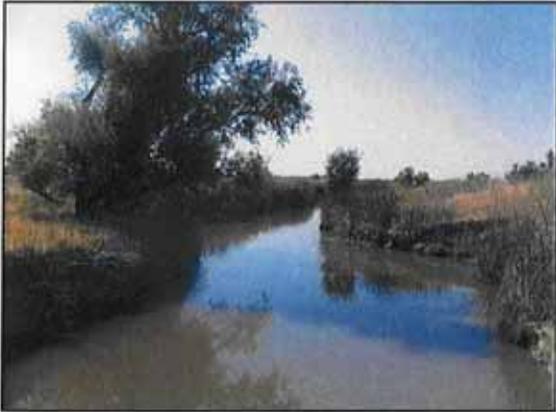


**LOGAN CREEK WATERSHED  
BEST MANAGEMENT PRACTICES (BMP) EVALUATION  
FOR THE IRRIGATED LANDS REGULATORY PROGRAM  
PERFORMED UNDER CONTRACT 07-078-150-0 BETWEEN  
THE COUNTY OF GLENN DEPARTMENT OF AGRICULTURE AND THE  
CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD**



**Prepared by Glenn County Department of Agriculture  
June 2009**

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**LOGAN CREEK WATERSHED  
BEST MANAGEMENT PRACTICES (BMP) EVALUATION  
FOR THE IRRIGATED LANDS REGULATORY PROGRAM  
PERFORMED UNDER CONTRACT 07-078-150-0 BETWEEN THE COUNTY OF  
GLENN DEPARTMENT OF AGRICULTURE AND THE CENTRAL VALLEY  
REGIONAL WATER QUALITY CONTROL BOARD**

**BACKGROUND**

The Central Valley Regional Water Quality Control Board has adopted a Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Resolutions No. R5-2003-015 & R5-2006-0053) herein referred to as the Irrigated Lands Regulatory Program (ILRP). In an effort to integrate resources, a Memorandum of Understanding (MOU) between the California Department of Pesticide Regulation, the Agricultural Commissioners of Butte and Glenn County, the Central Valley Regional Water Quality Control Board (Regional Board), and the State Water Resources Control Board was developed. This MOU applies to a pilot program initiated with Glenn and Butte Counties. These two counties, under the jurisdiction of the Regional Board, may undertake activities throughout the Sacramento River Basin. Subsequent to the MOU, a contract has been entered into between the Regional Board and the Glenn County Agricultural Commissioner (County) to perform tasks requested by the Regional Board specific to the MOU. The resulting contract contained five tasks for the County to perform at the request of the Regional Board.

From previous discussions with the Regional Board contract manager, and with the positive response to the Walker Creek BMP Evaluation, it was decided to continue quantifying monitoring results at selected sampling points of the Sacramento Valley Water Quality Coalition (SVWQC) of agricultural dischargers to waters of the state with documentation of management practices employed within those agricultural operations and the potential beneficial effect those practices may have on those results.

In an effort to assist the SVWQC and the Regional Board, County staff suggested that a survey of existing visual management practices in place that may benefit water quality be performed. In order to make the evaluation comprehensive, the Logan Creek Watershed which is contained within Glenn and Colusa Counties would serve the purposes of all concerned. The previously completed Walker Creek Watershed BMP Evaluation serves as a template for this evaluation with minor changes in data collection and Arc View layer presentation.

## METHODS

County staff began the Best Management Practices (BMP) evaluation by utilizing a portion of the map previously developed for Task 1 of the contract (submitted to the Regional Board May 2006). Logan Creek (Attachment A) is a Cal Fed recognized watershed contained within Glenn and Colusa Counties. Staff from the Glenn County and Colusa County Departments of Agriculture had access to all available information such as parcel number, property owner or operator, agricultural production and cropping, and pesticide use reports. A MOA was developed between the two counties to work cooperatively on the program (Attachment B).

Once the Logan Creek watershed was selected for the evaluation, an overlay of a fields database was developed to determine which growers were located within the borders of the watershed. It was decided that fields having their centers in the boundary were to be included in the evaluation. After selecting those fields, an attribute table containing the permit number and site number was exported into an Excel spreadsheet. The list had to be cross-referenced with the pesticide permitting programs of the two counties to collect permittee, crop and additional site information. This information was used to formulate a mailing list and also for a field/grower list to help determine how many acres would be surveyed and how many growers would be contacted.

It was also decided that growers with 10 acres or less would not be surveyed. Most of these sites are ranchette type operations for home use. The fields were hard often landlocked making it difficult to survey. This in no way indicates whether or not the owner of the parcel is a member of the coalition.

The Walker Creek Field Survey Sheet was used as a template for the Logan Creek Field Survey Sheet (Attachment C). The field survey is used to document the management practices in place while in the field. Crop type and other relevant information are also noted. The Logan Creek survey was similar to the Walker Creek survey with some minor changes. A place for Primary ID number and County were added. Check boxes for additional Drainage Management practices were added due to the large number of rice fields to be surveyed. A section for Residue Management was also added as a seasonal component for rice fields. APN number, Water Source, and Soil Management were deleted. The information listed on the survey was grouped into categories: Field Type, Irrigation System, General Practices, Visible Mix & Load, Vegetation Management, Residue Management, and Drainage Management. If a field could not be surveyed because it was not accessible, that was noted on the survey sheet. It was also noted if there was a field belonging to a grower with 10 acres or less. This was to be sure that there were no holes in the maps. Each field was given a survey number (primary ID).

More in depth answers to unobserved practices employed on each site would be disclosed in a Farm Site Self Assessment survey (Attachment D). The Farm Site Self Assessment Survey used in the Walker Creek survey was developed by CURES. It was decided that the survey could be shortened to capture the most relevant information to achieve a

higher level of response from growers. The Farm Site Self Assessment Survey was modified from the one used in Walker Creek and mailed to each identified property operator in the watershed. Outreach to growers in this evaluation was recognized as a very important component. Growers within the watershed were mailed a letter explaining the BMP watershed evaluation along with the survey. It was explained that visual surveys were being conducted and that they would be asked to complete the accompanying survey and additional information may be requested of them as the evaluation continues. At this point the survey is only being used as a backup to the field survey for focused outreach if necessary by the local Subwatershed group.

The survey response from growers was very low. Unlike Walker Creek with 60% of the surveyed acreage responding, only 10% of Logan Creek growers responded. This was probably due to the excessive level of one on one outreach performed for Walker Creek. If monitoring results from the Logan Creek location indicated a greater level of outreach was necessary, than it is predicted that a 50-60% response could have been generated.

The majority of the staff's time was spent conducting the field surveys and developing the database and mapping program that incorporated the aspects of the evaluation. The surveys were conducted from November 2007 and concluded in February 2009 by driving around all sides of each site when possible (There was a two month period between August and October 2008 delaying the evaluation observations). If it was not possible to drive around the site, not accessible was noted on the survey sheet and entered into the computer. The site was still drawn on the map. Staff used the ArcMap of the watershed and the fields database from the county's pesticide permitting program to determine which fields should be surveyed. If the field was at least halfway in the watershed, a survey was conducted. Maps were printed for a large blocks of fields to complete surveys of sections of the watershed at one time regardless of grower. Then smaller maps showing the location of each field and the nearest roads were made to assist in the field survey. The maps were used to draw in major drainages, public waterways, BMPs employed, and other relevant information during the survey. The maps are kept along with the paper copy of the field survey and are used for backup information (Maps and survey sheets are not included in this report but all are available upon request).

Similar to the Walker Creek Evaluation, there was a wide range of practices observed and it was noted that all surveys should be conducted within a shorter period of time for consistency. Seasonal changes may occur and surveys done are only a snapshot in time. Orchards that have vegetation between the rows in the spring may be bare in the fall due to herbicide applications to clean the floor for harvest. The surveys should be conducted after crops are planted and actively growing to be able to see what practices and irrigation methods are used. Crops can change from year to year, so this year's survey will not be as useful for applied pesticides next year, except for permanent crops.

In addition to being consistent with season of survey, the surveyors need to be consistent. All surveyors should be using the same definitions and applications of management practices employed. It is best to have one person train each surveyor so that the surveys are consistent.

After the survey was conducted, the information was transcribed on a large wall map of the watershed. Each field was outlined in a specified color as it was completed to depict irrigation method. (Map is available upon request).

An access database was created and linked to an ArcMap of the watershed to incorporate the data into a usable format. The map used to obtain the grower contact list was elaborated to include a new layer for fields surveyed. The map originally included layers for aerial photos, the field database from AgGIS 2, Glenn County watershed boundaries, streams, and Glenn County roads. The Logan Creek watershed boundary was selected from the layer that included all Glenn and Colusa County watersheds and a new shapefile was made from that. Logan Creek was selected from the streams layer and the rivers layer and a new shapefile was made for Logan Creek. This would allow staff to run queries with respect to the creek boundary. Surveyed fields were drawn into the fields surveyed shapefile. Fields that were not surveyed were also entered into the fields surveyed shapefile with as much information that was available. The appropriate selection was chosen from the surveyed category to document why the field was not surveyed. A layer with the sample location was also incorporated into the map. Additionally, an organic fields layer was also added. This layer had already been developed for other purposes within the office, but was used to help fill in gaps for fields that did not have a pesticide permit. This layer overlaps with the field survey in some instances in which the organic grower does have an operator ID. Surveys were not conducted on organic sites that did not have operator IDs.

The information from the completed surveys was entered into the database and drawn onto the ArcMap immediately, making it easy to find fields that were missed and identifying gaps in the information gathered. The map serves a good visual representation of the work done.

One of the largest obstacles with the mapping is that the layers come from many sources and are not all in the same projection. The layers do not match up and leaves room for error. Because of the mismatch, it is possible that some fields included in the survey are really not in the watershed and some fields that should have been included may have been missed. It is important that all layer projections are the same.

The access database was created to incorporate all aspects of the field survey into a useable format. The database was then joined to the ArcMap of the watershed so that a person can click on a site and pull up the field survey data, the grower information, and the site information. It also allows more in depth queries to be conducted.

The next task was to mesh the two programs. Staff exported database tables to a file. Once exported, a join can be made from the database file to the map. Click on a site and all relevant information comes up. It is important to remember that each time the database is updated, the files need to be re-exported so that the map contains the most current information.

At this point, significant queries can be run in both ArcMap for a spatial representation or in the Access database for tabular information. Queries can be conducted for irrigation type, crop type, distance from creek, specific crop, specific grower, specific area, or combinations of these or other criteria. Queries can also be conducted in Access and exported and linked to the map for visual representation of the query.

## **SUMMARY**

The Logan Creek watershed was chosen because it is fully contained within Glenn and Colusa Counties. Staff has access to all pesticide use reporting information for both counties and has access to the permitting program which in turn can be used to acquire a grower list and contact information. Sampling had been conducted near the bottom of the Logan Creek watershed for two years.

As a component of this BMP evaluation, a pesticide use query was performed in the watershed to coincide with visual inspection of the agricultural discharger parcels. A total of 196,129 pounds of active ingredient from all pesticides and herbicides that were applied within the watershed boundaries from November 1, 2007 through October 31, 2008 was reported. There were no water quality exceedances in the watershed during the study period, with the exception of DO and E. coli. On the surface it appears that the management practices in place are effective as a measure to protect water quality.

This type of evaluation is a good way to narrow the focus when dealing with water quality concerns. All land in the watershed drains to one area and has a monitoring point at the end of it. Narrowing the scope for a water quality concern within a watershed is more effective than searching the entire county for a possible cause.

Visual field assessment surveys can be used as a tool for a subwatershed group if water quality standards are not being met. They may use the survey information to help formulate a management plan or to suggest management practices that can be employed that may help alleviate water quality issues.

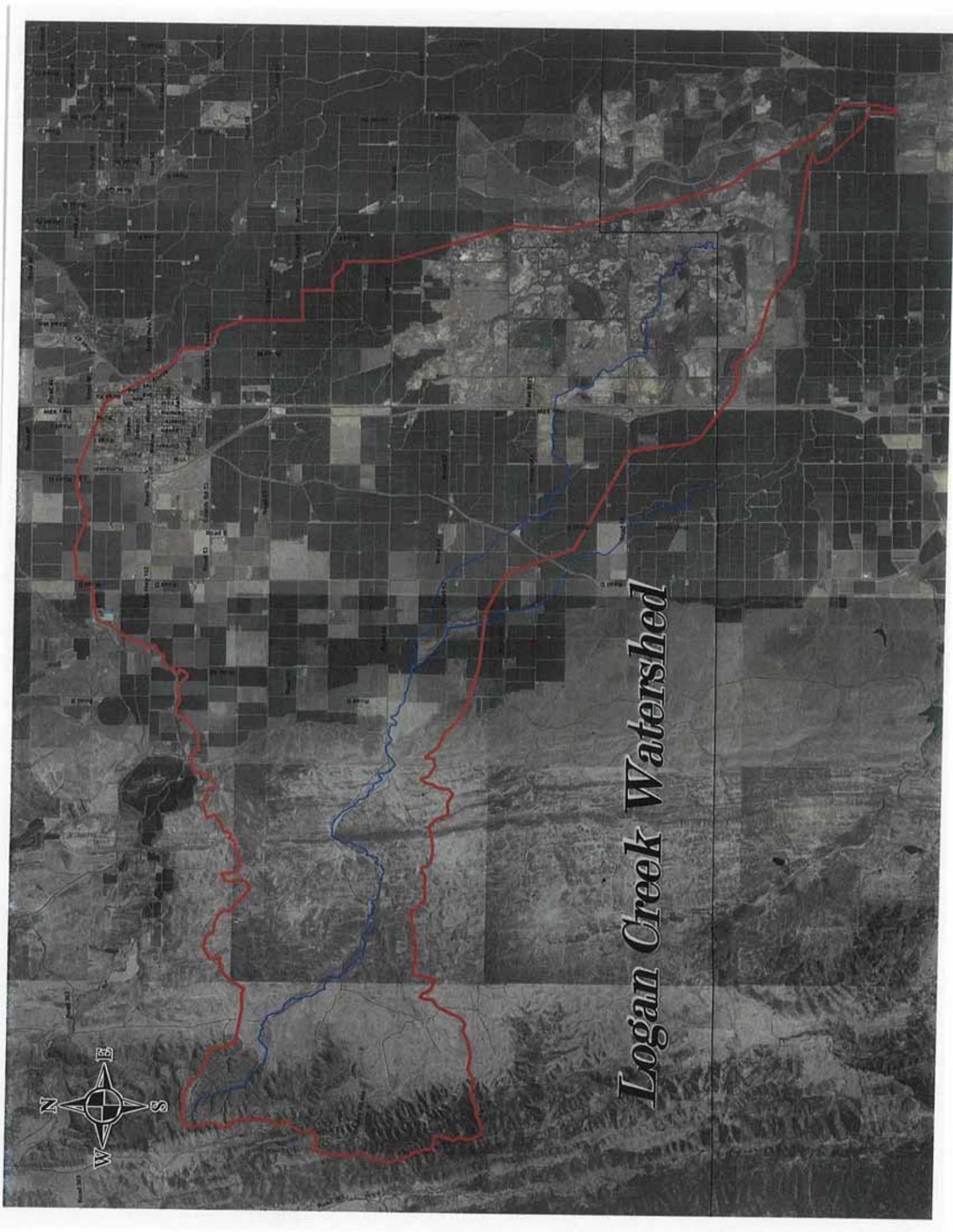
Conducting a watershed evaluation is a more relevant and practical way to determine water quality from a manageable section of land that drains to one area. Because the sampling is conducted near the end of the watershed, it gives good characterization of the watershed. Outreach for water quality concerns can be conducted quickly and more efficiently than on a county wide basis. It is more practical to target a group of growers in an area that drains to one location than it is to target the whole county. The subwatershed coordinators can use the information to conduct outreach on a whole watershed basis or by growers that were likely to contribute to the water quality concern. This is a way to keep the ILRP a non-point source program at the subwatershed level that can provide point-source outreach at a local, non-regulatory level to gain compliance and improve water quality.

## **NEXT STEPS**

As a follow up to the Walker Creek and Logan Creek Evaluations, staff from Glenn County has provided additional time and services to staff of Colusa County to perform a similar evaluation in the Freshwater Creek area of that county. It is anticipated this evaluation will be completed by September 2009 if funding remains available.

**Attachment A**

**Logan Creek Watershed Map**



*Logan Creek Watershed*



**Attachment B**

**MOA Glenn and Colusa Counties**

**MEMORANDUM OF AGREEMENT (MOA)**  
**BETWEEN THE**  
**GLENN AND COLUSA COUNTY AGRICULTURAL COMMISSIONERS**

1. Background. The Central Valley Regional Water Quality Control Board has adopted a Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Resolutions No. R5-2003-015 & R5-2006-0053) herein referred to as the Irrigated Lands Regulatory Program (ILRP). In an effort to integrate resources, a Memorandum of Understanding (MOU) between the California Department of Pesticide Regulation, the Agricultural Commissioners of Butte and Glenn County, the Central Valley Regional Water Quality Control Board (Regional Board), and the State Water Resources Control Board was developed. This MOU applies to a pilot program initiated with Glenn and Butte Counties. These two counties, under the jurisdiction of the Regional Board, may undertake activities throughout the Sacramento River Basin. Subsequent to the MOU, a contract has been entered into between the Regional Board and the Glenn County Agricultural Commissioner to perform tasks requested by the Regional Board specific to the MOU. Glenn and Colusa Counties are signatories to an existing Four-County MOU for cooperation and collaboration in water related activities.

2. Purpose/Goals. The purpose and goals undertaken by this MOA are for the Agricultural Commissioners of Glenn and Colusa Counties to work cooperatively within the context of the above referenced MOU and associated contract by performing a Best Management Practice (BMP) Evaluation in the Logan Creek watershed contained within both counties.

3. Parties. The Parties to this MOA shall initially include the Agricultural Commissioners of Glenn and Colusa Counties.

4. Areas of Responsibility. Staff from Glenn County will assist staff from Colusa County with performing visual BMP evaluations in the Colusa County portion of the Logan Creek watershed. Colusa County will provide Glenn County with all required relevant information on growers within the Logan Creek area necessary to perform the evaluation.

5. Participation//Termination/Renewal. Signatories to this MOA constitute the current participants. The Parties aspire to work collaboratively with other related programs and technical outreach efforts. Signatories of this MOA may terminate their involvement at any time with no recourse,

by either party giving 30 days' written notice of their intent. Otherwise, this MOA will be automatically renewed on an annual basis from the date of signing.

6. Compensation. Glenn County will compensate Colusa County for their efforts under this MOA on a per hour basis, similar to the existing compensation in the contract Glenn County has with the Regional Board, currently at a rate of \$65/hr, not to exceed 40 hours or \$2,600.00.

7. Non-Binding Nature. This document and participation under this MOA are nonbinding, and in no way suggest that a Party may not continue its own activities.

8. Signatories. We, the undersigned representatives of our respective entities, acknowledge the above as our understanding of how this MOA will be implemented.

**Glenn County Department of Agriculture**

Mark Black  
Mark Black, Commissioner

**Date**

10/15/07

**Colusa County Department of Agriculture**

Harry Krug  
Harry Krug, Commissioner

**Date**

10/19/07

**APPROVED AS TO FORM**

Thomas C. Agin  
THOMAS C. AGIN  
Glenn County Counsel

**Attachment C**

**BMP Field Survey**

# Logan Creek BMP Field Survey

Primary ID:
-------------

Grower: \_\_\_\_\_

Site #: \_\_\_\_\_

County: \_\_\_\_\_

Acres: \_\_\_\_\_

Field Type:	Field Crop	Orchard	Range	Rice	Other:
	Row Crop	Vineyard	Pasture	Uncultivated Ag	

Irrigation System:	Surface	Sprinkler	Microirrigation	None	Other:
--------------------	---------	-----------	-----------------	------	--------

**Observed Management Practices:**

**General**

- Field Properly Graded (Minimal Slope)
- Proper field sanitation
- Reduced herbicide treatment to berm areas

**Mix & Load**

- Containment pad with sump pump
- Area can be tilled and changed periodically
- Buffer from nearest water way. Distance to water = 
 

0--20'	20'--100'	>100'
--------	-----------	-------

**Vegetation Management**

<input type="checkbox"/> Cover crops:	Resident Veg.	Seeded	Annuals	Perennials	Green Manure
<input type="checkbox"/> Buffers:	Filter Strips	Hedgerows	Riparian	Vegetated Waterways	Constructed Wetlands

**Residue Management (Seasonal)**

Flooded for Decomp.	Burned	Uniformly Distributed	Bailed	Tilled	Wildlife Habitat
---------------------	--------	-----------------------	--------	--------	------------------

**Drainage Management System**

- |  |  |
|--|--|
| <input type="checkbox"/> Berms                           | <input type="checkbox"/> Settling Ponds                |
| <input type="checkbox"/> Water & Sediment control basins | <input type="checkbox"/> Recirculation system          |
| <input type="checkbox"/> Tailwater recovery              | <input type="checkbox"/> Checks in Good Condition      |
| <input type="checkbox"/> Vegetated drainage ditches      | <input type="checkbox"/> Lined Waterway or Outlet      |
| <input type="checkbox"/> Grassy waterways                | <input type="checkbox"/> "Box" in Good Condition       |
| <input type="checkbox"/> Constructed wetlands            | <input type="checkbox"/> Water appears to Stay on Site |

Notes: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Surveyor: \_\_\_\_\_

Date: \_\_\_\_\_

**Attachment D**

**Farm Site Self Assessment Survey**

# FARM SITE SELF-ASSESSMENT SUMMARY

This survey is intended to support visual assessment of agricultural properties in the Logan Creek Watershed in support of the Colusa Glenn Sub-watershed Program

DATE: January 7, 2008  
TO: Glenn and Colusa County Grower  
FROM: Lester Messina, Glenn County Department of Agriculture  
SUBJECT: Watershed Management Practice Evaluation

The Central Valley Regional Water Quality Control Board (Board) has implemented the Irrigated Lands Program (now the Irrigated Lands Regulatory Program) (ILRP) in response to the conditional waiver for runoff from commercial agricultural properties that use pesticides. By now, everyone is familiar with the Sacramento Valley Water Quality Coalition (Coalition) and the Colusa Glenn Sub-watershed, the local administrative entity for the Coalition that coordinates water quality sampling in Colusa and Glenn Counties or the California Rice Commission Monitoring Program that concentrates their efforts in rice water quality. Sampling results over the past few years have been very favorable, indicating that there may not be as much of an impact from irrigated agriculture as previously thought.

In a related matter, the Board, the State Water Resources Control Board, the Department of Pesticide Regulation, and the Agricultural Commissioners of Glenn and Butte Counties entered into a Memorandum of Understanding (MOU) to create a pilot program to assist the Regional Board, in a non-regulatory manner, with the implementation of the ILRP and provide input on agricultural practices within our counties. A work plan was developed from the MOU and the Counties entered into separate contracts with the Regional Board proposing specific tasks to perform and make recommendations or evaluate others. One such task is to document management practices in place used by growers that would have a positive effect on water quality to reduce runoff containing pesticides. Examples of pesticides that affect water quality are organophosphates (Diazinon, Guthion) or pyrethroids (Asana, Lorsban). There are many practices used that growers utilize intentionally and there are also practices that are unknowingly used in day to day operations. The documentation of these practices may be the most effective way of communicating to the Regional Board that pesticides are used in a safe and responsible manner.

In order to achieve this goal, staff from the Glenn County Department of Agriculture, in cooperation with the Colusa County Department of Agriculture, will be doing a visual management practice evaluation in the Logan Creek watershed starting in the fall of 2007. To provide backup to the evaluation, Logan Creek has been added to the Coalition's sampling locations (Four Mile Road at Delavan). You are receiving this survey to inform you that your agricultural operation falls within the Logan Creek watershed and we may be contacting you in the near future to discuss the specifics of the evaluation. There may be some additional requests made of you at the time you renew your restricted materials permit.

Please take the time to fill out this survey, as it will be an important component in any further outreach activities by the sub-watershed. If you feel a question is not applicable to your operation, please answer with an "N/A". This survey was originally developed with orchards in mind. Efforts are underway to establish additional management practices in row crops operations.

Your cooperation in this evaluation is greatly appreciated. This is an outreach program, and there will be no enforcement actions associated with the evaluation. In the meantime, if you have any questions or comments, please call Lester Messina or Lisa Hunter at (530) 934-6501 or Jon Richter at (530) 458-0580.

Grower or Farm Name \_\_\_\_\_ Acreage in Sub-watershed \_\_\_\_\_

## Farm Site

1) Have you made a visual evaluation of the surrounding area and fields to assess the runoff potential (from irrigation or storm water) of a field prior to a pesticide spray application?

Yes \_\_\_\_\_  
 No \_\_\_\_\_

2) Prior to an application do you check weather conditions and ask questions such as "Is it too windy?" or "Will it rain later today or tomorrow"?

Yes \_\_\_\_\_  
 No \_\_\_\_\_

3) If your operation includes orchards, prior to applying winter dormant sprays, what is the condition of your orchard floor?

	Acres This Year	Acres Next Year	
Vegetative Cover			Not applying a dormant spray this year.
Some Vegetation			
Vegetated Cover with Sprayed Berms			
No vegetation (disked)			
No vegetation (not disked)			

4) Do you contain runoff from your orchard(s) during winter storms and after dormant sprays, preventing runoff from entering nearby waterways?

Yes \_\_\_\_\_  
 No \_\_\_\_\_  
 No runoff on property \_\_\_\_\_

5) What type(s) of practices are used to lessen storm runoff from fields into ditches, canals or streams that flow into nearby rivers.

	Acres This Year	Acres Next Year
Vegetative Filter Strips Around Edges		
Grass Row Centers		
Tailwater Return System		
None		

6) In the past two years, have you practiced any mitigation measures (checking weather conditions, i.e. avoided spraying on windy days or when rainfall is imminent, checking droplet size/calibrating nozzles, maintaining setback zones) to reduce drift of pesticides to non-target areas?

Yes \_\_\_\_\_  
No \_\_\_\_\_

7) Have you been informed of methods to reduce the potential of pesticides being carried into ditches, canals or streams that feed into nearby rivers?

Yes \_\_\_\_\_  
No \_\_\_\_\_

## Pest Management

1) Are pesticides used only when insect scouting or PCA indicates they are necessary?

Yes \_\_\_\_\_  
No \_\_\_\_\_

2) Are populations of pests and beneficials considered when making pest management decisions?

Yes \_\_\_\_\_  
No \_\_\_\_\_

3) Are economic thresholds (when applicable) considered when making pest management decisions?

Yes \_\_\_\_\_  
No \_\_\_\_\_

4) Are UCIPM guidelines and/or other IPM information considered when making pest management decisions?

Yes \_\_\_\_\_  
No \_\_\_\_\_

5) If you have an orchard near a sensitive waterway or with drainage to waterways, have you or your PCA considered alternative strategies to using diazinon or chlorpyrifos (Lorsban) in your spray program either during the dormant or growing season?

Yes \_\_\_\_\_  
No \_\_\_\_\_

6) Do you normally spot treat pest-infested areas or treat an entire field to prevent further infestation?

Decision based on many variables \_\_\_\_\_  
Spot-treat only \_\_\_\_\_  
Treat whole field always \_\_\_\_\_

7) Are chemical rotation and insect resistance management considered in the decision to use a pesticide?

Yes \_\_\_\_\_  
No \_\_\_\_\_

8) Is the most environmentally benign pesticide that is effective against a pest used after considering the factors in question 7?

Yes \_\_\_\_\_  
No \_\_\_\_\_

9) Is crop rotation used to avoid buildup of pest populations?

Yes \_\_\_\_\_  
No \_\_\_\_\_

## Pesticide Mixing / Loading / Storage

1) What is the surface where pesticide or fertilizer mixing/loading takes place?

Concrete or asphalt pad that drains to a central sump \_\_\_\_\_  
Concrete or asphalt pad \_\_\_\_\_  
Field \_\_\_\_\_  
Soil or gravel \_\_\_\_\_  
Hard packed or paved road \_\_\_\_\_

2) What is the minimum distance between any pesticide or fertilizer mixing/loading area and any ditches, canals or streams that feed into nearby rivers?

Less than 20 feet \_\_\_\_\_  
Between 20 and 100 feet \_\_\_\_\_  
More than 100 feet \_\_\_\_\_

3) What is the minimum distance between any pesticide or fertilizer mixing/loading area and any deep well locations?

Less than 20 feet \_\_\_\_\_  
Between 20 and 100 feet \_\_\_\_\_  
More than 100 feet \_\_\_\_\_

4) Is the sprayer checked for cracked or broken hoses and is the drain plug in place prior to filling the tank?

Yes \_\_\_\_\_  
Yes \_\_\_\_\_

5) Is the tank filled to overflowing?

Yes \_\_\_\_\_  
No \_\_\_\_\_

6) How do you prevent tank overfilling?

Stop when it foams over \_\_\_\_\_

Keep a close watch \_\_\_\_\_

7) Do you use an air gap between the fill tube and the tank?

Yes \_\_\_\_\_

No \_\_\_\_\_

8) During mixing and loading how full is the tank prior to the addition of chemicals?

One-third to one-half full \_\_\_\_\_

Two-thirds full \_\_\_\_\_

Full \_\_\_\_\_

## Pesticide Mixing / Loading / Storage (continued)

9) Is someone present during pesticide or fertilizer mixing/loading operations to watch for spills and other mishaps and to take corrective action?

Present entire time \_\_\_\_\_

Present most of the time \_\_\_\_\_

Start filling, leave and return after set time \_\_\_\_\_

10) Are you and your employees aware of the necessary corrective action when a spill occurs?

Yes \_\_\_\_\_

No \_\_\_\_\_

11) Do you use a closed system when required?

Yes \_\_\_\_\_

No \_\_\_\_\_

12) Do your pesticide and fertilizer storage areas have spill containment capability to protect from runoff into any nearby surface waters?

Yes \_\_\_\_\_

No \_\_\_\_\_

13) What type of floors are in your pesticide and fertilizer storage areas?

Impermeable surface with curbs (coated or sealed concrete is best) \_\_\_\_\_

Impermeable surface without curbs, no cracks \_\_\_\_\_

Impermeable surface with curbs, some cracks \_\_\_\_\_

Permeable surface \_\_\_\_\_

# Sprayer Equipment and Spraying

1) How often is spray equipment calibrated?

Prior to each application \_\_\_\_\_  
Once per month \_\_\_\_\_  
Once per year \_\_\_\_\_  
Never \_\_\_\_\_

2) Are spray nozzles adjusted to match the crop canopy profile?

Yes \_\_\_\_\_  
No \_\_\_\_\_

3) When spraying young orchards, are top nozzles shut off to minimize overspray and conserve materials?

Yes \_\_\_\_\_  
No \_\_\_\_\_

4) Are outside nozzles shut off when spraying outer rows next to sensitive sites?

Yes \_\_\_\_\_  
No \_\_\_\_\_

5) In the past two years, what type of sprayer(s) did you use for orchard or row crop application(s)?

Electronic controlled sprayer nozzles (e.g. Smart Sprayer) \_\_\_\_\_  
Conventional Airblast \_\_\_\_\_  
Aerial \_\_\_\_\_

6) Are nozzles used that provide the largest effective droplet size in order to minimize drift?

Yes \_\_\_\_\_  
No \_\_\_\_\_

7) How many acres of dormant pesticides are applied with ground equipment?

Acres This Year	Acres Next Year
_____	_____

8) Have you been informed through your PCA, farm input supplier or grower meetings about recent changes in the Diazinon label that no longer allow for aerial applications?

Yes \_\_\_\_\_  
No \_\_\_\_\_

9) How many acres sprayed with dormant pesticides are within 100' upslope of any surface water, including ag ditches?

Acres This Year	Acres Next Year
_____	_____

10) Are the first 3 rows closest to water bodies sprayed only when wind is blowing away from the water bodies?

Yes \_\_\_\_\_  
No \_\_\_\_\_

11) Are air blast applications made only when wind is between 3-10 mph as measured with an anemometer on the side nearest and upwind from a sensitive site?

Yes \_\_\_\_\_  
No \_\_\_\_\_

## Sprayer Cleanup and Container Disposal

1) How do you dispose of rinsate from your sprayer(s)?

Mix with water and reapply to field \_\_\_\_\_  
Store in hazardous waste container \_\_\_\_\_  
In field, not prone to runoff, that can be disked \_\_\_\_\_  
In field, more than 150 feet from surface waters \_\_\_\_\_  
In field, less than 150 feet from surface waters \_\_\_\_\_

2) Where do you clean spray application equipment?

On a mixing/loading pad \_\_\_\_\_  
On application site (rinseate re-applied to field) \_\_\_\_\_  
More than 300 feet from surface waters \_\_\_\_\_  
More than 150 feet from surface waters \_\_\_\_\_  
Less than 150 feet from surface waters \_\_\_\_\_

3) Are you aware of regulations concerning empty pesticide containers?

Yes \_\_\_\_\_  
No \_\_\_\_\_

4) Do you clean up pesticide and fertilizer spills promptly?

Yes \_\_\_\_\_  
No \_\_\_\_\_

## Runoff Management

1) Is vegetation planted or allowed to grow in and along drainage ditches to trap sediment?

Yes \_\_\_\_\_  
No \_\_\_\_\_

2) Do you maintain vegetated filter strips at least 10' wide downslope of cropped areas that are adjacent to and within 100' of sensitive aquatic sites?

Yes \_\_\_\_\_  
No \_\_\_\_\_

3) Are orchard dormant applications made when soil moisture is at field capacity and/or when a storm event likely to produce runoff is forecast to occur within 48 hours after application?

Yes \_\_\_\_\_  
No \_\_\_\_\_

4) Are appropriate slopes, tillage, furrow lengths, and irrigation set times used to optimize irrigation efficiency and reduce runoff?

Yes \_\_\_\_\_  
No \_\_\_\_\_

5) Do you use drainage basins (sediment ponds) or wetlands to capture and retain runoff for at least 72 hours?

Yes \_\_\_\_\_  
No \_\_\_\_\_

6) Are tailwater return systems utilized to recirculate and reapply irrigation runoff to other fields?

Yes \_\_\_\_\_  
No \_\_\_\_\_

7) Is Polyacrylamide (PAM) used to increase water infiltration, and reduce furrow erosion and sediment levels in runoff?

Yes \_\_\_\_\_  
No \_\_\_\_\_

8) Are irrigations scheduled according to actual moisture levels or by the calendar?

Yes \_\_\_\_\_  
No \_\_\_\_\_

## Nutrient Management

1) Prior to planting are soil samples taken to determine amounts of nutrients currently present in the soil?

Yes \_\_\_\_\_  
No \_\_\_\_\_

2) Are fertilizer applications based on crop needs and past crop production versus production goals?

Yes \_\_\_\_\_  
No \_\_\_\_\_

3) Are plant tissue samples taken mid to late season to determine the plant's fertilizer needs?

Yes \_\_\_\_\_  
No \_\_\_\_\_

4) Is nitrogen supplied in excess of total crop needs?

Yes \_\_\_\_\_  
No \_\_\_\_\_

5) Are fertilizers placed where maximum plant uptake can occur?

Yes \_\_\_\_\_  
No \_\_\_\_\_

6) When injecting fertilizer into irrigation water are proper backflow devices installed?

Yes \_\_\_\_\_  
No \_\_\_\_\_

7) Before application are applicators made aware of any sensitive areas that need to be avoided during application?

Yes \_\_\_\_\_  
No \_\_\_\_\_

## Manure Management (if applicable)

1) Do you currently make applications of manure to your irrigated land?

Yes \_\_\_\_\_  
No \_\_\_\_\_ If No, skip this section

2) Who is most responsible for making decisions about the application of manure for your operation? (Please check only one)

Owner \_\_\_\_\_  
Employee \_\_\_\_\_  
Other \_\_\_\_\_

3) Who actually applies the manure for your operation? (Please check only one)

Owner \_\_\_\_\_  
Employee \_\_\_\_\_  
Contractor \_\_\_\_\_  
Other \_\_\_\_\_

4) Please check all the manure types that your agricultural operation has applied in the past 5 years.

Dairy \_\_\_\_\_  
Chicken \_\_\_\_\_  
Other \_\_\_\_\_

5) Please check all the manure types that your agricultural operation will likely apply in the next 5 years.

Dairy \_\_\_\_\_  
Chicken \_\_\_\_\_  
Other \_\_\_\_\_

6) What is the average rate per acre of manure that you apply annually?

Dairy \_\_\_\_\_  
Chicken \_\_\_\_\_  
Other \_\_\_\_\_

7) Within your agriculture operation, do you see a trend away from the use of manure?

Yes \_\_\_\_\_  
No \_\_\_\_\_

8) How much, if at all, has manure degraded surface water quality in your area?

A lot \_\_\_\_\_  
A little \_\_\_\_\_  
None \_\_\_\_\_  
Unknown \_\_\_\_\_

9) How close are surface water ways (creeks, drains, irrigation ditches or canals, etc) to the fields where you apply manure?

Adjacent \_\_\_\_\_  
Very close (< 100 ft) \_\_\_\_\_  
Close (< 300 ft) \_\_\_\_\_  
Distant (> 300 ft) \_\_\_\_\_

## Continuing Education

1) Have you read any Stewardship Bulletin on "Best Management Practices for Protecting Surface Water"?

Yes \_\_\_\_\_  
No \_\_\_\_\_

2) Do you know how to get Stewardship Bulletins on "Best Management Practices for Protecting Surface Water" ?

Yes \_\_\_\_\_  
No \_\_\_\_\_

3) Which of the following management practices (sometimes referred to as "Best Management Practices" or "BMPs") do you most frequently implement to protect surface water quality? (Check all that apply)

Soil Nutrient Analysis \_\_\_\_\_  
Nutrient Management Plan \_\_\_\_\_  
Vegetated Ditches / Grass Swales \_\_\_\_\_  
Agronomist's Advice \_\_\_\_\_  
Commodity-Specific Training Sessions \_\_\_\_\_  
CCA Fertilizer Recommendation \_\_\_\_\_  
Tailwater Return System \_\_\_\_\_  
PCA Recommendation \_\_\_\_\_  
Sprayer Calibration \_\_\_\_\_  
Laser Leveling \_\_\_\_\_

4) If you are not already implementing "BMPs" that are applicable to your operation, why not?

Convinced it will not work \_\_\_\_\_  
Lack of available equipment \_\_\_\_\_  
Cost of implementation \_\_\_\_\_  
Lack of knowledge (for example, engineering) \_\_\_\_\_  
Not applicable to my situation \_\_\_\_\_  
Other \_\_\_\_\_

5) Are you interested in participating in a BMP effectiveness study if your expenses are covered?

Yes \_\_\_\_\_  
No \_\_\_\_\_

6) Are you interested in receiving a free on-site consultation to identify potential BMPs that might be useful for your operation?

Yes \_\_\_\_\_  
No \_\_\_\_\_

**Have you attended or completed the following?**

7) NRCS, UCCE, or other Farm Water Quality training

Yes \_\_\_\_\_  
No \_\_\_\_\_  
Completed \_\_\_\_\_

8) NRCS or UCCE Farm Water Quality Plan

Yes \_\_\_\_\_  
No \_\_\_\_\_  
Completed \_\_\_\_\_

9) Erosion control training

Yes \_\_\_\_\_  
No \_\_\_\_\_  
Completed \_\_\_\_\_

10) Irrigation management training

Yes \_\_\_\_\_  
No \_\_\_\_\_  
Completed \_\_\_\_\_

11) Pest management training

Yes \_\_\_\_\_  
No \_\_\_\_\_  
Completed \_\_\_\_\_

**Attachment E**

**Arc View Layer Key**

Editor

Task: Create New Feature

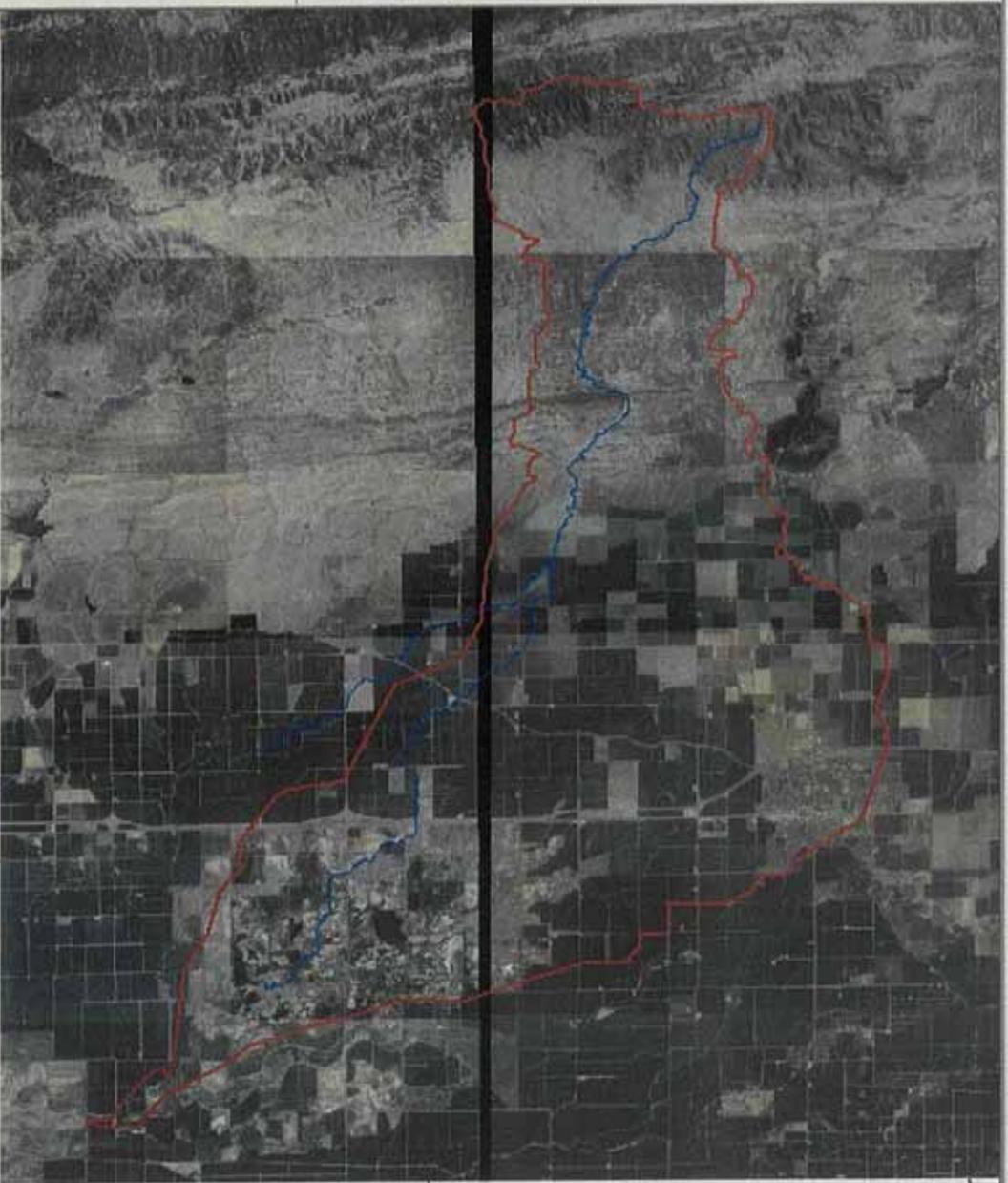
Scale: 1:189,446

Target:

Spatial Adjustment

Layers

- LC\_major\_Drains
- LCrapard
- non\_attributed\_Lc
- field\_survey\_Lc
- Logan\_Creek\_Watershed
- monitoring\_points
- Logan\_Creek\_rivers
- Logan\_Creek
- CO\_BOUND
- Roads
- Organic\_fields
- kfields08
- Hydrology
- Images
- narp\_1-1\_2n\_s\_ca011\_2004\_1.sid
- narp\_1-1\_2n\_s\_ca021\_2004\_1.sid



Display

Source Selection

Arial

Scale: 10

Tools: B I U A

Coordinates: -122.26 39.51 Decimal Degrees

### **Layers in the Logan Creek ArcView Map**

LC\_major\_Drains -- contains the major drains into Logan Creek noted in the field surveys drawn in by staff.

LCtaxparcel – contains boundaries of the tax parcels located with their centers within the Logan Creek Watershed boundary.

non\_attributed\_lc – contains areas of the Logan Creek Watershed that the county does not have pesticide permit information. These areas could be rangeland, habitat, organic, urban, etc. Field surveys were not conducted in these areas.

field\_survey\_lc – contains all fields surveyed for the BMP evaluation.

Logan Creek Watershed – contains the boundary for the Logan Creek Watershed.

monitoring\_points – contains sampling locations.

Logan\_Creek\_rivers – contains the outline of most of the North and South forks of Logan Creek.

Logan\_Creek – contains the outline for a portion of the South fork of Logan Creek.

CO\_BOUND – contains the outline of the Glenn County boundary.

Roads – contains Glenn County roads.

Organic\_fields – contains sites in the Logan Creek Watershed that are organic according to the Glenn County's organic registration information. This helped determine where there were gaps in the survey information. Not all organic growers have pesticide permits.

lcFields08 – contains all sites in the permitting program utilized in Glenn County. This gave staff a basis for fields to be surveyed and growers to be contacted.

Hydrology – contains streams, rivers, creek information for Glenn County. Part of the Logan\_Creek layer was cut from this layer.

Images – group layer that contains two layers containing the images for Glenn County and the images for Colusa County.