PILOT WATERSHED MANAGEMENT PRACTICES PLAN

Prepared by the

El Dorado County Agricultural Water Quality Management Corporation

Representing the

El Dorado Subwatershed,

a Member of the

Sacramento Valley Water Quality Coalition

In response to the

California Regional Water Quality Control Board
Central Valley Region

Monitoring and Reporting Program
Order No. R5-2009-0875

Attachment D

The El Dorado County Agricultural Water Quality Management Corporation (EDCAWQMC) was incorporated as a non-profit, mutual benefit, membership corporation in 2008 to formally represent the El Dorado Subwatershed (henceforth known as the Subwatershed) in the Sacramento Valley Water Quality Coalition (SVWQC). This plan describes the EDCAWQMC approach to implementing the Optional Pilot Management Practices Plan as described in Part II.B and Attachment D of Order No. R5-2009-0875. This Plan encompasses the entire geographic area of the Subwatershed. It includes:

1. A Subwatershed description including: climate, topography, soils, hydrology, agricultural operations, agricultural commodities, and agricultural resources;
2. A set of management objectives to be accomplished in order to minimize the impact of waste discharged by irrigated agricultural operations into the waters of the state;
3. A set of management practices that can be used to accomplish the stated objectives;
4. The methodology that will be used to promote, document, and report the implementation of the plan;
5. The methodology that will be used to validate and verify the implementation of the plan; and
6. The methodology that will be used to issue an Annual Report.

1. Subwatershed description. The Subwatershed encompasses approximately 1.1 million acres in two primary river watersheds, the South Fork American River (SFAR) and Cosumnes River, of El Dorado County as well as portions of the Middle and North Forks American River. The Subwatershed extends from the crest of the Sierra Nevada Mountains in the east to the Sacramento County line in the west and from the Placer County line in the north to the Amador County line in the south. The topography is characterized by hilly to mountainous terrain with elevations ranging from approximately 400 to 10,000 feet above sea level. Irrigated agricultural use occurs on less than 4,000 acres, or less than 0.4% of the watershed area, and is primarily situated at elevations ranging from 1,000 to 3,500 feet above sea level.

1.1 Climate. In general, the climate of the Subwatershed agricultural region can be described as Mediterranean with warm, dry summers and cool to cold, wet winters. Average rainfall is about 40 inches per year in Placerville, which is the county seat and located just about in the middle of the irrigated agricultural area.[1] The average evapotranspiration (ETo) rate is 54.96 inches per year as calculated by the California Irrigation Management Information Service (CIMIS) weather station #13 in Camino.[2] Seasonal rainfall occurs during the late fall, winter, and early spring so irrigation water needs to be applied in the summer season to non-endemic crops. Average maximum temperatures vary from the summertime mid 90's (^{o} F) to the winter upper 40's (^{o} F); however, spring frosts are a significant hazard to a majority of the crops grown in the Subwatershed at elevations above 2,000 feet. Frost-free days during the growing season range from 275 days at the lower elevations to less than 50 days at the upper elevations.[1]

1.2 Topography. The Subwatershed forms a gently sloping ramp that connects the flat Central Valley with the high rugged crest of the Sierra Nevada Range. Most irrigated agricultural operations occur on that part of the ramp between elevations of 1,000 and 3,500 feet generally on gentle sloping to steep hillsides (Figure 1-1). Westerly flowing streams and rivers have excised deep canyons into the slope that act as conduits for air drainage and so have a dramatic affect on the temperatures of surrounding areas.

1.3 Soils. Soil characteristics play a significant role in both agricultural productivity and water quality conditions in the Subwatershed. Almost all soils are sandy to clay loams that formed in place by weathering of the underlying bedrock.[3] In general, the soils are very shallow to deep and well- to excessively-drained. Young volcanic, granitic, and slate rocks have produced the soils best suited for agricultural crops. Soil depth influences what types and where crops can be planted. Crop root zones range from 6 inches for some berries to greater than 4 feet for grapes with

the remainder of the commodities somewhere between these two values.[4] Ridge tops tend to have thin soils that are not conducive for agricultural operations. Hillside soils are often ideal for planting, but erosion control and instability issues must be addressed. Commercial crops are grown on over 40 soil types as described in "Soil Survey of El Dorado Area, California." Soil type transitions are abrupt which further limits the production area on any given parcel.

1.4 Hydrology and Irrigation Water. The hydrology of the Subwatershed is characterized by natural watercourses: the American River, the Cosumnes River and their tributaries. Distinct, identifiable ground water basins do not exist in the Subwatershed. Agricultural irrigation water is generally provided by one of three methods: 1) one of two water purveyors {El Dorado Irrigation District (EID) in the Apple Hill, Placerville and Gold Hill areas (Figure 1-2), and Georgetown Divide Public Utility District (GDPUD) in the North County (Figure 1-3)}; 2) wells drilled into granitic fissures (also known as fractured rock), often to a depth of over 300 feet and which occasionally run dry; and, to a much lesser degree 3) ponds or springs. The majority of the irrigation water supplied by EID is potable and meets or exceeds all drinking water standards.[5]

1.4.1 Water Quality. The quality of the waters of the State within El Dorado County is considered excellent. During the last five years of monitoring by the Irrigated Lands Regulatory Program (ILRP) there has been only one pesticide exceedance. There were several toxicity, legacy pesticide (DDT/DDE) and E. coli exceedances that were not due to irrigated agricultural operations.[6] This excellent water quality is further supported by the test results from the two major commercial water purveyors: EID[5,7] and GDPUD.[8] Additional water quality data obtained by the El Dorado County Water Agency (EDCWA) from the Sacramento Municipal Utility District (SMUD) also supports this declaration.[9,10]

1.4.1.1 ILRP Data. There have been 34 sampling events since ILRP monitoring was initiated in 2004. The sampling has occurred after major storm events (normally two per season) and six samplings during the irrigation season. The sampling results demonstrate that the water in El Dorado County is among the best in the state. Anecdotal evidence to this statement is that a catch and release rainbow trout fishery is immediately upstream of the North Canyon Creek site, and has been in operation for nearly forty years. In this time period there has not been any fish die-off in this reach due to poor water quality.

1.4.1.2 EID Data. These reports list all detections of various constituents while all other tests with non-detectable measurements are not reported. All of

the tested constituents meet or exceeds all state and federal drinking water standards.

1.4.1.3 GDPUD Data. This report lists all constituents tested and the results of these tests. The only constituents with detectable levels are by products of drinking water disinfection, and these meet or exceed all state and federal drinking water standards. All others are at non-detectable levels, including inorganic chemicals as well as organic chemicals and some pesticides.

1.4.1.4 SMUD Data. The SMUD water quality data were collected as part of the FERC Project No. 2101 re-licensing requirement. The data were collected for the years 2002, 2003, and 2004 with the report published in 2005. Data collected represents the project area. The primary points of interest for EDCAWQMC are reference sites #43 and #46. Site 43 is located at the base of Slab Creek Reservoir dam and Site 46 is located down-stream at the confluence of Rock Creek and the SFAR. The in-flows from both North Canyon Creek and Coon Hollow Creek into the SFAR occur between these two reference sites.

The data monitored included basic water parameters, elemental analysis, fecal coliform/E. coli, and petroleum hydrocarbon. Pesticides were not included in this analysis since SMUD does not use pesticides in the project area. Once again this data demonstrates that this area of California has excellent water quality.

1.5 Agricultural Operations. Irrigated agricultural operations in the Subwatershed are typically small family-owned and operated farms. The average parcel size is 38 acres that includes an irrigated agricultural production area of 10 acres.[11] The agricultural production areas are limited in size by topography and soil conditions. Many operations are smaller than 10 acres and very few are greater than 25 acres (extremely small relative to the typical California family farm). There are a number of larger parcels but only 8 percent of the total have greater than 20 acres in irrigated agricultural operations.[11] Most growers live on their parcels and they strive to ensure and/or enhance the quality of life for themselves and their heirs. This includes protecting the environment, wildlife and water quality.

1.5.1 Irrigation Methods. All commodities within the Subwatershed are irrigated by one of three methods: high-volume sprinklers; micro-sprinklers; or drip irrigation. High-volume sprinklers are only used in areas served by EID or GDPUD because the volume of water necessary to operate is beyond the capability of most wells. Many growers who historically used these systems for irrigation have replaced them with the

more efficient micro-sprinklers or drip systems; however, many of these growers have maintained the high-volume systems for frost protection. Table 1-1, provided by EID, demonstrates that a variety of irrigation methods are used by their customers on all commodities, and methods used have changed over time. The irrigation management practices identified in section 3.2 may be applied to any commodity grown in the Subwatershed depending on topography, water supply and soil type.

1.5.2 Frost Protection Methods. Many growers in the higher elevations, where late frost is a danger (an elevation band from 2,000 to 3,000 feet above sea level), have invested in frost protection systems. These systems include over-head sprinklers and, in very rare instances, wind machines. The majority of sprinkler frost protection systems were designed by the NRCS in the mid- to late-1970's. Crop damaging frost events are very unpredictable in both timing and duration. Water is applied to developing buds when temperatures drop below 28-29 °F and remain on until the temperature exceeds 30-32 °F. Some years temperatures never reach critical thresholds while other years it may happen two to three times. The freeze event duration also can vary from 2 to 12 hours while normal irrigation events during the summer range from 24 to 48 hours with these systems. The sediment control management practices identified in section 3.3 will minimize the discharge of sediment during these unpredictable events.

1.5.3 Pesticide Application Methods. Due to the topography and small production areas pesticides are applied with ground-based equipment. This equipment ranges from 4-gallon backpack liquid sprayers to 400-gallon air-blast liquid sprayers as well as sulfur dust applicators. The smaller equipment is normally used with hand-wand or downward facing nozzle(s) or boom(s) for herbicide applications targeting specific plants or in-row strip spraying in production areas. Application volumes range from 4 to 50 gallons per acre. The downward application nearly eliminates the potential for drift and off-site migration. Air-blast sprayers are used to apply fungicides and insecticides at rates from 100 to 400 gallons per acre depending on the equipment and pesticides being applied. The pesticide management practices identified in section 3.1 will minimize the discharge of pesticidesinto adjacent waters.

1.5.4 Nutrient Application Methods. Nutrients and soil amendments are applied: 1) by hand; 2) mechanically (spreaders); 3) air-blast sprayers; or 4) through irrigation systems (fertigation). The largest commercial commodity in the Subwatershed is wine grapes where nutrient management is critical to fruit quality as opposed to quantity. This limits the amount of nitrogen to ≤50 pounds per acre per year. Tree crops require 1- to 2- pounds per tree per year.

1.5.5 Pesticides Used. The main year-to-year pests for nearly all commodities are weeds, bacteria, fungi and insects. Pesticide application timing is based on pest pressures, environmental conditions, and/or computer models. Herbicides are applied in the early to late spring to control weeds along crop rows to reduce or eliminate water and nutrient competition. Spot spraying to control weeds during the summer may take place depending on the weed and environmental pressures.

Orchard growers mainly apply pesticides to control bacteria, fungi and insects depending on the time of year. Fungal pests are controlled through dormant, delayed dormant, bloom and post-bloom applications. Pests of concern include brown rot, scab and powdery mildew. Most dormant applications use a contact fungicide while the remaining applications utilize systemic fungicides. Most control applications are completed by June 1. Bacterial pest controls are typically applied at the same time as fungicides during the bloom and post-bloom applications as a tank mix. The main two bacterial pests are canker and fire blight. Insect pests vary based upon the commodity with most applications during the delayed dormant and pre-harvest timeframes.

Normal grape pests include fungi and insects. Pest pressures occur from bud break to several weeks prior to harvest, generally from April 1 through mid to late July depending on varietal and location of the vineyard. Contact fungicide, mainly sulfur, is applied through full bloom at which time systemic materials are applied. Fungal pressures are monitored and applications are based on environmental conditions and pest pressure. Application scheduling varies from 3 to 5 weeks between events. Insect control applications are random throughout the growing season based on environmental conditions and pest pressures. Many vineyards do not apply insecticides at all.

1.6 Agricultural Commodities. The primary commercial commodities are permanent crops consisting of fruit and nut orchards, wine grapes, Christmas trees, berries with a few vegetables as well as a small amount of irrigated pasture operations.[11,12] Irrigated agricultural operations are concentrated within seven geographically distinct agricultural districts (Figure 1-4) that were identified and established by El Dorado County to protect and enhance agricultural activities. Due to the availability of commercial irrigation water nearly all major commodities are produced in the Camino/Fruitridge District, the second largest. The lack of commercial water results in wine grapes and dry farmed walnuts dominating the Somerset/Fairplay District, the largest District. It is estimated that for all commercial crops other than wine grapes, 90% of the sales are through

direct marketing either at on-site ranch marketing shops or farmer's markets.

1.6.1 Orchards. Irrigated orchard crops include, in descending order of total acreage: apples, pears, peaches, plums, cherries, olives, nectarines and walnuts (the majority of walnut orchards in the Subwatershed are dry farmed). It has been estimated that it takes roughly 2-3 acre-feet of water per acre of orchard per year to produce a commercial crop of apples or pears in the Apple Hill area (part of the Camino/Fruitridge Agricultural District).[4] As the elevation decreases the amount of water needed increases. Therefore, the majority of these crops are grown where water purveyor supplied water is available: Camino/Fruitridge and Gold Hill Agricultural Districts which are served by EID.

1.6.2 Wine Grapes. Over 60 varieties of wine grapes are grown in the Subwatershed.[13] It has been estimated that it takes roughly 0.5-1.0 acre-feet of water per acre of vineyard per year to produce a commercial crop of wine grapes in the Apple Hill area.[4] Vineyards are found throughout the Subwatershed between elevations of 1,000 and 3,500 feet but are the primary irrigated agricultural crop in the Somerset/Fairplay District where water is scarce and there are no commercial water purveyors.

1.6.3 Christmas Trees. There are over 30 Christmas Tree farms in the Subwatershed.[14] These farms are generally at the higher elevations although there are a number of farms in the Apple Hill/Camino area and a small number in the Somerset/Fairplay area. Irrigation practices vary considerably with the elevation of the farms, the age of the trees and the availability of water.

1.6.4 Berries. A small number of acres of blueberries, raspberries, blackberries and strawberries are grown for Direct Market sales, primarily in the Camino/Fruitridge and Gold Hill Agricultural Districts.

1.6.5 Irrigated Pastures. Irrigated pastureland is generally limited in the Subwatershed due to the availability and cost of water. Most of the irrigated pasture is located north of Highway 50 and is serviced by EID or GDPUD.

1.6.6 Minor Vegetable Crops. A very small number of acres of summer and winter squash as well as other summer vegetables are grown for sale at Farmers' Markets and through on site Ranch Marketing activities.

1.7 Agricultural Resources. Growers use a number of conservation resources available in El Dorado County. These include, but are not limited to, the following: Irrigation Management Service (IMS) program,

University of California Cooperative Extension (UCCE), El Dorado County Agriculture Department, Natural Resource Conservation Service (NRCS), Resource Conservation Districts (RCDs), and privately owned businesses.

1.7.1 IMS. The IMS program is offered by EID and the EDCWA. The program uses a neutron probe weekly to monitor soil-moisture levels during the irrigation season. This soil-moisture data is used by the growers to schedule irrigation events and set irrigation run-times. The EID program is an in-house program while the EDCWA program hires outside contractors. The two programs monitored over 460 sites during the 2009 growing season. The EID program is free to commercial growers while the EDCWA charges the grower $250 per site.

1.7.2 UCCE. UCCE has been one of the most valuable assets to the agricultural community within the county. Part of the UCCE mission is to provide science-based information and educational programs to solve local issues in areas of agriculture and natural resources. UCCE also conducts original research that allows growers to modify and/or adopt new conservation strategies. The first integrated pest management (IPM) book (Pear Pest Management) was written by the UCCE county director Dick Bethel in 1978 based on research conducted primarily in El Dorado County. This publication served as the template for the current IPM manuals developed for various commodities. In addition, Mr. Bethel was awarded the grant that provided the foundation for EID's IMS program.

1.7.3 El Dorado County Agriculture Department. This department is responsible for pesticide regulation in the county. This includes issuing permits and gathering the monthly pesticide use reports. In 2004, this department became responsible for issuing grading permits for agricultural operations if more than 1 acre of native vegetation is removed to develop a commercial operation. The purpose of this permit is to mitigate soil erosion through the implementation of appropriate management practice(s) based on site-specific conditions.[15] This permitting process also includes site visits to ensure that management practice(s) are in place.

1.7.4 NRCS. The NRCS uses the following principles as a guide to help private landowners develop and implement conservation strategies. The principles are: 1) Assess the resources on the land, the conservation problems and opportunities; 2) Draw on various sciences and disciplines and integrate all their contributions into a plan for the whole property; 3) Work closely with land users so that the plans for conservation mesh with their objectives; and 4) Through implementing conservation on individual properties, contribute to the overall quality of life in the watershed or

region. In addition, NRCS can provide funding to implement some of these strategies as conditions allow.

1.7.5 RCD. RCDs are empowered to conserve resources within their districts by implementing projects on public and private lands and to educate landowners and the public about resource conservation. Beyond this, RCDs are given the right to form associations to coordinate resource conservation efforts on a larger level. The core functions of a district revolve around its right to use diverse means to further resource conservation within their districts. Further, the El Dorado and Georgetown RCDs were initially responsible for the ILRP coordination within the county.

1.7.6 Privately Owned Businesses. There are a number of private businesses that operate within El Dorado County that assist growers with resource management strategies. These include:

1.7.6.1 Vineyard Management Consultants. These individuals work with growers of various size and complexity to assist the owners in producing marketable grapes. This may include marketing, irrigation management, cover cropping, sediment control, nutrient control, and pest control recommendations to name a few.

1.7.6.2 Orchard Management Consultants. Due to the various commodities produced in El Dorado County, there are a few individuals that provide the same functions in an orchard setting as found in a vineyard setting.

1.7.6.3 Pest Control Advisors (PCA). There are state-licensed PCAs that assist growers with pest control activities that may include pesticide timing and material recommendations based on trap and/or degree-day monitoring. Individuals are available for both orchard and vineyard operations.

2. Management Objectives. The management objectives for minimizing impacts to waters of the State are the same for all operations. This is as a result of a number of similarity factors: 1) climate; 2) topography; 3) permanent nature of the majority of crops; and 4) agricultural practices, e.g. irrigation methods and pesticide and nutrient application methods. The EDCAWQMC has identified four specific management objectives that will ensure that the goals of the ILRP are met.

2.1 Pesticide Management. Manage pesticides and pesticide use so that applications are targeted to an identified pest and conducted so as to minimize the potential for off site movement. This will eliminate, reduce, or slow the direct discharge of pesticide(s) to adjacent watercourse.

2.2 **Irrigation Water Management.** Manage irrigation systems and events so as to eliminate, reduce, or slow the direct discharge of runoff to adjacent watercourses.

2.3 **Erosion and Sediment Control Management.** Manage erosion so as to eliminate, reduce, or slow the direct discharge of sediment to adjacent watercourses.

2.4 **Nutrient Management.** Manage soil amendment(s) and crop nutrient(s) to prevent excess applications and minimize the potential for offsite movement.

3. **Management Practices.** The EDCAWQMC has identified the practices currently being used or are appropriate for use by our growers that meet the four objectives listed above. The members use various combinations of these practices depending on the topographical characteristics of their property, the soils on their property, and on commodities being grown. The continued and, where appropriate, expanded use of these practices will ensure that the high quality of water in El Dorado County is maintained. Growers, vineyard and orchard managers and registered PCAs developed the practices with the assistance of personnel from the UCCE, RCDs and NRCS.

3.1 **Pesticide Management Practices.** These practices are designed to manage pesticide(s) and pesticide application so as to eliminate, reduce, or slow the direct discharge of pesticide(s) to adjacent watercourse(s). Due to the topography and small production areas pesticides are applied with ground-based equipment. This equipment ranges from 4-gallon backpack sprayers to 400-gallon air-blast sprayers.

3.1.1 **P1. Integrated Pest Management (IPM) Program.** An IPM program uses a wide range of technology and techniques to control target pest(s). The program is specific to the commodity, growing region and target pest(s) of concern. Growers, not using a formal IPM program, may use these principles without formal documentation.

3.1.2 **P2. Pest Control Advisor (PCA).** Use a PCA to identify pests and determine appropriate action. Specific pests and areas will be targeted to minimize the use of broad-spectrum pesticides.

3.1.3 **P3 Scientific Application Decisions.** Base application decisions on environmental conditions (wind, rain, temperature, etc.), scouting data, pest thresholds and/or risk assessment models. Growers may use pest traps or County Agriculture Department monitored traps to determine if there is a need to apply pesticide(s). This will eliminate

unnecessary pesticide applications that are based on calendar scheduling.

3.1.4 P4. Pesticide Selection. Select pesticides with lower risk of runoff or leaching based on pesticide chemistry (see Table 1-2) and site conditions, i.e. soil type and slope conditions. This will help to prevent any materials from entering adjacent watercourses via runoff and/or soil movement.

3.1.5 P5. Minimize Seasonal Use. Manage overall seasonal use to minimize the amount of pesticide(s) needed to be effective. Regularly scheduled applications of pesticides will be reduced or eliminated, thereby eliminating the possibility of pesticide(s) entering waterways.

3.1.6 P6. Equipment Calibration. Regularly, at least once annually, check and calibrate application equipment and/or injectors. This will eliminate the possibility of excessive chemical application, overspray, and/or drift that could adversely affect adjacent waterways.

3.1.7 P7. Biological Controls. Use biological controls where possible to reduce or eliminate the need for applying pesticide(s).

3.1.8 P8. Beneficial Insects. Introduce populations of beneficial insects when appropriate to eliminate the need for applying pesticide(s).

3.1.9 P9. Follow Labels. Store, handle and apply pesticides according to labels as required by law. The safe handling will eliminate the possibility of materials leaking to unwanted areas.

3.1.10 P10. Department of Pesticide Regulation (DPR). Comply with DPR Pesticide Application Permit requirements. El Dorado County requires each of its growers who use pesticides to take a certifying test every three years and to obtain a permit every year. The grower is required to obtain the permit in person from the County Agriculture Department. This ensures that our growers are cognizant of any new laws or changes to existing conditions prior to obtaining the permit.

3.1.11 P11. Pest Control Operator (PCO). Use a PCO for pesticide applications. PCOs are trained to apply pesticides in the most environmentally friendly methods in accordance with current DPR rules.

3.1.12 P12. Organic Alternatives. Use organic materials when and where conditions allow. An example would be to mulch around crops to reduce water and herbicide needs.

3.1.13 P13. Cultural Practices. Cultural practices are applied when and where appropriate to reduce pesticide use. An example would be to mow instead of applying herbicides.

3.1.14 P14. UCCE Farm Advisor(s). Consult with a UCCE Farm Advisor to identify any unknown causes of crop damage in order to determine the correct pesticide(s) to be applied.

3.2 Irrigation Water Management Practices. These practices are designed to manage irrigation water so as to eliminate, reduce, or slow the direct discharge of irrigation water to adjacent watercourses.

3.2.1 I1. Irrigation Management System (IMS). Participate in an IMS program provided by a local water purveyor or the EDCWA to schedule irrigation events to accurately provide water based on the plants' needs and soil moisture status.

3.2.2 I2. Evapotranspiration (ETo) Data. Use ETo data to schedule irrigation events to accurately provide water based on environmental conditions.

3.2.3 I3. Irrigation System Maintenance. Maintain and monitor irrigation system(s) on a regular basis to ensure designed performance and uniformity of coverage. Timing will depend on the frequency of irrigation application and the system being used.

3.2.4 I4. Low-flow Irrigation Systems. Use drip or micro-sprinkler irrigation systems to maximize water application efficiency.

3.2.5 I5. Soil Water Holding Capacity. Know the water holding capacity of the agricultural operation soil so as not to over irrigate, which might result in irrigation water runoff.

3.2.6 I6. Soil Infiltration Rate. Know the soil infiltration rate so that irrigation systems are designed and operated so as not to exceed the water absorption rate of the soil.

3.3 Erosion and Sediment Control Management Practices. These practices are designed to manage erosion so as to eliminate, reduce, or slow the direct discharge of sediment to adjacent watercourses.

3.3.1 S1. Cover crops. Use cover crops between rows to stabilize soil in the area.

3.3.2 S2. Vegetative Buffers. Use vegetative buffers down slope of the irrigated lands to stabilize soil in the area and help filter sediment out of storm water.

3.3.3 S3. Water Bars and Diversion Ditches. Use water bars and diversion ditches on service roads within and adjacent to the irrigated agricultural operation to prevent erosion in these traffic areas.

3.3.4 S4. Service Road Cover. Apply gravel, vegetative material and/or establish a cover crop on service roads within and adjacent to the irrigated agricultural operation to prevent erosion in these traffic areas.

3.3.5 S5. Terracing. If terracing is necessary comply with county grading requirements[15] to ensure that a proper grade is maintained on terraced sites so that soil cannot leave the area.

3.3.6 S6. Ditch and Channel Bank Protection. Use grassed waterways, lined channels and/or diversions in ditches and channel banks to stabilize and hold soil in place.

3.3.7 S7. Sediment Control Basins. Use sediment control basins where practical and necessary to allow sediment to settle from irrigation and/or storm water runoff.

3.3.8 S8. Visual Monitoring. Visually monitor runoff during excessive storm events to identify previously unknown problem areas to allow repairs to take place before additional soil movement can occur.

3.3.9 S9. Field Soil Surface Management. Apply and/or manage plant residues or other materials on the field soil surface to ensure there is successful reseeding and continued viability. Plant residue can be mulched on top to prevent erosion and reduce soil moisture evaporation.

3.4 Nutrient Management Practices. These practices are designed to manage soil amendment(s) and crop nutrient(s) to prevent excess applications and to minimize the potential for offsite movement.

3.4.1 N1. Nutrient Budgets. Determine crop nutrient requirements and establish nutrient budget(s) so as to apply only what is needed.

3.4.2 N2. Plant Tissue Analysis. Use plant tissue analysis to assist in fertilizer application decisions so as to apply correct amount(s) of the specific nutrient(s) needed.

3.4.3 N3. Backflow Prevention Devices. Incorporate a backflow prevention device into a fertigation system so that injected materials cannot enter the water source.

3.4.4 N4. Equipment Maintenance and Calibration. Regularly, at least once annually, maintain and calibrate fertilizer application equipment to ensure accurate application.

3.4.5 N5. Mixing and Loading Operations. Mix and load fertilizer on low runoff hazard sites away from surface water and well-heads to minimize any chance of soil movement into the well or surface water.

4. Management Plan Implementation. In 2009, the EDCAWQMC membership was comprised of 319 owners with approximately 3,200 irrigated acres. Most, if not all, of the members already meet the above objectives by employing many of the identified practices. The initial steps of this program will include member education and outreach to describe the new program requirements and stress the importance of the accuracy of the member surveys.

4.1 Member Education and Outreach. Our education and outreach strategy is two-fold: 1) Inform the members of the requirements of the Pilot Program; and 2) Provide members with any information they need to improve existing, or implement new, management practices. The initial outreach to members was a briefing at the Annual Meeting of Members in January 2010. The next step, in March 2010, will be a newsletter to all members describing the program and the responsibilities of the members. Upon approval of this Plan by the Regional Board a copy will be sent to all members. Continuing education and outreach will be accomplished through workshops, classes and field demonstrations of management practice implementation. Whenever possible, EDCAWQMC will partner with government and non-government organizations to accomplish the education and outreach portion of the program.

4.1.1 Commodity Organization Meetings. The EDCAWQMC Board of Directors consists of 9 members who represent the 5 major commodity organizations within the county (El Dorado Wine Grape Growers, Apple

Hill Growers, Farm Trails, Christmas Tree Growers, and Organic Farmers) as well as irrigated pastures (not a formal organization) and an at-large position. Each of these Board members will continue to report the status of the ILRP at their commodity organization meetings and where available through publications.

4.1.2 Government Agency Involvement. EDCAWQMC has a solid history of partnering with the County Agriculture Department, UCCE, NRCS, RCDs, EID and the EDWA to inform growers of the ILRP and deliver programs that address growers' needs related to water quality issues. We will continue to work with these organizations to develop and conduct workshops to further educate members on the various management practices that are available. Programs already planned for 2010 include a cover crop and erosion control field day, an irrigation management meeting and a pest management meeting.

4.1.3 Internet Website. EDCAWQMC plans to develop a website as funding becomes available either through grants or membership dues. The website will be maintained and updated on a regular basis to provide our members and the general public with the status of the program and to promote workshops as they are developed.

4.2 Member Surveys and Reporting. Upon approval of this Plan by the Regional Board, a management practices survey will be sent to all members. A copy of the draft survey is included as Appendix A. The results of that survey will be entered into the membership database. Summary data will then be provided to the SVWQC for submission to the Regional Board as soon as members who operate 75% of the irrigated acres enrolled in the program have responded. At that time the current water-monitoring program will cease except for any remaining Special Project Monitoring.

5. Tracking and Evaluation. The Management Practices included in this Plan were identified locally; however, they are a subset of, and consistent with, the U.S. Environmental Protection Agency (EPA) *Agricultural Management Practices for Water Quality Protection* module found on the EPA's Watershed Academy Web.[16] They are also a subset of and consistent with the EPA *National Management Measures to Control Nonpoint Source Pollution from Agriculture*.[17] Therefore, verification of individual practice efficacy is not necessary.

5.1 Membership Database. This database will be the primary tool to track the Subwatershed-wide management practice implementation. EDCAWQMC will be able to provide the SVWQC with summary data in many formats due to the flexibility of the Database Management Program.

Individual parcel or owner information will be kept confidential by the EDCAWQMC and not provided to SVWQC or the Regional Board.

5.2 **On-Site Visits.** EDCAWQMC representatives will conduct on-site visits to members' parcels to visually verify observable management practice implementation. Each year members owning 10% of the Subwatershed irrigated acres will be visited by individuals qualified to verify observable management practice implementation. These individuals may include local, private parties, e.g. farm managers or pest control advisors. The assistance of government agency personnel, e.g. Agricultural Commissioner or UCCE, may also be requested or contracted. The individuals conducting verification will be given copies of the member-completed survey annotated to identify which practices are to be verified.

5.3 **Cultural Practice Verification.** Implementation of those practices that cannot be verified visually will be documented through questionnaires or interviews with the owners either in person or via the telephone.

6. Monitoring and Reporting.

6.1 **Annual Report.** The EDCAWQMC will prepare an annual report that meets the conditions stipulated by SVWQC after its discussions with the Regional Board staff. The annual report will be provided in a manner that will keep individual landowner information confidential. It is anticipated that the report will identify: the number and percentage of members who have responded to the survey; the number and percentage of irrigated acres represented by the responding members; a summary showing the number and percentages of the management practices that have been or are scheduled to be adopted by the responding members; and a summary of the members and acreages that have been independently verified. This report will demonstrate that our members are complying with the requirements of the Pilot Program.

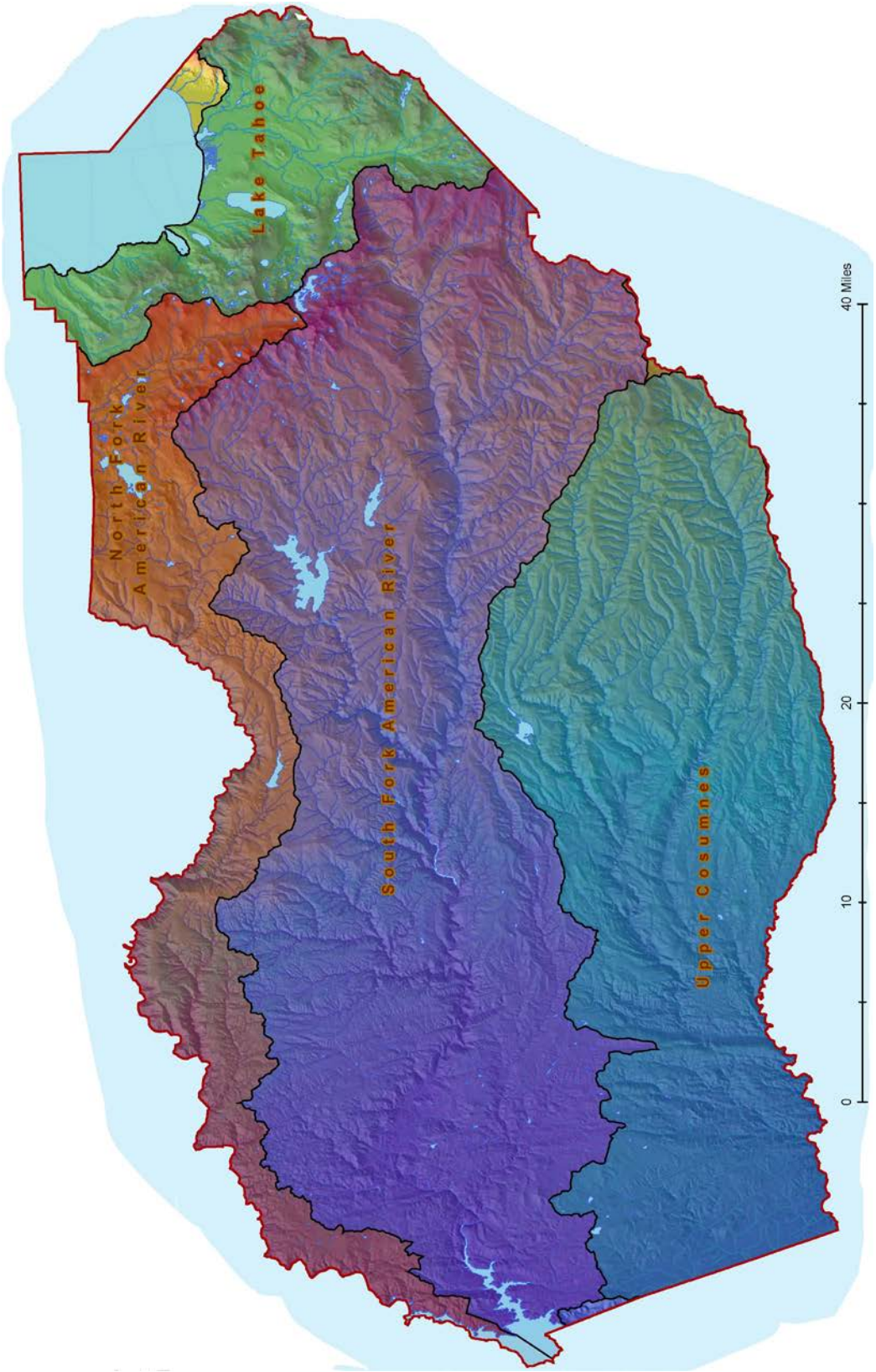

Figure 1-1 Map of El Dorado County

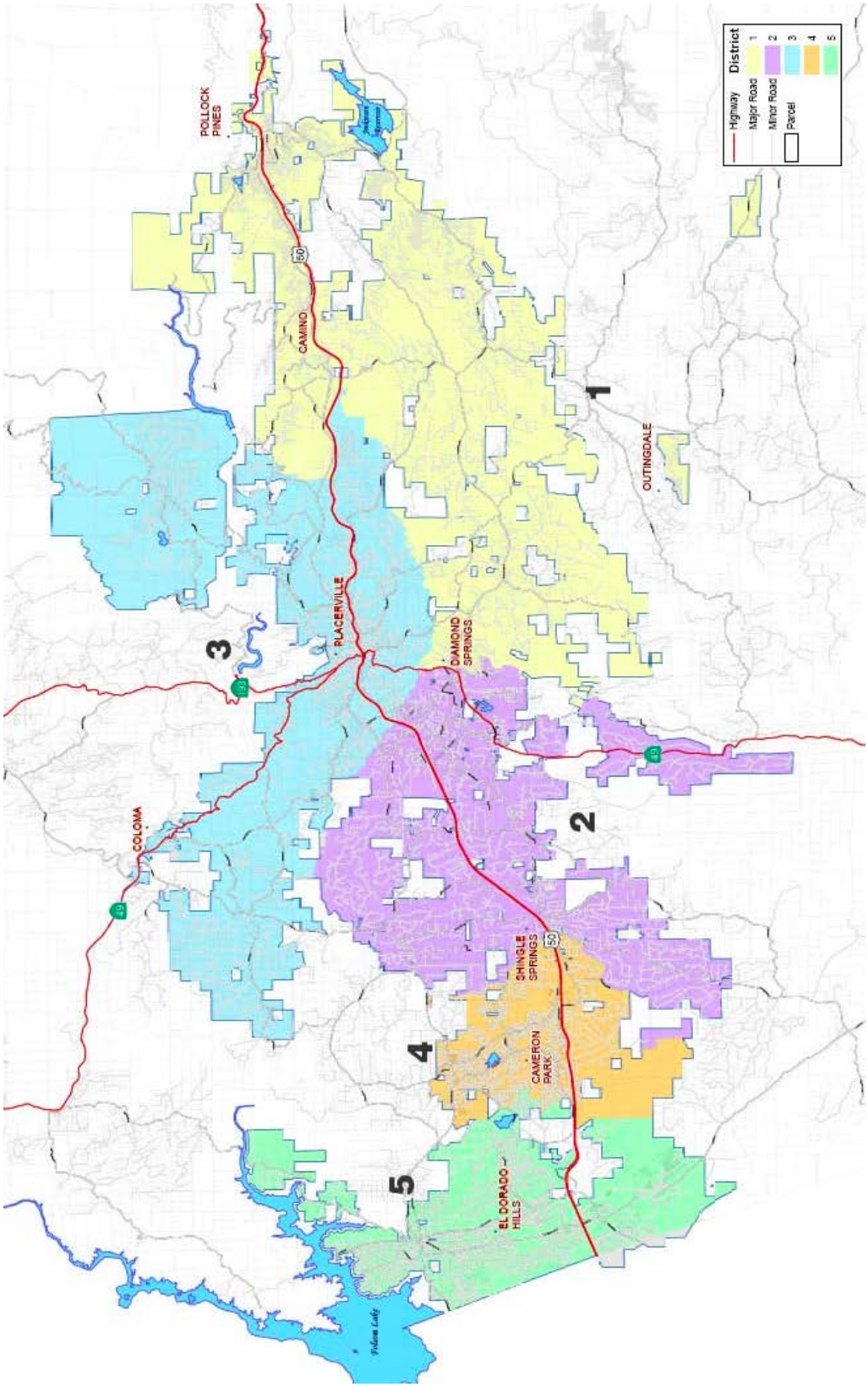

Figure 1-2 EID Area of Service

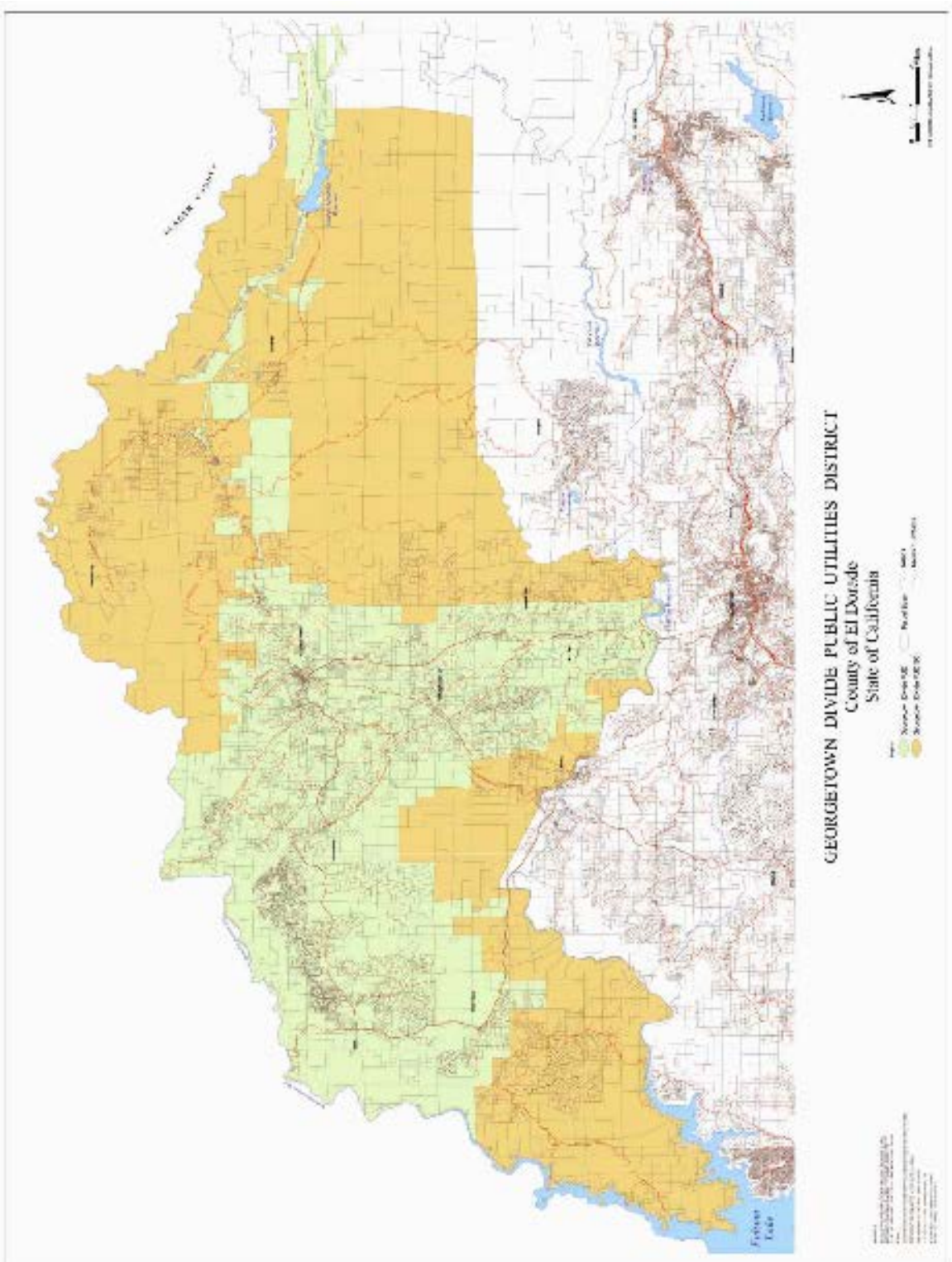

Figure 1-3 GDPUD Area of Service

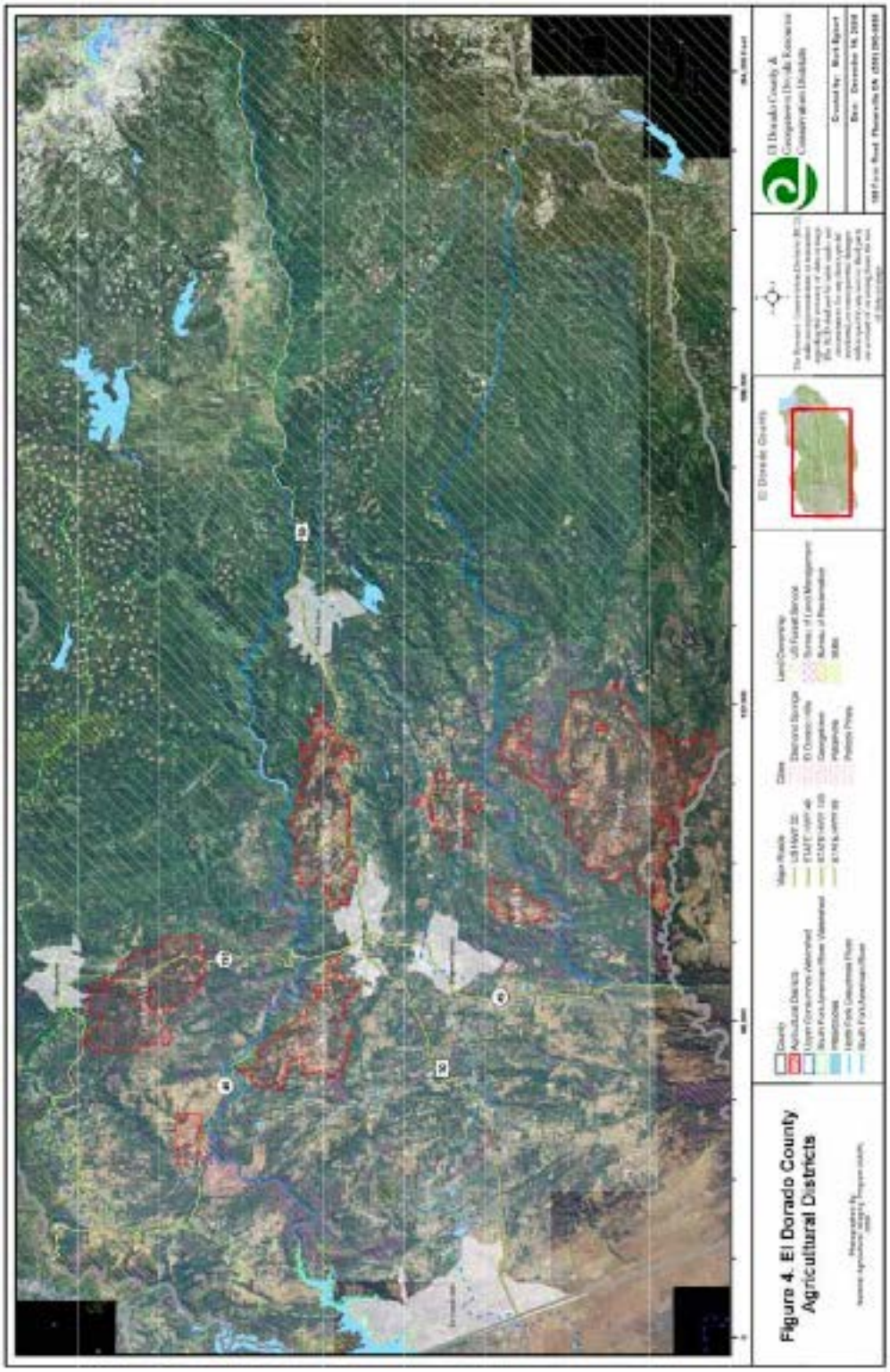

Figure 1-4 El Dorado County Agricultural Districts

Table 1-1: Irrigation systems and commodities grown within the EID service district.

This table lists commodities grown and the irrigation systems used on these commodities over time. Agriculture is a dynamic endeavor so cropping patterns and irrigation practices change over time. The easiest way to make this comparison is a percentage of the whole since total numbers change over time. Currently, the single largest commodity being grown in the District is wine grapes at nearly 48% with apples coming in at 29%. These two commodities account for over two-thirds of the crops grown. The most water efficient systems are the micro and drip systems and they account for nearly 64% of the systems in use. The large increase in drip systems over time is due to the improvements in technology and wine grapes replacing pear orchard.

Crop	Portable	Under Tree	Overhead	Micro	Drip	Total	2009	2005	1999	1981
Apple	31	3	23	45	5	107	28.9%	33.7%	36.9%	32.0%
Cherry	1	0	0	13	1	15	4.0%	4.6%	4.5%	2.1%
Chestnut	0	0	0	1	0	2	0.5%	0.4%	0.0%	0.0%
Grape	1	0	51	5	120	177	47.8%	41.8%	30.0%	3.3%
Nursery	2	0	4	2	0	10	2.7%	0.7%	0.0%	1.2%
Peaches	1	2	1	25	1	30	8.1%	9.1%	10.5%	0.8%
Pears	9	1	1	6	1	18	4.9%	6.3%	12.9%	57.7%
Persimmon	0	0	0	0	1	1	0.3%	0.4%	0.3%	0.0%
Plums	0	0	0	6	0	6	1.6%	1.8%	2.4%	2.9%
Trailing Berry	0	0	1	0	0	1	0.3%	0.4%	1.0%	0.0%
Walnuts	0	0	1	2	0	3	0.8%	1.1%	1.4%	0.0%
Total	46	7	82	106	129	370				
2009	12.4%	1.9%	22.2%	28.6%	34.9%					
2005	14.4%	2.1%	23.9%	31.9%	27.7%					
1999	23.7%	3.1%	26.5%	30.7%	16.0%					
1981	71.0%	2.9%	24.5%	0.0%	1.7%					

Commodity

Irrigation

Table 1-2 Pesticides with a High Potential to Contaminate Surface Water. The following pesticides have been determined to have a high potential to contaminate surface water.

Active Ingredient	
Alachlor	Malathion
Aldicarb	MCPA
Atrazine	MCPA, dimethylamine salt
Azinphos-methyl	MCPA, 2-ethyl hexyl ester
Benefin (benfluralin)	MCPA, isooctyl ester
Bentazon, sodium salt	Methidathion
beta-Cyfluthrin	Methiocarb
Bifenthrin	Methomyl
Bromacil	Methyl parathion
Carbaryl	Metolachlor
Carbofuran	S-metolachlor
Chlorpyrifos	Metribuzin
Cyfluthrin	Naled
Cypermethrin	Norflurazon
S-cypermethrin	Oryzalin
Deltamethrin	Oxadiazon
Diazinon	Oxyfluorfen
Dicamba, dimethylamine salt	Pendimethalin
Dicamba, sodium salt	Permethrin
Dicofol	Phorate
Dimethoate	Phosmet
Disulfoton	Prodiamine
Diuron	Prometryn
Esfenvalerate	Propanil
Ethalfluralin	Propargite
Ethoprop	Propoxur
Fenoxycarb	Propyzamide (pronamide)
Fenpropathrin	Pyriproxifen
Fipronil	Siduron
gamma-Cyhalothri	Simazine
Hexazinone	Tetrachlorvinphos
Imidacloprid	Triallate
lambda-Cyhalothrin	Tribufos (Folex - S,S,S-tributyl phosphorotrithioate)
Linuron	Trifluralin

* Source is "***Department of Pesticide Regulation's Draft Restrictions to Address Pesticide Drift and Runoff to Protect Surface Water***
June 1, 2009"

El Dorado County Agriculture Water Quality Management Corporation

Membership Survey of Management Practices

Land owner name: _____ **Business name:** _____ **Commodities grown:** _____ _____ _____ _____	Office use only: Membership Number: _____

The purpose of this survey is to document the Management Practices that you currently employ or plan to implement within the next 2 years. There are four Management Objectives that have been identified that when satisfied will minimize the impact of waste discharged from irrigated lands into the waters of the State thereby achieving the goals of the Irrigated Lands Regulatory Program (ILRP). Each objective has a set of Management Practices that will help achieve the Objectives. Not all practices will apply to your irrigated agricultural operation. Please review each of the Practices listed under each of the four Objectives and make a check mark by those you already employ or plan to employ within the next 2 years. The data collected through this survey will be summarized for submission to the Central Valley Regional Water Quality Control Board. Individual grower data will not be released to anyone outside of our local coalition.

You will be contacted to verify observable practices. An individual acceptable to both you and the coalition will accomplish the visual verification by comparing your operation with your completed survey. Verification that you have implemented a practice will not be judgmental as to how well or poorly you have implemented that practice. As a member of the coalition you agree to allow coordinated access to your operation as well as the completion of surveys from time to time. You will be contacted to verbally verify non-observable practice, e.g. Use of an IPM – Do you use a formal IPM including monitoring and detailed record keeping?

Your cooperation in completing this survey will allow us to reduce the costly water monitoring that we have undertaken over the last 5 years and still ensure that the quality of water within El Dorado County remains excellent.

Use Now | 2-Year Plan

Pesticide Management Practices. These practices are designed to manage pesticide(s) and pesticide application so as to eliminate, reduce, or slow the direct discharge of pesticide(s) to adjacent watercourse(s).

____ ____ P1. Use a formal or informal Integrated Pest Management (IPM) program to control target pest(s).

____ ____ P2 Use Pest Control Advisor (PCA) to identify pests and determine appropriate action.

____ ____ P3 Base application decisions on environmental conditions (wind, rain, temperature, etc.), scouting data, pest thresholds and/or risk assessment models.

____ ____ P4. Select pesticides with lower risk of runoff or leaching based on pesticide chemistry and site conditions, i.e. soil type and slope conditions.

____ ____ P5. Manage overall seasonal use to minimize the amount of pesticide(s) needed to be effective.

____ ____ P6. Regularly, at least annually, check and calibrate application equipment and/or injectors.

____ ____ P7. Use biological controls where possible to eliminate the need for applying pesticide(s).

____ ____ P8. Introduce populations of beneficial insects when appropriate to eliminate the need for applying pesticide(s).

____ ____ P9. Store, handle and apply pesticides according to labels as required by law.

____ ____ P10. Comply with DPR Pesticide Application Permit requirements.

____ ____ P11. Use a Pest Control Operator (PCO) for pesticide applications.

____ ____ P12. Use organic materials when and where conditions allow.

____ ____ P13. Use cultural practices, e.g. mowing instead of applying herbicides, when and where appropriate.

Use Now | 2-Year Plan

____ ____ P14. Consult with a UCCE Farm Advisor to identify any unknown causes of crop damage in order to determine the correct pesticide(s) to be applied.

____ ____ P15. Other (Please describe) _____
_____

Irrigation Water Management Practices. These practices are designed to manage irrigation water so as to eliminate, reduce, or slow the direct discharge of irrigation water to adjacent watercourses.

____ ____ I1. Participate in an IMS program provided by a local water purveyor or the El Dorado County Water Agency.

____ ____ I2. Use evapotranspiration (ET) data to schedule irrigation events.

____ ____ I3. Maintain and monitor irrigation system(s) on a regular basis.

____ ____ I4. Use drip or micro-sprinkler irrigation systems.

____ ____ I5. Know the water holding capacity of the agricultural operation soil.

____ ____ I6. Know the water infiltration rate of the agricultural operation soil.

____ ____ I7. Other (Please describe) _____
_____

Erosion and Sediment Control Management Practices. These practices are designed to manage erosion so as to eliminate, reduce, or slow the direct discharge of sediment to adjacent watercourses.

____ ____ S1. Use cover crops between rows.

____ ____ S2. Use vegetative buffers down slope of the irrigated lands.

____ ____ S3. Use water bars and diversion ditches on service roads within and adjacent to the irrigated agricultural operation.

____ ____ S4. Apply gravel, vegetative material and/or establish a cover crop on service roads within and adjacent to the irrigated agricultural operation.

____ ____ S5. If terracing is necessary comply with county grading requirements.

Use Now | 2-Year Plan

____ ____ S6. Use grassed waterways, lined channels and/or diversions in ditches and channel banks.

____ ____ S7. Use sediment control basins where practical and necessary.

____ ____ S8. Visually monitor runoff during excessive storm events to identify previously unknown problem areas.

____ ____ S9. Apply and/or manage plant residues or other materials on the field soil surface to ensure there is successful reseeding and continued viability.

____ ____ S10. Other (Please describe) _____
_____

Nutrient Management Practices. These practices are designed to manage soil amendment(s) and crop nutrient(s) to prevent excess applications and to minimize the potential for offsite movement.

____ ____ N1. Determine crop nutrient requirements and establish nutrient budgets.

____ ____ N2. Use plant tissue analysis to assist in fertilizer application decisions.

____ ____ N3. Incorporate a backflow prevention device into a fertigation system.

____ ____ N4. Regularly maintain and calibrate fertilizer application equipment.

____ ____ N5. Mix and load fertilizer on low runoff hazard sites away from surface water and wellheads.

____ ____ N6. Other (Please describe) _____
_____

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