North Area Irrigation Water Reuse

YCWA-04

I. Project Sponsor Contact Information

Lead Agency/Organization	Yuba County Water Agency
Name of Primary Contact(s)	Curt Aikens
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Project Partners/Collaborators	Hallwood Irrigation Company (and other member units?)

II. General Project Information

Project Title	North Area Irrigation Water Reuse
Project Total Budget	TBD
Project Funding Match	TBD
Project Funding Request	Component #1: $175,000 Component #2: between $20,000-$80,000 (depending on choice of design) Component #3: $90,000 (rough estimate)
Can a detailed cost estimate be provided upon request?	No
Project Location:	Jack Slough
Latitude	39.1585029
Longitude	-121.609411
Could you provide a map of the project location including boundaries upon request?	Yes
County	Yuba
City/Community	Hallwood Irrigation Company District Boundary
Watershed/subwatershed	Yuba
Groundwater Basin	Yuba Groundwater Basin/ North Yuba Sub-basin
Project Type	Facility Construction Best Management Practices

III. Project Description

This irrigation system improvement project would accomplish the following:

1. Operate the canal, ditches, and laterals in a much more flexible and reliable manner.

2. Simplify the operation for the ditchtender.

3. Reduce spills at the ends of laterals.

4. Recirculate water that is presently entering the district in Jack Slough.

5. Replace two aging flumes.

6. Reduce diversions from the Yuba River. A rough estimate of this reduction is 40-50 CFS, based on additional well usage, decreased spill, and pumping from Jack Slough.

A detailed description of project components is as follows:

1. Changing the Main Ditch Crossing of the Jack Slough

This project component entails several physical changes, all of which would work together to provide flexibility. The basic idea is:

a. If excess flow came down the Main Ditch, it would spill into Jack Slough.

b. If insufficient flow came down the Main Ditch, a pump would automatically deliver water from Jack Slough.

By cleaning out the Main Ditch downstream of the Drier Ditch to the Jack Slough crossing,

replacing the deteriorating flume, and raising the banks, the water depth on the downstream side of the Jack Slough crossing could be raised by about 1.5’. The Main Ditch flow rate would be “restarted” downstream of the new Jack Slough crossing. An automatic sluice gate would automatically maintain a desired target flow rate even though the upstream water level would change with time.

If excess flow arrived from upstream, the water level would rise until it would trigger the opening of an ITRC Flap Gate, which would automatically spill into the Slough and prevent the water level from rising more. This flap gate would be designed to pass a maximum of 50 CFS. There are about 200 ITRC Flap Gates working in irrigation districts in California as automated check structures or as automated spills.

If the water level dropped below a second lower target elevation, a pump in the Slough would automatically turn on to add extra water to the canal. If the water level rose to slightly lower than the opening level of the flap gates, the pump would shut off. It is envisioned that this pump would be able to supply 20 CFS.

2. Modification of Main Ditch Check Structures

The second major change would be a modification of Main Ditch check structures between the split point to the Handy and Hwy 20 Ditches and the Drier Ditch.

Key elements include:

• Sluice gates would be installed at the entrance to the Handy and Hwy 20 Ditches.

• A long-crested weir would be installed in the Main Ditch where the Main Ditch diverges from the Handy and Hwy 20 ditches. The impact of the sluice gates at the Handy and Hwy 20 Ditches, and this long-crested weir, would be that all fluctuations in flow would go down the Main Ditch towards the Jack Slough crossing.

• The Main Ditch check structure at the Drier Ditch entrance would be converted to a long-crested weir.

• Perhaps 3-5 other check structures enroute would be converted to long-crested weirs or to ITRC Flap

3. Real-Time Management of Well Pumps as a Buffer Supply

The third major modernization change would involve real-time management of well pumps as a buffer supply. Active manipulation of wells along the Main Ditch (downstream of Hwy 20) to add/subtract water as needed, plus other wells along some laterals could provide excellent flexibility plus conserve water. At the moment, farmer wells are being used as *substitution* water. However, there is another possibility that is relatively inexpensive (compared to other options): using wells as “a readily available and flexible supply” to compensate for fluctuating flows lower in the system. The water table in the district is relatively high, meaning the expense of pumping from wells is relatively low. The district could install a system of new wells to supplement surface water “as needed” on an hourly basis – a completely different concept than substituting surface water for a week or months. If the well pumps were equipped with automatic sensors and variable frequency drive (VFD) controllers, it would be possible to start and stop the pumps slowly (maintaining a long life on the wells), and to deliver precisely the flow rate needed to augment temporary shortages. A good strategy for the district would be to deliver about 2 CFS less than needed down each of several laterals. A flow control gate (manual sluice gate) could be installed about half the way (to ⅔ the way) down each lateral. Well pumps would sense the water level upstream of the flow control gate, and would automatically supply water that is lacking. On the other hand, if users upstream in the laterals shut off early, that water would not be wasted because the VFD pumps would reduce their flows.

The additional measures for long term include the following:

• SCADA for remote monitoring. This would be relatively simple monitoring of water levels over weirs at the downstream ends of laterals and ditches, monitoring of spill and pumping at the Jack Slough crossing under the Main Ditch, and monitoring wells in option #3. Technology now allows the ditchtender to see the status of these points via a Palm Pilot, cell phone, or hardened laptop.

• Pipelining some additional laterals. In particular, some of the laterals in the permanent crop areas are small and difficult to manage.

IV. Project Rationale/Issues Statement

The project addresses the following identified regional issues:

Infrastructure
Develop new infrastructure as well as repair, replace and retrofit aging infrastructure to ensure adequate and reliable water supply

Water use Efficiency and Conservation
Promote and implement policies and practices to increase water use efficiency *and* water conservation in municipal and agricultural sectors

Groundwater
Promote integrated management of groundwater and surface water

Water Quality Contamination: Urban and Agricultural Run-off
Maintain and improve water quality by mitigating for urban and agricultural runoff

Environmental Flows
At minimum, maintain quantity, timing, and quality of stream-flows required to restore and protect freshwater ecosystems

Climate Change
Respond to projected climate change impacts on water supply reliability, water quality, public safety and watershed health and develop regional and inter-regional adaptive management strategies

V. Goals/Objectives/Performance Metrics

Goals Addressed by the Project	**Goal 1:** Ensure adequate and reliable water supply that meets the diverse needs of the region **Goal 2:** Protect, restore and enhance water quality for water users and in support of healthy watersheds **Goal 4:** Enhance regional economic development by supporting recreational opportunities and sustainable agriculture **Goal 6:** Address climate vulnerabilities and reduce greenhouse gas emissions
Objectives Addressed by Project	1.1 Improve water supply system capacity, flexibility and efficiency, including, but not limited to, optimizing existing water storage; upgrading and retrofitting aging infrastructure; and, developing new infrastructure, where necessary; 1.2 Promote water conservation and water use efficiency by instituting various techniques including, but not limited to, groundwater recharge, conjunctive management, irrigation efficiencies, municipal water conservation, water recycling and reuse; 1.3 Protect and restore water supplies that support watershed health;

	1.6 Preserve water supplies that support recreational opportunities and agricultural uses; 1.7 Support regulatory compliance with current and future state and federal water supply standards; 2.5 Maintain and improve water quality required to restore and protect freshwater ecosystems, fisheries and groundwater-dependent habitat; 2.6 Support regulatory compliance with current and future state and federal water quality standards; 4.5 Protect and restore working landscapes, particularly ranch/ag lands, and the watershed benefits they provide; 6.3 Increase system flexibility and resiliency to adapt to climate variability.
What performance metrics will be used to demonstrate that objectives are being met? Wherever possible, provide a quantitative measurement reflecting successful project outcomes	TBD

VI. Resource Management Strategies

Reduce Water Demand	
Agricultural Water Use Efficiency	system-wide physical changes and improvements to reduce water loss and spills in the system
Improve Operational Efficiency and Transfers	
Conveyance—Regional/Local	system-wide physical changes and improvements to increase operational efficiency
System Reoperation	modernization and SCADA to re-operate system, improving efficiency
Water Transfers	reduces diversions from the Yuba River. A rough estimate of this reduction is 40-50 CFS, based on additional well usage, decreased spill, and pumping from Jack Slough
Increase Water Supply	
Conjunctive Management and Groundwater	installs a system of new wells to supplement surface water "as needed" on an hourly basis
Recycled Municipal Water	re-circulates water that is presently entering the district in Jack Slough

VII. Statewide Priorities

Drought Preparedness

- Promote water conservation, conjunctive use, reuse and recycling

- Improve landscape and agricultural irrigation efficiencies
- Achieve long term reduction of water use
- Efficient groundwater basin management
- System interties

Use and Reuse Water More Efficiently

- Increase urban and agricultural water use efficiency measures such as conservation and recycling

Climate Change Response Actions

- Adaptation to Climate Change: Advance and expand conjunctive management of multiple water supply sources
- Adaptation to Climate Change: Use and reuse water more efficiently
- Adaptation to Climate Change: Water management system modifications that address anticipated climate
- Reduction of Greenhouse Gas (GHG) Emissions: Reduce energy consumption of water systems and uses
- Reduce Energy Consumption: Water use efficiency
- Reduce Energy Consumption: Water recycling
- Reduce Energy Consumption: Water system energy efficiency

Protect Surface and Groundwater Quality

- Protecting and restoring surface water and groundwater quality to safeguard public and environmental health and secure water supplies for beneficial uses

Ensure Equitable Distribution of Benefits

- Develop multi-benefit projects with consideration of affected disadvantaged communities and vulnerable populations

Climate Change Adaptation

This project takes a comprehensive approach in responding to the range of water supply climate change vulnerabilities in the region. By improving operational efficiency, expanding conjunctive management, reusing water and reducing the system’s energy consumption, the project achieves long term reduction in water use.

GHG Emissions Reduction

The project is currently in a conceptual stage and has yet to consider climate GHG emissions reduction strategies. However, the project mitigates for GHG by improving operational efficiency and reducing system-wide energy consumption.

VIII. Project Status and Schedule

For Conceptual Projects Only: The Project is currently in the Conceptual Stage: YES

Project Stage	Description of Activities in Each Project Stage	Planned/Actual Start Date	Planned/Actual Completion Date
Planning			
Design			
Environmental Documentation (CEQA/NEPA)			
Permitting			
Tribal Consultation (if not applicable, indicate by N/A)			
Construction/ Implementation			

IX. Project Technical Feasibility

a. List the water planning documents that specifically identify this project.	
b. List the adopted planning documents the proposed project is consistent with (e.g., General Plans, UWMPs, GWMPs, Water Master Plans, Habitat Conservation Plans, etc.)	Yuba County Groundwater Management Plan Yuba County Agricultural Water Management Plan Lower Yuba River Accord
c. List technical reports and studies supporting the feasibility of this project.	Hallwood Irrigation Company Rapid Appraisal Process (RAP) Report
If you are an Urban Water Supplier:	
1. Have you completed an Urban Water Management Plan and submitted to DWR?	Yuba County Water Agency (YCWA) does not supply water for direct urban use and is not subject to the Urban Water Management Plan Act (UWMPA).
2. Are you in compliance with AB1420?	See above.
3. Do you comply with the water meter requirements (CWC Section 525)?	See above.
If you are an Agricultural Water Supplier:	
1. Have you completed and submitted an AWMP?	Yes
If the project is related to groundwater:	
1. Has GWMP been completed and	Yes

submitted for the subject basin?	