*A Project of*

*The Sacramento Valley*

Water Management Agreement

# ACID Main Canal Modernization Projects

CALFED
BAY-DELTA
PROGRAM

PREPARED FOR

**CALIFORNIA DEPARTMENT OF WATER RESOURCES**
**WATER USE EFFICIENCY PROGRAM**

March 1, 2002

W022002007RDD_900

**Consolidated Water Use Efficiency 2002 PSP**
**Proposal Part One:**
**A. Project Information Form**

1. Applying for (select one):
   - ☐ (a) Prop 13 Urban Water Conservation Capital Outlay Grant
   - ☐ (b) Prop 13 Agricultural Water Conservation Capital Outlay Feasibility Study Grant
   - ☒ (c) DWR Water Use Efficiency Project
2. Principal applicant (Organization or affiliation): Anderson-Cottonwood Irrigation District
3. Project Title: Main Canal Modernization Project to Partially Address CALFED Quantifiable Objectives 6 and 7
4. Person authorized to sign and submit proposal:
   - Name, title: Dee Swearingen, General Manager
   - Mailing address: 2810 Silver St., Anderson, CA 96007-4297
   - Telephone: (530) 365-7329
   - Fax.: (530) 365-7623
   - E-mail: acid@shasta.com
5. Contact person (if different):
   - Name, title.: (same as above)
   - Mailing address.:
   - Telephone:
   - Fax.:
   - E-mail:
6. Funds requested (dollar amount): $6.3 million (estimated)
7. Applicant funds pledged (dollar amount): $0.00
8. Total project costs (dollar amount): $6.3 million
9. Estimated total quantifiable project benefits (dollar amount): To be determined by Feasibility Study, but currently estimated at $1 million per year (20,000 acre-feet at $50 per acre-foot)

**Consolidated Water Use Efficiency 2002 PSP**
**Proposal Part One:**
**A. Project Information Form (continued)**

Percentage of benefit to be accrued by applicant: To be determined by Feasibility Study

Percentage of benefit to be accrued by CALFED or others: To be determined by Feasibility Study

10. Estimated annual amount of water to be saved (acre-feet): 20,000

Estimated total amount of water to be saved (acre-feet): 20,000 acre-feet/year in perpetuity

Estimated benefits to be realized in terms of water quality, instream flow, other: Saving of 20,000 acre-feet/year in seepage and other losses will presumably result in potential increases in instream flows with corresponding ecological and water quality benefits.

11. Duration of project (month/year to month/year): July 2002 to April 2004

12. State Assembly District where the project is to be conducted: District 2

13. State Senate District where the project is to be conducted: District 4

14. Congressional district(s) where the project is to be conducted: District 2

15. County where the project is to be conducted: Shasta

16. Date most recent Urban Water Management Plan submitted to the Department of Water Resources: N/A

17. Type of applicant (select one):
Prop 13 Urban Grants and Prop 13 Agricultural Feasibility Study Grants:

- ☐ (a) city
- ☐ (b) county
- ☐ (c) city and county
- ☐ (d) joint power authority
- ☒ (e) other political subdivision of the State, including public water district
- ☐ (f) incorporated mutual water company

DWR WUE Projects: the above entities (a) through (f) or:

- ☐ (g) investor-owned utility
- ☐ (h) non-profit organization
- ☐ (i) tribe
- ☐ (j) university
- ☐ (k) state agency
- ☐ (l) federal agency

**Consolidated Water Use Efficiency 2002 PSP**
**Proposal Part One:**
**A. Project Information Form (continued)**

18. Project focus:

- ☒ (a) agricultural
- ☐ (b) urban

19. Project type (select one):
Prop 13 Urban Grant or Prop 13 Agricultural Feasibility Study Grant capital outlay project related to:

- ☐ (a) implementation of Urban Best Management Practices
- ☐ (b) implementation of Agricultural Efficient Water Management Practices
- ☐ (c) implementation of Quantifiable Objectives (include QO number(s))

  6 and 7
- ☐ (d) other (specify)

DWR WUE Project related to:

- ☐ (e) implementation of Urban Best Management Practices
- ☒ (f) implementation of Agricultural Efficient Water Management Practices
- ☐ (g) implementation of Quantifiable Objectives (include QO number(s)) 6 and 7.
- ☐ (h) innovative projects (initial investigation of new technologies, methodologies, approaches, or institutional frameworks)
- ☐ (i) research or pilot projects
- ☐ (j) education or public information programs
- ☐ (k) other (specify)

20. Do the actions in this proposal involve physical changes in land use, or potential future changes in land use?

- ☐ (a) yes
- ☒ (b) no

If yes, the applicant must complete the CALFED If yes, the applicant must complete the CAL PSP Land Use Checklist found at http://calfed.water.ca.gov/environmental_docs.ht ml and submit it with the proposal.

**Consolidated Water Use Efficiency 2002 PSP**
**Proposal Part One:**
**B. Signature Page**

By signing below, the official declares the following:

The truthfulness of all representations in the proposal;

The individual signing the form is authorized to submit the proposal on behalf of the applicant; and

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.

| | | |
|---|---|---|
| _____ | Dee Swearingen, General Manager | _____ |
| Signature | Name and title | Date |

# Proposal Part Two

## Project Summary

The District proposes to construct 17 new automated flow control and measurement structures using a centralized control facility along the ACID Main Canal and major laterals in an effort to continuously control and monitor system flows to increase water use efficiency (Figure 1). Also, the project would include lining critical canal sections with high seepage rates to reduce seepage losses.

The District diverts water from the Sacramento River in Redding, California, primarily from a gravity diversion in the river at the seasonal ACID diversion dam in Redding. The District also operates a pump station on the river several miles downstream to supply a lateral canal. ACID's distribution system includes approximately 35 miles of Main Canal, about 98 percent of which is unlined. The Main Canal flows through six inverted siphons to cross streams, such as Clear Creek, and also three flume sections across smaller streams and lowland areas. Several wasteways are located along the canal route, which return water to the Sacramento River and local streams when flow exceeds the capacity of the canal.

The District is unmetered and has flow measurement capabilities at only one location on the Main Canal. Water management has historically been limited to management of the headgate near the river and manual control structures downstream, with surpluses spilling at the various wasteways. Also, canal seepage is significant in certain sections near natural creek and drainage channels where soils are fast draining and the canal contributes directly to the underlying groundwater basin.

The project includes two components: installing the control and measurement facilities and lining sections of the canal to achieve the goals and objectives of improved water management and reduce seepage losses. These objectives are compatible with **CALFED Quantifiable Objectives 6 and 7 for Sub-Region 1 (Redding Basin).** Methods to be implemented include installing flow measurement devices, water control facilities, and telemetry along the Main Canal and lining critical sections of the Main Canal. Project procedures will include CEQA and NEPA compliance, provision for public participation, and long-term monitoring. The expected outcomes of the project include a Feasibility Report, preliminary and final design, permitting and environmental documentation, construction, operation, and monitoring. The estimated $6.3 million project is anticipated to provide greatly improved ability to manage the District's supply and reduced seepage losses, potentially saving 20,000 acre-feet per year.

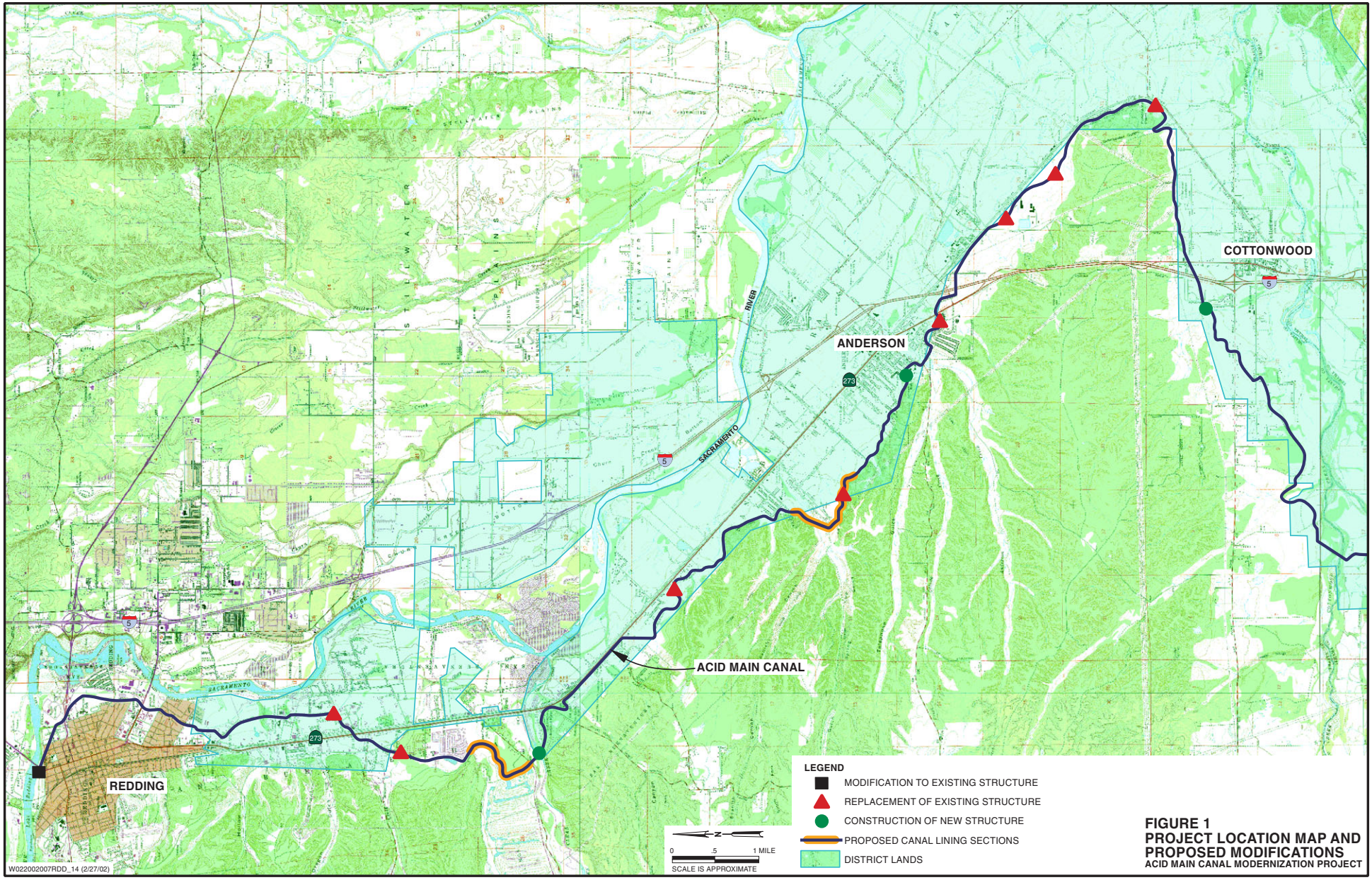


**FIGURE 1**
**PROJECT LOCATION MAP AND PROPOSED MODIFICATIONS**
**ACID MAIN CANAL MODERNIZATION PROJECT**

# A. Scope of Work: Relevance and Importance

## 1. Nature, Scope, and Objectives

The proposed project was identified in the Short-term Workplan developed as part of the Sacramento Valley Water Management Agreement (Agreement). This unprecedented agreement was developed by Sacramento Valley water users, export interests, the California Department of Water Resources (DWR), and U.S. Bureau of Reclamation (USBR) as an alternative to a potentially contentious process within Phase 8 of the State Water Resources Control Board (SWRCB) Bay-Delta Water Rights Hearings. The intent of the Agreement is to establish a framework to meet water supply, water quality, and environmental needs through a cooperative project development process. Each of the water system improvement projects evaluated under the Agreement, including the project described herein, would provide benefits toward achieving at least one of four quantifiable objectives:

- Provide flow to improve aquatic ecosystem conditions
- Decrease nonproductive evapotranspiration (ET)
- Provide long-term diversion flexibility to increase the water supply for beneficial uses
- Reduce salinity to enhance and maintain beneficial uses of water

The District proposes to construct 17 new automated flow control and measurement structures with telemetry along the ACID Main Canal and major laterals to continuously control and monitor system flows to increase water use efficiency. Also, the project would include lining critical canal sections with high seepage to reduce seepage losses. The District diverts water from the Sacramento River in Redding, California, primarily from a gravity diversion in the river at the seasonal ACID diversion dam in Redding. The District also operates a pump station on the river several miles downstream to supply a lateral canal. ACID's distribution system includes approximately 35 miles of Main Canal, about 98 percent of which is unlined. The Main Canal flows through six inverted siphons to cross streams, such as Clear Creek, and also three flume sections across smaller streams and lowland areas. Several wasteways are located along the canal route, which return water to the Sacramento River and local streams when flow exceeds the capacity of the canal. The District is unmetered and has flow measurement capabilities at only one location on the Main Canal. Water management has historically been limited to management of the headgate near the river and manual control structures downstream, with surpluses spilling at the various wasteways. Also, canal seepage is significant in certain sections near natural creek and drainage channels where soils are fast draining and the canal contributes directly to the underlying groundwater basin. The goals and objectives of the two-component project are to facilitate improved water management and reduce seepage losses.

The District is separately seeking Proposition 13 funding to complete the project Feasibility Study (FS), begun with funding awarded during the previous funding cycle.

### Critical Local, Regional, Bay-Delta, State, or Federal Water Issues

**Local Water Management Initiatives.** ACID is one of 14 Redding Area Water Council (RAWC) members working on a regional plan to solidify the Basin's water resources through 2030. This proposal is consistent with the plan; it will help to quantify water

requirements at key District locations and provide better information on seepage rates from the District's unlined canals. Data from monitoring ACID's system will help to enhance the RAWC surface-water/groundwater model and evaluate future water management options.

**Basin-wide Water Management Plan.** ACID is among the Sacramento Valley Settlement Contractors who are partners with the USBR in developing the Sacramento River Basin-wide Water Management Plan (BWMP) with the assistance of the DWR. This proposed project would implement some of the water use efficiency recommendations of the BWMP.

**Sacramento Valley Water Management Agreement.** The project also is an outgrowth of the Sacramento Valley Water Management Agreement reached in April 2001 among more than 100 organizations. The Agreement was reached as part of Phase 8 of the SWRCB Bay-Delta Water Rights Hearings by the Sacramento Valley water users, the DWR, USBR, and export water users. The Agreement is consistent with other water management activities and provides for managing water in a way that meets water supply, water quality, and environmental needs throughout the Sacramento Valley and the State of California.

**California Public Policy.** The California Constitution and California Water Code prohibit "waste or unreasonable use" of water and exclude from water rights any water that is not reasonably required for beneficial use. The SWRCB places water conservation conditions on water rights permits that it approves.

**Central Valley Project Improvement Act and State Water Project Policy.** The Central Valley Project Improvement Act **(**CVPIA) calls for water conservation criteria to promote the "highest level of water use efficiency reasonably achievable by project contractors." Some State Water Project (SWP) contracts include conservation requirements, and some water rights granted to the SWP by the SWRCB include specific conservation requirements.

**CALFED Bay-Delta Program and Linkage to Quantifiable Objectives.** CALFED's Water Use Efficiency (WUE) Program and Quantifiable Objectives (QO) are intended to help ensure that California's water is used efficiently and provides multiple benefits. The proposed project will contribute directly to Sub-Region 1 (Redding Sub-basin) QOs 6 and 7 by reducing Sacramento River diversions and reducing spillage and seepage from the ACID Main Canal, respectively. CALFED has not defined Priority Outcomes for the Sacramento River in Sub-Region 1.

# B. Scope of Work: Technical/Scientific Merit, Feasibility, Monitoring, and Assessment

## 1. Methods, Procedures, and Facilities

The project has two components—Control and Measurement Facilities and Canal Lining.

### Control and Measurement Facilities Component

The control and measurement facilities component consists of installing flow measurement devices, water control facilities, and automated control devices along the Main Canal. It is assumed that environmental compliance requirements would be minimal because the improvements would occur within the footprint of the canal or its laterals and have little or

no direct short- or long-term environmental impacts. However, if it is determined during environmental evaluations of this or other Sacramento Valley Water Management Agreement projects that reduction in spills to adjacent drainages as a result of improved water management is a significant environmental consequence, the timeframe for project implementation may be revised.

The benefits of this component would be realized during the 2004 irrigation season when construction is completed and the new facilities are put into service. This completion date assumes receipt of funding for the FS by July 2002 and timely funding of design, environmental documentation, and construction. Implementation of this component would entail the necessary site selection, design, construction, construction management, and post-construction monitoring associated with the following facilities:

- **Water control structures—**Facilities located along the ACID Main Canal, combining new construction and retrofit of existing structures, are as follows:
  - Replacement of motor for existing radial gate headworks structure.
  - Construction of three new concrete control structures with motor-operated radial gates or slide gates. General locations and design flows that have been estimated for the three new control structures are as follows:
    - Immediately downstream of Churn Creek Lateral in south Redding, 320 cubic feet per second (cfs)
    - South of Anderson near Anderson High School, 250 cfs
    - Northeast of Cottonwood, near Schmeider Gulch and Balls Ferry Road, 150 cfs
  - Replacement of 12 turnouts on the Main Canal with new concrete structures and motor-operated slide gates.
  - Construction of a siphon and wasteway at Crowley Gulch.
  - Construction of a siphon at the Main Canal crossing of Olney Creek.
- **13 measurement stations—**Each turnout will have a flow measurement device. One additional measurement station will be installed on the Main Canal.
- **Supervisory control and data acquisition (SCADA) facilities—**Automation through the installation of SCADA facilities integrated with the each water measurement and control structure.

### Canal Lining Component

This portion of the project would include the lining of critical sections of the Main Canal. The environmental documentation requirements could be more significant for the canal lining component than for the control and measurement facilities component because of the potential effects of canal lining on surface water and groundwater adjacent to the canal. However, for the purposes of this proposal, it will be assumed that environmental documentation can be completed in the same time frame as for the control and measurement structures. Therefore, the canal lining component would be completed between the 2003 and

2004 irrigation seasons. Reconnaissance, feasibility studies, and conceptual design are anticipated to be conducted concurrent with the studies for the control and measurement facilities component, lasting approximately 5 months. The benefits of the project would be realized during the 2004 irrigation season when construction is completed. Implementation of this component would entail the necessary site selection, design, construction, construction management, and post-construction monitoring associated with the following facilities:

- **2.0 miles of canal lining—**Concrete lining would occur in the high seepage, sandy areas of the ACID Main Canal, presumably about 2.0 miles in total length. It is expected that approximately 1.0 mile of canal would be lined just north of Clear Creek, 0.2 mile would be lined 1 mile south of Happy Valley Road near Highway 273, 0.2 mile would be lined 1½ miles south of Happy Valley Road near Highway 273, and 0.6 mile would be lined just south of Spring Gulch.

## 2. Task List and Schedule

Extensive engineering and environmental investigations are necessary to further evaluate this project. The implementation plan is shown on Figure 2. Figure 3 shows costs by project phase and quarter in year 2002 dollars not adjusted for inflation. Specific tasks necessary to complete the project, some of which (i.e., Feasibility Study) were initiated under a previous grant, are as follows:

### Phase I—Feasibility Study

**1.1 Data Collection and Mapping—**This task will focus on collecting the remainder of the necessary field data during operation of the canal (previously funded investigations occurred when the system was out of service for the non-irrigation season). Hydraulic studies and conceptual design will be completed. Preliminary geotechnical data will also be gathered to confirm the locations and extent of seepage problems and verify that we are targeting the most critical areas for canal lining. (This task is about 95 percent complete as a result of funding of last year's Prop 13 application.)

***Deliverables:*** Remainder of canal water-surface elevation data and update of hydraulic model to incorporate these data.

**1.2 Environmental Reconnaissance—**This task would provide for biological field surveys, resource database review, and other reconnaissance necessary to determine permitting requirements and the appropriate level of environmental documentation required to implement each of the two project components. This task would also support site selection in the preliminary design task by identifying any sensitive areas or issues of environmental concern. (This task is approximately 20 percent complete as a result of funding of last year's Prop 13 application.)

***Deliverables:*** Environmental checklists.

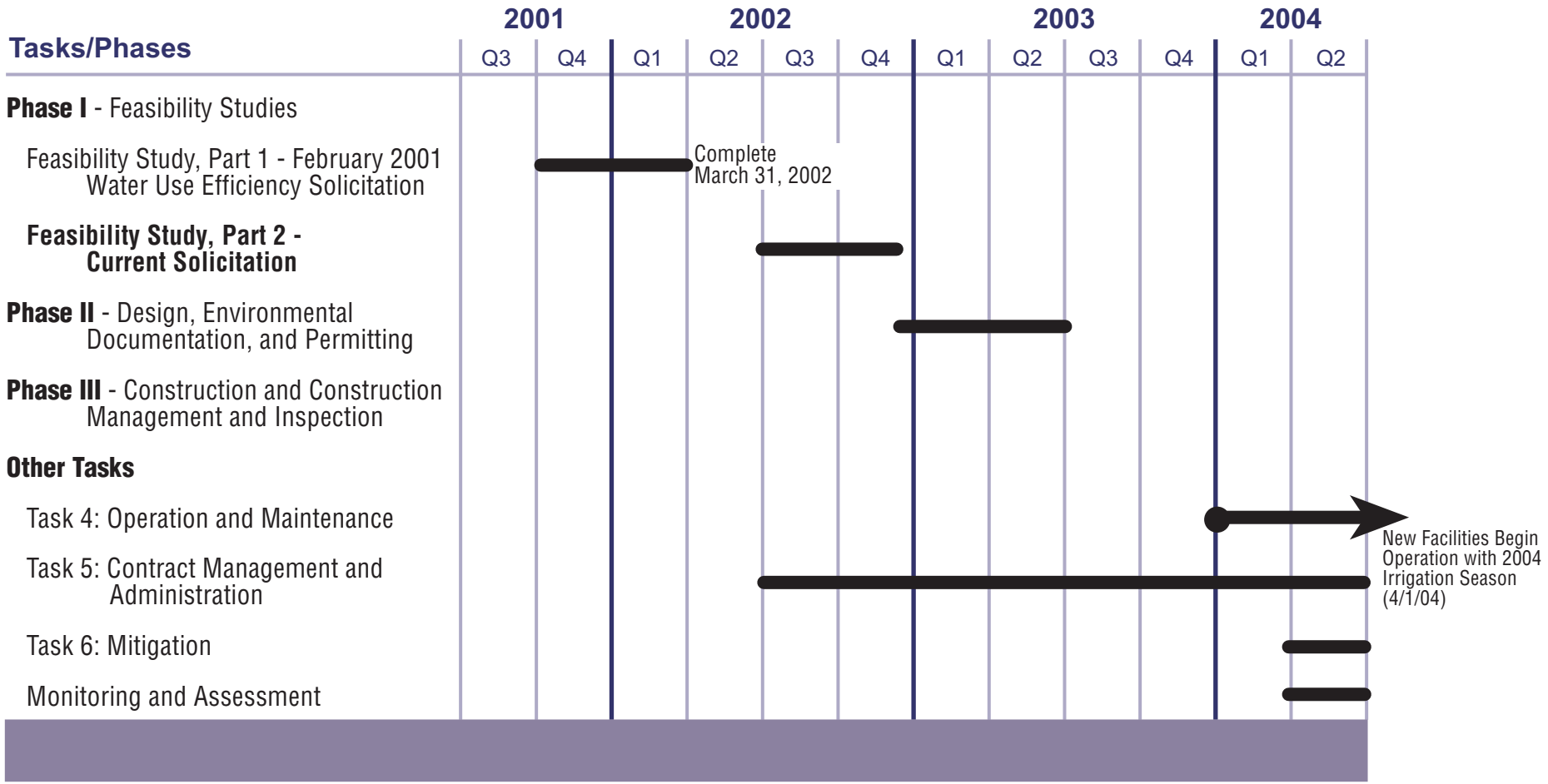


**FIGURE 2**
**WORK SCHEDULE**
MAIN CANAL MODERNIZATION PROJECT
ANDERSON-COTTONWOOD IRRIGATION DISTRICT
DWR GRANT APPLICATION

W022002007RDD_0300 (2/27/02)

| Tasks/Phases | Total Cost ($) | 2002 | | 2003 | | | | 2004 | |
|---|---|---|---|---|---|---|---|---|---|
| | | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 |
| **Phase I** - Feasibility Studies | | | | | | | | | |
| Feasibility Study, Part 1 - February 2001 Water Use Efficiency Solicitation | | | | | | | | | |
| **Feasibility Study, Part 2 - Current Solicitation** | **100,000** | 60,000 | 40,000 | | | | | | |
| **Phase II** - Design, Environmental Documentation, and Permitting | **750,000** | | 100,000 | 350,000 | 300,000 | | | | |
| **Phase III** - Construction and Construction Management and Inspection | **5,000,000** | | | | | | 2,500,000 | 2,500,000 | |
| **Other Tasks** | | | | | | | | | |
| Task 4: Operation and Maintenance | **400,000**[a] | | | | | | | | |
| Task 5: Contract Management and Administration | **60,000** | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 | 7,500 |
| Task 6: Mitigation | **20,000** | | | | | | | | 20,000 |
| Monitoring and Assessment | **0** | | | | | | | | |
| **Totals** | **6,330,000** | 67,500 | 147,500 | 357,500 | 307,500 | 7,500 | 2,507,500 | 2,507,500 | 27,500 |

[a]Task 4 cost shown is Present Worth for O&M activities beginning Q2 of 2004

**FIGURE 3**
**QUARTERLY EXPENDITURE PROJECTION**
MAIN CANAL MODERNIZATION PROJECT
ANDERSON-COTTONWOOD IRRIGATION DISTRICT
DWR GRANT APPLICATION

W022002007RDD_04 (2/28/02)

**1.3 Geotechnical Investigations—**Geotechnical explorations (borings and/or backhoe pits) will be conducted at check structures and stream crossings to establish foundation criteria. In addition, foundation conditions will be characterized for each new turnout, using borings and/or backhoe pits as necessary. A technical memorandum presenting design criteria will be prepared. Two to three borings are anticipated, along with 10 to 14 backhoe pits.

In addition, explorations will provide information to help determine scour depths at all stream crossings. Material samples will be evaluated for corrosion characteristics.

***Deliverables:*** Technical memorandum.

**1.4 Hydraulics and Site Engineering—**All revised and new structures will be hydraulically sized to accommodate existing hydraulic conditions. Flow measurement concepts, sizing, and locations will also be established. A preliminary hydraulic profile will be developed for the entire canal reach, with elevations of each delivery point (turnout) delineated. Concepts for all hydraulic structures will be developed. Site engineering will address all localized project access, earthwork needs, and utility relocation(s).

***Deliverables:*** Hydraulic profiles and structure concepts as presented in the Feasibility Report.

**1.5 SCADA—**Concepts for the monitoring and operational control of the canal system will be developed. It is anticipated that a central control facility will be constructed to handle all automation and monitoring. We envision that each turnout will be operated from the central control panel, while check structures will operate according to upstream water levels.

***Deliverables:*** Tentative SCADA facility locations and general concepts for operational control as presented in the Feasibility Report.

**1.6 Right-of-Way and Temporary Construction Easements—**For all construction sites, canal right-of-way will be delineated from existing information. No surveys or right-of-way description work is assumed. Recommendations for temporary and permanent construction easements will be established.

***Deliverables:*** General identification of right-of-way requirements and construction easements as presented in the Feasibility Report.

**1.7 Cost Estimates—**A feasibility level construction cost estimate will be prepared.

***Deliverables:*** Order-of-magnitude (budget-level) cost estimates as presented in the Feasibility Report.

**1.8 Feasibility Report—**All tasks associated with the FS will be documented in the Feasibility Report.

***Deliverables:*** Feasibility Report.

### Phase II—Final Design, Permitting, and Environmental Documentation

**Task 2A: Design.** Information collected in Tasks 1A and 1B will help identify sites for improvements and types of facilities. Sufficient design will be completed to estimate construction cost and establish the Preferred Alternative for NEPA/CEQA compliance.

Meetings with affected landowners will ensure cooperation and coordination prior to proceeding further at each location. Land/easement acquisition proceedings will be initiated at this point if required. Criteria for site selection will include accessibility, potential for environmental impacts, site topography and geotechnical characteristics, cost, and hydraulic considerations.

After the sites are verified and the preferred alternative selected, facilities will be designed for site and hydraulic conditions and sized for existing in-channel flows. New control structures are expected to be standard concrete canal checks with radial gates or motor-operated slide gates (MOSG) mounted on breastwalls. Turnouts will require new concrete headwalls with MOSG. Measurement facilities would consist of a mixture of replogle flumes and turnout pipes designed properly for accurate measurement with flow meters, as dictated by site conditions. Lining is expected to be reinforced shotcrete, but other methods/products, such as clay, may be evaluated for cost and performance. Construction plans and specifications will be developed to facilitate bidding for one or multiple construction contracts.

***Deliverables:*** Construction plans and specifications.

**Task 2B: Permitting and Environmental Documentation.** Key issues in the NEPA/CEQA environmental document (anticipated to be an Environmental Assessment/Initial Study [EA/IS]) relate to canal lining and, possibly, secondary groundwater recharge impacts and elimination of habitat. Task 2B involves scoping, an administrative draft coordinated with preliminary design, public review draft, and final draft. Permits are anticipated to be limited to NPDES stormwater-related approvals and, potentially, U.S. Army Corps of Engineers and California Department of Fish and Game permits/agreements where streams and/or jurisdictional wetland areas are affected.

***Deliverables:*** CEQA/NEPA document and completed permit applications.

### Phase III—Construction

**Task 3A: Construction.** Construction includes installing control and measurement facilities, SCADA systems, and canal lining. It is expected that most of the construction activity will need to occur between November and March, when ACID is not delivering irrigation water. It is expected that a construction contract would be awarded through a conventional bidding process.

**Task 3B: Construction Management and Inspection.** An engineering consultant will administer the construction contract and inspect the work for compliance with the contract documents. Services will include processing the contractor's pay requests, reviewing construction submittals, materials testing, and startup procedures.

### Other Tasks

**Task 4: Operation and Maintenance (O&M).** O&M of all new facilities and equipment is proposed to be accomplished by the District as an in-kind, cost-sharing service.

**Task 5: Contract Management and Administration.** This task incorporates management of project costs and schedule, administering grant funds, developing work plans, coordinating with other entities and agencies, and overseeing activities of the project team.

**Task 5: Mitigation.** Upon completion of construction, environmental specialists will develop and carry out a mitigation planting program to replant or replace affected riparian and/or wetland vegetation at the predetermined replacement ratio.

***Deliverables:*** Quarterly reports, monthly billing statements, and all other documentation required by DWR.

### 3. Monitoring and Assessment

Information from each measuring facility will be compiled as a routine O&M task and made available to USBR and DWR. The appropriate level/frequency of data collection will be determined in consultation with USBR and DWR. The 13 additional measurement points, one along the Main Canal and one on each turnout, will enable the District to monitor deliveries and losses. In addition to comparing flows from various points in the system, it will be possible to compare flows at the existing USGS gage near Sharon Street in Redding with new flows measured in the upper reaches of the canal to compare historical river diversions to post-project diversions.

## C. Qualifications

### 1. Project Manager

The resume of Dee Swearingen, ACID General Manager, is attached. Mr. Swearingen will administer the contract, oversee the work, and provide all required documentation to DWR.

### 2. External Cooperators

It is not anticipated that the project will require additional assistance from any other entity or agency. ACID will coordinate with landowners who may be affected by project construction.

## D. Benefits and Costs

### 1. Budget Breakdown and Justification

**k. Land Purchase/Easement**. It is expected that the applicant will need to acquire about 1 acre of permanent easement for SCADA facilities on adjacent hills. New structures in the canal are expected to occupy applicant's right-of-way. It is assumed that approximately 3 to 5 acres of temporary (construction) easements will need to be acquired to provide adequate room for construction at the various facilities. The costs for these temporary and permanent easements are included with the costs for construction.

**l. Planning/Design/Engineering.** Tasks 2 and 3B would be completed by an engineering consultant with expertise in design, environmental compliance, and construction management. These services would be provided through a service contract with the applicant.

**m. Materials/Installation.** None (included in construction contract under Item Q).

**n. Structures.** None (included in construction contract under Item Q).

**o. Equipment Purchases/Rentals.** None.

**p. Environmental Mitigation/Enhancement.** It is expected that a minor amount of riparian or wetland vegetation may be impacted by construction, particularly associated with new structures near stream crossings. Mitigation planting and maintenance will be performed after construction is complete. Affected areas are expected to total 2 acres or less.

**q. Construction/Administration/Overhead.** Salaries and wages associated with Task 5, Contract Management and Administration, include 80 hours per month for the ACID General Manager as described above. Travel costs associated with Task 5 were estimated at $100 per month, primarily for driving to meetings and potential facility sites. It is expected that Task 3A, Construction, would be executed by means of a construction contract awarded through a conventional bidding process.

**r. Project/Legal/License Fees.** None.

**s. Contingency (up to 15%; amount must be fully justified by applicant).** None.

**t. Other.** None.

## 2. Cost Sharing

ACID will assume all O&M costs associated with the project in perpetuity. The tasks associated with O&M include collecting and analyzing data from the instruments, maintaining and operating the SCADA and control facilities, and ordering water accordingly. The value of these services is estimated at $50,000 per year in perpetuity.

## 3. Benefit Summary and Breakdown

The proposed construction of new facilities is expected to generate numerous benefits for both local and regional water users. The benefactors of this program include ACID, downstream users, the environment, and the Sacramento-San Joaquin Delta. The following benefits are discussed in this section:

- Water Supply Benefits
- Water Management Benefits
- Environmental and Water Quality Benefits

### Water Supply Benefits

The proposed project would provide the capability to more flexibly and efficiently manage the amount and timing of diversions from the Sacramento River. It would reduce diversions, thereby increasing instream flows, and also would reduce spill, ET, and seepage losses. Water supply benefits would include:

- **Water control, automation, and measurement—**The new/retrofitted canal structures would automatically adjust to changing canal water levels, as influenced by fluctuations in Sacramento River flows and downstream irrigation needs. The resulting reduction in operational spills would reduce both diversion from the river and ET losses in the drainage courses receiving the spills. The flow measurement component would enhance the District's capability to track river diversions, quantify losses and conservation benefits, and schedule and synchronize diversions with grower needs. It is estimated that through improved control, automation, and measurement, annual ACID diversions from

the Sacramento River may be reduced by as much as 7.5 percent, or 10,000 acre-feet, as a result of reducing operational spills through this project.

It is recognized that a portion of ACID's historical spills return to the river through natural or constructed watercourses. This portion, therefore, may not add "new" flow to the river. However, the associated delay and water quality degradation are undesirable and further warrant control of the spills. The significant portion that does not return to the river is lost to the system through evaporation and transpiration en route to the river. Thus, the reduction in operational spills through improved control and automation would decrease non-productive ET and increase river flows by a corresponding amount.

ACID is the largest purveyor among the 14 members of the RAWC, which is working on a regional plan to solidify the Redding Basin's water resources through the year 2030. Improved control and measurement capabilities would enhance the District's contribution to this initiative.

- **Canal lining—**The canal lining component would drastically reduce seepage in critical areas. Concrete lining in the high seepage, sandy areas of the canal, presumably about 2 miles long, may reduce seepage by about 10,000 acre-feet/year. This reduction estimate is based on canal dimensions and a seepage loss rate of 17 inches per day for a 180-day irrigation season. The loss rate of 17 inches per day reflects the seepage difference between an unlined canal in sandy soil (20 inches per day) and a concrete-lined canal (3 inches per day). The resulting seepage estimate for the project, therefore, represents an "avoided loss" by upgrading to concrete lining.

  Seepage along ACID's Main Canal contributes, in part, to groundwater. Because the canal is elevated above surrounding terrain over the majority of its length, a significant portion of the seepage also resides at or near the ground surface outside the canal. This portion ultimately evaporates or is transpired by nearby grass and vegetation. The canal lining element of the project also would benefit adjacent landowners in certain areas along the canal that are adversely affected by canal seepage.

### Water Management Benefits

Water management benefits include:

- **System efficiency—**The predominant goal of the project is increased system efficiency. The automation of ACID's Main Canal would substantially improve the District's ability to more efficiently utilize its supply. The automated check structures would enable District staff to micromanage water delivery and prevent the majority of the inevitable operational spills that are often associated with manual structures. The District and its patrons would benefit by virtue of new, automated facilities and canal lining providing improved control, flexibility, and reliability along with less maintenance.

- **System flow measurement**—The new structures could be incorporated with ongoing efforts by the District to more accurately define system inflows and outflows. Measurement and tracking of flows add a necessary dimension to the management of water supply by allowing the District to more accurately quantify its water use.

### Environmental and Water Quality Benefits

As ACID's primary source of supply, the Sacramento River would be directly and most beneficially influenced by the District's efficient use of its water supply. The potential 20,000-acre-foot/year decrease in surface water diversions has the potential for increasing available seasonal in-stream flows to the Sacramento-San Joaquin Delta. This additional water would contribute to addressing Delta water quality concerns that have been at the core of CALFED and other programs' efforts for the past several years. These and other potential environmental benefits associated with this project would be quantified throughout the various stages of the project, from FS through final design.

## 4. Assessment of Costs and Benefits

Project costs are shown in Table 1. There would be no real reduction in District labor associated with this project. Deferred replacement would, however, constitute a quantified benefit for the headworks structure and the nine Main Canal turnouts. Perhaps most significantly, the reduced Sacramento River diversion also represents a quantified benefit. The potential savings of 20,000 acre-feet per year represent a manageable volume of water available for other beneficial uses, such as:

- Instream flows for fish or other aquatic species
- Wildlife refuges
- Water banking programs

A typical current price for the Environmental Water Account is $50 per acre-foot. Other programs pay a much higher cost, but for this analysis and comparison of project costs and benefits, we have assumed the $50 per acre-foot rate. The water conservation benefits (20,000 acre-feet per year at $50 per acre-foot) is estimated at $1 million per year. Benefits to ACID customers related to improved reliability and flexibility, and benefits to local and regional water management and planning initiatives, are considered "non-quantified" benefits because no specific monetary value can reasonably be assigned.

# E. Outreach, Community Involvement, and Acceptance

ACID is one of 14 RAWC members working on a regional plan to solidify the Basin's water resources through 2030. This proposal is consistent with the plan; it will help to quantify water requirements at key District locations and provide better information on seepage rates from the District's unlined canals. Data from monitoring ACID's system will help to enhance the RAWC surface-water/groundwater model and evaluate future water management options. The project also is an outgrowth of the BWMP and the Sacramento Valley Water Management Agreement. The activities associated with the RAWC, the BWMP, and the Sacramento Valley Water Management Agreement all are undertaken in conjunction with a public information and involvement component.

The project implements BWMP recommendations. The BWMP, being developed by most Sacramento Valley agricultural water contractors in association with USBR and DWR, has a strong public information and involvement component. During BWMP development, numerous presentations were made among participating "Settlement Contractors" with DWR and USBR staff. Informational meetings were held with Settlement Contractor Boards of

Directors, water users, and environmental interest groups to solicit stakeholder input and disseminate information about the BWMP.

The project is an outgrowth of the Sacramento Valley Water Management Agreement among the Sacramento Valley water users, DWR, USBR, and export water users. The ongoing process that resulted in the Agreement has a strong public outreach component to inform agencies, environmental and other interests, and the public on the Agreement. Numerous presentations have been made to the CALFED Management Team and associated staff, county supervisors in all affected counties, water districts and their customers, and other organizations and agencies, including the SWRCB, Trust for Public Lands, The Bay Institute, U.S. Fish and Wildlife Service, Natural Heritage Institute, The Nature Conservancy, and the public. Additional meetings will occur as the planning and implementation process proceeds. No individual or organization has expressed formal opposition to the Agreement or the projects to be undertaken under the Agreement. The projects, including the one described herein, have been summarized in a published "Short-term Workplan" prepared in conjunction with the Agreement.

The planning effort associated with the Agreement provides a formal framework for disseminating project information. Feedback on benefits achieved through the management and conservation measures recommended in the Agreement will be made available to all Sacramento Valley water contractors, USBR, and DWR through the planning partnership. The participants are aware of the need to share this information to ensure successful water supply management throughout the Sacramento Valley.

Additionally, this and all other capital outlay projects associated with the Agreement will be subject to CEQA and NEPA documentation. The CEQA and NEPA statutes and implementing guidelines ensure that the public and all affected agencies will be fully informed of the project and its effects and receive meaningful opportunities to provide input and review and comment on the project through the CEQA and NEPA public review process.

The project does not directly involve training, employment, or capacity building, but through more efficient agricultural water supply management, it potentially makes more water available for beneficial uses. According to the *Community Assessment Project Report* (Shasta Regional Community Foundation and United Way of Northern California, 2000) Shasta County (i.e., Redding Basin and CALFED Sub-Region 1) typically has higher unemployment (6.6 percent in 1999) and lower average per capita income (31$^{st}$ out of 58 California counties in 1999) and median family income (19 percent lower than 1997state average) than the rest of the state. A better managed water supply will help sustain the gains being made in the northern California economy by accommodating growth in industry and agriculture, providing growth in employment opportunities in all economic sectors.

## Resume of Dee Swearingen