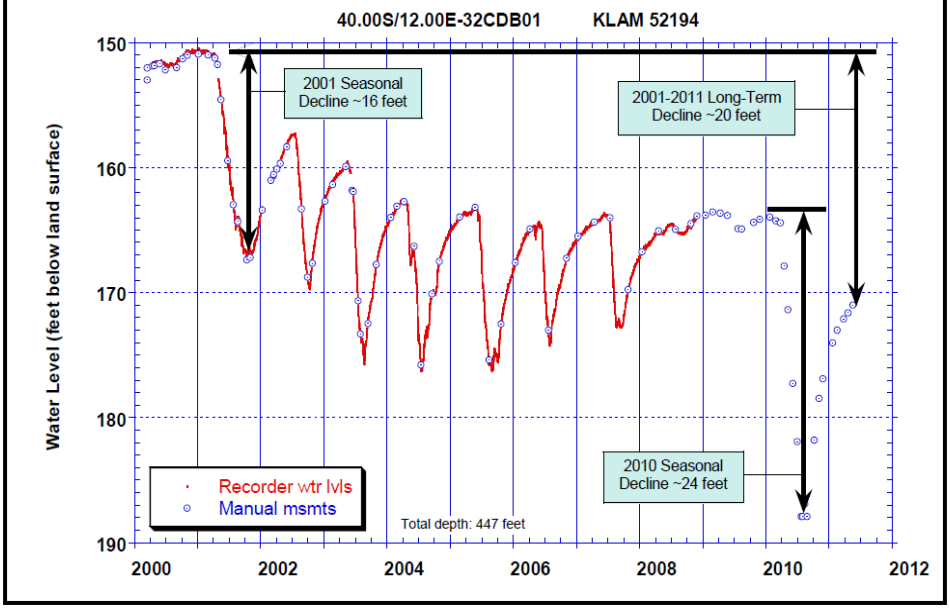


FIGURE 2—Well Water Level Graph Illustrating Seasonal Versus Long-Term Declines. *Oregon Water Resources Department 2011. Assessment of 2010 Supplemental Groundwater Pumping in the Klamath Basin, Oregon.*

TM 3: Irrigation and Water Requirements / Demands

Technical Memo 3 addresses current and future water demands associated with current and anticipated future cropping patterns and agricultural land use. It also identifies potential changes in cropping patterns within the On-Project Plan Area (OPPA) and anticipates resulting water needs.

Mark Oliver (CH2M Hill, Redding, CA) presented TM 3 to the OPPAC on March 22nd in Klamath Falls. At that meeting were many representatives of the irrigation districts, improvement districts, and drainage districts that are described in the memo. These entities and the national wildlife refuge lease lands that comprise the OPPA are evaluated in TM 3, where a uniform approach for quantifying crop consumptive use, total on-field water requirements, and district water requirements is presented. A key deliverable associated with this effort is a presentation of acreages and cropping patterns for each entity, with associated independent water demand results.

"Water demand was estimated at both the individual district and OPPA levels though the use of information gathered primarily from the Bureau of Reclamation," said Mark Oliver, (CH2M Hill, Redding, CA), who oversaw this technical effort.

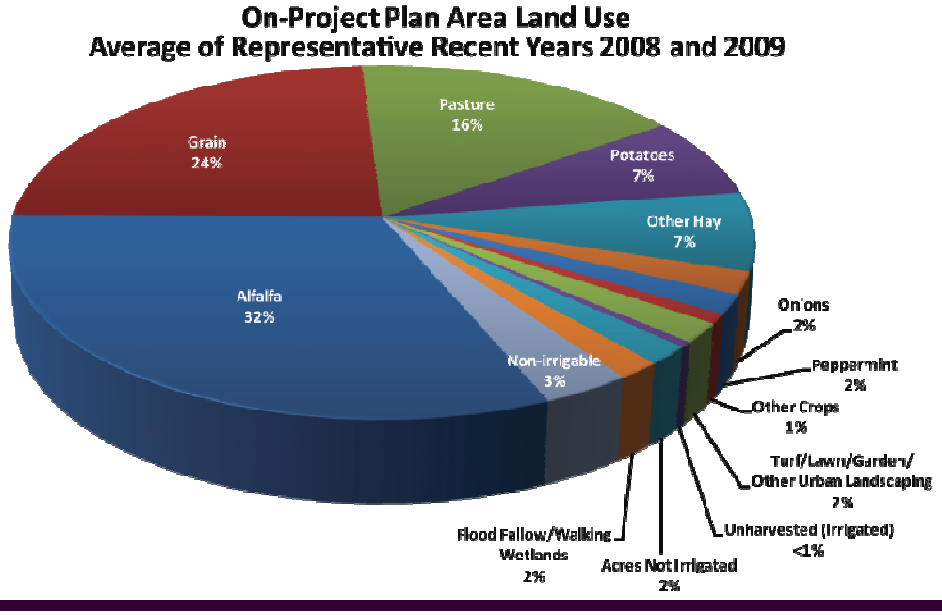
"We also relied upon previous reports and studies, climate data, and correspondence with irrigation districts," said Oliver.

Although previous studies have examined water balances, and irrigation and water use efficiencies at the basin and sub-basin levels, irrigation requirements and district-level water demand have not been uniformly and consistently quantified for each irrigation district comprising the OPPA.

At the March 22 OPPAC meeting, Mr. Oliver walked through the approach used to determine water requirements, the total of which is comprised of crop consumptive use, total on-field water requirements, and district water requirements. Within the OPPA, the Klamath Project supplies water to about 165,000 acres. Tulelake Irrigation District, Klamath Irrigation District, and Klamath Drainage District account for about 90% of the irrigated acrage within the OPPA. Ten other districts encompass the remainder of the acreage. Tule Lake National Wildlife Refuge (NWR) is included as part of TID. Lower Klamath NWR is addressed but is not included as part of the OPPA, although Area K lease lands are included in KDD demands.

Data sources to assess land use and cropping patterns were derived from Reclamation and cross-checked using other information. The years 2008 and 2009 – years where a water bank was not implemented - were chosen to best represent recent cropping patterns. Alfalfa, grain and pasture account for approximately 75% of total irrigated acreage within the OPPA. It is expected that similar cropping patterns will occur in the future.

The water demand quantities developed in TM 3, coupled with previous reports and studies, will provide a basis for the identification and prioritization of potential water management enhancements and irrigation modernization projects to support the OPP.



On-Project Plan Advisory Committee

Bob Flowers - Ady District Improvement Company

Shane McDonald - Enterprise Irrigation District

Ed Bair - Klamath Basin Improvement District

Luther Horsley - Klamath Drainage District

Rocky Liskey - Klamath Hills District Improvement Co.

Dave Cacka - Klamath Irrigation District

Luke Robison - Malin Irrigation District

Curt Mullis - Pioneer District Improvement Company

Gary Derry - Shasta View Irrigation District

Pat Patterson - Sunny Side Irrigation District

Earl Danosky - Tulelake Irrigation District

David Jensen - Van Brimmer Ditch Company

Steve Kandra - Westside Improvement District

KLAMATH WATER AND POWER AGENCY

735 Commercial Street
Suite 4000
P.O. Box 1282
Klamath Falls, OR 97601

Phone: 541-850-2503
Fax: 541-883-8893
E-mail: jan.million@kwapa.org

We're on the web!
www.kwapa.org

Working together towards locally based solutions to energy issues, water management issues

And coordination in other areas to the benefit of the whole community.

The Klamath Water and Power Agency (KWAPA) is a joint powers / inter-governmental agency whose members are water agencies within the Klamath Reclamation Project.

KWAPA provides programs to align water supply and demand, generally within the Klamath Project. We seek to identify areas for efficient use of energy and exercise the authority of a PUD.

KWAPA is working to obtain and provide transmission and delivery of Federal preference power for eligible On-Project and Off-Project Power Users.

Background and Development of the Klamath Basin Restoration Agreement

Representatives of diverse communities in the Klamath Basin, working with federal, state, and county governments, and with other interested organizations, developed the Klamath Basin Restoration Agreement (KBRA) to rebuild fisheries, sustain agricultural communities, and resolve longstanding disputes related to the allocation of water resources. KWAPA and its member entities are parties to the KBRA. Relevant key provisions of the KBRA related to water supply include the following:

- *An ultimate limitation on diversions (DIVERSION is a term in the KBRA defined as the total amount of water from the Klamath system diverted from specific Upper Klamath Lake and Klamath River diversion facilities).*
- *Reliability and certainty regarding water that will be available for a sustainable agricultural community and national wildlife refuges.*

For more information on the KBRA, go to http://kwua.org/kbra.

OPP Goals and Objectives

- ***Meet commitments specified in the KBRA***
- ***Maintain long - term sustainability of Klamath Reclamation Project agriculture***
- ***Minimize reductions in irrigated agriculture in the On-Project Plan Area (OPPA) and avoid any uncompensated reduction in irrigated agriculture***
- ***Ensure equitable treatment among districts, avoid impacts on district operations, and seek opportunities for improved water management operations within and across districts***
- ***Develop fair, equitable, and transparent strategies for aligning water supply and demand***
- ***Consider cost effectiveness of alternatives to the overall Klamath Basin economy and minimize third - party impacts***
- ***Avoid adverse impacts on groundwater as a result of OPP implementation or administration***
- ***Use groundwater in a long - term and sustainable manner, and address all relevant in - basin groundwater management objectives, including identifying and addressing potential impacts on areas directly adjacent to the OPPA***

Klamath Water and Power Agency KWAPA