

# OPPportunities

*Bringing You the Latest News on the OPP*

Volume I, Issue 5

**Welcome to  
OPPportunities!**

You are reading the fifth 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.

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## OPP Phase 3 Complete: Implementation Plan in the Works

The Klamath Water and Power Agency (KWAPA) has completed three of four phases in the ongoing development of the On-Project Plan (OPP), which is intended to align long-term water supply and demand for the On Project Plan Area (OPPA) of the Klamath Irrigation Project. OPP development now moves into Phase 4, where future Klamath water management alternatives and an implementation plan will be developed. That final plan will be rolled into a final OPP summary report, scheduled to be completed this summer.

Six Technical Memorandums (TMs) - over 500 pages of a developing report—have been completed so far. Over the course of the past two years,

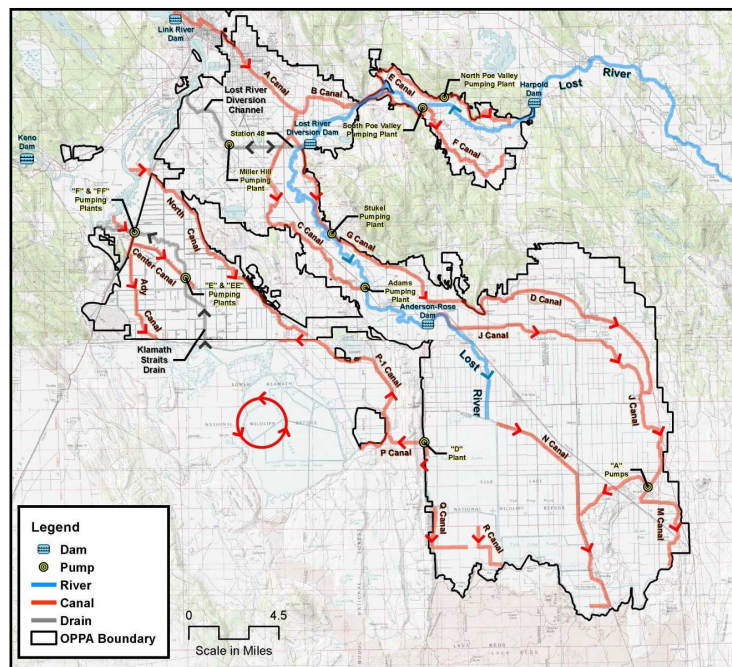
KWAPA consultants have worked with local irrigators and government agencies to estimate the amount of water needed to align water supply with demand. Using this data and other tools, various alternatives were evaluated to address how “supplemental water needs” can be met within the OPFA.

Input from the On-Project Plan Advisory Committee (OPPAC)—which is made up of representatives from Klamath Irrigation Project districts and water companies—was critical to the development of water management and supply option analysis.

“We looked at many, many options and mechanisms to satisfy future supplemental wa-

ter need,” said Marc Van Camp, the consulting team’s representative from MBK Engineers. “The on-the-ground experience and knowledge of the OPPAC members provided invaluable guidance as we evaluated all of the supply and management options.”

This issue of *OPPportunities* will focus on the suite of water management and supply options evaluated by KWAPA, its consulting team, and the On-Project Plan Advisory Committee (OPPAC) in recent months. The approach that will be used to finish this final phase will also be outlined. This work, and the direction established by OPPAC, set the stage for completing the final draft OPP by July 2013.



**FIGURE 1—Water Flow Path of the On-Project Plan Area.**

A flow path shows how water flows through a drainage / delivery system and can assist in identifying characteristics such as direction, quantity and quality of water flows.

Existing surface water flow paths in the OPFA were documented in Technical Memorandum 5, which supported the development of TM 6 –Water Management and Supply Options—the focus of this edition of *OPPportunities*.

### Evaluation Criteria Used to Rank Water Management and Storage Options

- Provides verifiable benefit to align water supply and demand for the OPPA
- Sustainability of agriculture and related economy
- Consistency with legal and regulatory requirements
- Affordability
- Durability and Implementability
- Flexibility
- Equitability
- Protection afforded water rights
- Environmental and third party impacts or benefits

## TM 6—Water Management and Supply Options for the On-Project Plan

Technical Memorandum (TM ) 6 identifies and evaluates potential options that can feasibly assist in meeting the “supplemental water need” identified in TM 4 - *Supplemental Water Need of the On-Project Plan*.

Some options evaluated as part of TM 6 are currently being implemented within the OPPA in some manner, and all options were evaluated on the basis of being potentially able to assist in providing supplies to align water supply with demand.

TM 6 proposed and evaluated a variety of water management and supply options. The categories of these options included water conservation and efficiency, storage, groundwater, demand management, and others. A “menu” of options was developed within each category to support aligning water supply with demand. Then, the OPP Work Group, coordinating with OPPAC, evaluated and ranked options according to criteria (see Inset Box, Left).

Nine criteria were utilized to evaluate each option, with the understanding that all criteria

must be satisfied for that option to remain feasible as part of the OPP.

“Failure to satisfy even one of the criteria made that option infeasible relative to the OPP,” said Mark Oliver, the consulting team’s representative from CH2M HILL.

Each option was ranked, according to a color-coded matrix that documents the relative feasibility within the context of the each evaluation criteria. The figure below describes the option ranking approach used in TM 6.

**“Failure to satisfy even one of the criteria made that option infeasible relative to the OPP.”**

Mark Oliver, CH2M HILL, Redding, CA.

## Option Ranking Approach

Document the feasibility/infeasibility of each option within the context of each evaluation criteria:

- **Acceptable** (green) –appears to perform well under the criterion. No major issues or problems identified, or minor issues could be offset by significant advantages.
- **Conditionally Acceptable** (yellow) –could perform reasonably well but not as well as options rated “acceptable,” or could perform well if certain identified precautions taken.
- **Marginally Acceptable** (orange) –appears to have significant performance problems that could be overcome so as to make the option marginally acceptable.
- **Unacceptable** (red) –has a potentially fatal flaw that cannot be avoided, or can only be mitigated by costs that are unacceptably large.

Figure 2: Option Ranking Approach

## TM 6 Overall Evaluations: Conservation and Efficiency

TM 6 evaluated a variety of water conservation and efficiency options to determine if, and to what degree, an option would assist in meeting the overall objective of the OPP.

"Many of the options evaluated may not clearly and directly assist with providing a verifiable benefit to align supply and demand for the OPPA," said Mr. Van Camp. "However, they may provide additional water conservation and efficiency benefits to the OPPA and individual water users, such as reduction in power costs, improved water management, and timing of deliveries."

### Past Conservation Efforts

Numerous water conservation and efficiency programs and activities were implemented within the Klamath Project and the OPPA during the past 10 years, through both the Bureau of Reclamation and the Natural Resources Conservation Service (NRCS).

Nearly 26 miles of pipeline were installed within the OPPA through Reclamation programs between 2004 and 2008.

Over \$62 million of local and federal funding cost-share in the 2002 Farm Bill Environmental Quality Incentives Program (EQIP) supported installation of new pipeline, lining of canals, sprinkler systems, land leveling and improved irrigation water management. This may be contributing to a reduction in deliveries at the on-farm level, and thereby, district level.

This potential reduction in diversions is difficult to quantify for all of the water conservation and efficiency projects implemented with the Klamath Project through EQIP funding. However, a reasonable esti-

mate of the potential reduction in diversions is arrived at in TM 6 for the installation of pipeline installed within the OPPA.

### Highly Efficient Nature of Klamath Irrigation Project

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. A project-wide view identifies a high level of efficiency and suggests there is very little opportunity for reducing diversions from the Klamath River or Upper Klamath Lake (UKL) without reducing consumptive use, replacing surface water with groundwater, or increasing surface storage.

However, a water use efficiency improvement action that reduces irrecoverable loss, such as evaporation or nonproductive riparian vegetation that also "stretches" the supply available to irrigation would assist in meeting the goals identified in the OPP.

### Canal Lining and Pipeline Installation Option

Concerns raised in the TM 6 assessment of the canal lining and pipeline installation option included significant initial investment and uncertainty relative to the reduction of groundwater recharge.

### Improved Water Management Option

An important component (element) to improved water management and timing of deliveries is the understanding of real-time flows within the OPPA. Much data exists within the OPPA relative to flow measurement. However, as of today, there is no one central

repository for the data, nor is there a defined system for quality control or assurance to verify the accuracy of all data collected. TM 6 proposes a foundational flow measurement element (see side bar, this page) that provides a recommendation as to the level of measurement, data access, and the need for a systematic approach to data management.

### Feasibility of Canal Lining / Pipeline Installation & Water Management Options

Both the canal lining and pipeline installation option and the "water management actions" options were ranked as marginally acceptable in TM 6. Although both of these options will be evaluated for inclusion for the development of alternatives in TM 7, it is highly unlikely that these options will be pursued under the OPP.

"However, these projects should continue to be pursued by irrigation districts and individuals within the OPPA," said Mr. Van Camp. "This could help to improve water management and water use efficiency in certain areas."

### Recirculation Options

Opportunities for recirculation of surface water flows within the OPPA and to the Lower Klamath National Wildlife Refuge (LKNWR) were also identified as beneficial to meet demands following a review of the surface water flow path of the OPPA in TM 5 (see Figure 1 on Page 1 of this newsletter).

Presently, there is a significant amount of recirculation that occurs within the OPPA, as return flows from one district create a downstream water

### Foundational Flow Measurement Element of the OPP

*The need for improved knowledge of the quantity of flows throughout the OPPA has resulted in the identification of flow measurement as a foundational element of the OPP.*

*The specific locations and types of flow measurement devices that are selected to measure, record, and transmit data will depend on many factors. Several sites are recommended for improvement and installation of flow measurement as part of the foundational element of the OPP.*

*The majority of these locations currently have some type of measurement approach or device in place and may require only a simple upgrade or the addition of telemetry equipment to accomplish this fundamental flow measurement element.*

*An additional component of the foundational flow measurement element is the ability to provide the information (flow measurement) to irrigation district managers on a real-time basis so they can make changes to operations that could result in improved water management and water conservation. This can be accomplished through the development of supervisory control and data acquisition (SCADA) system for the OPPA.*

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## TM 6 Overall Evaluations: Conservation and Efficiency (Cont'd from Page 3)

supply for another. Still, there is additional opportunity for recirculation within the OPPA.

TM6 evaluated two specific options that represent the greatest potential in Klamath River diversions: Tule Lake Sump IA and Klamath Straits Drain Flow to LKNWR. TM 6 ranked both options as “conditionally acceptable” because of the high costs and need for monitoring of the water quality and crop yields, and, in the case of the Klamath Straits Drain option, potential impacts on LKNWR.

For the Tule Lake Sump IA recirculation option, the potential quantity of reuse coupled with the resulting reduction in power costs for the operation of D-Plant could provide great benefits to the OPPA.

The Straits Drain option was found to provide significant

supply benefits and delivery flexibility to the LKNWR, primarily due to the existing capacity limitations of the Ady Canal (see figure, below right) and the need to provide flows to the refuge on a pattern to meet demand within the refuge.

In addition, the Straits Drain recirculation option would function well if D-Plant pumping were limited to the 9,000 acre-feet required under the KBRA during the months of September and October, offsetting the historical D-Plant flows with flows from the Klamath Straits Drain. A reduction in flows discharged at pumps F and FF to the Klamath River may also assist in meeting water quality goals.

Because of these reasons, both recirculation options are recommended for further evaluation in TM 7.



Tule Lake Sump IA. Source: U.S. Fish and Wildlife Service



Ady Canal. Source: U.S. Bureau of Reclamation

## TM 6 Overall Evaluations: Storage Option Not Recommended for Further Study

Water storage generally refers to the capture of water during times of surplus for subsequent beneficial use during times when supply is inadequate to meet demand. Currently, the OPPA relies significantly on the storage in UKL.

In TM 6, the storage category of options evaluates whether potential new storage is a reliable and substantial means to assist in achieving the overall objectives of the OPP.

It is important to recognize that many potential storage options have been evaluated within the Klamath River Basin (and OPPA). However, for the purposes of the OPP, only those storage projects viewed as most viable (by Reclama-

tion) have been included in TM 6 and for further pursuit through the OPP.

New water storage could increase the water available for diversion during the irrigation season by creating additional supplies under a new water right. An alternative to the development of an additional supply is to store water under the Limitation on DIVERSION for use in subsequent seasons or periods.

After assessing aquifer and surface water storage options upstream and within the OPPA, TM 6 concludes that the storage option is unacceptable. Water availability analyses show there is great

uncertainty regarding the likelihood of obtaining water rights for the diversion and storage of water to help align water supply and demand within the OPPA.

In addition, the costs associated with developing a storage project (for example, feasibility analysis, environmental studies, and permitting) are significant. Once these analyses and studies are performed and permits are obtained, there is still uncertainty as to the construction and implementation of these options. Finally, the time required to advance storage options would exceed the implementation schedule of the KBRA.

Although increasing the ability to store water appears to be a straightforward proposition, developing storage today is complicated by significant high costs, challenges with state and federal regulatory laws, and permitting processes including environmental restrictions and challenges. TM 6 provides insight into past Reclamation storage studies, describes political and regulatory constraints, assesses storage availability for the Klamath River and Lost River, and identifies and evaluates the storage options for consideration in the OPP.

Thus, the storage option is not recommended for further evaluation in Technical Memo 7.

## TM 6 Overall Evaluations: Groundwater Development and Substitution

The Groundwater Development and Substitution category of options (groundwater options) is intended to provide an additional water supply for the OPPA by using groundwater during dry years. This category of options is considered a preferred method (in comparison to land idling or other demand management options) to assist in meeting the supplemental water need of the OPPA.

All options discussed in TM 6 assume that a mutually agreeable compensation agreement could be negotiated with a given landowner or well owner.

By design and intent, options in this category would make groundwater available for consumptive use to meet a significant portion of the supplemental water need in a given water year when surface water supplies could not meet full demand.

The Groundwater Development and Substitution category of options is separated into groundwater development and groundwater substitution. Groundwater development options seek to augment supply by developing new groundwater resources in areas where feasible. Groundwater substitution options are defined as agreements where surface water deliveries are reduced and the well owner and landowner are encouraged to pump or use groundwater for surface water.

The general approach to developing groundwater options for TM 6 was to assess groundwater use and management scenarios in order to develop management options

aimed at increasing the yield of groundwater pumping to meet the supplemental water need. Quantitative groundwater pumping assessments were conducted, including evaluating historic pumping, specifically the past water bank practices, and groundwater optimization modeling assessments conducted by the U.S. Geological Survey. The resulting groundwater options were developed based on the physical, legal, political, and practical limitations of pumping the aquifers that supply the OPPA, as well as the potential aquifer response to various groundwater pumping configurations.

TM 6 provides further background to the assessment of historical pumping and potential effects, as analyzed through the USGS Management Optimization Model.

### Groundwater Substitution

**Option 1 - Maximize pumping using existing wells consistent with current configuration, regulations, and practices** - would pay or otherwise incentivize a well owner to either substitute groundwater from existing wells for surface deliveries on their own lands or pump groundwater for delivery to other lands (for an irrigation season), consistent with California and Oregon water rights, regulations and current practices. This option was ranked as acceptable, provided that costs for pumping groundwater are not prohibitive and that groundwater levels are monitored to assure the impacts of OPP-based pumping are acceptable. Therefore, this option will be further evaluated during the development of alter-



Jerry Pyle stands next to one of the Tulelake Irrigation District wells on the state line. Source: Herald & News

natives in TM 7.

**Option 2 - Maximize groundwater pumping consistent with California law along the Oregon Border** - would pay or otherwise incentivize a well owner to either substitute groundwater from existing wells for surface deliveries on their own lands or pump groundwater for delivery to other lands (for an irrigation season), consistent with California and Oregon water rights and regulations. Oregon Water Resources Department (OWRD) water table drawdown limitations that legally apply only to Oregon wells would not limit the groundwater pumping in California near the state line. This voluntary action has been taken recently by Tulelake

Irrigation District but is not a legal requirement.

This option was ranked as unacceptable for the OPP because of the issues associated with equitability, water rights, and environmental and third-party impacts. This option favors state-line wells, has consequences for exercising Oregon groundwater rights, and would likely lower groundwater levels in Oregon to the point of regulatory intervention. This option will not be included in the development of alternatives in TM 7.

**Option 3 - Interpretation and revision of OWRD regulations in Oregon** - would entail KWAPA coordi-

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## TM 6 Overall Evaluations: Groundwater Development and Substitution

### Groundwater Development (Continued from Page 5)

nating with OWRD to allow for interpretation (or potentially revision) of existing OWRD groundwater regulations to provide for production of additional groundwater to meet the supplemental water need. This option includes several possible actions regarding the various interpretations or revisions to OWRD regulations, but would not seek changes in the long-term draw-down limits in Oregon.

This option was ranked conditionally acceptable, provided that regulatory approval is obtained, costs for pumping groundwater are not prohibitive, and that groundwater levels are monitored to assure the impacts of OPP-related pumping are acceptable. Therefore, this option will be further evaluated during the development of alternatives in TM 7.

**Option 4 - Decrease pumping within and directly adjacent to the OPPA to increase recharge** - involves KWAPA paying well owners and landowners at select locations within and directly adjacent to the OPPA to not pump groundwater during wet years (or possibly all years). The option would provide additional opportunity for recharge of the groundwater basin and provide opportunities to potentially increase pumping within the OPPA in subsequent years. If possible, the well owner and landowner would be offered surface water during wet years as a substitute for groundwater. Of course, this would be subject to the availability of existing surface water conveyance facilities or feasible installation of necessary facilities and water right regulatory approvals. The well owner and landowner would agree to not pump groundwater during peri-

ods when surface water is not available for delivery.

On its own, this option was ranked as marginally acceptable at best, but is likely not acceptable. It is likely that no reduction in DIVERSIONS would result from this option. Additional infrastructure necessary to provide surface water to background groundwater irrigators would likely be cost prohibitive and could require the expansion of the OPPA. Further analysis would be necessary to assess the feasibility of this option as part of an overall demand reduction strategy.

### Groundwater Development

**Option 5 - Movement of well capacity to strategic locations within the OPPA** - would pay well owner and landowners at strategic locations within the OPPA to relocate wells with limited yields (due to interference from surrounding wells) to alternate locations farther from existing pumping wells. Wells selected for this option would be wells in Oregon that are permitted to pump more groundwater than they can achieve at their current location (due to interference from surrounding wells).

This option was ranked conditionally acceptable, provided that costs for new wells and operational costs for pumping groundwater are not prohibitive, and that groundwater levels are monitored to make certain the impacts of OPP-based pumping are acceptable. This option may only be applicable in Oregon, as substitution of groundwater rights is not an issue in California. Therefore, this option will be further

evaluated during the development of alternatives in TM 7.

**Option 6 - Installation of new wells within the OPPA** - would pay well owners and landowners or districts to install new wells, or install KWAPA-owned wells at strategic locations within the OPPA. This option would increase groundwater production capacity, and improve the delivery and timing of groundwater to meet the supplemental water need. In practice, however, the installation of a significant number of new wells within the OPPA is unlikely. This is because OWRD considers the groundwater resources in Oregon to be over-allocated, and issuance of groundwater rights or permits by OWRD that would provide significant amounts of water appears low. Furthermore, the capacity of existing wells in California appears to be adequate to meet anticipated demand so the installation of additional new wells does not appear warranted.

This option was ranked as unacceptable in Oregon because the issuance of new groundwater rights that provide significant amounts of water are extremely unlikely. This option was ranked as marginally acceptable in California, where it is assumed that the current distribution of groundwater wells is sufficient to supplement the Klamath River diversions to California water users. If additional groundwater resources are deemed necessary in California, this option would be considered. Therefore, the California portion of Option 6 will be further evaluated during the development of alternatives for TM 7. The Oregon portion of Option 6 will not be further evaluated in that TM.

#### 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*

Jason Chapman—*Poe Valley Irrigation District*

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*

## TM 6 Overall Evaluations : Other Measures

The KBRA commits KWAPA to consider and evaluate various specified measures and “any other applicable measures.” TM 6 considers these “other” measures, including:

- Water transfers
- Water acquisitions
- Voluntary transactions
- Other applicable transactions.

The options identified in TM 6 for evaluation include water transfers, permanent change to groundwater for some uses in the OPPA, water acquisitions, voluntary transactions and phreatophyte control. All options were determined to have varying degrees of acceptability and will be further evaluated in TM 7.

**Option 1 - Water transfers** - would entail KWAPA pursuing or facilitating transfers of water rights from other consumptive uses to use in the OPPA. Under state law, there are procedures to transfer elements of a water right - including the point of diversion and place of use - from one place of use to another.

This option was ranked as marginally acceptable because of the significant uncertainties with regulatory processes, future water rights determinations, and resultant lack of predictability of quantity available. In addition, further consideration must be given to areas that could be adversely affected by a transfer.

**Option 2 - Additional surface water availability.** A surface water demand for Reames Golf & Country Club, Inc., which is a Klamath Project contractor, is currently assumed. Reames has groundwater wells, and if it were to permanently rely on the wells, it would contribute to aligning supply with demand. In addition, some strawberry growers may be willing to forego rights to surface water because groundwater is a preferable source for their industry. Suburban areas of Klamath Falls that are within the OPPA and have an entitlement to Klamath Project water could potentially shift to groundwater use, through the city or otherwise.

These additional surface water supplies could potentially reduce the reliance on surface water and thereby allow for these supplies to be diverted within the OPPA. This option could provide verifiable additional water supplies that may be obtainable from a cost standpoint without encountering major impediments.

This option was ranked as conditionally acceptable .

**Option 3 - Water acquisitions** - as a stand alone option, are considered by TM 6 to represent acquiring a new water right through application to the state for a permit. Any such water rights would have a priority of the date on the application. This option was ranked as unacceptable because of the low likelihood that it would increase water availability for

the OPPA when needed, the likely regulatory uncertainty, and potential third-party concerns.

**Option 4 - Voluntary transactions** - are identified by the KBRA as a measure to be considered and evaluated for the OPP. Many options already discussed involve voluntary transactions, but an option with this specific title is included in TM 6 because of the specific terms of the KBRA. Depending on the nature of any specific voluntary transaction, this option can meet each evaluation criterion; therefore, this option was ranked as acceptable.

**Option 5 - Other applicable measures** - would direct KWAPA or another party to pursue a program of removal or killing vegetation in facilities that may increase evapotranspiration within the OPPA.

This option could be considered a subset of conservation. It would require frequent mechanical removal or chemical application. The quantity of water that would be made available under this option is uncertain, but not expected to be large. A program would need to be developed to systematically reduce or eliminate vegetation. Controls would have to be implemented on a recurring basis in many future years, and the existing and potential environmental constraints are uncertain.

For these reasons, this option was ranked as conditionally acceptable .

### 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.

#### 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.*

### What Does “Supplemental Water Need” Mean?

*Supplemental water need is a conservative or high estimate of the quantity of water projected to be needed above the Limitation on DIVERSION to satisfy the water demand within the OPPA.*

## TM 6 Overall Evaluations: Demand Management Options

The Demand Management category of options evaluates actions that would reduce or shift in time the use of irrigation water by agricultural users through a variety of means, ranging from crop shifting to land idling. This category of options is considered a “last resort” but necessary in drier years to assist in meeting the supplemental water need and provide for the continued sustainability of agriculture in the OPPA.

“All demand management options assume that a mutually agreeable compensation arrangement can be negotiated with the participating landowner,” said Hollie Cannon, KWAPA Executive Director.

By design and intent, a demand management option would reduce agricultural consumptive use of Klamath River water during the targeted period. Demand management options provide incentives to growers to reduce acreage irrigated, shift to a crop that consumes less water, or alter planting and irrigation timing to reduce consumption during targeted periods.

The three demand management options described and evaluated in TM 6 are full-year land idling, partial year land idling, and crop shifting. TM 6 also provides background on the OPPA agricultural economy and relevant demand management programs that have been implemented in Oregon and California. The costs associated with a demand management program, as well as the structure of the agreements that can be reached between KWAPA and the landowners are also investigated by this TM.

**Option 1 - Full-year land idling** - would have the participating land owner forego irrigation in the program for a full year or full irrigation season. Growers / landowners would be required to idle only in years when supplemental water needs could not be fully met by other non-demand management options. Potentially, limits could be

Although this option has been used successfully on an annual basis since the inception of the Klamath water bank in 2002, it was ranked as condi-

tionally acceptable given a long-term arrangement would need to be developed and implemented with willing participants. Verification would be similar to what is being done by KWAPA on an annual basis and would be developed to support a long-term approach.

**Option 2 - Partial year land idling** - would entail having the participating landowner forego irrigation of land in the program during part of the irrigation season. Contracts would be with willing participants and could be made through different types of contracts. Other aspects of the option would be similar to full-year land idling.

It is ranked as conditionally acceptable given a long-term arrangement would need to be developed and implemented with willing participants. The verification and administrative process would also need to be improved.

**Option 3 - Crop shifting** - involves having a grower/ landowner agree to grow a crop with lower consumptive

water use than the grower was intending to plant. Contracts would be with willing participants, and could be made through different types of contracts as described for full-year land idling.

“KWAPA would need to establish a reliable method for determining the crop that would have been grown and the difference in consumptive use between it and the agreed-upon crop,” said Mr. Cannon.

This option was ranked as marginally acceptable because of the anticipated difficulty in growers being able to shift to crops that would result in a substantial change in water use, given the limiting nature of the Upper Klamath Basin climate.

All three options were considered to be—to some degree—feasible.

Assuming that agreements could be reached in a manner that was agreeable and affordable to KWAPA given sufficient funding, all of these options will be further evaluated in TM 7.

### Summary of Findings: Overall Evaluation of Options

- Only those options identified as “feasible” - green, yellow and orange ranked options in the TM 6 evaluation matrices, most likely - will be evaluated for in the development of alternatives (TM 7).
- Options identified as “infeasible” for the purposes of the OPP may provide benefits to the OPPA; however, for the purposes of TM 7, they will not be evaluated.
- Various combinations of options will be combined to form the final alternatives to align supply and demand in the OPPA.



## Preview of Technical Memorandum 7: Alternatives and Implementation Plan

The approach to develop the Alternatives and Implementation Plan (TM 7) will build upon the TM 6 evaluation and ranking criteria to develop alternatives. A combination of options (and option categories) will be developed to arrive at alternatives. Because of its infeasibility, the Storage option will not be included in the development of alternatives. All other options will be

considered, to some degree, for inclusion in alternatives.

Figure 3 provides an example of how options could be implemented to satisfy future supplemental water need in the OPPA.

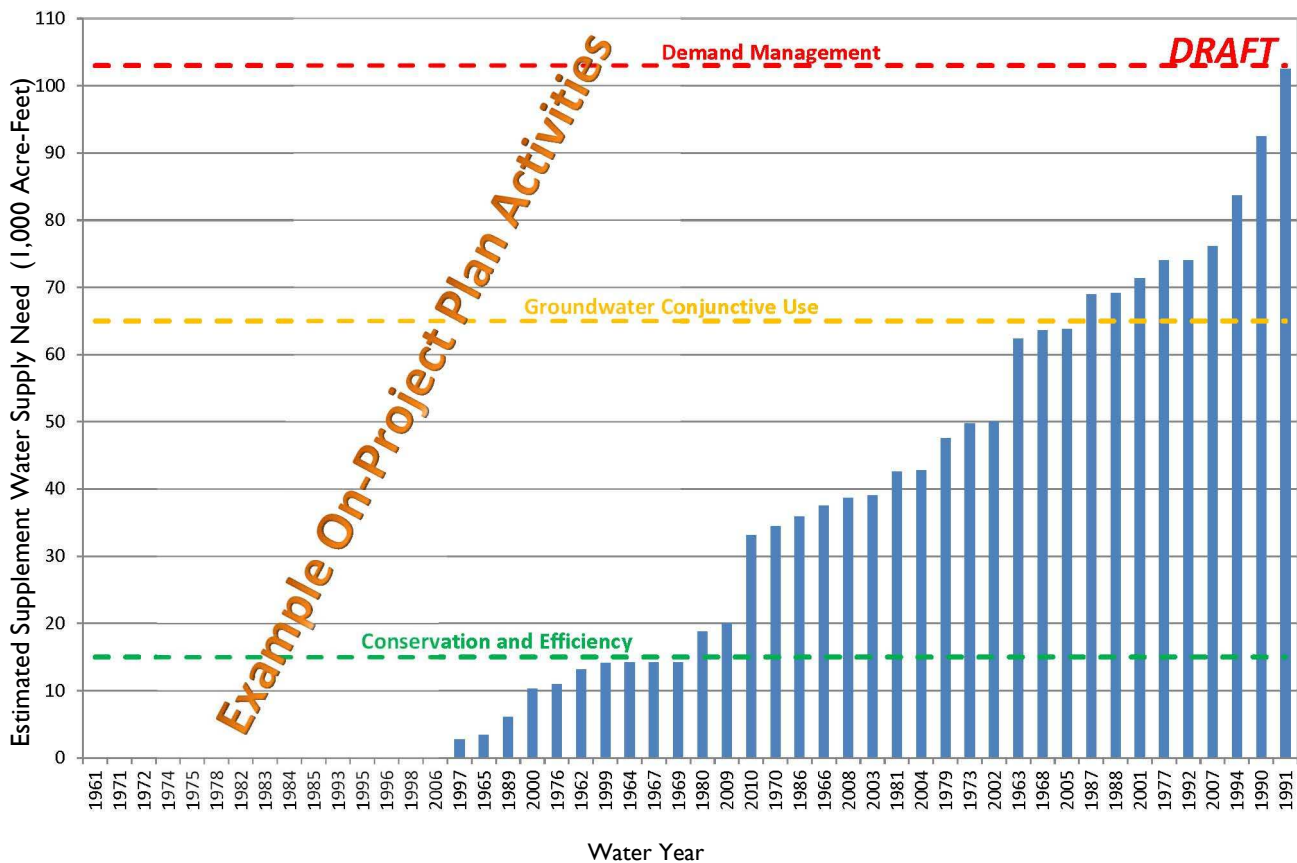
Regardless of the alternative, there are five elements that will be common to each alternative. Foundational measure-

ment (see inset box, Page 3) and measurement and monitoring specific to options will be part of each alternative. Each option will have an associated administration component and operations committee. And, importantly, every alternative must have no "adverse impact" associated with it.

Public meetings will be held

March 13-14, 2013 to provide the local community with an update on TM 6, the approach to be used on TM 7, and other aspects of the OPP.

Three OPPAC meetings are scheduled between April and July. The final draft of the OPP Summary Report will be presented to OPPAC for review on July 17, 2013.



**FIGURE 3—Examples of how Options Could be Implemented**

This graph provides an example showing how an alternative, consisting of various water management options, would be used to meet supplemental water need over the 1961-2010 time period. The supplemental water need quantities are based on conservative estimates and assumptions (described in TM 4). This example assumes that 330,000 acre-feet of water would be provided out of the Klamath River system (Limit on DIVERSION), which would be announced on March 1st. Surface water deliveries would be sufficient to meet OPPA demand in 15 of those years. Conservation and efficiency measures—saving 15,000 acre-feet—would be sufficient to meet supplemental need in another ten years. Groundwater conjunctive use programs—up to a maximum of 50,000 acre-feet per year—in addition to conservation and efficiency—would meet supplemental needs in another 16 years. Demand management actions that would generate 5,000-40,000 acre-feet of supplemental water—would only be required in 9 years of this historic time period.

**Who's Doing the Work?**

The OPP is being prepared by consultants working for the Klamath Water and Power Agency (KWAPA), which was formed in 2008 as a product of discussions among local irrigators, districts, and others in the community. KWAPA consists of public agency members in Oregon and California, all of whom are contractors of the Bureau of Reclamation and provide water delivery within areas of the Klamath Reclamation Project.

KWAPA is an intergovernmental agency under Oregon law and a joint exercise of powers agency under California law.

**We're on the web!**  
[www.kwapa.org](http://www.kwapa.org)

**The OPP Work Group**

Hollie Cannon (KWAPA)  
Greg Addington (KWUA)  
Cathy Waters (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 & Sara Harper (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)

**Technical Memo Approach to Developing the OPP****TM<sub>s</sub> and OPP Development Phases Explained**

The 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 OPPAC in September. TM 2 and TM 3 were reviewed by OPPAC on March 22, 2012 and finalized. TM 4 was finalized in July 2012 after incorporating changes suggested by Reclamation, the U.S. Fish and Wildlife Service, and OPPAC on June 27, 2012.

OPPAC members are listed in the inset box on Page 6 of this newsletter. You can see TMs 1, 2, 3, 4 and 5 in their entirety by going to [www.kwapa.org](http://www.kwapa.org).

**OPP Development**

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 in the fall of 2011. TM 1 identified the project goals and objectives and approach for development of the OPP. The background and development of the Klamath Basin Restoration Agreement (KBRA), together with the need for the OPP, are also summarized in TM 1.

**Phase 2** included the work necessary to complete the foundational TM 2 and TM 3 documents, as well as TM 4, which identified supplemental water needs (see inset box on Page 7 for definition) of the OPPA. TM 2 described the water supply and operations for the OPPA. It 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

TM 3 addressed current and future water demands associated with current and anticipated future cropping patterns and agricultural land use. It also identified potential changes in cropping patterns within the OPPA and anticipates resulting water needs.

This phase also included the initial efforts for developing TM 5 – Surface Water Flow Path of the OPPA. Finally, as an ongoing effort, Phase 2 included outreach efforts and implementation of an agreed upon communication plan.

**Phase 3** includes the completion of TM 5 and continuation of TM 8, as well as the initiation and completion of TM 6—Water Management and Supply Options. TM 7—Future Water Management Alternatives and the OPP Summary Report was initiated in Phase 3.

Phase 3 began in April 2012 and key technical work was completed in February 2013.

**Phase 4** is now underway and is scheduled to finish in July 2013.

Before the completion of Phase 4, the NEPA/CEQA compliance effort with the Bureau of Reclamation will begin, with expected completion in 2014 (see inset box, this page, for more on NEPA/CEQA).

Since the last edition of *OPP* opportunities (September 2012), TM 5 has been completed. Much of the work completed on the OPP in recent months relates to TM 6, which identifies and assesses water management and supply options.

The summary of TM 6 is the primary focus of the current edition of *OPP* opportunities.

**What is NEPA?** - The National Environmental Policy Act (NEPA) is a federal environmental law that establishes procedural requirements for all federal government agencies to 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.

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**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 reduce power costs for irrigators in the Klamath Project.**

**KWAPA is working to obtain and provide transmission and delivery of Federal preference power for eligible On-Project and Off-Project Power Users and investigate power generation that would offset power costs.**

**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://kwapa.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**