CONSOLIDATED IRRIGATION DISTRICT

PROPOSITION 13 AGRICULTURAL WATER CONSERVATION FEASIBILITY STUDY GRANT APPLICATION

RECHARGE CAPACITY ENLARGEMENT

Consolidated Water Use Efficiency
2002 PSP

California Department of Water Resources

February 2002

Application Number	Application for (a-urban, b-agriculture, c-DWR/WUE:
449	b) Prop 13 Agricultural Water Conservation

Principle Applicant(Organization/Affiliation)

Consolidated Irrigation District

Project Title

Recharge Capacity enlargement

First Name-Authorized	Last Name (AA):	Title
Eugene J.	Branch	

Street Address	PO Box
2255 Chandler Street	209
City	State
Selma	CA
Zip Code	Telephone Number(Include Area Code)
93662	(559) 896-1660
Fax Number (Include Area Code)	E-mail Address
(559) 896-8488	Geneb012000@yahoo.com

First Name-Contact Per	Last Name-CP:	Contact-Title

Contact-Street Address	Contact-PO Box
Contact-City	Contact-State
Contact-Zip Code	Contact-Phone Number
Contact-Fax Number	Contact-E-Mail Address

Funds Requested (dollar amount	Applicant Funds Pledged (dollar amount	Total Project Costs (dollar amou
$60,000.00		$60,000.00

Estimated Total Quantifiable Project Benefits (dollar amount	Percentage of Benefits to be Accrued by App
Percentage of Benefits to be Accrued by CALFED or othe	Estimated Annual Water to be Saved (acre-fe
Estimated Total Amount of Water to be Saved (acre-fee	Over _____ Number of Years

Estimated Benefits to be Realized (terms of water qual,instream

N/A

Duration of Project (month/year-month/year):	State-Wide
10/02-06/03	☐

State Assembly District-location of project(	29	State Senate District-location of project(1	14
State Assembly District-location of project(	30	State Senate District-location of project(2	16
State Assembly District-location of project(	31	State Senate District-location of project(3	
State Assembly District-location of project(		State Senate District-location of project(4	
State Assembly District-location of project(		State Senate District-location of project(5	
State Assembly District-location of project(		State Senate District-location of project(6	
State Assembly District-location of project(		State Senate District-location of project(7	
State Assembly District-location of project(		State Senate District-location of project(8	
State Assembly District-location of project(		State Senate District-location of project(9	
State Assembly District-location of project(		State Senate District-location of project(10	

Congressional District(s)-location of project	20	Congressional District(s)-location of project(	
Congressional District(s)-location of project		Congressional District(s)-location of project(	
Congressional District(s)-location of project		Congressional District(s)-location of project(	
Congressional District(s)-location of project		Congressional District(s)-location of project(	
Congressional District(s)-location of project		Congressional District(s)-location of project(1	

County-location of project	Most recent Urban Water Mgt Plan Submitt
Fresno, Kings, tulare	

Type Applicant-Urban(a)Agricl Feas Study(b) Gra	DWR WUE Projects	Project Focus
e) other-subdivision of state(include public water)		a) Agricultural

Project Type:

b) Implement. of Agric. efficient Water Mgt Pract

Quantifable Objectives

Specify from choice (d) above

Specify from (k) above

Does Proposal involve change in land use (planned/future)ICheck box if yes

☐

APPENDIX A

PROPOSAL PART TWO

Project Summary

Consolidated Irrigation District (CID) is located in the San Joaquin Valley, on the eastern side of Fresno County and in portions of Kings and Tulare Counties. The attached Figure 1 is a map of the District. CID is comprised of approximately 140,000 acres of land. Approximately 92,000 acres are capable of receiving surface water through the District's diversion from the Kings River. This supply is typically used to augment ground water pumping on those lands while the remaining acreage in the District relies totally on ground water.

CID currently owns or has easements to operate 46 recharge (ponding) basins with a total surface area of approximately 1,300 acres. In addition to the ponding basins, the District owns and operates approximately 350 miles of unlined channels that also provide recharge to the ground water basin. As part of the District's ground water management program they own approximately 82 monitoring wells, located on a two mile grid throughout the District, which are measured and recorded quarterly.

When flood releases are made from Pine Flat Reservoir, which is located upstream of CID's river diversion point, CID and other Kings River water users are eligible to divert the excess flow from the river into their systems. Weather conditions and operational constraints often dictate that the flood releases occur over a relatively short period. To maximize recharge benefits CID has historically diverted flood water into their system of canals and ponding basins, but because of the short duration of the flood releases they are often constrained by a capacity deficiency in their system. The District's diversion facilities on the Kings River have capacity for approximately 1,800 cfs while the total recharge capacity of their canal and ponding basin system is only about 1,100 cfs initially and 700 cfs on a continuous basis.

To increase the recharge benefits provided through CID's system, the capacities of key conveyance facilities need to be increased and additional recharge basins need to be

added at strategic locations. Two main channels, the Fowler Switch (FS) and the Centerville & Kingsburg (C&K) Canals serve the District's water delivery system but only the FS is utilized for most recharge deliveries. The capacity of the FS would be enlarged and ponds would be added near the upper reaches of the canal. For the C&K, additional Ponds would be constructed at more optimal locations.

A feasibility study is needed to determine specific requirements for a proposed capital project and the benefits which might be realized in terms of water savings and water quality improvements. Greater recharge capacity for CID's system would reduce the amount of flood water which is discharged out of the CID service area and out of the Kings River basin. It would also help maintain ground water quality in certain areas in the basin by diluting contaminated ground water with good quality Kings River water.

The expected outcome of the study is that CID's system could be improved thus creating the potential for significant water savings and ground water quality benefits. The cost to perform the feasibility study is estimated to be $60,000.

A. Scope of Work: Relevance and Importance

CID proposes to conduct a feasibility study to determine the required modifications or additions to key District facilities for increased ground water recharge capacity. The purposes of the study are to determine where system improvements would provide the greatest benefits, to identify what the improvements might be, to estimate the capital costs for the improvements, and to determine the benefits which might be realized by implementing the project.

The two main channels which serve the District's water delivery system are the Fowler Switch (FS) and Centerville & Kingsburg (C&K) Canals. Currently the majority of flood releases are diverted to CID ponds through the FS Canal. The C&K is not utilized for recharge as much as the FS for two primary reasons: (1) there are fewer ponds available along the canal alinement and (2) the proximity of the C&K to the Kings River allows a portion of the water that has been diverted through the District's system and recharged into their ponds to migrate back into the river and ultimately out of the CID boundary.

Improvements to the FS would be to increase its maximum capacity from 900 cfs to 1,200 cfs by enlarging the channel or improving the flow efficiency by lining upper portions of the channel. Road crossings and canal regulating structures might also need to be enlarged for increased flow. To better utilize a 1,200 cfs recharge delivery from the FS, additional ponding basins would also be added close to the upper reaches of the canal and more toward the east side of the District. This approach is optimal in two ways: (1) it provides recharge to the ground water basin near the high end of the gradient (within the significant areas of pumping) so the recharged water will migrate southwesterly across the District and benefit more users both inside and outside the District; and (2) the length in which the FS canal must be enlarged for additional recharge capacity is minimized because more ponds are available near the head of the canal.

Improvements to the C&K would focus on adding more ponding basins along its alinement. Preferably, new ponds served by the C&K would be located west of the canal to decrease migration of recharged water back into the river as noted previously. The alinements of the C&K and its upper lateral ditches are generally in a south or southwest direction along the east side of the District. Additional ponds along this corridor would again recharge water near the upper portion of the gradient and allow it to migrate southwesterly and benefit a larger number of users. Figure 1 is a map of CID's system with general areas of proposed modification noted.

B. Scope of Work: Technical/Scientific Merit and Feasibility

Technical/Scientific Merit

The feasibility study will be broken down into seven (7) major components. (1) Review the current capacity of existing recharge facilities and identify where improvements might be made. (2) Gather information from previous studies or surveys of applicable District facilities. (3) Make field investigations as needed. (4) Perform hydraulic and hydrogeologic analyses to determine the recommended improvements to the system. (5) Estimate the capital costs for the system improvements. (6) Estimate the quantity of potential water savings and identify ground water quality benefits. (7) Compile the data and prepare a report.

District operations staff can identify the current limitations of the recharge facilities. Items to be marked for improvement might include sections of the FS Canal that operate at capacity during recharge operations, structures and crossings on the FS Canal that create flow restrictions, and more optimal pond locations that can be served by both the FS and C&K Canals. A previous study has been done by the District regarding the capacity of their main channels and it is possible a portion of this information could be incorporated into the proposed study. Specific structures or canals may have also been surveyed or investigated as a part of other past District projects. A moderate review of District files will provide an indication of the information available.

Once the areas of potential improvement have been identified and any ancillary information has been gathered, hydraulic and hydrogeologic calculations can be performed to determine the specific modifications that will be needed. Typical open channel and closed conduit hydraulic computational methods based on Manning's equation and other widely accepted principals will be utilized. Estimates of recharge potential at proposed pond sites will be calculated based on nearby facilities or soils data available through the Soil Conservation Service (SCS). Cost estimates for the proposed improvements will be prepared based on current material prices, review with general contractors and bidding results of previous projects with similar work.

The benefits that might be realized by the capital project will be estimated and/or identified. The quantity of additional water which can be diverted during Kings River flood releases and ultimately delivered for recharge is not only dependent on the capacity of the District's facilities but on the frequency and duration of the flood releases. Investigations will be made of historic flood releases on the Kings River as well as the agreements the District is bound to when making flood water diversions. Improvement of ground water quality is an anticipated benefit of the project. Local run off that infiltrates the ground water aquifer can contribute to quality degradation. Increased recharge using good quality Kings River water will dilute contaminates and increase flushing of the aquifer. An analysis of potential ground water quality improvements will be made to identify the benefits.

The data which is generated throughout the study or gathered from previous studies will be compiled and summarized in a final report that will constitute both the feasibility study report and the final progress report required for the grant. The report will include a discussion of the feasibility of the capital project and possibilities for funding the work. Table 1 on the following page indicates the time line and estimated expenditures set forth for the feasibility study. Invoicing for expenses would be submitted quarterly together with a brief written progress report of the work completed. The final invoice would be submitted with the aforementioned final report. If only partial grant funding is

awarded the depth of the study will have to be reduced and the value of the information provided will be reduced accordingly.

Table 1
Task Schedule and Quarterly Expenditures

Item No.	Task	2002			2003						Task Cost
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
1	Review of Existing Recharge Capacity										$4,500
2	Research Previous Studies for Applicable Data										$3,000
3	Field Investigations										$15,000
4	Hydraulic & Hydrogeologic Analyses, Cost Estimates										$22,500
5	Prepare Final Report										$15,000
	Quarterly Expenditure	$8,000			$23,500			$28,500			$60,000

Feasibility

The information gathered and developed through the course of the study will be summarized and assessed. Feasibility of increasing the District's recharge capacity will be dependent on the costs to modify their facilities versus the benefits provided. Other considerations beyond capital costs will be assessed regarding modifications of major road crossings. For instance, it may be determined more feasible to raise the banks of a canal for a distance upstream of a road crossing than to construct a larger road crossing even though the costs suggest otherwise.

C. Qualifications of the Applicants and Cooperators.

CID's General Manager will be designated as the Project Manager of the feasibility study. The General Manager's resume is attached as Appendix A. Except for the review of existing recharge capacity by District staff, the District's engineer, Summers Engineering, Inc. (SEI) will perform all aspects of the feasibility study. SEI will provide written progress reports to the District and aid the District in processing invoices for quarterly submittals to the State.

D. Benefits and Costs.

1. Budget Breakdown and Justification.

The following Table 2 is a break down of the budget set forth to perform the recharge capacity enlargement feasibility study.

Table 2
Budget Breakdown

Item	Description	Unit Price	Units	Quan.	Amount
a.	**Labor and Salaries**				
a.1.	Review of Existing Recharge Capacity	$250	per day	6	$1,500
c.	**Benefits**	(included in Salaries)			
d.	**Travel**	N/A			
e.	**Supplies and Expendables**	(included in Services and Consultants)			
f.	**Services and Consultants**				
f.1.	Review of Existing Recharge Capacity	$750	per day	4	$3,000
f.2.	Research Previous Studies for Applicable Data	$750	per day	4	$3,000
f.3.	Field Investigations	$750	per day	20	$15,000
f.4.	Hydraulic & Hydrogeologic Analysis, Cost Estimates	$750	per day	30	$22,500
f.5.	Prepare Report	$750	per day	20	$15,000
g.	**Equipment**	N/A			
h.	**Other Direct Costs**	N/A			
i.	**Indirect Costs**	(included in Labor and Salaries, Services and Consultants)			
Total					**$60,000**

Applicable items from the Table 1 Task Schedule are listed under each budget category together with the unit price of the budget item, the estimated time or quantity to complete the task and the extended amount. The labor and salary category lists the single task that would be performed in part by District employees. The rate includes salary plus benefits and overhead. Travel within the District would all be considered local and is therefore not an applicable charge. Supplies and expendables are not anticipated to be significant and will be covered in the rates for Services and Consultants. Summers Engineering will perform all the tasks included in the study as listed in the breakdown under Services and Consultants. Equipment and Other Indirect Costs are not applicable. Indirect Costs for items such as District or Consultant overhead are included in the rates for those categories. The total estimated cost to perform the recharge capacity enlargement feasibility study is $60,000.

2. Cost-Sharing.

No cost sharing is proposed for the turnout metering feasibility study.

3. Benefit Summary and Breakdown.

Primary benefits that will be provided as a result of the study are an estimate of the potential water savings and identification of potential water quality benefits. In addition, capital cost information will be developed and used to help determine the feasibility of the project. Options available to the District for funding the proposed capital project will be identified.

The information provided by the proposed recharge capacity enlargement feasibility study is valuable not only to CID but to other stakeholders in the Kings River basin. By providing an outline for reducing the amount of flood water that leaves the basin and identifying the costs, CID may attract other agencies to participate in a cost sharing program to implement the capital project and share in the benefits through possible water exchanges.

E. Outreach, Community Involvement and Acceptance

Once the proposed feasibility study is completed, CID will conduct community outreach programs such as public information meetings, press releases or mailings. They will also seek out other interested stakeholders in the Kings River basin to participate in a possible cost sharing program for the capital project.