A. Upper Feather River Watershed (UFRW) Irrigation Discharge Management Program

A local coalition has formed within the UFRW to respond to the RWQCB's requirements of discharge from irrigated lands and to establish a locally led, effective program to address water quality concerns from irrigated agricultural operations. The University of California is working with them and is applying for this grant on their behalf and for their benefit.

The 'management program' and proposed work elements in this Agricultural Water Quality Monitoring and Implementation (Proposition 50) grant request include 1) compilation of existing information and accurate description of irrigated agricultural operations in the UFRW including practices directed at water quality protection/enhancement, 2) monitoring - both ambient water quality of rivers and streams, and irrigation discharge, 3) a program for education/outreach to inform members of the ag community about irrigation discharge/water quality issues, current RWQCB requirements, and management practices for improving discharge and ambient water quality, and 4) a process to demonstrate implementation of effective management practices to mitigate water quality impacts from irrigated agricultural, and 5) a means to assist in developing individual farm management plans.

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The overall objective is to interact with local agricultural landowners and support work activities within the UFRW which will be responsive to the requirements of the RWQCB's agricultural discharge waiver program and addresses water quality issues associated with discharge from irrigated lands in this area.

The UFRW involves approximately 60,000 acres of irrigated lands, predominantly irrigated pasture lands and hay, located primarily within Sierra Valley, Indian Valley and American Valley. The Middle and North Forks Feather River, Indian Cr, Spanish Cr, Greenhorn Cr, and Goodrich Cr and adjacent watercourses are important for recreational, fishery, and aquatic habitat benefits, in addition to contributing to local and state supplies for agriculture, industry, and municipal uses. Water quality concerns associated with irrigated agriculture are thought to be temperature, nutrient enrichment, bacterial contamination, and sediment discharge.

The goal of this project is the establishment of a locally led, proactive program to address water quality impacts from irrigated agricultural operations in the UFRW. This program will involve a cooperative, non-threatening partnership effort by UC personnel, local, state and federal resource agencies, and private landowners engaged in irrigation agriculture. The desired results are 1) compilation of comprehensive and accurate information on existing irrigation ag operations, and known or potential water quality impacts from those operations, 2) implementation of an ambient water quality monitoring program to better define and understand water quality impacts from irrigation operations, 3) transfer of information from 1 and 2 above to the ag community, the RWQCB, and

other watershed stakeholders in order to facilitate good decision making, and 4) establishment of a process by which individual farm owners/managers can evaluate their current operations, identify problems or concerns, and plan for any needed management improvements. The expected benefits will be improved water quality in the rivers and streams of the UFRW and the continuation of a viable agricultural economy, relieved of the threat of regulatory or punitive action, working towards the mutual benefit of industry and environmental interests.

B. **Water Quality Protection**

Previous studies in the UFRW provide limited data on water quality and watershed conditions. The most recent information is from the ongoing watershed monitoring program implemented by the Feather River Coordinated Resource Management Program (FRCRM). In the CRM's Feb. 2004 monitoring report, it is stated that the MF Feather River @ Beckwourth (downstream of Sierra Valley) had high levels of turbidity, nutrients, TDS, EC, and selected metals (high relative to other watershed monitoring sites). Other monitoring sites downstream of irrigated lands showed some water quality impacts, however, the database in insufficient to adequately evaluate and define water quality changes resulting from current irrigation practices. Seasonal low flow, in part due to diversion and irrigation use, is also believed to have an impact on water quality and aquatic life.

Currently there is virtually no information specific to water quality impacts from irrigated agriculture (primarily pastures and hayland) in the upper watersheds. Chemical use on ag lands in UFRW is nominal. In 2002, the Agricultural Commissioner reported that only 433 pounds of active pesticide ingredients were applied to irrigated agricultural lands in Plumas-Sierra counties. For this reason, ag chemical related toxicity is not believed to be an important water quality issue in this area. However, in order to validate whether or not this is true, toxicity monitoring will be included in the first year of the proposed monitoring program. Focus of the monitoring program will be to assess water quality above and below areas of intensive irrigation operations and sampling will emphasize constituents which are believed to have potential for beneficial use impacts (i.e. impacts on fisheries, aquatic life, recreation, and municipal/agricultural supplies resulting from temperature increases, nutrient enrichment, bacteria discharge, and erosion/sediment discharge).

None of the waters in the Upper Feather River watershed are currently listed as impaired per Section 303(d) of the Federal Clean Water Act. However, past human activity from logging, mining, grazing, roads and railroads, stream channel modification, water diversion, and urban and rural residential development have substantially impacted natural functioning conditions in rivers and streams and impacted overall watershed conditions. The Feather River CRM (established in 1984) and more recently the Sierra Valley CRM have been working to address degraded watershed conditions through restoration, community education, and promotion of improved management practices. This project proposal, which is to address impacts from irrigation agriculture, is but a part of this overall effort to protect and enhance watershed conditions.

C. Environmental Compliance

This project involves water quality monitoring, demonstration and evaluation of management practices, community education, and farm/ranch planning. It is not expected that CEQA or other environmental compliance or permits will apply to activities undertaken as part of this project. Plans and information coming from this project may subsequently lead to implementation actions which involve environmental compliance issues. This will be addressed at a later date.

D. Project Description (expanded description and maps are in Attachment E)

This project will work directly with agricultural landowners, water quality regulators and educational entities interacting with the watershed community in the Upper Feather River watershed within Plumas Sierra and part of Lassen Counties to proactively monitor ambient water quality to better understand local river/stream conditions and identify impacts of irrigated agriculture plus demonstrate and promote economically feasible management practices (MMs) that minimize negative water quality impacts. The project will build upon existing information and data from a variety of sources, including the Feather River Watershed Management Strategy from the Monterey Settlement Agreement, individual watershed assessments conducted by the Plumas & Tahoe National Forests, the Feather River CRM Watershed monitoring program (http://www.feather-river-crm.org/monitoring.html) , the Sierra Valley Watershed Assessment (by Sierra Valley RCD), and numerous other watershed plans and studies undertaken by federal, state and local entities including NRCS, the Dept of Water Resources, RWQCB, local Community Service Districts, Feather River and Sierra Valley RCDs, Sierra Valley Ground Water Management District, and Plumas and Sierra County Planning and Agriculture Departments.

The Feather River watershed is located in California's northern Sierra Nevada and encompasses a broad variety of terrain, climate, historic use, and flora and fauna. It includes 3,222 square miles of land that drains west from the northern Sierra Nevada into the Sacramento River. The Feather River is unique in that the two branches, the North and Middle Forks, originate east of the Sierra Range in the Diamond Mountains and as these two forks flow west, they breach the crest of the Sierra Nevada Range on their way to Lake Oroville. Elevation ranges from 2,250 to over 10,000 feet, and annual precipitation varies broadly from more than 70 inches on the wet western slopes to less that 12 inches on the arid east side. Vegetation is diverse and ranges from productive mixed conifer and deciduous forests in the west to sparse sage/yellow pine plant communities in the east. The National Forest manages over 80 percent of the watershed, while alluvial valleys are predominantly privately owned and used for livestock grazing and hay production. There are approximately 60,000 irrigated acres in UFRW. Irrigation agriculture on private lands takes place principally within three large valley areas, i.e. Sierra Valley which is near the headwaters of the MF Feather River, Indian Valley which drains to Indian Cr near Greenville, and American Valley draining to Greenhorn and Spanish Crs near Quincy. Other irrigated lands are located on Goodrich Cr and on Red Clover Cr, both tributaries to the East Branch of the North Fork Feather River.

Objective 1: Establish and monitor in-stream monitoring sites in collaboration with the Project Steering Committee to supplement monitoring sites previously established and monitored by the FR-CRM. This builds upon an existing dataset and investment by expanding the effort to isolate and quantify the change in pollutant levels due to irrigated agriculture discharge. This data will be valuable for developing baseline data on the change in concentration and load of pollutants of concern above and below irrigated agriculture systems in the upper Feather River watershed. This data will be valuable for: a) determining the current status of pollutant levels above and below the major irrigated agriculture systems (Sierra Valley, American Valley, and Indian Valley) in the upper Feather River Watershed at the sub watershed scale; and b) providing baseline data for future evaluation of water quality improvement resulting from broad-scale implementation of water quality improvement practices.

A tentative monitoring plan (MP) has been identified to estimate labor and analyses costs. This tentative MP is based on input from RWQCB and local agricultural landowners as an attempt to bracket water quality impacts from irrigated agriculture. The final approved MP will be developed and implemented following meetings and discussion between the Project Team and the Project Steering Committee. (as described in Section E).

Starting mid-irrigation season in year one and continuing through years two and three, digital pictures will be recorded at each monitoring site every time water samples are taken. The following constituents will be measured at all sites from grab samples: pH, electrical conductivity, total nitrogen (N), nitrate ($NO_{3)}$, ammonium (NH4), total phosphorus (P), phosphate (PO4), total and dissolved organic carbon (TOC/DOC), turbidity, total suspended solids, and E. coli. Dissolved oxygen, and streamflow will be recorded in the field at the time of grab sample collection. Stream temperature will be recorded automatically each 0.5 hr using automatic temperature loggers. Frequency for grab sample monitoring will be per the Ag Waiver Phase I monitoring requirement (monthly during irrigation season (April-October) and twice during the storm season). Water sample analysis will be conducted by UC Cooperative Extension water quality laboratories at UC Davis. Standard methods and quality assurance protection protocols will be developed which comply with SWRCB SWAMP requirements. Photos and GPS documentation will be part of each monitoring site.

Toxicity testing (water column and sediment) will be done only at the downstream sites in each of the 3 valleys at the same frequency as grab samples. As an additional measure of potential toxicity, macroinvertebrate bioassessment collections will be made at each location once per year (June-early July). Macroinvertebrate sampling and analysis will comply with CADF&G California Stream Bioassessment Protocol (CSBP). Toxicity analysis (water column and sediment) will be contracted with Pacific Eco Risk which complies with RWQCB protocols and QAPP. Macroinvertebrate analysis will be contracted with either CADF&G or Utah State University macroinvertebrate laboratories.

Objective 2: Establish three demonstration water quality management improvement measures or practices (MM) in each of the three sub watersheds and quantify water quality improvement due to each practice using water quality monitoring and standard

monitoring designs (above and below, before and after, and treatment - control pairs).). In addition to establishing new management measures and demonstration sites, monitoring may also be conducted at existing landowner sites where good management practices are already in place. These demonstration sites and supporting data are critical to convince and motivate local producers to implement management measures by informing them about the types of practices available, logistical and management requirements associated with their success and sustainability, relative efficiency for improving water quality, and costs. These sites and supporting information would form the backbone of outreach and education efforts in the sub watershed to accomplish broad-scale implementation. The results of this effort would also be applicable to irrigated agriculture systems across the north Sierra region.

Numerous MMs exist which can be effective at improving discharge from irrigated pasture and hayland. Potential practicess to demonstrate and evaluate in this project include, but are not limited to, practices such as: 1) grass filter strips, wetland construction/augmentation/restoration and retention ponds to filter and trap pollutants in runoff; and 2) modification of grazing management practices and 3) improved irrigation timing and efficiency to reduce pollutant transport potential. Final selection of MMs for demonstration will be made in consultation with the project advisory team and will be based upon: 1) reasonable expectation of water quality improvement; 2) technical/economic feasibility and potential for landowner acceptance by landowners - cooperators and 3) availability of sites appropriate to demonstrate and evaluate.

The first step for this project component is to conduct a survey of agricultural landowners/managers, irrigators, and natural resources professionals (RWQCB, NRCS, FR-CRM) to: 1) determine which MMs have already been employed in the watershed; 2) evaluate how well these MMs functioned and why they did or did not function 3) determine management issues / obstacles to broad-base adoption to existing and other MMs in the watershed; 4) identify a set of MMs which managers believe would be feasible to implement. A product of this survey will be an inventory of existing MMs and a qualitative assessment of effectiveness and feasibility.

Based upon the results of the survey, we will solicit landowner participations and enroll three demonstration sites on ranches in each of the three valleys in the project (9 total sites). Working collectively with the landowner/manager the Project Team will plan and implement the installation of MMs selected based upon: 1) the information derived from the survey; 2) site characteristics and MMs suitable for the site; 3) monitoring design and collection constraints required to evaluate water quality improvement due to implementation of the MM.

Objective 3: Educational Outreach, Extension of Project Activities and Clientele Training A critical part of this project is a program and process for ongoing education/outreach to inform members of the UFRW agricultural community about: irrigation discharge/water quality issues, current RWQCB requirements, promising management practices for improving discharge and ambient water quality, evaluation and cost benefit information related to management practices, technical and financial

resources to aid landowners interested in BMP implementation, etc. The goal is increased awareness of and understanding of irrigated agriculture water quality issues and implementation of management practices to minimize impacts.

Throughout the project, field trips, creek walks, demonstrations and seminars will be organized to: "get out on the ground", observe and understand current irrigated ag systems including how they function, things that are working well, things that aren't working so well or seem to be contributing to water quality concerns; discover possibilities that individuals or maybe a group of neighbors could implement to mitigate concerns; identify technical and financial resources available to individuals and groups to assist with implementation of practices, expand the understanding of alternatives, i.e.: mitigation or wetland banks, various easements, etc.; and foster improved communication and trust to work together. A variety of delivery methods including the Internet will be used to encourage participation and share results. Ultimate success of these educational efforts is dependent upon landowner attitudes and actions.

Objective 4: The Project Team will work with cooperating landowners to assist them in developing their own ranch and farm plans which evaluate existing operations, establish management and production goals, assess existing or potential impacts to water quality, habitat, and associated aquatic resources, and identify opportunities for management improvements. Several possible templates exist for the preparation of farm/ranch plans, including the Conservation Plans currently utilized by NRCS, the On-Farm Assessment & Environmental Review (by America's Clean Water Foundation), and Farm Assessment Plan process currently used by UC Cooperative Extension in the Central Coast Region and the Statewide Rangeland Water Quality Program. The specific number of plans developed will depend on cooperating landowners and the capabilities of the Project Team. The objective will be to demonstrate the benefits of this type of planning process and to gradually expand its use throughout the watershed.

E. Work to Be Performed and Task Descriptions

Task 1. Project Administration, Project Coordinators, and Project Team

Overall responsibility for project management and administration will be with the UC Cooperative Extension, Plumas/Sierra County office in Quincy. Two part-time Project Coordinators (one in SV and one for AV and IV) will be hired and will have responsibility for the day to day work activities discussed in this proposal (i.e. monitoring, MM demonstration, education/outreach, and assistance with farm planning). Work activities will be carried out cooperatively by a Project Team. The Project Team includes: Plumas-Sierra and Lassen UCCE Extension Advisors, Project Coordinators (described above), UCCE Extension Rangeland Watershed Specialist, UC Davis Land, Air & Water Department Chair, NRCS District Conservationist, and Sierra Valley RCD and Feather River CRM Education Coordinators.

Task 2. Project Steering Committee

To build trust, assure participation, encourage input and ultimately action by the stakeholders it is critical that a method for involvement throughout the course of the project is established. The Steering Committee will be composed of landowner representatives from Sierra Valley, Indian Valley, American Valley and Goodrich Cr, representatives from water resource protection agencies, agricultural groups in UFRW including coordinators from the three local sub-watersheds, conservation assistance agencies, Plumas/Sierra Co Agricultural Commissioner, Feather River and Sierra Valley RCDs, , NRCS Greenville Office, CA RWQCB, and The Sacramento Valley Water Quality Coalition.

The Steering Committee will have an initial meeting soon after the project start date to: a) discuss project objectives and overall scope, b) clarify committee role, c) allow input at the outset of the project and d) schedule future meetings. The Committee will meet periodically to review all aspects of project activities to assure accuracy of information, quality of products, and acceptance by the local ag community.

Task 3. Augment Existing Information On Irrigated Agriculture Operations In UFRW

3.1 With consultation from the Steering Committee, the Project Team will develop comprehensive, accurate information (through survey and other means) about current status of irrigated lands in UFRW including: total acreage and location of irrigated lands, types of farming/ranching operations, types of irrigation practices, types and amount of ag chemical use, sources of water, farming/grazing practices, irrigation return flow and storm runoff, and management practices (MMs) commonly in use. The survey will also detect willingness to cooperate in the demonstration site activities of this project, and will assess the general knowledge of agricultural community on water quality issues and requirements.

3.2 Working with Plumas & Sierra County Assessors and Planning Departments, Ag Commissioner, NRCS, sub-watershed coordinators, etc. create a comprehensive mailing list of irrigated agriculture landowners in UFRW. Complete within three months of project start date.

3.3 Prepare a report to adequately describe irrigated agricultural operations in UFRW, Jan 2006.

Task 4. Establish Monitoring Plan, Develop QAPP, and Implement Water Quality Monitoring Program at Baseline Monitoring Sites

4.1 In consultation with the Steering Committee, develop a baseline water quality monitoring plan to identify water quality impacts from irrigated agricultural operations in the UFRW. The proposed monitoring program (described in Attachment E) will bracket irrigated agriculture in the main valleys in the UFRW and is expected to include 5 sites in Sierra Valley, 3 in Indian Valley, 3 in American Valley and 2 in the Goodrich Creek area

above Lake Almanor. Water quality constituents and frequency of sampling will be consistent with the Phase I requirements of the Regional Boards Ag Waiver Program.

4.2 Following established monitoring protocols such as the SWRCB SWAMP QAPP, the Feather River CRM Monitoring Program QAPP, and other sources, the Project Team will develop a QAPP and Monitoring Plan for major irrigated agricultural areas in the UFRW to comply with RWQCB Ag Discharge Waiver Requirements. SWRCB approval will come prior to any sampling or monitoring.

4.3 Start monthly sampling of water quality constituents at 13 in-stream sites by mid-irrigation season 2005, if not earlier, depending on project start date and QAPP and MP/QAP approval date. Monthly sampling will be completed by Oct 2005 then 2X/wet season. Bioassessment monitoring will be done 1X/yr at each of the 13 sites, mid-June/early July. In years 2 & 3, monthly in-stream monitoring will commence with irrigation, ~April + 2X during storms.

4.4 For purposes of augmenting information on baseline water quality, selected irrigation return flow locations will be identified and sampled. The purpose of this sampling will be to characterize the general range of constituent levels in irrigation return flows throughout the watershed. Water quality of runoff from non-irrigated lands may also be monitoring for additional information purposes.

Task 5. Identify and Monitor Demonstration Sites To Evaluate Management Measures

5.1 Based on subwatershed group meetings, survey results, input from willing cooperators and the Steering Committee, the Project Team will make field visits and decide most feasible MMs to be implemented at demonstration sites that will offer a benefit to water quality and means to evaluate water quality and cost/benefit to landowners. The goal will be to establish three demonstration sites in each of the three valley areas.

5.2 Develop a site specific monitoring plan and QAPP for each demonstration site, Winter 2006.

5.3 Collect water quality monitoring data, photo documentation and associated economic data to evaluate the performance, and technical/economic feasibility of the MMs, during irrigation seasons 2006 & 2007.

Task 6. Educational Outreach

6.1 The Project Coordinators and rest of the Project Team and Steering Committee will interact with existing organizations and individuals in UFRW to explain goals/objectives of the project and expectations for participation in order to make this program/project successful. Initially within 3 mos.

6.2 Building upon existing information, compile a list of technical resources and potential funding opportunities to assist landowners in writing ranch plans and implementing MMs. List will be distributed at educational events, posted on the Internet. Completion 02/06.

6.3 Share results of the report on ag operations in the UFRW (Task 3) via meetings with existing organizations, newsletters, and small group meetings plus post on the Internet. Winter 2006.

6.4 Share results of Yr 1 baseline water quality monitoring via the same means as 6.3 Stakeholder input will be sought if additional sites need to be added to deal with concerns or unanswered questions. 3/06.

6.5 Share status and results of demonstration sites and MM monitoring via the same means as 6.3. 3/07

6.6 Conduct Creek Walks and demonstration site visits to learn who the players are, current practices, what is happening, how things are functioning and explore ideas for improving water quality. Ongoing.

6.7 Field trips, seminars, newsletters will be organized throughout the project and posted on the Internet.

Task 7. Facilitate Completion of Conservation or Farm/Ranch Plans

7.1 Working with willing individuals and small groups within the sub-watersheds, Coordinators will work with NRCS, UCCE and others to assist landowners in developing their own ranch and farm plans.

NRCS has agreed to provide technical assistance in the form of GIS maps with aerial photograph overlays for each cooperating landowner.

Task 8. Draft and Final Project Report

Working with Project Team and Advisory Committee draft project report three months before final report is due to SWRCB. Organize public meetings to share findings. Circulate draft report to cooperating agencies, organizations and make available for stakeholder review and input. Incorporate comments and finalize report to be shared with SWRQB and made available to the public via libraries and Internet.03/08

F. Project Effectiveness

The overall goal of this project is to establish a locally led program which is responsive to the requirements of the Regional Board's program requirements for discharge from irrigated ag lands, and to address known or potential water quality impacts from irrigation operations. Following are some criteria for project success: -Establishment of a Project

Team which is knowledgeable about ag operations in the UFRW and has the trust and respect of the agricultural community. -Establishment of a Project Steering Committee which is knowledgeable, understands the project objectives, and is representative of private landowners engaged in irrigation agriculture throughout the watershed. -Collection of accurate, comprehensive information on existing ag operations, and on known or potential irrigation/water quality issues, in the UFRW and the successful communication of that information to the ag community, the RWQCB, and other stakeholders. -Collection of water quality data which better defines water quality changes in affected rivers and streams resulting from irrigated land discharges. -Collection of information from MM demonstration sites which validates water quality benefits from implementing these measures and provides motivation for landowners to accept and implement these measures on a broader scale.

-Implementation of an education/outreach program which results in a more informed community, with increased understanding of the compatibility of a viable agricultural industry and water quality/resource protection. -Increasing development and use of individual farm plans to better understand management objectives, water quality/resource concerns, and improvement opportunities.

The project will involve collecting baseline water quality data bracketing the impacts of irrigated agricultural practices in the main valleys of the UFRW. Evaluation of management measures/practices effectiveness for reducing pollutants in runoff will be achieved by application of standard study/effectiveness monitoring designs including: 1) monitoring of water quality before and after MM implementation; 2) monitoring water quality above and below the MM; and 3) establishment and monitoring of treatment (MM) and control (no MM) sites. A combination of MM evaluation designs (before and after monitoring above and below the MM, or before and after monitoring on paired treatment and control sites) will be employed at each demonstration site to allow for collection of baseline and post MM implementation data of sufficient quality to test MM effectiveness.

Water quality metrics to be evaluated at each MM demonstration site (objective 2) include pollutants of primary concern from irrigated, grazed pastures and hayland. Water samples will be analyzed for: E. coli, total nitrogen (N), nitrate (NO3), ammonium (NH4), total phosphorus (P), phosphate (PO4), total suspended sediment (TSS), turbidity, total and dissolved organic carbon (TOC/DOC). Water quality samples will be collected for 4 irrigation events before and after MM implementation (8 events total). Samples will be collected above and below or from control and treatment sites during each event, depending upon monitoring design for the MM site. Water temperature, dissolved oxygen, and flow volume will be determined in the field during each irrigation event at each sample site. Water sample collection and dissolved oxygen - temperature - flow measurements will occur hourly throughout each irrigation event at each sample site. Irrigation event duration is expected to range from 6 to 12 hours, resulting in 6 to 12 samples per site per event. Our experience in monitoring discharge from these types of agricultural systems is that this sampling frequency will allow us to capture peak concentrations, account for flushing and dilution of soluble pollutants, and accurately

estimate pollutant load reductions due to MM implementation. Across 3 sub-basins, 3 MM sites per sub-basin, 2 monitoring sites per MM site (above/below, or treatment/control), over 6 irrigation events (3 before/3 after), with 6 to 12 samples per event we estimate that sample size will range from 648 to 1296 over the course of the project for this objective. This level of water quality characterization coupled with standard monitoring design and implementation will allow for a powerful analysis and evaluation of MM effectiveness at the management scale. Data verification, entry QA/QC can be addressed in the MP and QAPP.

Effectiveness of educational outreach efforts to landowners will be a comparison of responses from pre-and post-project questionnaires about their understanding of agriculture water quality regulations, requirements and management measures to mitigate negative impacts plus resources available to assist with monitoring and reporting documentation as well as implementation of practices. Landowner attitudes and actions taken to complete farm/ranch plans on their own or in conjunction with NRCS plus changes in management or implementation of new practices, if needed, will all be used to measure effectiveness.

G. Submittal List and Schedule[1]

Task Number & Deliverables	**Estimated Deliverable Timeframe1**
Task 1. Project Administration:	
Contract Summary Form submitted electronically	July 15, 2005
Expenditure Projections	July 15, 2005 & every 6 months
Task Number & Deliverables	**Estimated Timeframe 1**
Quarterly Progress Reports	July 15, 2005 then quarterly
Task 2. List of Project Steering Committee Members	June 15, 2005
Task 3. Augment Existing Information about Land Management Practices on Irrigated Agriculture Lands in UFRW	
Landowner Survey Form	July 15, 2005
Mailing list of Irrigated Ag Landowners	July 15, 2005
Draft Report of Irrigated Ag Practices in UFRW	January 15, 2006
Final Report of Irrigated Ag Practices in UFRW	April 15, 2006

Task 4. Establish Monitoring Plan, Develop QAPP, and Implement Water Quality Monitoring Program at Baseline Monitoring Sites	
Approved Monitoring Plan	June 15, 2006
Approved QAPP	June 15, 2006
Annual Progress Reports of Baseline Sites	March 2006, 2007, 2008
Task 5. Identify and Develop Demonstration Sites in Each Valley to Monitor Management Measures	
List of Proposed Demonstration Sites	February 28, 2006
Approved Monitoring Plan & QAPP for Each Site	March 31, 2006
Annual Progress Reports of Demonstration Sites	March 2007, 2008
Task 6. Educational Outreach	
Overview of Project Goals, Expectations & Contacts	June 15, 2005
List of Technical Resources & Funding Opportunities	February 28, 2006
Newsletters, Seminars, Field Trip Announcements	Summer 2005 & as needed
Website Posting of Announcements & Progress Reports	September 2005 & update regularly throughout project
Task 7. Facilitate Completion of Conservation or Farm/Ranch Plans by Landowners	
Farm Planning Workgroup Promotion Materials	October 31, 2005
Announcements of Trainings & Workgroup Meetings	Start Winter 2006 & as needed
Task 8. Draft and Final Project Report	
Draft Project Report	January 1, 2008
Final Project Report	March 31, 2008

1 Assuming project start date of 4/15/05 and end date of 3/31/08 (Prop50)

H. Education, Outreach, etc. (Letters of Support are in Attachment F)

Once funded, a stakeholder Steering Committee will be established to guarantee landowner input, foster trust-building, facilitate open communication and encourage participation throughout the project. In addition to the monitoring work previously discussed, this project will fund 2 part-time individuals (Project Coordinators) to work directly with irrigated ag operators in each of the sub-watersheds.

Working with landowners via a number of venues including existing organizations, i.e.: Farm Bureau, Cattlemen's, RCDs, FR-CRM, Last Chance Irrigation District, Sierra Valley Ground Water Management District, Sierra Valley Water Company, Farmers' Mill Race in Indian Valley, etc., Coordinators will work with individuals and groups to encourage completion of surveys then facilitate bringing people together in the subwatersheds or smaller groups if needed to share results and refine information. Building upon existing data, looking at maps, photographs, etc. have individuals (in small groups) describe current cultural practices, irrigation practices, livestock grazing practices, observations they've made about water quantity and quality (concerns, potential solutions that have been tried, other possibilities that could be considered, barriers to implementation, suggestions or opportunities to overcome barriers, etc.) A summary of the finished product will be made available to landowners plus they'll be notified of where copies of the comprehensive report and maps can be obtained. (Year 1 task)

During years two and three, Coordinators will facilitate workgroups aimed at assisting landowners complete their own Ranch Plans so that they meet requirements of ag waiver program and Clean Water Act. NRCS as agreed to provide technical assistance in the form of GIS maps with aerial photograph overlays for each cooperating landowner. Project Coordinators will have access to laptops with templates of farm/ranch plans including Conservation Planning from NRCS, Farm and Ranch Water Quality Plans from Cooperative Extension so they can assist landowners in completing their own plans. Digital cameras will be used to help establish photo monitoring as a component of the plans. Water quality monitoring on the ranch (if any) plus that being done in UFRW will be referenced. Completed plans will be the property of individual cooperators. Coordinators with the Steering Committee and Project Team will develop a program and process to demonstrate implementation of effective management practices to mitigate water quality impacts from irrigated agricultural operations.

Following local concerns about requirements associated with the ag waiver regulation and interest in Prop40/50 funds as a possibility to help with compliance, Cooperative Extension circulated a three page written concept paper to and sought input from the following individuals and groups within the UFRW before developing this proposal: Sierra Valley Resource Conservation District (SV-RCD), Feather River Coordinated Resource Management Group, Feather River RCD, Plumas-Sierra Cattlemen's Association, Plumas-Sierra Farm Bureau, Last Chance Irrigation District, Aaron Ferguson from Northern California Water Association, Karl Bishop-Plumas Sierra Agricultural Commissioner, Coordinators for the 3 subwatersheds within in the UFRW (Carl Genasci, Russell Reid, Brain Kingdon and Jerry Spurlock), Natural Resource Conservation Service staff working in Plumas-Sierra, Dennis Heiman-Regional Water Quality Control Board, Plumas County Watershed Forum (key players are Plumas

County Board of Supervisors, Department of Water Resources and Sacramento Valley Water Contractors) plus about 20 irrigators in UFRW at a public meeting in Sierra Valley to discuss local efforts to comply with Ag Waiver requirements. The proposal is seen as a proactive way to benefit agricultural irrigators in the UFRW by gathering information about local irrigated agriculture systems including water quality data from ambient and return flow sources to comply with the requirements of the Ag Discharge Waiver as well as learning more about economically feasible management practices that could be implemented to mitigate water quality impacts from irrigated agriculture. Local groups and individuals encouraged UCCE to move ahead with a full proposal and agreed to cooperate and encourage landowner participation if funded.

While most of the local agricultural community agrees that a proactive stance is good; and are open to collecting data in the streams and evaluating management practices, there are still some concerns that regardless of management measures implemented and improvements in water quality from agricultural lands, the State and Regional Boards will never be satisfied. There is frustration related to regulations, associated fees to comply and what appears to be "one shoe fits all" approach to dealing with the problem. Agriculture in the UFRW is relatively "low impact" compared to much of the Sacramento Valley. The Plumas-Sierra Agricultural Commissioner has stated that for 2002, the latest year that figures are available, that only ~433 pounds of active pesticide ingredients were applied in the two counties to agricultural lands some of which may not have been irrigated. Thus, he feels that toxicological monitoring is not warranted. In preparing the budget for this proposal, the Project Team is very concerned with the HIGH costs of toxicity monitoring (water column for three species plus sediment). We want to collect data that complies with the requirements established by RWQCB, yet question the expense and need of nine annual toxicity analyses (monthly during irrigation season, Apr-Oct and twice during storm events).

I. Costs and Financial Feasibility (see Attachment B for Task and Line Item Budget)

Members of the Project Team (Tate & Singer) have significant experience in conducting and managing this type of project and have offered to assist colleague Holly George who will be the Project Leader. David Lile and Holly George have cooperated with Dr. Tate on numerous projects in the past. Cost estimates are based upon this experience and the going rates for staff salary and supplies. There are no equipment purchases or construction costs associated with this budget. The summary includes total budget figures ($786,980) with breakdown of match funds ($267,768) for **grant request of $512,512**.

Personnel expenses ($421,446) are driven by requirements for staff skilled in: 1) Field data collection and statistical analyses (Graduate Student) 2) Project coordination and community outreach (SRA1) 3) Financial and data analysis (_____Assistant). Salaries and benefits for each job title are defined by University of California salary scales. Total number of work hours represents three years of significant field data collection, associated laboratory analysis, survey preparation, meetings with landowners and agency personnel, field days and clientele ranch planning "work sessions". Personnel match costs are comprised of in kind contributions of UCCE Project Leader Holly George (30%),

Project Team Members, Kenneth Tate (20%), David Lile (15%) and Michael Singer (10%). Contributions for these individuals include base salary, benefits @ 17% for Tate and Singer and 30% for George and Lile plus 25% indirect costs on base salary and benefits. The match for UC personnel equals $267,768.

Operating Expenses: ($189,317) Almost all of this ($172,317) is associated with establishing, collecting, shipping and analyzing non-toxicity water quality parameters for (Tasks 4 and 5). Plumas-Sierra UCCE via funds from the Plumas County Watershed Forum is contributing $2,000 towards match for the purchase of field sampling tools. Cost of supplies for microbial, organic C, and colloidal pollutant analysis and collection of water samples are calculated based upon item by item costs, not current commercial lab rates which are higher than UCD estimates. These calculations include the costs of complying with QAPP including field trip blanks, replicates, spikes, blind samples, reference materials, positive and negative controls, and confirmation of presumptive positives. Total sample size for the 3 years of water sample collection and analysis will be ~1078 samples which will be analyzed per Phase 1 of Ag Waiver Requirements. ~$12,000 of the budget ($5,000 in-kind match from NRCS) is directed to Tasks 6 & 7. A small amount ($5,000) for misc. supplies, including postage and phone will be used across all Tasks. The Sac Valley Coalition intends to contribute a match pending final collection of fees.

Travel expenses: ($36,375) Travel is for extensive field collection over 3 years and transport of samples in a timely manner to the labs in Davis and Martinez plus Coordinators' travel for education outreach, community involvement, and assistance in facilitating landowner completion of farm plans across the UFRW, Project Team and Steering Committee meetings & field visits to establish monitoring and demonstration sites, and attendance of the Team Leader at meetings to share results.

Professional and Consultant Services ($46,750) The majority of this will go to Pacific Eco Risk to do toxicity analyses (Task 4) at one location at the bottom of the main valleys for the first year of the project, Task 2. Estimated costs for continuing this through years 2&3 were over $95,000 plus significant additions to travel and shipping budget would be needed. Macroinvertebrate samples collected once a year at each of the baseline monitoring sites will be analyzed by Utah State or CDFG BugLab, Task 4.

Overhead ($93,092) University of California applies a 25% (modified total direct costs or MTDC) to all State agreements, a rate which is about half of the University's federally approved research rate. An agreement between the University and State agencies has been reached and is referenced in University of California Operating Guidance Memo No. 03-02, Dated May 9, 2003 (http://www.ucop.edu/raohome/cgmemos/03-02.html). The University's federally negotiated indirect cost rate agreement may be viewed at http://ovcr.ucdavis.edu/IndirectCosts/indirectcosts.cfm.

J. Readiness to Proceed (Letters of Intent to Cooperate are in Attachment H)

There is interest, willingness to proceed with this project and commitments from the Dr. Kenneth Tate, UC Rangeland Watershed Extension Specialist, Dr. Michael Singer, UC Davis Department Chair Land Air and Water, David Lile, Lassen County Cooperative Extension Advisor in addition to Holly George, Plumas-Sierra Cooperative Extension Advisor as PI. Dennis Heiman, RWQCB, contributed comments throughout proposal preparation and has agreed to work with Leslie Mink, Monitoring Coordinator with the Feather River Coordinated Resource Management Group has verbally agreed to share information collected at their continuous recording stations. A draft concept paper of the proposed project has been shared with local stakeholders who have expressed support to proceed and willingness to participate once funding is secured. The Northern California Water Association and the Sacramento Water Quality Coalition have seen the proposal and have offered to share their pending QAPP for our use. They have also offered as a match the funds they are expending (which come from local ag producers) for ag water quality monitoring this coming year at three locations (the bottom site in each of the 3 valleys). Pacific Eco Risk is the lab the Coalition has contracted with to do sampling and analyses in the UFRW and who we propose do the toxicological tests. Pacific Eco Risk qualifications and resumes are in Attachment I.

K. Qualifications of Applicants, etc. (Vitaes are in Attachment G)

Holly George is the UCCE County Director and Livestock/Natural Resources Advisor in Plumas-Sierra Counties and has a 17 year working relationship with the agricultural community in the UFRW and their trust to move forward with this project. She has conducted numerous educational programs related to rangeland water quality and involved local landowners in a number of statewide water quality research efforts. As the County Director she has experience managing budgets and supervising personnel.

Dr. Kenneth Tate, UC Extension Rangeland Watershed Specialist, has worked with landowners across the State for over 14 years and has significant experience in developing and conducting such evaluation and applied research projects and will provide design and implementation advice, laboratory analysis support, and data analysis and interpretation services. He has an extensive publication list and has managed enumerable grants In 2000 he received national recognition from Society for Range Management for outstanding contributions to the science of range management.

Dr. Michael Singer, Department Chair of Land, Air and Water at UC Davis, has over 30 years experience as a Soil Science and Resource Scientist in the Experiment Station, publishing over 120 articles and will provide technical expertise, graduate student supervision and assist with economic and statistical analysis.

Over the last 8 years, David Lile, UCCE Natural Resources and Livestock Farm Advisor in Lassen County has conducted applied research and extension programs relating to water quality focused on issues such as stream temperature, rangeland water quality, and most recently, run-off from irrigated pastures and meadows. Working with colleagues, this research has resulted in several peer-reviewed publications relating to the management and monitoring of rangeland and meadow streams. He also has a proven

working relationship with landowners in the Goodrich Cr area and their commitment to cooperate.

L. Disadvantaged Community I don't think Plumas-Sierra Qualifies per application definition.