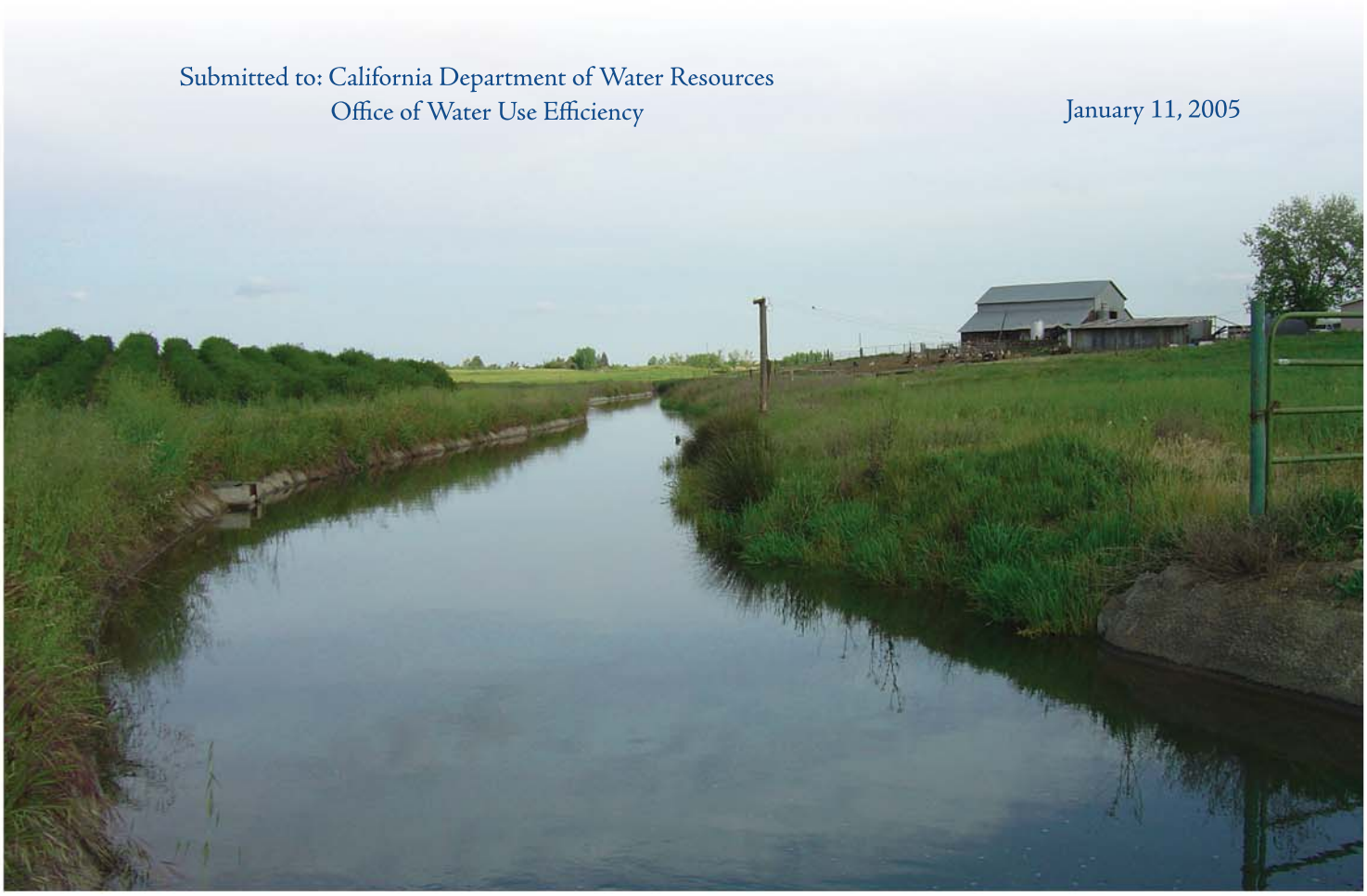
2004 Water Use Efficiency Proposal Solicitation Package

Tailwater Recovery Program

Oakdale Irrigation District

Submitted to: California Department of Water Resources
Office of Water Use Efficiency

January 11, 2005



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Project Information Form

Applying for:	❑ Urban	☑ Agricultural
1. (Section A) **Urban or Agricultural Water Use Efficiency Implementation Project**	❑(a) implementation of Urban Best Management Practice, #_____ ☑ (b) implementation of Agricultural Efficient Water Management Practice, #7, Construct and operate water supplier spill and tailwater recovery systems ❑ (c) implementation of other projects to meet California Bay-Delta Program objectives, Targeted Benefit # or Quantifiable Objective #, if applicable _____ ❑ (d) Specify other: _____	
2. Section B) **Urban or Agricultural Research and Development; Feasibility Studies, Pilot, or Demonstration Projects; Training, Education or Public Information; Technical Assistance**	❑ (e) research and development, feasibility studies, pilot, or demonstration projects ❑ (f) training, education or public information programs with statewide application ❑ (g) technical assistance ❑ (h) other	
3. Principal applicant:	Oakdale Irrigation District	
4. Project Title:	Tailwater Recovery Program	
5. Person authorized to sign and submit proposal and contract:	Name, Title	Steven Knell, General Manager
	Mailing Address	1205 East F Street Oakdale CA 95361
	Telephone	209-847-0341
	Fax	209-847-3468
	E-mail	srknell@oakdaleirrigation.com
6. Contact person (if different):	Name, Title	Kevin L. King, Special Project Coordinator
	Mailing Address	Same
	Telephone	Same
	Fax	Same
	E-mail	kking@oakdaleirrigation.com
7. Grant funds requested (dollar amount): *(from Table C-1, column VI)*		$731,500
8. Applicant funds pledged (dollar amount):		$690,000 – OID $687,750 - Participants

9. Total project costs (dollar amount): *(from Table C-1, column IV, row n)*	$2,109,250
10. Percent of State share requested (%) *(from Table C-1)*	35%
11. Percent of local share as match (%) *(from Table C-1)*	65%
12. Is your project locally cost-effective? *Locally cost-effective means that the benefits to an entity (in dollar terms) of implementing a program exceed the costs of that program within the boundaries of that entity.* *(If yes, provide information that the project in addition to Bay-Delta benefit meets one of the following conditions: broad transferable benefits, overcome implementation barriers, or accelerate implementation.)*	❑ (a) yes ☑ (b) no
13. Is your project required by regulation, law or contract? *If no, your project is eligible.* *If yes, your project may be eligible only if there will be accelerated implementation to fulfill a future requirement and is not currently required.* *Provide a description of the regulation, law or contract and an explanation of why the project is not currently required.*	❑ (a) yes ☑ (b) no
14. Duration of project (month/year to month/year):	3/06–1/09
15. Assembly District where the project is to be conducted:	25
16. State Senate District where the project is to be conducted.	14
17. Congressional district(s) where the project is to be conducted	11
18. County where the project is to be conducted	Stanislaus & San Joaquin
19. Location of project (longitude and latitude)	Lat 37° 46' Long 120° 51’
20. How many service connections in your service area (urban)?	3,500 parcels
21. How many acre-feet of water per year does your agency serve?	281,000

22. Type of applicant (select one):

- ❑ (a) City
- ❑ (b) County
- ❑ (c) City and County
- ❑ (d) Joint Powers Authority
- ☑ (e) Public Water District
- ❑ (f) Tribe
- ❑ (g) Non Profit Organization
- ❑ (h) University, College
- ❑ (i) State Agency
- ❑ (j) Federal Agency
- ❑ (k) Other
  - ❑ (i) Investor-Owned Utility
  - ❑ (ii) Incorporated Mutual Water Co.
  - ❑ (iii) Specify _____

23. Is applicant a disadvantaged community? If ‘yes’ include annual median household income. *(Provide supporting documentation.)*

- ❑ (a) yes, _____ median household income
- ☑ (b) no

Signature Page

By signing below, the official declares the following:

The truthfulness of all representations in the proposal;

The individual signing the form has the legal authority to submit the proposal on behalf of the applicant;

There is no pending litigation that may impact the financial condition of the applicant or its ability to complete the proposed project;

The individual signing the form read and understood the conflict of interest and confidentiality section and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant;

The applicant will comply with all terms and conditions identified in this PSP if selected for funding; and

The applicant has legal authority to enter into a contract with the State.

Signature	Steve Knell - General Manager	12/27/04
Signature	Name and title	Date

Certification Page

Certification of Preliminary Plans and Specifications

I, Naser James Bateni, a California registered civil engineer, have directly supervised the preparation of the preliminary plans and specifications and reviewed the documents presented in support of this grant application. Based on this information and any other knowledge I have regarding the proposed project, I find that the project is feasible and that it can be designed, constructed, and operated to accomplish the purpose for which it is planned. The information I have reviewed to document this statement includes "Statement of Work, Section 2: Technical/Scientific Merit, Feasibility" of this Water Use Efficiency Grant Application.

REGISTERED PROFESSIONAL ENGINEER
NASER J. BATENI
No. C 36128
Exp. 6/30/06
CIVIL
STATE OF CALIFORNIA

Naser Bateni

Original signature and stamp with expiration date

Statement of Work: Section 1, Relevance and Importance

Oakdale Irrigation District (OID or the District) covers approximately 72,345 acres in Stanislaus and San Joaquin Counties. The District diverts water from the Stanislaus River to serve approximately 53,000 acres of irrigated land. Important crops within the District include hay and pasture, double-cropped wheat and corn, and orchard crops. OID's location is shown on Figure 1.

OID has recently embarked on a series of extensive water resource planning initiatives. It has completed a Water Measurement Study and has installed water measurement devices on a number of drains and spills conveying water from the District. It has also begun work on its Water Resource Plan, which will be a major effort to plan capital improvements and operational changes to benefit both District customers and other regional water users. In addition, the District is a signatory to the Memorandum of Agreement for the Agricultural Water Management Council and is committed to preparing a Water Management Plan for presentation to and endorsement by the council.

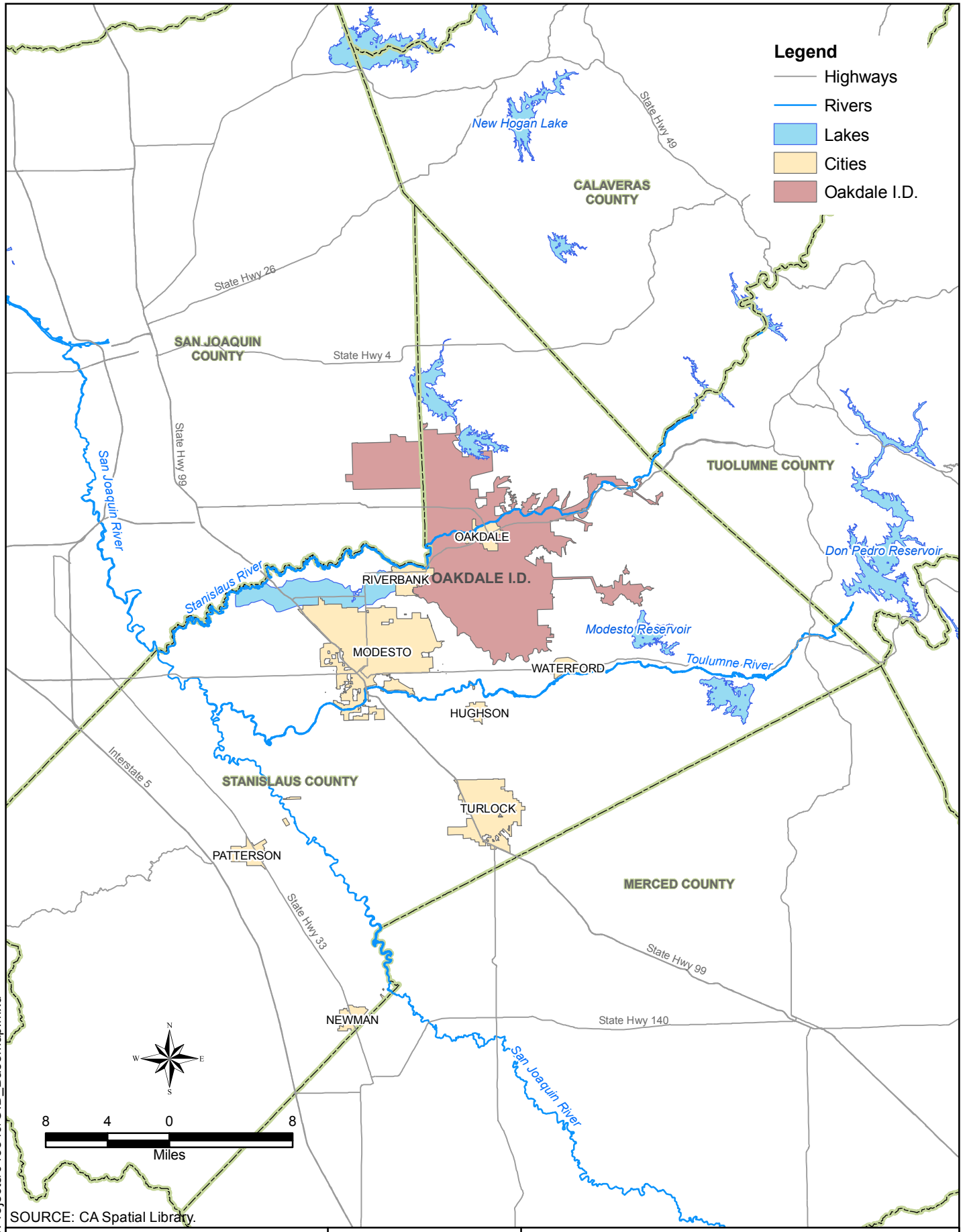
Although these major planning efforts have yet to be completed, water balance studies performed for the Water Measurement Study have shown that a significant proportion of OID irrigation deliveries flow from the District as tailwater.

As a result of this finding, OID plans to collaborate with its growers to develop an on-farm tailwater recovery program. Financial support from participating growers will be augmented by funding from OID revenues and from the Water Use Efficiency grant program to pay for the design and installation of on-farm tailwater recovery systems. Each of the systems will be tailored to the conditions of the individual field, with an objective of increasing both water use efficiency and irrigation management flexibility.

Although the tailwater recovery program is to be implemented before the completion of broad planning efforts, it is already understood that tailwater recovery will be an essential element of more comprehensive system improvements and that, for this reason, there is nothing to be gained by deferring implementation of the program. The program is designed as a three-year effort, with tailwater recovery systems being constructed during each year of the project.

Project Goals and Objectives

The tailwater recovery program is an initial step in OID's program to reduce the volume of water flowing out of the District's service area. OID receives high quality water from the Stanislaus River. Concentrations of sediment, nutrients, and pesticides and the increases in temperature, which differentiate tailwater from source water, do not significantly degrade the utility of tailwater for irrigation. However, these changes in water quality do diminish the ability of tailwater water to support environmental uses.



SOURCE: CA Spatial Library.

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Tailwater Recovery Program	Bookman-Edmonston A Division of GEI Consultants	PROJECT LOCATION
Stanislaus County, California		DECEMBER 2004 FIGURE 1

Therefore, the primary goals of the tailwater recovery program are to reduce outflows from the District and to reduce the diversion requirements needed to support irrigation by substituting recycled tailwater. Other project objectives are to increase crop production through more flexible on-farm irrigation practices and to improve water quality through reduced outflow of tailwater to streams and rivers.

Implementation of a tailwater recovery program is particularly well suited to the soil and cropping conditions of OID. Much of OID is underlain by a soil hardpan. This restrictive layer limits the ability of water to percolate to groundwater and increases the percentage of irrigation water that flows from fields as tailwater. Water balances for the irrigation operations of OID and of nearby districts (such as Merced Irrigation District and Turlock Irrigation District) suggest that deep percolation constitutes a smaller percentage of on-farm losses in OID than in nearby districts, while the proportion of tailwater in OID is higher. The high proportion of land devoted to pasture and hay crops in OID means that a high proportion of the OID tailwater recovery systems are likely to be installed on fields planted in these crops. Typically, these crops are irrigated in a manner that generates a high volume of tailwater. However, hay and pasture fields act as continuous filter strips that trap sediment and reduce the frequency at which tailwater reservoirs must be cleared of sediment.

Local Issues

One of the objectives of OID's planning efforts is to identify strategies to conserve water within the District and to improve the flexibility of irrigation management. The introduction of tailwater recovery systems offers a mechanism to address both of these local issues. Water is conserved by recirculating tailwater within farm fields, and the construction of tailwater reservoirs provides a limited volume of on-farm storage that will provide growers with some latitude in how they apply water to fields. In addition, because this will be a voluntary program requiring a financial commitment on the part of participating growers, the design and implementation of the tailwater recovery systems will be specific to the condition and management objectives of the enrolled farms.

Both the conservation and flexibility benefits of the program enhance local water supply reliability.

Regional Issues

The regional value of the project is that it will reduce the requirement for releases from New Melones Reservoir to meet the irrigation demands of OID. This conserved water in New Melones Reservoir will be available for other reasonable and beneficial uses by OID.

Bay-Delta Issues

The project is valuable to the Bay-Delta because it reduces the volume of degraded tailwater that flows from OID to tributaries to the Bay-Delta. It will enable OID to meet its participation in the San Joaquin River Agreement during below-normal water use types.

Specific Bay-Delta benefits include direct contributions toward the attainment of the following flow and quality benefits targeted by the California Bay-Delta Authority:

- 113 – Flow: Provide flow to improve aquatic ecosystem conditions in the Stanislaus River
- 116 – Quality: Reduce group A pesticides to enhance and maintain beneficial uses of water in the Stanislaus River
- 121 – Quality: Reduce other pesticides to enhance and maintain beneficial uses of water in the Stanislaus River
- 123, 140 – Quality: Reduce salinity to enhance and maintain aquatic species populations in the San Joaquin River near Vernalis
- 125 – Quality: Reduce temperature in the Stanislaus River
- 140 – Quality: Reduce temperatures to enhance and maintain aquatic species populations in the San Joaquin River near Vernalis

In addition, the reduction of tailwater outflows from the District will reduce loadings of nutrients and sediment to receiving waters and will lower water temperatures.

The primary flow paths affected by the project will be the drainage outflows that will be reduced through tailwater recovery. The extent of this reduction will be governed by the program's success in encouraging growers to install on-farm tailwater recycling systems. In addition, the extent to which growers enroll in the program will determine the degree to which the program affects irrigation deliveries and Stanislaus River diversions.

The program helps relieve stress on the Bay-Delta by:

- Increasing flows of high quality water in the Stanislaus and San Joaquin Rivers and in the Delta
- Decreasing releases of lower quality surface drainage to the rivers and the Delta
- Providing an opportunity to improve the timing of flows in the rivers and Delta by retaining water in New Melones Reservoir until it is needed. The nature and timing of these releases have yet to be determined, but the timing will not be dictated by OID's need to divert water for irrigation.

State Issues

By diminishing the release of drainage water, the implementation of tailwater recycling systems will decrease pollutant outflows to the San Joaquin River during the summer. Reduced irrigation diversions resulting from tailwater reuse are expected to result in increased flows of direct releases from New Melones Dam in the Stanislaus and San Joaquin Rivers and in the Delta. The net impact of the reduced drainage outflows and the increased direct releases from New Melones Reservoir will be an improvement in the assimilative capacity of the Stanislaus River and a net contribution to compliance with state water quality standards at Vernalis.

Federal Issues

The program conserves water within an area designated as a "hot spot" in the U.S. Bureau of Reclamation's Water 2025 program. In addition, diversion reductions will contribute to compliance with the provisions of the Clean Water Act (in particular, the Total Maximum Daily Load [TMDL] requirements being implemented on the San Joaquin River).

Consistency with Local or Regional Water Management Plans

As noted earlier in this application, implementation of a tailwater recovery program results from water balances prepared for OID's irrigation operations and its Water Measurement Program, both of which indicate that tailwater recovery will be useful in improving water use efficiency within the District and reducing surface outflows from the District.

OID has begun work on a comprehensive Water Resources Plan and is committed to the development of an AB 3616 Water Management Plan. Although neither of these planning efforts is complete, the District recognizes that a tailwater reuse program will be among the recommendations of both planning efforts. In addition, OID is a participant in the Stanislaus and Toulumne Rivers Groundwater Management Association and is active in the development of an AB 3030 Regional Groundwater Management Plan for this group. The impacts of a tailwater recovery program on the area's groundwater resources are not expected to be significant; however, the program is expected to support water supply reliability in the region.

Implementation of Water Demand Management Activities Identified in Urban or Agricultural Water Management Plans

The proposed tailwater recovery program conforms with List B EWMP No. 7, Construct and Operate Water Supplier Spill and Tailwater Recovery Systems.

Importance of Project Implementation on Current Water Management Activities or Initiation of New Activities

OID is beginning a major effort to modernize and improve its irrigation infrastructure and operations. While this planning effort is under way, it is following a parallel track of implementing projects where the project need is already evident. The District has recently implemented an outflow measurement program to collect data on major drains and spills and is also carrying out a program of canal improvements.

Implementation of a voluntary tailwater recovery program is the first concrete step in OID's plan to improve irrigation service and irrigation efficiency District-wide. Installation of on-farm tailwater recovery systems will have both local benefits and Bay-Delta benefits.

Statement of Work: Section 2, Technical/Scientific Merit, Feasibility

The tailwater recovery program is a combination of activities needed to plan, design, administer, implement, and monitor the installation of approximately 25 tailwater recovery systems. Based on experience at Imperial Irrigation District and elsewhere, tailwater systems installed in this program will capture tailwater and circulate it for reapplication to the same field. Each system will be equipped with a permanent pump facility and a buried tailwater return pipeline. Experience at other districts indicates that permanent facilities are more cost-effective than portable pumps and return lines shared by a group of growers.

The number of systems installed and the scale of program benefits depend on the growers who enroll in the program. In general, there are benefits of scale associated with tailwater recovery systems in that it is more efficient to install fewer systems on larger fields than a large number of systems on smaller fields. An 80-acre average field size has been selected as representative for program design and cost estimation. However, the size of the fields enrolled in the program will be a determinant of the final program participants.

Based on an 80-acre average field size, the tailwater recovery program is expected to install between 8 and 10 tailwater recycling projects per year over a project life of three years to reach a program target of 25 systems. The program will generate benefits for three categories of beneficiaries. Although most of the benefits relate to the Bay-Delta, the program is designed to receive approximately one-third of its funding from each of the following categories:

- Direct beneficiaries contribution
- OID contribution
- Water Use Efficiency program contribution

A typical tailwater recovery system is estimated to cost $84,400, which includes funds for project administration, outreach, monitoring and assessment, design, and construction. Although the specifics of each tailwater recovery system will be unique, the general configuration will be to capture and store tailwater at low points in irrigated fields and to pump that water to the head of fields where the recycled water is to be used for irrigation.

It is estimated that during each irrigation application, a typical 80-acre field in OID generates an average of 0.11 acre-feet of tailwater per acre. Consequently, during a typical season of 16 irrigation applications, the total volume of tailwater generated is approximately 1.8 acre-feet per acre (144 acre-feet for 80 acres). Recapturing this water will enable growers to reduce system deliveries required to meet irrigation requirements.

It is assumed that tailwater recovery systems will be most attractive to, and most effective for, growers that can install the systems on fields averaging at least 80 acres in size. It is

assumed that most program participants will choose to minimize construction costs and land acquisition requirements by installing tailwater reservoirs with a storage capacity of approximately 1.5 acre-feet. However, some participants may elect to construct reservoirs with larger capacities to increase the flexibility of their irrigation operations.

The scale of the program's benefits will depend upon the number of tailwater recovery systems that are installed and the sizes of the fields on which they are installed. If the average field size is 80 acres and 25 systems are installed over the course of the three-year program, it is expected that the tailwater recovery systems on these fields (totaling 2,000 acres) will capture approximately 3,600 acre-feet annually. This captured tailwater is expected to generate roughly 3,000 acre-feet of recycled water that will translate to an approximately equivalent reduction in irrigation deliveries and river diversions.

Growers participating in the project will receive funding from OID and from the Water Use Efficiency grant program, contingent upon an agreement to reduce their annual diversion by a quantity that will be determined during the design of the individual tailwater system. This agreement will provide an assurance that project participants receive OID and Water Use Efficiency program support in exchange for a commitment to provide the agreed-upon grower contribution to the project. In addition, the agreement will specify the volume of water to be delivered to the field and the adjusted water charge to be paid for the reduced delivery.

Preliminary Plans and Specifications and Certification Statements

Estimate of Conserved Water

Tailwater recovery system designs will be based on the following considerations:

- Field size and shape
- Elevation change in the field
- Soil type
- Presence of and depth to hardpan or other restrictive layer

The designs will conform to Natural Resources Conservation Service guidelines. The primary objective of installing tailwater recovery systems at OID will be to conserve water by reducing delivered water volumes and to eliminate tailwater releases. Providing on-farm storage to improve irrigation scheduling flexibility or to increase the number of irrigations will be a lower priority that may be exercised by some program participants. However, the typical system will be designed to recirculate tailwater for application during the same irrigation set that generated the tailwater.

The prototype design assumes that growers will begin each irrigation with an empty tailwater reservoir and will take a full delivery head. After one-fifth of the irrigation set (or after the tailwater reservoir contains a sufficient volume of water to support pumping), the grower will cut back to approximately 60 percent of the initial delivery head and will begin recycling

tailwater to fill the cutback volume and to prevent overflow of the tailwater reservoir. This proportion of 60 percent gate delivery and 40 percent recycled water will be maintained until the end of the set. Tailwater accumulated after the end of the set will be used to provide a finish head.

An 80-acre field, operating on this schedule, will require a minimum of 1.5 acre-feet of storage to allow the capture of tailwater and to provide sufficient dead storage to submerge the pump intake. Standard design guidelines recommend that tailwater reservoirs be approximately 8 to 10 feet deep to limit the surface area of the reservoir and to control the growth of aquatic weeds. Therefore, the surface area of the prototype reservoir is expected to range between 0.15 and 0.20 acres.

Construction Method

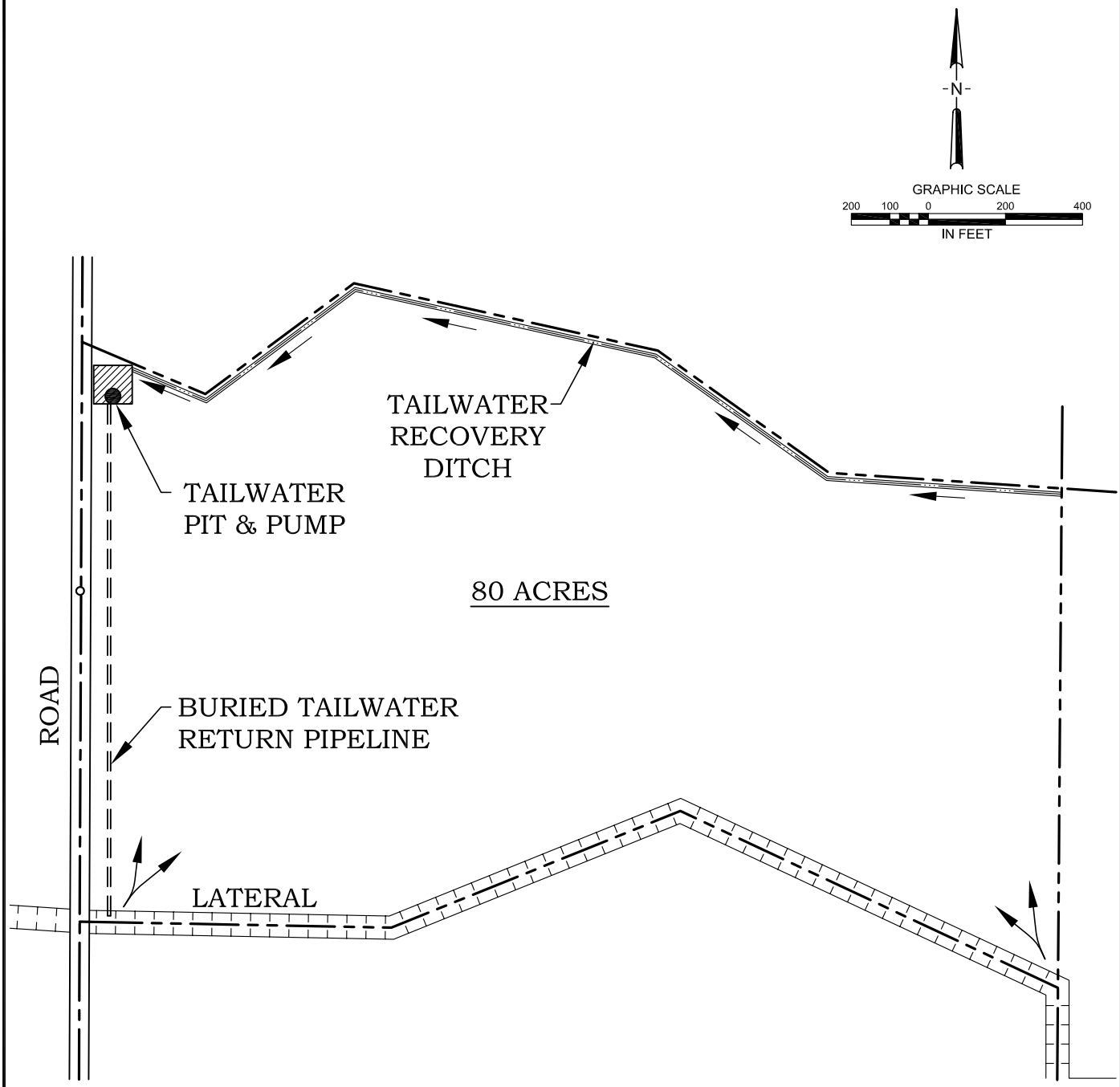
The on-farm tailwater systems will consist of tailwater recovery ditches to capture water as it runs off fields, small reservoirs to store collected tailwater, and pumping plants and buried PVC pipelines to convey water from the tailwater reservoirs to the head of the system. While all tailwater recovery systems are expected to share these features, the specifics of each recovery system will vary with the specifics of the site and the grower's operational practices. An important factor in site selection will be the provision of power for pumping. For sites requiring three-phase power, experience at Imperial Irrigation District indicates that the costs to provide power may be a major component of the system's capital costs.

Figure 2 shows a typical field layout, indicating the location of tailwater collection and recirculation facilities.

Task List and Schedule

The tailwater recovery program is composed of the following activities:

1. Advertise and generate interest in program among OID water users
2. Compile list of interested water users
3. Develop scoring system and evaluation procedure for selecting participants
4. Evaluate and rank interested water users
5. Provide results of participant evaluation and ranking to the OID Board for selection of participants
6. Notify Board of selected participants
7. Enroll participants
8. Initiate pre-project monitoring at enrolled fields



	Bookman-Edmonston A Division of GEI Consultants	TYPICAL TAILWATER RECOVERY SYSTEM
OAKDALE IRRIGATION DISTRICT OAKDALE, CALIFORNIA	043840	DECEMBER 2004 FIGURE 2

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9. Provide required level of compliance with the California Environmental Quality Act (CEQA)

10. Design tailwater systems

11. Develop, release, analyze, and award bids for each project

12. Construct tailwater recovery systems

13. Provide quarterly project reporting

14. Conduct continued project monitoring and assessment

Table 1 illustrates how these 14 activities align with Water Use Efficiency program budget categories used in Table C-1 and how responsibilities for each of these activities will be shared by the three program participants.

Table 1 Budget Categories by Activity and Participant

Budget Category	Activity	Participant
Administration	1 – 7	OID
Planning/Design/Engineering	10	OID
Materials/Installation/Implementation	11,12	Water Use Efficiency program, OID
Land Purchase/Easement	12	Grower
Environmental Compliance/Mitigation/Enhancement	9	OID
Construction	11,12	Water Use Efficiency program, OID, Grower
Monitoring and Assessment	8,14	Water Use Efficiency program
Report Preparation	13	OID

The program schedule is based on three full implementation cycles. The first cycle will be the most intensive because it will lay the groundwork for subsequent cycles. Each program cycle is expected to follow the schedule presented below, which combines project activities into tasks:

- Program development and outreach (activities 1-4) March through May
- Program enrollment (activities 5 -7) May through June
- Facility planning (activity 10) June through July
- Environmental documentation (activity 9) May through August
- Facility design (activity 10) July through September

▪ Facility construction (activities 11 and 12)	September through January
▪ Project reporting (activity 14)	Quarterly
▪ Monitoring and assessment (activities 8 and 14)	Each irrigation season after project inception until termination of the monitoring and assessment period

The construction schedule assumes six days for reservoir construction, four days to construct the tailwater collection ditch, six days to lay the recycled water pipeline, two days to install the pump, motor, and electrical connection, one day for testing, and one day for mobilization and demobilization.

With allowances for bad weather and other contingencies, it is expected that 30 days will be required to construct each tailwater recovery system. Because each on-farm system will be constructed and operated independently, more than one system can be under construction at any given time. The task list, described above, is shown on the project schedule (Figure 3).

Construction is anticipated to be carried out during three seasons:

- September 2006 through January 2007
- September 2007 through January 2008
- September 2008 through January 2009

Prior to each of these construction seasons, growers will be enrolled in the tailwater recycling program and designs prepared for these growers. In order to maximize both local and Bay-Delta benefits, the program will be designed to enroll fields with a minimum size. At this point, it is believed that the average field size will be 80 acres or greater.

To comply with Central Valley Regional Air Quality Control Board regulations, it is anticipated that all pumps will be driven by electric motors. However, because of the low heads and volumes of water to be pumped and the relatively small number of systems to be installed, this program is not expected to have a significant impact on regional energy demand.

Table 2 in the Benefits and Costs section of this application presents itemized costs for a typical tailwater recovery system. An overall project budget is shown in Table C-1 in the Benefits and Costs section. The estimated project contingency is 10 percent of the projected construction costs.

Budgets for tailwater recovery systems operated by Imperial Irrigation District show that the operations and maintenance costs for such systems can be broken down into the following components:

- Power

- Maintenance (weed control, silt removal, pump and motor maintenance)
- Management and labor (starting and stopping the systems)

Costs associated with these items are discussed in the Benefits and Costs section of this application.

Certification of project feasibility and certification that the preliminary plans and specifications, presented above, have been prepared by a California registered civil engineer are found at the beginning of this application.

Environmental Documentation

The proposed tailwater recovery project will comply with all applicable state laws and water rights. Both California water laws and the CALFED program support and promote water use efficiency projects in California. This project will reduce water use and improve water supply availability to all Delta water users and will reduce conflicts in the region.

Prior to the implementation of this project, the CEQA guidelines will be followed to adequately study potential environmental impacts. CEQA compliance will be completed utilizing CEQA guidelines. Compliance with CEQA includes an Initial Study. A draft Initial Study checklist for a typical project has been completed. This checklist is included in Appendix B. Biological and cultural surveys will have been performed prior to completion of the Initial Study and will assist with the CEQA determination. All environmental documentation will be completed prior to implementation and construction of the project.

No additional environmental permits required for the project. Work will be conducted on farm fields and the area of land to be disturbed at individual sites is less than five acres. The preparation of environmental documentation will begin upon notification of project acceptance and will identify locations where construction of tailwater recovery systems would result in environmental challenges. Environmental documentation will be completed after the tailwater recovery system sites have been selected.

There is no federal nexus with the proposed project.

Statement of Work: Section 3, Monitoring and Assessment

Project reporting on construction and water conservation activities will be divided into four parts: Description of pre-project conditions and data baselines; monitoring methodologies and project monitoring data; evaluation of the project's success; and consideration of external factors. Monitoring and assessment activities will generate information that will be valuable to Bay-Delta Program staff and to OID staff and management. Therefore, these program partners will share the costs of monitoring and assessment and reporting activities.

Description of Pre-Project Conditions and Data Baselines

For each field participating in the tailwater recovery program, mandatory irrigation audits to collect baseline data on irrigation deliveries and tailwater volumes will be conducted prior to system installation. These baseline data will be entered into a project database and will be available to both participating growers and OID staff. Measured delivery volumes and tailwater flows will be applied in the design of individual systems and will be a fundamental yardstick for estimating the actual water conservation benefits of the project.

Monitoring Methodologies and Project Monitoring Data Collected to Assess Project Results

Construction Reporting

An ongoing photographic record of construction activity will be maintained. Construction progress reports will be filed daily. Budget and project status reports submitted to the Department of Water Resources (DWR) quarterly will include a discussion of active construction. Construction reporting will end with a certification of completion for each tailwater recovery system.

Post-Project Monitoring

Photographs will be taken of tailwater recovery systems during operation. In addition, deliveries to fields participating in the program, tailwater volumes entering the reservoirs, and tailwater volumes recycled to the head of the fields will be measured. These measurements will provide a basis for estimating the impact the systems have on delivered water volumes, the proportion of delivered water that is captured by the systems, and the proportion of captured water that is actually reused. OID staff will produce annual reports on the performance of each of the systems and make recommendations to participating growers on how they might improve system operation and performance. An annual summary report will be prepared for DWR that provides an overall assessment of project performance in terms of:

- Number of systems in operation

- Number of acres served
- Overall impact on water deliveries to participating farms
- Overall volume of tailwater captured
- Overall volume of tailwater recycled
- Summary of project performance, issues encountered, and operational challenges

In addition to comparing pre-project and post-project delivered water volumes at participating farms, the annual report to DWR will compare pre-project and post-project volumes of water diverted by OID and will assess any correlation found between changes in on-farm deliveries and changes in District diversions.

Evaluation of Success in Relation to Project Goals and Objectives

The tailwater recycling program is intended to (1) conserve diverted and delivered water by substituting recycled tailwater for system deliveries, (2) reduce outflow of tailwater to receiving waters tributary to the Bay-Delta, and (3) provide greater water supply reliability and flexibility in irrigation management by offering participating growers small volumes of on-farm storage that they can manage at their own discretion.

A separate yardstick will be applied to determine the success of the tailwater recovery program in meeting each of these objectives.

Water Conservation

The success of this program in meeting its objectives with respect to providing water to meet Bay-Delta objectives will be based upon reductions in water delivered to participating fields. Reductions in deliveries will be estimated by comparing post-project deliveries with pre-project deliveries and by interviewing participating growers to learn, under post-project conditions, how much water they believe would have been applied if they had not installed a tailwater recovery system.

A true measure of the program's benefits would be reductions in diversions to the OID system. However, because of the small size of the OID tailwater recovery program, while program implementation is expected to result in reduced diversions, these reductions may not be sufficiently large to discern with confidence in OID diversion data.

Water Quality

Water quality benefits of the tailwater recovery program will be based on the assumption that the volume of tailwater captured by the on-farm systems represents the reduction in tailwater outflow to tributaries of the Bay-Delta and that constituent concentrations observed in intercepted tailwater represent the concentrations that would have flowed to the Bay-Delta. By knowing both volumes and concentrations, reductions in loading to the Bay-Delta system can be computed.

Volumes of intercepted tailwater will be determined both from pre-project irrigation audits and from post-project recording of tailwater pumping and changes in tailwater reservoir storage. Water quality characteristics will be determined by sampling selected tailwater reservoirs two times per irrigation season and analyzing these samples to determine their concentrations of salts, BOD, and nutrients. The water quality sampling program may be expanded at the discretion of the Water Use Efficiency program to include more extensive testing including testing for pesticides. However, because of the high costs associated with laboratory analysis for some constituents, the project budget has assumed laboratory analysis of a limited number of constituents.

Water Supply Reliability and Operational Flexibility

The tailwater recovery program's success in meeting its local objective of improving water supply reliability and operational flexibility for participating growers will be evaluated through interviews with these growers. They will be asked to describe how their operating practices have changed in response to the implementation of tailwater recovery systems. The purpose of these interviews will be both to evaluate the on-farm benefits of the program and to solicit ideas on how the tailwater recovery program can be improved in terms of either program formulation or the construction and operation of the tailwater recovery systems.

Consideration of External Factors

Influences external to the project are expected to play a role in the evaluation of the effectiveness of the tailwater recovery systems because the key yardsticks of performance, such as farm deliveries and system diversions, are affected by climate, cropping patterns, and the program's scale.

Therefore, the assessment of benefits will begin with the measurement of the volume of recycled water pumping, which is insulated from extraneous influences. Changes in delivered water volumes and discussions with growers on changes in irrigation practices will be used to determine the degree to which the introduction of recycled water resulted in changes in farm deliveries. This information will be used to capture on-farm benefits by describing the correspondence between recycled water volumes and changes in irrigation delivery patterns.

Because of the small number of fields participating in the project, any reductions in delivered water volumes at participating fields may be entirely obscured by factors having a larger impact on District diversions. Therefore, while an effort will be made to correlate changes in deliveries with changes in diversions, this correlation may not be apparent because of many confounding factors. If a correlation cannot be established between changes in farm deliveries at participating fields and OID diversions, reductions in farm deliveries will be used to represent the program's contribution to water conservation that benefits the Bay-Delta

Information About How Data and Other Information Will Be Handled, Stored, Reported, and Made Accessible to DWR and Others

Delivery data for fields participating in the tailwater recovery program, volumes of captured and recycled tailwater, and data on the timing of tailwater pumping will be downloaded to the OID computer system monthly. Annual reports of benefits and costs based on analyses of data contained in the OID database will be prepared for five years after the completion of the program.

Estimated Costs Associated with the Implementation of the Monitoring and Evaluation Plan

Estimated costs for implementation of the Monitoring and Evaluation Plan are $1,200 per site or $30,000 for a total of 25 sites. This total is included in the request for Water Use Efficiency program funds.

Qualifications of the Applicants and Cooperators

Resume of Project Manager

Kevin King, Special Project Coordinator of Oakdale Irrigation District, will be the project manager. He will supervise project implementation, including contracting with participating growers; monitor expenditures; and ensure that DWR requirements for monitoring, assessment, and reporting are fulfilled. His resume is included in Appendix A at the end of this application.

External Cooperators

A qualified water resources consultant will support OID in implementing the tailwater recovery program. This consultant will have knowledge of the District, its operations, and the design, construction, and operation of tailwater recovery systems. The consultant will also have to demonstrate a capacity to complete grant-funded projects in a timely manner and within the available budget. There are no known entities opposing this project.

Previous Water Use Efficiency Grant Projects

OID has not been the recipient of any previous Water Use Efficiency grants.

Disadvantaged Community Status

OID does not qualify as a disadvantaged community.

Outreach, Community Involvement, and Acceptance

Public outreach and education of a targeted group of OID customers will be vital to the success of the tailwater recovery program. Public outreach will be developed to perform the following functions:

- Describe the program to area growers
- Educate growers on program benefits
- Clearly describe the costs of owning and operating a tailwater recovery system
- Illustrate how the program proposes to distribute costs among the beneficiaries
- Solicit growers to be program participants

OID has already initiated discussions of the program with growers and neighboring water agencies and has received considerable support for the program as indicated by the letters of support it has received. Copies of these letters are included in Appendix C.

Innovation

The OID tailwater recovery program presents an innovative approach to pool the resources of the Water Use Efficiency program, OID, and local growers by forming partnerships to share the costs and benefits of program implementation. The installation of tailwater recovery systems at OID is expected to be particularly beneficial because of the characteristics of OID soils and cropping patterns and because of OID's water distribution practices. The program will be an early component of the wide-ranging improvements in OID irrigation management anticipated in coming years.

Benefits and Costs

Table 2 is an itemized budget for a single tailwater recovery system, based on the design criteria presented in the Preliminary Plans and Specifications and Certification Statements section of this application.

Table 2
Preliminary Costs—80-Acre Field Size and 1.5-Acre Nominal Pond Capacity

	Units	Quantity	Price	Cost
Tailwater pit excavation[1]	cubic yards	2,420	$3.27	$7,900
Tailwater collection ditch[2]	linear feet	2,750	$1.50	$4,100
Vertical turbine pump set	lump sum	1	$8,000	$8,000
Trash rack	lump sum	1	$500	$500
Flow meter	lump sum	1	$1,000	$1,000
Pump intake	lump sum	1	$500	$500
Pump discharge (black iron)	lump sum	1	$500	$500
Tailwater return pipeline (buried 8-inch PVC)[3]	linear feet	1,350	$11	$14,900
Control panel	lump sum	1	$1,500	$1,500
Electrical connection	lump sum	1	$12,000	$12,000
Subtotal – materials and installation				**$50,900**
Land occupied by tailwater collection ditch and tailwater pit	acre	2	$6,500	$13,000
Surveying	lump sum	1	$2,000	$2,000
Engineering and construction management	lump sum	6% of construction	$3,000	$3,000
Environmental documentation	lump sum	1	$1,000	$1,000
Program administration	lump sum	10% of construction	$5,100	$5,100
Monitoring and assessment	lump sum		$1,000	$1,200
Report preparation	lump sum	1	$500	$500
Subtotal – engineering and administration				**$12,800**
Contingency (10%)	lump sum			$7,670
Total Cost				**$84,370**

[1] Cost from R.S. Means 2004 Heavy Construction Cost Data; trench excavation 6 to 10 feet deep, using a hydraulic backhoe with a 1-cubic-yard bucket.

[2] Tailwater collection ditch is assumed to be a component of the grower cost-share, to be dug across the bottom of the field to convey tailwater to the tailwater pit. In some instances, this will be dug to reverse the direction of flow at the bottom of the field so that the tailwater pit can be at the same end of the field as the most upstream turnout. Where applicable, this configuration will reduce the length of the tailwater return pipeline and lower project construction and operation costs.

[3] Use of a buried return pipe is strongly recommended over the use of exposed pipe, based on experience at Imperial Irrigation District.

Distribution of Cost-Share

The proposed cost-sharing strategy is described below. The concept behind this approach is to hold growers responsible for making land available for project facilities and for simple earth work, to hold the District responsible for program administration and for the payment of fees associated with engineering and environmental documentation, and to apply Proposition 50 funds to the purchase and installation of hardware such as pumps, motors, pipes, and ancillary fittings.

Proposition 50 Allocation

Proposition 50 funds will be used to fund the monitoring and assessment activities and to purchase and install the following equipment:

- Vertical turbine pump
- Trash rack
- Pump intake
- Flow meter
- Pump discharge
- Tailwater return pipeline

Approximately $29,300 in Proposition 50 funds (including contingency) will be requested for each of the tailwater return systems. The costs associated with individual systems will vary with field size and shape.

This example shows a customer cost share of 32 percent, an OID cost share of 33 percent and a Proposition 50 cost share of 35 percent.

Table C-1: Project Implementation Costs (Budget)

Table C-1 applies the individual project budget shown in Table 1, the target of 25 tailwater recovery systems, and the cost-sharing formula described above to generate a program budget. Administrative costs are confined to salaries and benefits for OID staff.

Table C-2: Annual Operation and Maintenance Costs

Annual operation and maintenance costs will be borne by the participating growers. These costs break down into three categories:

- Power
- Maintenance
- Management and labor

PG&E agricultural rate schedules were used to compute average pumping costs. Using a blended value of the AG-1B rate and the AG4-B rate results in an estimated annual pumping cost of $625 per tailwater recovery system or $15,625 for the 25 systems.

Applicant: Oakdale Irrigation District

Table C-1: Project Costs (Budget) in Dollars)

	Category (I)	Project Costs $ (II)	Contingency % (ex. 5 or 10) (III)	Project Cost + Contingency $ (IV)	Applicant Share $ (V)	State Share Grant $ (VI)	Life of investment (years) (VII	Capital Recovery Factor (VIII)	Annualized Costs $ (IX)
	Administration[1]								
	Salaries, wages	$85,375	10	$93,913	$93,913	$0	20	0.0872	$8,189
	Fringe benefits	$42,125	10	$46,338	$46,338	$0	20	0.0872	$4,041
	Supplies	$0	0	$0	$0	$0		0.0000	$0
	Equipment	$0	0	$0	$0	$0		0.0000	$0
	Consulting services	$0	0	$0	$0	$0		0.0000	$0
	Travel	$0	0	$0	$0	$0		0.0000	$0
	Other	$0	0	$0	$0	$0		0.0000	$0
(a)	Total Administration Costs	$127,500		$140,250	$140,251	-$1			$12,230
(b)	Planning/Design/Engineering	$125,000	10	$137,500	$137,500	$0	20	0.0872	$11,990
(c)	Equipment Purchases/Rentals/Rebates/Vouchers	$0	0	$0	$0	$0	20	0.0872	$0
(d)	Materials/Installation/Implementation	$337,500	10	$371,250	$371,250	$0	20	0.0872	$32,373
(e)	Implementation Verification	$0	0	$0	$0	$0		0.0000	$0
(f)	Project Legal/License Fees	$0	0	$0	$0	$0		0.0000	$0
(g)	Structures	$0	0	$0	$0	$0		0.0000	$0
(h)	Land Purchase/Easement	$325,000	10	$357,500	$357,500	$0	20	0.0872	$31,174
(i)	Environmental Compliance/Mitigation/Enhancement	$25,000	10	$27,500	$27,500	$0	20	0.0872	$2,398
(j)	Construction	$935,000	10	$1,028,500	$330,000	$698,500	20	0.0872	$89,685
(k)	Other (Specify)								
(l)	Monitoring and Assessment	$30,000	10	$33,000	$0	$33,000	20	0.0872	$2,878
(m)	Report Preparation	$12,500	10	$13,750	$13,750	$0	20	0.0872	$1,199
(n)	**TOTAL**	$1,917,500		$2,109,250	$1,377,751	$731,499			$183,927
(o)	Cost Share -Percentage				65	35			

1- excludes administration O&M.

Applicant: **Oakdale Irrigation District**

Table C-2: Annual Operations and Maintenance Costs

Operations (1) (I)	Maintenance (II)	Other (III)	Total (IV) (I + II + II)
$22,900	$12,250		$35,150

(1) Include annual O & M administration costs here.

Table C-3: Total Annual Project Costs

Annual Project Costs (1) (I)	Annual O&M Costs (2) (II)	Total Annual Project Costs (III) (I + II)
$183,927	$35,150	$219,077

(1) From Table C-1, row (n) column (IX)
(2) From Table C-2, column (IV)

System maintenance costs center on the cost of removing sediment from the tailwater reservoir. It was assumed that soil loss from the participating fields would be approximately 2.5 tons per acre, a reasonable value for the irrigated pasture fields in which most systems are expected to be installed. If the tailwater recovery system captures 75 percent of this sediment (a conservative assumption), this would be equivalent to a volume of about 170 cubic yards (about 0.11 acre-foot). A local excavation cost of $2.00 per cubic yard has been applied for excavating and spreading the accumulated sediment, if the grower uses his own labor and farm equipment to perform the work. The assumed volume of annual sediment removal and the unit cost for handling sediment yield an annual cost of $340. Additional maintenance costs, including pump maintenance, are estimated at $150 per year.

The management and labor component of system operation is expected to require one hour of an irrigator's time for each irrigation in addition to the irrigator's other responsibilities. This management cost was estimated at approximately $500 per system per season and has been included, together with pumping costs, in Column 1 of Table C-2.

Table C-3: Total Annual Project Costs

Sums from Tables C-1 and C-2 are presented in Table C-3, Total Annual Project Costs.

Table C-4: Capital Recovery Factor

A capital recovery factor representing a 6 percent interest rate and a 20-year project life has been used to develop annualized project costs. It is expected that the tailwater recovery reservoir and the tailwater recovery channel will have indefinite lives, given the annual maintenance (sediment removal) that is budgeted for the project. Similarly, the buried PVC tailwater return pipeline is expected to have an operating life in excess of 20 years. Other project components, such as the electric motor and control panel are expected to have lives that will not exceed 20 years, although they are expected to remain in service for at least 15 years.

Table C-5: Project Annual Physical Benefits (Qualitative and Quantitative)

Bay-Delta benefits will accrue over the 20-year life of the project and can be divided into the following components:

- Water quality benefits
- Water supply reliability and flow timing benefits

The tailwater recovery program does not focus on reducing crop water use or other sources of consumptive demand and, therefore, would not generate quantifiable water savings. However, the program does reduce outflows of tailwater from the OID system and, by using this tailwater as a source of irrigation water supply, reduces delivery requirements to fields participating in the program.

The net benefits of tailwater recovery on the Bay-Delta can be divided into two elements: an immediate water quality benefit and water supply reliability and flow timing benefits.

Table C- 4: Capital Recovery Table (1)

Life of Project (in years)	Capital Recovery Factor
1	1.0600
2	0.5454
3	0.3741
4	0.2886
5	0.2374
6	0.2034
7	0.1791
8	0.1610
9	0.1470
10	0.1359
11	0.1268
12	0.1193
13	0.1130
14	0.1076
15	0.1030
16	0.0990
17	0.0954
18	0.0924
19	0.0896
20	0.0872
21	0.0850
22	0.0830
23	0.0813
24	0.0797
25	0.0782
26	0.0769
27	0.0757
28	0.0746
29	0.0736
30	0.0726
31	0.0718
32	0.0710
33	0.0703
34	0.0696
35	0.0690
36	0.0684
37	0.0679
38	0.0674
39	0.0669
40	0.0665
41	0.0661
42	0.0657
43	0.0653
44	0.0650
45	0.0647
46	0.0644
47	0.0641
48	0.0639
49	0.0637
50	0.0634

(1) Based on 6% discount rate.

Applicant: **Oakdale Irrigation District**

Table C-5 Project Annual Physical Benefits (Quantitative and Qualitative Description of Benefits)

	Qualitative Description - Required of all applicants[1]				**Quantitative Benefits - where data are available [2]**
	Description of physical benefits (in-stream flow and timing, water quantity and water quality) for:	Time pattern and Location of Benefit	Project Life: Duration of Benefits	State Why Project Bay Delta benefit is Direct[3] Indirect [4] or Both	Quantified Benefits (in-stream flow and timing, water quantity and water quality)
Bay Delta	See attached sheet	see application text	20	Direct	
Local	See attached sheet	see application text	20	**Not applicable.**	

[1] The qualitative benefits should be provided in a narrative description. Use additional sheet.

[2] Direct benefits are project outcomes that contribute to a CALFED objective within the Bay-Delta system during the life of the project.

[3] Indirect benefits are project outcomes that help to reduce dependency on the Bay-Delta system. Indirect benefits may be realized over time.

[4] The project benefits that can be quantified (i.e. volume of water saved or mass of constituents reduced) should be provided.

- The immediate water quality benefit: The volume of low-quality, high temperature tailwater flowing to the Bay-Delta system will be reduced by approximately 3,000 acre-feet per year. Assuming an average TDS concentration of 700 milligrams per liter, eliminating this outflow would remove approximately 360 tons of salt annually from the Bay-Delta system.

- The water supply reliability and flow timing benefit: By reducing demands for delivered water, water can be retained in New Melones Reservoir for its later release as a component of environmental or water supply reliability programs. Because such releases need not be routed through the OID system, they can be scheduled to meet the requirements of program participants and would not be degraded in either quality or temperature.

- The overall reliability and timing impacts: By substituting tailwater for system deliveries as a source of local irrigation supply, it would be possible to replace tailwater outflows with reservoir releases as the pathway through which water could be routed to the Bay-Delta. These actions increase on-farm water supply reliability because they give growers more immediate control over a portion of their water supplies. The actions also increase water supply reliability for the Bay-Delta because they free a portion of Bay-Delta inflows from irrigation operations. In addition, the tailwater currently suffers losses to evaporation and evapotranspiration from drainage ditches. Although not quantifiable at this time, reducing these losses will contribute to an increased water supply in the system.

Table C-6: Project Annual Local Monetary Benefits

OID will receive no annual monetary benefits from the installation of the tailwater recovery systems because its obligation to operate and maintain its facilities would be unchanged.

Participating growers will receive a level of monetary benefit related to the reduction in delivered water that will be a requirement of program participation. Participating growers now pay approximately $3.55 per acre-foot for delivered water. Reducing deliveries by 120 acre-feet per year for a typical field receiving a tailwater system would reduce payments by approximately $426 per year. Given an estimated operating cost of $1,400 per year, savings from reduced deliveries would pay approximately one-third of the annual operating costs.

Table C-7: Project Local Monetary Benefits and Project Costs

Table C-7 compares the annual project local monetary benefits, as described above, with project costs from Table C-1.

Table C-8: Applicant's Cost Share and Description

As noted previously in this grant application, an innovative aspect of the program formulation is that the local cost share is divided into two components:

Applicant: **Oakdale Irrigation District**

Table C-6 Project Annual Local Monetary Benefits

ANNUAL LOCAL BENEFITS	ANNUAL QUANTITY	UNIT OF MEASUREMENT	ANNUAL MONETARY BENEFITS
(a) Avoided Water Supply Costs (Current or Future Source)	3000	acre-feet	$10,650
(b) Avoided Energy Costs	0		$0
(c) Avoided Waste Water Treatment Costs	0		$0
(d) Avoided Labor Costs	0		$0
(e) Other (describe)	0		$0
(f) Total [(a) + (b) + (c) + (d) + (e)]			$10,650

Table C-7 Project Local Monetary Benefits and Project Costs

(a) Total Annual Monetary Benefits [(Table C-6, row (f)]		$10,650
(b) Total Annual Project Costs (Table C-3, column III)		$219,077

Table C-8 Applicant's Cost Share and Description

Applicant's cost share %: (from Table C-1, row o, column V)	**65**
Describe how the cost share (based on relative balance between Bay-Delta and Local Benefits) is derived. (See Section A-7 for description.)	
Provide Description in a narrative form.	

- A component funded by the participating growers who are direct beneficiaries of the program
- A component funded by OID

Grower Cost-Share

Under the cost-sharing strategy outlined above, growers would contribute land occupied by the tailwater collection and recirculation facilities and the following construction items:

- Excavation of the tailwater pond
- Excavation of the tailwater collection ditch

The mix between cash and in-kind contributions of these items will depend on the resources and preferences of each individual grower. The estimated cash value of these items (including approximately 2.0 acres of land and a contingency) is about $27,500 for each tailwater recovery system.

OID Cost-Share

The OID cost-share is concentrated on administration (an in-kind cost) and payment for services including the following:

- Surveying
- Engineering
- Environmental documentation
- Electrical connections (including control panel)
- Report preparation

The value of the OID cost-share is estimated to be approximately $5,600 in administrative services and about $21,500 in payment to consultants and for electrical connections (all values include a contingency). These cost-share components yield a total OID contribution of approximately $27,600 for each tailwater recovery system.

The total local cost share is equivalent to 65 percent of the overall program costs, or $1,337,751 of a total cost of $2,109,250.

Appendix A

Resume of Kevin King

Kevin L. King
1205 East F Street, Oakdale, CA. 95361
(209) 847-0341 extension 209
kking@oakdaleirrigation.com

Summary

Mr. King is an experienced project manager with nearly six years of water resource planning and management experience that has included the implementation of numerous programs. He has been instrumental in the successful completion of both local and regional irrigation and drainage projects. Mr. King's experience and education have prepared him in a manner that is consistent with the demands and responsibilities required of a water resource management professional.

Education

Masters Degree in Business Administration *In Process*
California State University Stanislaus, Turlock, CA.

B.S. Degree in Agricultural Systems Management *2001*
California Polytechnic State University, San Luis Obispo, CA.
Double Minor: Water Science; Agribusiness

Career History & Accomplishments

Special Project Coordinator, *Oakdale Irrigation District* *Current*

- Work directly and assist the General Manager on day to day operations of Oakdale Irrigation District. Key responsibilities include Resource Planning, Water Conservation, and Regulatory Compliance.
- Vice Chairman, Stanislaus & Tuolumne Rivers Groundwater Basin Association.
- Project Manager, Oakdale Irrigation District – Boundary Flow Measurement Program.
- Assistant Project Manager, Oakdale Irrigation District – Water Resource Plan. Developing a major water resource management plan to guide the District operations and management for the next 20 years.
- Project Manager, Oakdale Irrigation District – Agricultural Waiver Monitoring and Reporting Program.
- Project Manager, Oakdale Irrigation District – Aquatic Pesticide Application Program.
- Participation in various regional planning efforts, including the development of an Integrated Resource Management Plan for the Modesto Groundwater Basin, as well as for the Eastside Region of the Central Valley Project.

Resource Conservation Specialist, *Patterson Irrigation District* *2001-2003*

- Held key responsibility in this small, dynamic California Irrigation District for helping facilitate and implement an extensive modernization program.
- Worked directly with the General Manager to develop, design, construct and implement various projects centered on increasing water and energy resource efficiencies and customer service.
- Operated and maintained a fully automated downstream controlled open lateral distribution system.
- Project Manager, Patterson Irrigation District – Water Use Management and Billing Program.

Research Assistant, *Irrigation Training & Research Center, Cal Poly SLO* *2000-2001*

- Contributed to various projects centered on irrigation research and education.
- Performed irrigation evaluations.
- Prepared reports and evaluations on flow measurement equipment.

Memberships & Affiliations

- Member, United States Committee on Irrigation and Drainage
- Member, Planning Committee for the 2007 International Conference on Irrigation and Drainage
- Alumni Member, Kappa Sigma Fraternity

Appendix B

Environmental Checklist

Appendix B – Tailwater Recovery Program

Environmental Checklist Form

1. Project title: **Oakdale Irrigation District – Tailwater Recovery Program**

2. Lead agency name and address:

   Oakdale Irrigation District
   1205 East F Street
   Oakdale, CA 95361

3. Contact person and phone number: **Mr. Steve Knell, (209) 847-0341**

4. Project location: **Stanislaus County, CA**

5. Project sponsor's name and address:

   Mr. Steve Knell
   Oakdale Irrigation District
   1205 East F Street
   Oakdale, CA 95361

6. General plan designation: **Agriculture** 7. Zoning: **A-1**

8. Description of project: (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary.)

   The proposed project includes the construction of on-farm tailwater recovery facilities to control discharges of agricultural tailwater and to enable this tailwater to be reapplied to farm fields.

9. Surrounding land uses and setting: (Briefly describe the project's surroundings.)

   The proposed project is located in Stanislaus County, around the city of Oakdale. The project area is entirely agriculturally converted floodplains.

10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)

    None, work will be conducted on farm fields and area of land to be disturbed at individual sites is under five acres.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture Resources	☐ Air Quality
☐ Biological Resources	☐ Cultural Resources	☐ Geology/Soils
☐ Hazards & Hazardous Materials	☐ Hydrology/Water Quality	☐ Land Use/Planning
☐ Mineral Resources	☐ Noise	☐ Population/Housing
☐ Public Services	☐ Recreation	☐ Transportation/Traffic
☐ Utilities/Service Systems	☐ Mandatory Findings of Significance	

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

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

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

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

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

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature	Date
Printed name	For

Appendix C

Letters of Support

SRK

12/14/04

RECEIVED
DEC 1 5 2004
OAKDALE IRRIGATION DISTRICT

STANISLAUS COUNTY FARM BUREAU

JORGE A. ALVARADO
PRESIDENT

WAYNE ZIPSER
EXECUTIVE MANAGER

1201 L Street
Modesto, CA 95354
Phone: (209) 522-7278
Fax: (209) 521-9938
Info@stanfarmbureau.org

SERVING AGRICULTURE SINCE 1914

Ms. Debra Gonzalez
Department of Water Resources
Office of Water Use Efficiency
P.O. Box 942836
Sacramento, California, 94236-0001

RE: Endorsement of the Oakdale Irrigation District – Tail-water Recovery and Water Use Efficiency Project

Dear Ms. Gonzalez:

The Stanislaus County Farm Bureau supports and endorses the implementation of a Tail-water Recovery and Water Use Efficiency project for the Oakdale Irrigation District and encourages the California Department of Water Resources to fund this exemplary project.

The proposed tail-water recovery project will provide for the installation of on-farm tail-water recovery systems. The primary objective of installing tail-water recovery systems at OID is to conserve water by reducing delivered water volumes and to eliminate tail-water discharges. Providing on-farm storage to improve irrigation scheduling flexibility will be a secondary, yet important benefit. Allowing on-farm water managers to take advantage of various conservation practices including pump operation during off-peak hours.

We recognize the importance of water use efficiency projects, as well as the tremendous benefits that this project provides to the well being of residents, the environment, and the economic interests of the communities within the Oakdale Irrigation District service area. A grant from DWR will enable OID to undertake this great project; a project specifically designed to better manage such a precious resource. We strongly encourage your support in funding this project.

Sincerely,

Wayne D. Zipser, Executive Manager
Stanislaus County Farm Bureau

December 14, 2004

Ms. Debra Gonzalez
Department of Water Resources
Office of Water Use Efficiency
P.O. Box 942836
Sacramento, California, 94236-0001

RE: Endorsement of the Oakdale Irrigation District – Tail-water Recovery and Water Use Efficiency Project

Dear Ms. Gonzalez:

I, John Brichetto, support and endorse the implementation of a Tail-water Recovery and Water Use Efficiency project for the Oakdale Irrigation District and encourage the California Department of Water Resources to fund this exemplary project.

The proposed tail-water recovery project will provide for the installation of on-farm tail-water recovery systems. The primary objective of installing tail-water recovery systems at OID is to conserve water by reducing delivered water volumes and to eliminate tail-water discharges. Providing on-farm storage to improve irrigation scheduling flexibility will be a secondary, yet important benefit. Allowing on-farm water managers to take advantage of various conservation practices including pump operation during off-peak hours.

I recognize the importance of water use efficiency projects, as well as the tremendous benefits that this project provides to the well being of residents, the environment, and the economic interests of the communities within the Oakdale Irrigation District service area. A grant from DWR will enable OID to undertake this great project; a project specifically designed to better manage such a precious resource. I strongly encourage your support in funding this project.

Sincerely,

John P Brichetto

John Brichetto

Independent Grower &
Oakdale Irrigation District Water User

MERCED IRRIGATION DISTRICT

December 20, 2004

Ms. Debra Gonzalez
Department of Water Resources
Office of Water Use Efficiency
P.O. Box 942836
Sacramento, CA 94236-0001

RE: Endorsement of the Oakdale Irrigation District – Tail-water Recovery and Water Use Efficiency Project

Dear Ms. Gonzalez:

The Merced Irrigation District (MID) supports and endorses the implementation of a Tail-water Recovery and Water Use Efficiency project for the Oakdale Irrigation District (OID) and encourages the California Department of Water Resources (DWR) to fund this exemplary project.

The proposed tail-water recovery project will provide for the installation of on-farm tail-water recovery systems. It is my understanding that the primary objective of installing tail-water recovery systems at OID is to conserve water by reducing delivered water volumes and to eliminate tail-water discharges. Providing on-farm storage to improve irrigation scheduling flexibility will be a secondary, yet important benefit, allowing on-farm water managers to take advantage of various conservation practices including pump operation during off-peak hours.

Our district recognizes the importance of water use efficiency projects such as being proposed by OID. MID has successfully implemented many such projects. OID realizes the tremendous benefits that projects of this type provide to the well being of residents, the environment, and the economic interests of the communities within its service area. A grant from DWR will enable OID to undertake this great project; a project specifically designed to better manage such a precious resource. We strongly encourage your support in funding this project.

Sincerely,

E. C. "Ted" Selb III
Deputy General Manager

cc: Kevin King, Oakdale Irrigation District

744 West 20th Street P.O. BOX 2288 Merced, California 95344-0288
Administration / Electric Services (209) 722-5761 / FAX (209) 722-6421 / Water Resources Engineering (209) 722-5761 / FAX (209) 726-4176
Finance \ Billing Dept. (209) 722-3041 / FAX (209) 722-1457 / Irrigation Operations (209) 722-2720 / FAX (209) 722-1457

Modesto Irrigation District
Water and Power

1231 Eleventh St.
P.O. Box 4060
Modesto, CA 95352
(209) 526-7373

January 3, 2005

Ms. Debra Gonzalez
Department of Water Resources
Office of Water Use Efficiency
P.O. Box 942836
Sacramento, California, 94236-0001

RE: Endorsement of the Oakdale Irrigation District – Tail-water Recovery and Water Use Efficiency Project

Dear Ms. Gonzalez:

The Modesto Irrigation District supports and endorses the implementation of a Tail-water Recovery and Water Use Efficiency project for the Oakdale Irrigation District and encourages the California Department of Water Resources to fund this exemplary project.

The proposed tail-water recovery project will provide for the installation of on-farm tail-water recovery systems. The primary objective of installing tail-water recovery systems at OID is to conserve water by reducing delivered water volumes and to eliminate tail-water discharges. Providing on-farm storage to improve irrigation scheduling flexibility will be a secondary, yet important benefit. Allowing on-farm water managers to take advantage of various conservation practices, including pump operation during off-peak hours, will also reduce electrical costs.

We recognize the importance of water use efficiency projects, as well as the tremendous benefits that this project provides to the well being of residents, the environment, and the economic interests of the communities within the Oakdale Irrigation District service area. A grant from DWR will enable OID to undertake this great project; a project specifically designed to better manage our water resources. We strongly encourage your support in funding this project.

Sincerely,

Allen Short

Allen Short
General Manager

OAKDALE IRRIGATION DISTRICT

January 6, 2005

Ms. Debra Gonzalez
Office of Water Use Efficiency
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236-0001

Re: Water Use Efficiency Grant Application for the Oakdale Irrigation District's Tailwater Recovery Project

Dear Ms. Gonzalez:

Oakdale Irrigation District (OID) is pleased to submit the enclosed grant application to fund the development of the Tailwater Recovery Program. This program is OID's initial step to reduce the volume of tailwater flowing out of its service area. The primary goal of this program is to reduce these outflows and to reduce the diversions needed to support irrigation by substituting recycled tailwater.

OID is a good candidate for a tailwater recovery program because much of OID is underlain by hardpan, and the hay and pasture crops are irrigated with flood/surface irrigation, which generate high volumes of tailwater.

Please feel free to call me at (209) 847-0341, ext. 208, if you have any questions or wish to discuss any issues presented in this application.

Sincerely,

OAKDALE IRRIGATION DISTRICT

Steven Knell,
General Manager

Enclosure

1205 East F Street / Oakdale, CA 95361 / (209) 847-0341 / Fax (209) 847-3468
E-Mail Address: oakdaleirrigation.com