

ECONOMIC IMPACTS OF THE CONDITIONAL AG WAIVER

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Abstract

This study was done to evaluate the costs associated with the Ag Waiver of Discharges from Irrigated Agricultural Lands. In order to determine the feasibility of this policy for the agricultural community across the Central Coast region, a thorough analysis of Appendix F: Cost Considerations was conducted. The ultimate goal of this water policy is to ensure drinking water quality across the Central Coast of California and therefore examining the benefits to public health was critical to determine the importance of this policy.

This report examines the scope of implementing this policy and the extensive economic impacts upon the agricultural community. An evaluation of the benefits to public health accredited to improved water quality or the lack thereof is essential to comprehend the inevitability of a regulatory policy of agricultural discharges. Extensive interviews with farmers and ranchers as well as organizations that represent the agricultural industry in the region provided information regarding the feasibility of this policy for growers across the region. It was determined that the regulations associated with the Ag Waiver are stringent and numerous and have the potential to force many growers out of business. Based on this conclusion it is important that a policy be implemented with guidelines that are feasible for growers and still manage to ensure a continued effort to improve water quality across the Central Coast.

TABLE OF CONTENTS

Chapter	Page
I. INTRODUCTION	
Problem Statement.....	1
Hypothesis.....	3
Objectives	3
Justification.....	4
II. REVIEW OF LITERATURE	
Significance of Water to Agriculture and Society	5
Economic Impacts of Water Regulation.....	7
Impacts of Nitrate Concentrations in Water	11
III. METHODOLOGY	
Procedures for Data Collection.....	14
Procedures for Data Analysis.....	16
Assumptions	17
Limitations.....	18
IV. DEVELOPMENT OF THE STUDY	
Data Collection Problems	19
Analysis.....	20
V. SUMMARY, CONCLUSION, AND RECOMMENDATIONS	
Summary.....	31
Conclusion	32
Recommendations.....	32
References Cited.....	35-38
Appendix.....	39-40

LIST OF FIGURES

Figure 1 Water Boards of California, Regional Board 3	21
Figure 2 Own-Price Elasticity of Demand.....	29

LIST OF TABLES

Table 7 Estimation of Costs to Implement Management Practices	21
Table 4 Cost Estimates and Potential Benefits for Nine Conservation Practices	24
Table 8 Acreage Potentially Affected by Buffer on Water Bodies.....	25
Table 12 Estimated Farmland within 50 Feet of a Water Body.....	26
Table 9 Estimated Average Gross Value per Acre of Select Crops.....	28
Table 10 Calculated Loss in Gross Production Value and Crop Acreage	28
Table 14 Water Board Staff Annual Cost to Administer Program	30

Chapter 1

INTRODUCTION

The recent proposal by the Regional Water Quality Control Board (RWQCB), Central Coast Region, is focused on new agricultural guidelines concerning the contamination of water resources (State of California 2010a). The implementation of these guidelines would, potentially, have profound economic impacts that directly affect local farmers, ranchers and consumers.

In many cases regulations are necessary to ensure that growers are producing healthy fruits, vegetables, and meats for public consumption. Modern agriculture's use of inorganic fertilizers and pesticides creates concerns regarding the harmful effects on the environment as well as the health of the public. Implementation of training and certification of pesticide applicators as well as thorough inspection of agricultural products and recalls have mitigated consumer concerns (Ruhl 2000). Technological advancements have provided growers with tools and resources to help reduce their detrimental environmental effects without regulatory intervention, ultimately making agricultural operations more sustainable.

Today, agriculture works alongside government agencies and other organizations to develop policies, which provide growers access to technologies, education, and incentives, in support of modern agricultural practices (Camargo and Alonso 2006). With these advances in more sustainable practices and regulations there can be hope that in the near future direct impacts on the environment from agricultural operations will be minimal or even nonexistent.

The "Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands," Draft Order No. R3-2011-0006 (State of California 2010a) enforces the Safe

Drinking Water Act required by the United States Environmental Protection Agency (Environmental Protection Agency 2009). It is more commonly known as the Agricultural Regulatory Program (State of California 2010a) or the Ag Waiver. The many purposes and goals of this program include preventing agricultural discharges from impairing the waters that receive the discharges, and protecting surface water and groundwater that may end up as drinking water. Ensuring that pollutant concentrations do not reach exorbitant levels in that ecosystems are harmed is of paramount concern. Since many surface water and groundwater bodies in California have been impaired due to pollutants from agricultural sources, the RWQCB is utilizing a coordinated watershed approach to implement the Agricultural Regulatory Program (ARP).

The main controversial issue brought up by this new program is how local farmers and ranchers are going to pay for the alterations needed to comply with these regulations. It is crucial that an evaluation of the economic impacts of the policy is conducted in order to weigh the benefits against the costs. While high concentrations of nitrates and nitrites, as well as other toxic chemicals from irrigation discharges may be harmful to overall human health, how are the direct impacts measured, in other words how will the public be sure that this policy is worth the taxpayers money. There is no doubt in anyone's mind that our survival is directly dependent upon clean water sources and one main objective of this research is to provide another economic cost-benefit analysis so that the board makes the most efficient and effective decision of controlling pesticide, fertilizer, and irrigation runoff.

Problem Statement

Do the positive effects on environmental and public health justify the economic impacts of the new updates to the Ag Waiver?

Hypothesis

The costs of the Ag Waiver will not be justified by the benefits to public health. Cleaner water sources may be achieved if nitrate levels are decreased in areas of high toxicity to below 10 mg/L however, the costs of monitoring, controlling and enacting this policy, estimated to be anywhere from \$300-900 per acre, will far outweigh the potential health risks of polluted runoff discharges and high levels of nitrates in groundwater.

Objectives

- 1) To analyze the estimated economic impacts of the Conditional Ag Waiver updates on the Central Coast.
- 2) To evaluate the public health benefits if the proposed revisions of this policy are enacted.
- 3) To weigh the economic impacts against the benefits to the public's health in order to understand the legitimacy of this policy.

Justification/Significance of the Study

The justification of this study is to comprehend the importance of clean drinking water and the best techniques to ensure agricultural runoff does not contaminate water resources. Implementation of regulations and guidelines can have profound economic impacts that directly affect local farmers and ranchers, which in turn may be passed onto consumers in the form of more expensive fruits, vegetables, and meats (Hazilla and Kopp 1990). According to the 2007 Census of Agriculture (Census 2007) San Luis Obispo County has 2,784 farms totaling 1,369,604 acres, Monterey County has 1,199 farms totaling 1,372,972 acres and Santa Barbara County has 1,597 farms totaling 727,050 acres combining to a total market land value of over \$3,690,403,000 (Census 2007), representing that this policy will affect one of the largest industries on the Central Coast. Another significant factor to this study is a thorough examination of human health effects that can be directly related to high levels of nitrates. Comparing the hefty expenses of this policy to other projects or efforts that may help the state save money in order to recover from budget deficits will also be a justification of this study. Ultimately, weighing the costs to growers against the benefits to public health will lead to an informed decision of an effective policy that will not push farmers and ranchers out of business, all the while ensuring a safe drinking water supply.

Chapter 2

REVIEW OF THE LITERATURE

Significance of Water to Agriculture and Society

Water is one of nature's most abundant elements and for humans it is one of the most important substances to the continuance of life. Clean drinking water is essential to almost every life form on earth and public access to safe drinking water has improved steadily and substantially over the last decades (Self and Waskom 2008). Water plays a critical role in the world economy because it directly contributes to food production. Approximately 70% of the global amount of freshwater is used for agriculture and the majority of it is used for irrigation (Finnemore 1993). Another important role it plays is acting as a solvent for a wide variety of chemical substances and facilitating industrial cooling and transportation (Finnemore 1993).

The human race is at the mercy of natural resource cycles and endowments. Society depends upon the condition of our environment and the manner in which we treat it. For farmers and ranchers across the globe and more specifically in the United States, the use of water is a major part of everyday life. Agriculture is widely believed to have significant impacts on water quality and many are worried that during operations to grow crops, surface waters in turn get polluted making them unsafe for drinking, fishing, and swimming (Camargo and Alonso 2006). Farmers and ranchers face a complex set of factors of how to safely grow produce or raise livestock, while weighing uncertainties about weather and markets and not having significant negative environmental impacts. Policies and compliances help to control the irrigation discharges by regulating point sources that discharge pollutants into local water sources.

Management of water discharges from irrigation runoff is crucial to keeping pollution and contamination to a minimum. Improved practices and monitoring will have the potential of reducing water contamination across the country. With incentives from state and federal levels, farmers and ranchers of today can begin to ensure that the most efficient and sustainable practices are used in order to use our natural resources wisely (Lee and Randhir 1997). A clear correlation has been observed between access to safe water and GDP per capita around the world. Some observers have estimated that by 2025 more than half of the world population will be facing water-based vulnerability (Lee and Randhir 1997). Unfortunately, a recent report done in November 2009 suggests that by 2030 water demand will exceed supply by 50% in some developing regions of the world (Parker 2010).

The impacts of irrigation discharges and fertilizer runoff remain major contributors of non-point water source pollution. Contamination from chemicals such as fertilizers, pesticides, and herbicides directly affect the quality of the surface water that flows from agricultural lands and the groundwater, both on-site and off-site. It is estimated that 64% of rivers and 57% of lakes in the United States have nonpoint source pollution that deteriorates water quality and that the costs of sediment loss annually is estimated to be 2.2 billion dollars (Lee and Randhir 1997). Policies to protect water sources must exist to protect the public from these negative externalities and to ensure the quality of water in the future. The proposed policies need to be a good balance of different considerations in order to achieve significant gains in farms' environmental performance without excessive administrative or compliance complexities and costs (Lee and Randhir 1997).

In 2004, the U.S. Environmental Protection Agency (EPA) conducted the National Water Quality Inventory and based on state assessments, concluded that agriculture is one of the

leading sources of pollution in the nation's rivers, lakes, and a minor source of impairment in estuaries (EPA 2009). Findings like these will undoubtedly bring more Federal environmental protection policies and programs that may restrict or encourage certain production practices. Non-point source water pollution is the most directly regulated and prevalent type of pollution associated with agriculture (Macartney 2010). Controlling the use of toxic agricultural inputs is paramount in order to maintain clean water sources for generations to come and to ensure that farmers and ranchers of today can continue to grow our crops and raise the livestock that the American society is so dependent upon. It is vital that we support growers with ethical and sustainable practices to begin the transformation of this multibillion-dollar industry.

Economic Impacts of Water Regulation

Policies that regulate input use or heavily tax farmers and ranchers may have spillover effects on other agricultural income, production, and risk levels (Lee and Randhir 1997). Certain policies that are directed toward controlling the runoff of particular inputs, nitrogen for example, may directly affect the amount of that pollutant, while indirect effects on phosphorus or potassium can have negative impacts on the business owner with decreases in crop yields (Lee and Randhir 1997). In the formulating of agricultural policies all of these variables must be weighed and many times on the policy side of the implications of non-targeted pollutants the full effects on farm income may not be considered (Lee and Randhir 1997). In order to satisfy the growers and the public, incentives such as tax deductions for creating riparian buffer zones will help to encourage growers to adopt farming practices that minimize their runoff (Department of Agriculture 2011b).

Many programs and policies including the Nonpoint Source Program, Safe Drinking

Water Act, and The Endangered Species Act all serve to ensure minimal environmental impacts from agriculture operations (Kensky 2010). The U.S. Department of Agriculture has several major programs for providing financial and technical assistance to farmers for protecting water quality, soil quality, and wildlife habitat in order to keep up with all of these policies (Kensky 2010). The chiefly responsible agency for administering these policies is the U.S. Environmental Protection Agency (EPA) and the major law protecting water quality is the Clean Water Act of 1972. The agency's assessment of water quality is provided by the EPA's 2004 National Water Quality Inventory, which was conducted on 16 percent of the nation's 3.5 million river and stream miles, 39 percent of lake acres, and 29 percent of estuarine square miles, and findings showed that agriculture was the leading source of pollution in 37 percent of river miles, 30 percent of lake acres, and 8 percent of estuarine waters found to be water quality impaired, or in other words they do not support designated uses (Kensky 2010).

The federal regulatory agency's use of cost-benefit analysis has greatly impacted the way regulations are established. In recent years the agencies have expanded greatly in scope and sophistication in order to employ environmental quality regulations. However in many cases, these agencies fail to analyze the costs to those that may be directly impacted in their business operations. The social cost of environmental quality regulations mandated by the Clean Air and Clean Water acts are brought upon business owners and too often they are not fully understood or taken into account (Hazilla and Kopp 1990). For farmers and ranchers new regulations on their agricultural operations can be very significant and pervasive leading to intertemporal affects that are many times ignored. By presidential executive order Federal agencies like the EPA are required to analyze new regulations or changes in existing regulations using benefit-cost analysis (Hazilla and Kopp 1990).

Even though many of these regulations are enacted to benefit society, the executive order includes neither explicit guidelines for conducting analyses nor precise definitions of benefits and costs (Hazilla and Kopp 1990). Compensation principles must be considered when direct costs to farmers and ranchers are incurred with new environmental quality regulations. Unfortunately, however a theoretically precise social cost measure is not used in practice and current procedures are subject to errors of unknown magnitude (Hazilla and Kopp 1990). A goal of researchers has now become improving these procedures by using compensating variation welfare measures to evaluate the social costs of environmental quality regulations promulgated by the Clean Air and Clean Water acts.

Applying cost-benefit analysis (CBA) to projects involving environmental regulations can be very problematic. Recent moves in governmental regulations to include environmental valuations in CBA exercises have resulted in a large amount of bias and controversy (Hanley 1992). Hanley (1992) discussed and addressed the problems of differences between citizen and consumer values. A consideration of a main problem that arises from the use of CBA to environmental projects is that environmental impacts are increasingly being drawn into economic appraisals. In a situation where the ultimate goal is the control of nitrate pollution, a considerable scientific uncertainty attaches to the health impacts of given nitrate levels in drinking water, whilst percolation rates through ground water are highly locale-specific (Hanley 1992).

The concept of contingent valuation has been widely applied to measuring the non-market resources of our nation and the earth. Contingent valuation is a survey-based economic technique to determine the value of resources that are not commonly sold or do not have a determined market price (Jordan and Elnagheeb 1993). Many of these resources give people

utility and are very important in our everyday lives, but how can one value, how much clean drinking water is worth using price-based models. People receive benefit from a beautiful view of a mountain, but determining how much benefit, is where economists run into problems. Contingent valuation surveys are one technique that can be used to measure these non-market resources by asking how much money people or the affected parties their maximum willingness-to-pay (WTP) or their minimum willingness to accept compensation (WTA) for either welfare increasing or welfare decreasing changes in environmental quality (Jordan and Elnagheeb 1993). Average bids are calculated which can be used to obtain an aggregate total value allowing economists to measure the benefits of increased environmental quality.

The economic impacts of agriculture regulation can be better understood through studies conducted in which growers are interviewed on their willingness to comply to regulations. For many agricultural operations the feasibility of altering irrigation practices is very costly, but certain studies show that in the long-term these more sustainable practices will be worth their initial cost (Millhouse 2006). Millhouse (2006) conducted a study based on the articulation between education of water quality practices and the willingness of farmers and ranchers to implement sustainable water quality practices in order to reduce their runoff. A fifteen-question survey was used to evaluate techniques being used on farmland of twenty-five agricultural operations residing on the Central Coast. The local growers took the fifteen-question survey in order to indicate the agreement or disagreement with various water quality policies. The consensus from all this research was that the more education about water quality planning techniques, the higher the adoption rate of sustainable practices of water usage.

Impacts of Nitrate Concentrations in Water

Nitrogen accounts for nearly 78% percent of the content of the air we breathe and is one of the most crucial elements needed for growing plants (Ruhl 2000). It has been used as a fertilizer for thousands of years and is one of the three main components of inorganic fertilizers used in agricultural operations globally. However, the potential cumulative effect of the buildup of nitrates in upper ground-water zones can be harmful to human health. While there is no doubt that contamination of water sources by these agricultural inputs has brought attention to maintaining water quality, the use of these inputs has also brought enormous economic and human health benefits due to dramatically increasing world food production, decrease in famine worldwide and overall a larger human population (Camargo and Alonso 2006).

High concentrations of nitrates in groundwater may be unsafe for consumption and standards are needed to regulate such contamination. In California, nitrate contamination has become a widespread problem with the potential to cause significant health problems and contribute to high costs of well remediation (Burton and Johnson 1990). In efforts to prevent contamination the California Department of Food and Agriculture (CDFA) created the Fertilizer Research and Education Program (FREP) in 1990; its goals being to advance the environmentally safe and agronomically sound use of fertilizing materials. Since 1991, 51 research and education projects have been funded and have evaluated cropping systems such as fruit and nut orchards on the east side of the San Joaquin Valley and cool season vegetables in the coastal regions of central California (Burton and Johnson 1990).

Human society is greatly dependent upon their water resources and therefore excessive nitrogen pollution on these resources can have adverse effects on human health and economy.

Data from many studies conducted by the World Health Organization and the U.S. Environmental Protection Agency have found that ingested nitrates and nitrites from polluted drinking water might induce methemoglobinemia in humans by the reduction of nitrates into nitrites, which under anaerobic conditions in the digestive tract, causes the subsequent blockade of the oxygen-carrying capacity of hemoglobin (Camargo and Alonso 2006).

Potential health risks of the contamination of groundwater and rural drinking water supplies by nitrates from livestock and human excrement, chemical fertilizers, and other organic waste may account for many illnesses each year. One of the main risks of contaminated groundwater by nitrates is infant illness and death from nitrate-induced methemoglobinemia, which is often misdiagnosed and considered perhaps as sudden infant death syndrome. Camargo and Alonso (2006) found that a 1950 report listed 144 cases of infant methemoglobinemia with 14 deaths in one 30-month period in Minnesota. Misdiagnosis of this preventable, treatable toxin problem resulted in infant deaths and was still occurring as recently as 1986 in South Dakota. Other statistics from this report show that in South Dakota about 39% of dug or bored wells were unsafe to because of such high concentrations of nitrate, compared to 22% of drilled wells and 16% of driven wells (Camargo and Alonso 2006).

Changes to the global nitrogen cycle can have positive human health effects such as the benefits of increased food production, which in turn decreases hunger and famine worldwide. While the use of nitrogen rich fertilizers have helped to create a larger food supply and less world hunger, it is important that the ecological impacts that occur from the continued uses of this chemical are studied (Townsend and Howarth 2003). Many intensively fertilized crops become animal feed, which in turns helps to create disparities in world food distribution and leads to unbalanced diets in nations across the globe. Excessive air and water-borne nitrogen are

linked to respiratory ailments, cardiac disease, and several cancers. Ultimately (Townsend and Howarth 2003), suggests that the net public health consequences of a changing nitrogen cycle are for the most part largely positive at lower levels, but as the levels eventually peak than our use of nitrogen becomes dangerous and can have many negative risks.

Chapter 3

METHODOLOGY

Procedures for Data Collection

The importance of water quality has been a topic of research studies for decades and for agriculture it is of paramount importance. Primary sources of data will include in-depth intensive interviews of local farmers and ranchers and of significant farm advisors that hold positions concerning the agricultural industry around the Central Coast. The use of data collected by the Regional Water Quality Control Board (RWQCB), Central Coast Region, will also assist in the collection of the costs incurred by the Ag Waiver. The data will help to support the hypothesis that the Ag Waiver may achieve cleaner water resources, however the costs of monitoring, controlling and enacting this policy will far outweigh the potential health risks of polluted runoff discharges and high levels of nitrates in groundwater.

In order to properly and accurately evaluate the costs of the Agricultural Regulatory Program (ARP) a cost study of Central Coast growers will be conducted. It will be necessary to interview local growers to determine how the new regulations and guidelines financially affect them. Due to the fact that many growers show little desire to engage themselves in researching or evaluating the costs to their operations it will be challenging to acquire a good deal of data that can be analyzed. Many farmers and ranchers do not wish to spend any more time in their offices than they have to, therefore collecting sufficient quantitative data is likely to be difficult. Discussing with farm advisors and coalitions such as the Grower-shipper of Santa Maria and Salinas will serve to give a professional's opinion of the feasibility of growers being able to cover

the costs of the Agricultural Regulatory Program. Much of the data and knowledge gained from speaking with these growers and farm advisors will be qualitative, which will help to gain a deeper understanding of the impacts to how the Central Coast Agricultural Industry.

To begin to collect projected costs of the Ag Waiver it will be helpful to conduct personal in-depth interviews with local farmers and ranchers. In deciding who to interview it is important to keep in mind that finding the most informed growers will probably lead to the most response rates. Because the Central Coast is such a vast region the interviews will likely need to be discussed over the phone and a questionnaire sheet will be emailed along with a cost evaluation spreadsheet to the grower to be looked over. Open-ended questions are encouraged because they will assist in calculating the value of the land taken out of production and the changes to farm income due to the adoption of the Ag Waiver's guidelines and compliances. The interviews will also be helpful to develop a broad estimate of the number of acres that may be directly affected by the Ag Waiver policy.

A representative sample of different farm sizes as well as different locations around the Central Coast should be used to best analyze potential economic impacts on local farms and ranches. An important aspect of choosing the growers to be interviewed will be their location within the region because those closest to water sources including rivers, creeks, and streams are more likely to be impacted by this policy. From the 2007 Census of Agriculture there were 2,784 farms in San Luis Obispo County with a total of 1,369,604 acres and this acreage will be taken into account due to the cost of removing some of it from production as well as the costs of replacing fencing and boundary lines. Due to the fact that the new Ag Waiver policy will establish a "riparian buffer zone" from the edge of creek banks to where crops may be grown, determining the land taken out of production is going to be critical to this study.

Procedures for Data Analysis

In order to analyze data collected from personal interviews as well as estimated costs determined by the RWQCB and other organizations it will be helpful to develop tables to compare benefits and costs. A main source of the evaluations of the costs related to this Agricultural Regulatory Program can be found in Appendix F: Cost Considerations, presented in the Staff Report of the Draft Agricultural Order, Draft Monitoring and Reporting Program released by on November, 19, 2010, by the Central Coast Water Board staff. Using data collected and presented in this appendix, analysis of the costs throughout the Central Coast region will be put into greater perspective. Tables and graphs found in Appendix F: Cost Considerations (Draft Order 2010b) of relative importance will be reviewed to determine what the short-term and long-term costs are evaluated at around the region.

Ranches and farms chosen to conduct intensive interviews with will need to be described in detail concerning their location, characteristics of the land, water availability, and any other pertinent aspects that will be significant to the study. The specific cost described in the Ag Waiver should be analyzed for each farm including the costs of water monitoring, costs of altering pesticide, fertilizer, and irrigation practices used as well as the cost of building new fence lines, and the changes in farm profit due to a decrease in production land and sales of produce or livestock.

After evaluating the economic impacts incurred by the new Ag Waiver policy, the benefits that may come from the policy need to be weighed against the costs that will be accrued around the county. However, one must be very careful when applying cost-benefit analysis to projects involving environmental regulations because a major problem exists in placing

monetary values on non-market goods. The potential health benefits may be the most difficult factors to measure because it is never easy to put a number on how much a human life is worth. Stating that a certain person growing up around the Central Coast will make an estimated amount and will benefit the community around him or her can be a difficult venture. The analysis of the potential of local citizens raised with clean drinking water sources is definitely an important consideration because a main goal of the policy is to eliminate eighty percent (80%) of agricultural runoff by 2025 (Draft Order 2010a).

Through the use of analysis techniques such as feasibility studies it will be possible to determine if the policy is justified in order to ensure that the Central Coast has safe drinking. Many of the owners of these farms may be willingly to give up some of their time to speak about their concerns with the policies, but getting them to actually determine per acre costs with more stringent regulations that have not even been passed yet is quite challenging. The questions asked will encompass how large the farm is, the number of years in business, awareness of the water board's new policy, irrigation practices, pesticide and fertilizer use, and preventive measures already established to prevent nonpoint source water pollution.

Assumptions

This study assumes that participation among those farms and ranches chosen will be sufficient enough to get a good sense of the impacts of the Ag Waiver. It will also be assumed that most of the farms interviewed will truthfully respond to the intensive interviews without a great deal of bias directly influenced by their opinions on the subject. The new policy is more likely to negatively affect small family farms than the larger farms across the county and thus the

adoption of more sustainable practices will be less likely solely upon the expensive initial costs. Another assumption is that estimated costs by the water board staff may be subject to errors of unknown magnitude.

Limitations

It will be very difficult to get a valuation of how much clean drinking water is worth to society and how clean it has to be to be considered pure or entirely uncontaminated.

Determining how much a human life is worth if he or she should contract a disease related to high nitrate levels as an infant will be extremely limiting because it is impossible to know difference in the outcome of someone's life if they have access to drinking water free of contamination and nitrates from agricultural runoff. If participation is not sufficient than much of the analysis will be limited to the cost considerations presented by the staff at the RWQCB. Results may also be limited to the number of growers and ranchers that are willingly to participate in the interviews and therefore the study may be based on the costs estimated by the Central Coast RWQCB.

Chapter 4

DEVELOPMENT OF THE STUDY

Data Collection Problems

Many data collection problems were encountered during the course of this study. To begin with it was very evident that many growers and ranchers that may be directly impacted by this policy show little concern until the policy regulations are actually amended. Many times in agriculture the actual growers do not have the time they may wish they had to keep up with all the policies and programs that regulate their operations. Ryan Talley, from Talley Farms, mentioned that it is difficult to put a number on the costs associated with the Ag Waiver until legislation is passed and a new Ag Waiver is adopted. While keeping the details on the costs spreadsheet simple and the interview questionnaire short it still seemed that growers around the Central Coast ran into difficulties in estimating the economic impacts of the alterations in the Ag Waiver. Richard Quandt of the Grower-Shipper Association of Santa Maria and Santa Barbara Counties, explained that in some cases a new full-time position of water quality manager might be necessary at some of the largest growers in region because the regulations are so stringent. Due to the difficulties of collecting tangible cost data, a thorough analysis of Appendix F: Cost Considerations (State of California 2011b) will be conducted, while keeping in mind that the RWQCB's estimates will tend to be lower than the growers who did participate in the study.

Analysis

In order to analyze the results found in this study one must gain a thorough understanding of the costs of the Ag Waiver by reading through the staff recommendation report published November 19, 2010. This is the newest document of the outlined policy of the Ag Waiver and it incorporates the public comments and suggestions that were respectfully submitted by growers and ranchers of the Central Coast. The document is extremely comprehensive because it explains why the policy updates are so important and the goals outlined by the order. The document of most importance that I reviewed was Appendix F: Cost Considerations. In this appendix I found many different tables and graphs that estimate the many different costs associated with the updated Ag Waiver.

The RWQCB developed estimations of the cost to implement management practices, acreage potentially affected by buffers on water bodies impaired by sediment, and the estimated average gross value per acre of select crops by county. Other costs calculated included the loss in gross production value and crop acreage for habitat buffers and water board staff annual cost to administer the program among others. The Water Board staff explains that they reviewed information from the United States Department of Agriculture Natural Resources Conservation Service, the University of California Cooperative Extension (UCCE), and obtained cost quotes from numerous agricultural technical consultants and growers (Appendix F 2011). It is significant to the study that the UCCE estimates reflect current prices as of 2003, when the studies were prepared, and therefore are outdated by nearly 8 years.



Figure 1: Water Boards of California, Regional Board 3 is the Central Coast Region

The Ag Waiver applies to the Central Coast region of the state, which includes San Luis Obispo (SLO), Monterey, Santa Barbara (SB), and parts of San Benito and Santa Clara Counties. Figure 1 displays the Central Coast region in reference to the state. Agricultural acreage not including San Benito and Santa Clara counties totals 3,469,626 acres and the region has over 5,580 farms. Table 7 of Appendix F: Cost Considerations (Draft Order 2011b) displays the costs associated with implementing management practices that improve or maintain water quality throughout the region. From this table we can see that many different management practices to improve water quality will be significant expenses for growers. While the nutrient management and pesticide elimination costs seem feasible, it would be difficult to convince a grower to implement a practice costing over \$900 per acre because many growers barely get that kind of return on their land after all other fixed and variable costs of farming. In 2008, Pinot Noir grapes had a value of nearly \$5,800 per acre and Hass avocados had a value of almost \$3,000 per acre (Crop Report 2008) around SLO County, however these values do not take into account

Table 7: Estimation of Cost to Implement Management Practices										
Management Practice Category	Area Basis (Acres)	Acres/Operation	Acres	Correction Factor	Acres Practice	Cost/Acre	Cost Year 1	% Year 1	Cost Years 2-4	Cost 5 Years
Sediment & Stormwater Management	Total Irrigated Farm Acreage	N/A	539,284	5%	26,964	\$ 992	\$ 26,748,486	25%	\$ 26,748,486	\$ 53,496,973
Irrigation Management	Operations with Tailwater	N/A	74,121	50%	37,061	\$ 903	\$ 33,465,632	10%	\$ 13,386,253	\$ 46,851,884
Nutrient & Salt Management	Total Vegetable Crop Acreage	N/A	444,443	20%	88,889	\$ 56	\$ 4,977,762	25%	\$ 4,977,762	\$ 9,955,523
Pesticide Runoff/Toxicity Elimination	102 Operations on toxicity impaired streams	20	2,040	50%	1,020	\$ 72	\$ 73,440	50%	\$ 146,880	\$ 220,320
Aquatic Habitat Protection	10 large operations on temp. & turbidity impaired streams	1,000	10,000	50%	5,000	\$ 1,184	\$ 5,920,000	10%	\$ 2,368,000	\$ 8,288,000

Source: Appendix F: Cost Considerations Concerning Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Draft Agricultural Order No. R3-2010-0006)

						One Year Total	\$ 71,185,320		Five Years	\$ 118,812,700
						Per Operation	\$ 23,728		Per Operation	\$ 39,604
						(*based on 3,000 operations in the region)				

numerous variable production costs. Many vegetable growers do not have such high returns per acre after all their production costs and therefore cool season vegetable growers in Santa Maria and the Salinas Valley regions will be some of the most impacted growers. Table 7 also shows that estimated costs per operation after one year will be \$23,728, totaling \$71,185,320 based on the assumption that the region has 3,000 farm operations, but the 2007 Census of Agriculture found that there were 5,580 farms in 3 counties of the region (Census 2007). If there are 5,580 farms in SLO, SB, and Monterey counties than it is assumed that the Water Board staff estimated the cost per operation based on farms in the region that use irrigation, pesticides, fertilizer, etc., and therefore only 3,000 farms were considered. Since the estimated costs are averages we can expect that the Ag Waiver may cost many farms less than \$39,604 over the first five years and for others it may cost more than this.

For many growers the Ag Waiver costs may be so substantial that the opportunity cost of continuing to farm will outweigh the cost of seeking another line of work. While \$23,728 per year may not push some of the largest growers out of business, according to the 2007 Census of Agriculture approximately 73% of Californian farms are 1 to 99 acres (Census 2007) and most do not have incomes above \$35,000 (Census 2007). Many growers in the Central Coast region are likely to farm less than 100 acres and although they may fall under the Tier 1 regulation guidelines, hundreds if not thousands of dollars to maintain and improve water quality may keep their operations from being profitable. It is important to consider that some growers will be negatively impacted even if they do not produce any irrigation discharges that impair drinking water sources. Table 4 displays the costs of nine conservation practices that the Water Board staff believes will be effective at reducing irrigation discharges. The costs may represent a big sacrifice in the beginning for growers, however in many cases predictions are that income may actually increase with the implementation of some of these conservation practices.

Table 4: Cost Estimates and Potential Benefits for Nine Conservation Practices

CONSERVATION PRACTICE	COSTS PER UNIT		
	Low	Representative	High
Annually Planted Cover Crop			
Costs & Reduced Returns	\$ 48	\$ 147	\$ 163
Additional Returns & Reduced Cost	\$ -	\$ 28	\$ 110
Net Change in Income Per Acre	\$ (48)	\$ (119)	\$ (53)
Annually Planted Grassed Filter Strip (0.5 ac)			
Costs & Reduced Returns	\$ 26	\$ 234	\$ 580
Additional Returns & Reduced Cost	\$ -	\$ 165	\$ 220
Net Change in Income Per Unit Per Year	\$ (26)	\$ (69)	\$ (360)
Grassed Farm Roads (5,800 Linear Feet/20 ac of Cropland)			
Costs & Reduced Returns	\$ 137	\$ 310	\$ 503
Additional Returns & Reduced Cost	\$ -	\$ 650	\$ 1,950
Net Change in Income Per Unit (5,800 Linear Ft.) Per Year	\$ (137)	\$ 340	\$ 1,447
Non-Engineered Grassed Waterways (1,000 Linear Ft.)			
Costs & Reduced Returns Per Unit Year 1	\$ 28	\$ 980	\$ 2,250
Costs & Reduced Returns Per Unit Year- Years 2-5	\$ 27	\$ 329	\$ 767
Additional Returns & Reduced Cost Per Unit Year 1	\$ -	\$ 275	\$ 660
Additional Returns & Reduced Cost Per Unit Per Year -Years 2-5	\$ -	\$ 275	\$ 660
Net Change in Income Per Unit Year 1	\$ 28	\$ (705)	\$ (1,590)
Net Change in Income Per Unit Per Year -Years 2-4	\$ 27	\$ (54)	\$ (107)
Non-Engineered Water/Sediment Control Basin (237 Cubic Yards)			
Costs & Reduced Returns Per Unit Year 1	\$ 1,698	\$ 4,061	\$ 7,002
Costs & Reduced Returns Per Unit Per Year -Years 2-5	\$ 354	\$ 2,017	\$ 3,751
Additional Returns & Reduced Cost Per Unit Per Year	\$ -	\$ 650	\$ 1,950
Net Change in Income Per Unit Year 1	\$ (1,698)	\$ (3,411)	\$ (5,052)
Net Change in Income Per Unit Per Year -Years 2-4	\$ (354)	\$ (1,367)	\$ (1,801)
On-Farm Row Arrangement (25 Acre Parcel)			
Costs & Reduced Returns Per Unit Per Year**	\$ 474	\$ 920	\$ 1,849
Additional Returns & Reduced Cost Per Unit Per Year	\$ -	\$ 3,500	\$ 7,000
Net Change in Income Per Unit Per Year	\$ (474)	\$ 2,580	\$ 5,151
Net Change in Income Per Acre Per Year	\$ (19)	\$ 103	\$ 206
Perennial Critical Area Planting (Acre)			
Costs & Reduced Returns Per Unit -Year 1	\$ 394	\$ 903	\$ 1,780
Additional Returns & Reduced Costs Per Unit Per Year -Years 1-5	\$ 50	\$ 121	\$ 241
Costs & Reduced Returns Per Unit Per Year -Years 2 -5	\$ -	\$ -	\$ -
Net Change in Income Per Acre Year 1	\$ 394	\$ (903)	\$ (1,780)
Net Change in Income Per Acre Per Year -Years 2-5	\$ (50)	\$ (121)	\$ (241)
Perennial Hedgerow Planting (1,000 Linear Ft. X 8 Ft.)			
Costs & Reduced Returns Per Unit Year 1	\$ 1,276	\$ 2,918	\$ 3,938
Costs & Reduced Returns Per Unit Per Year -Years 2-5	\$ 280	\$ 515	\$ 739
Additional Returns & Reduced Cost Per Unit Per Year	\$ -	\$ -	\$ -
Net Change in Income Per Unit (1,000 LF) Year 1	\$ (1,276)	\$ (2,918)	\$ (3,938)
Net Change in Income Per Unit Per Year -Years 2-5	\$ (280)	\$ (515)	\$ (739)
Underground Outlet (400 Linear Ft.)			
Costs & Reduced Returns Per Unit Year 1	\$ 4,630	\$ 5,918	\$ 6,634
Costs & Reduced Returns Per Unit Per Year -Years 2-5	\$ 91	\$ 726	\$ 1,362
Additional Returns & Reduced Cost Per Unit Per Year	\$ -	\$ 2,058	\$ 4,062
Net Change in Income Per Unit Year 1	\$ (4,630)	\$ (3,860)	\$ (2,772)
Net Change in Income Per Unit Per Year -Years 2-5	\$ (91)	\$ 1,332	\$ 2,772 2,700

Source: Appendix F: Cost Considerations Concerning Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Draft Agricultural Order No. R3-2010-0006)

Another important consideration of the Ag Order is the implementation of riparian buffer zones on Tier 3 farm operations, which are operations that are greater than 1,000 acres in size and adjacent to or including water bodies listed for temperature, sediment or turbidity on the 2006 Clean Water Act Section 3030(d) List of Impaired Water bodies (State of California 2011a). Table 8 displays that out of the 34,255 acres of the interviewed growers that will be classified as Tier 3 under the new Ag Waiver, there is only 83 acres within the 30-ft buffer zone and 234 acres within the 50-ft buffer zone. It is somewhat difficult to believe that out of 34,255 acres, these would be the only affected acres by the buffer zones.

Table 8 : Acreage potentially Affected by Buffer on Waterbodies Impaired by Sediment*

County	Grower Operation	Total Acres	Acres in 30-ft buffer	Acres in 50-ft buffer
Monterey	1	4,017	12.54	43.0
	2	2,164	21.60	37.0
	3	1,329	7.70	27.0
	4	3,879	0.20	0.2
	5	1,020	0.06	0.1
	6	10,619	8.95	30.0
	7	1,132	4.80	17.0
	<i>Subtotal</i>	24,160	56	154
San Luis Obispo	1	1,274	8.12	14.0
	<i>Subtotal</i>	1,274	8	14
Santa Barbara	1	7,731	18.52	65.0
	2	1,490	0.10	0.3
	<i>Subtotal</i>	8,821	19	65
TOTALS		34,255	83	234

* Includes only operations > 1,000 acres in size and adjacent to or including water bodies listed for temperature, sediment or turbidity on the 2006 Clean Water Act Section 3030(d) List of Impaired Waterbodies
Source: Appendix F: Cost Considerations Concerning Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Draft Agricultural Order No. R3-2010-0006)

Nonetheless, this estimate only takes into account ten operations in the region and the 2007 Ag Census found nearly 500 farm operations that are greater than 1,000 acres in size within SLO, SB, and Monterey counties (Census 2007). However, many of these large farms may be only pastureland rather than irrigated cropland. Table 12 shows the amount of farmland that the Water Board staff determined as prime farmland, farmland of statewide importance, and unique farmland. This table is

mainly to indicate the amount of land that has the possibility of being removed from production with the new guidelines of the Ag Waiver.

Table 12: Estimated Farmland Within 50 feet of a Water body

County	FARMLAND TYPE	Acres within 50-ft of Stream
Monterey	Prime Farmland	550
	Farmland of Statewide Importance	92
	Unique Farmland	235
	<i>Subtotal</i>	<i>877</i>
San Benito	Prime Farmland	73
	Farmland of Statewide Importance	37
	Unique Farmland	155
	<i>Subtotal</i>	<i>265</i>
San Luis Obispo	Prime Farmland	292
	Farmland of Statewide Importance	57
	Unique Farmland	158
	<i>Subtotal</i>	<i>507</i>
San Mateo	Unique Farmland	1
	<i>Subtotal</i>	<i>1</i>
Santa Barbara	Prime Farmland	181
	Farmland of Statewide Importance	40
	Unique Farmland	111
	<i>Subtotal</i>	<i>332</i>
Santa Cruz	Prime Farmland	140
	Farmland of Statewide Importance	2
	Unique Farmland	25
	<i>Subtotal</i>	<i>166</i>
Santa Clara	Prime Farmland	113
	Farmland of Statewide Importance	26
	Unique Farmland	85
	<i>Subtotal</i>	<i>224</i>
TOTAL ACREAGE		2372

Source: Appendix F: Cost Considerations pg. 30, Considerations Concerning Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Draft Agricultural Order No. R3-2010-0006)

One of the most hotly debated portions of the new implications set forth by the Ag Waiver (State of California 2010a) is the value of the land lost to acreage within the riparian habitat buffer zones. A legitimate concern farmers and ranchers have is that if they are required to implement these riparian habitat buffer zones would new boundary lines be the edge of the buffer zone or would their

acreages remain the same should they ever choose to sell it or lease it, etc. In essence a riparian buffer zone is a vegetated zone adjacent to streams and wetlands that represents a best management practice (BMP) for controlling nitrogen entering water bodies (EPA 2009).

Further review of table 8 says that out of these 34,255 acres only 83 acres will be taken out of production with a 30-ft buffer zone and 234 acres with a 50-ft buffer zone. An acre measures 43,560 ft² and has dimensions of 208.71ft x 208.71 ft. If a farm in the region has a small creek flowing through a portion of the property roughly 2,000 feet-long than a riparian buffer zone of 30 feet and 50 feet respectively (assuming zone on both sides of creek were removed).

$$30\text{Ft Buffer Zone} = (2,000\text{ft} \times 30\text{ft}) = 60,000 \text{ ft}^2 \times 2 = 120,000 \frac{\text{ft}^2}{43,560 \text{ ft/acre}} = 2.75 \text{ acres}$$

$$50\text{Ft Buffer Zone} = (2,000\text{ft} \times 50\text{ft}) = 100,000 \text{ ft}^2 \times 2 = 200,000 \frac{\text{ft}^2}{43,560 \text{ ft/acre}} = 4.59 \text{ acres}$$

It is reasonable to expect that there will be much more acreage taken out of production with the implementation of buffer zones by all Tier 3 growers in the region if one small 2,000 ft creek has the possibility of removing 4.59 acres if it runs 2,000ft and thus the total value of would increase.

Appendix F mentions that the “greatest benefit to the grower of implementing a buffer could be the avoided cost of implementing other potentially more expensive water quality management practices to maintain these functions,” (State of California 2010b) but this may or may not be true if fencing near streams is removed and then built on the edge of the riparian buffer zone.

Table 9 : Estimated Average Gross Value per Acre of Select Crops, by County (2009)

County	Vegetable Crops			Fruits & Nuts			Seed Crops			Total Irrigated Crops		
	Value (Millions)	Acres	Average \$/Acre	Value (Millions)	Acres	Average \$/Acre	Value (Millions)	Acres	Average \$/Acre	Value	Acres	Average \$/Acre
Santa Cruz	\$ 47	7,431	\$ 6,322	\$ 317	9,074	\$ 34,925				\$364M	16,505	\$ 22,047
San Luis Obispo	\$ 187	31,926	\$ 5,867	\$ 271	46,034	\$ 5,897				\$459M	77,960	\$ 5,885
Monterey	\$ 2,632	314,311	\$ 8,373	\$ 1,043	55,095	\$ 18,925	\$ 9	4,995	\$ 1,863	\$3.7 B	374,401	\$ 9,839
Santa Barbara	\$ 469	65,775	\$ 7,135	\$ 547	39,963	\$ 13,698	\$ 10	2,199	\$ 4,701	\$1.0 B	107,937	\$ 9,515
San Benito	\$ 157	25,000	\$ 6,262	\$ 31	7,641	\$ 4,029				\$187M	32,641	\$ 5,739
TOTAL	\$ 3,492	444,443	\$ 7,857	\$ 2,209	157,807	\$ 14,000	\$ 20	7,194	\$ 2,730	\$5.7 Billion	609,444	\$ 9,387

Source: Appendix F: Cost Considerations Concerning Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Draft Agricultural Order No. R3-2010-0006)

Table 10 : Calculated Loss in Gross Production Value and Crop Acreage for Habitat Buffers

County	Avg. Crop Value per Acre	Total Operation Acres	Total Operation Crop Value	Acres and Land Loss to 30' Buffer			Acres and Value Loss to 50' Buffer		
				Acres	Gross Value	% of Total Operation Crop Value	Acres	Gross Value	% of Total Operation Crop Value
Monterey	\$ 9,839	24,160	\$ 237,710,240	56	\$ 549,508	0.23%	154	\$ 1,518,453	0.64%
San Luis Obispo	\$ 5,885	1,274	\$ 7,497,490	8	\$ 47,786	0.64%	14	\$ 82,390	1.1%
Santa Barbara	\$ 9,515	8,821	\$ 83,931,815	19	\$ 177,169	0.21%	65	\$ 621,330	0.74%
Total Operation Loss to Buffers		34,255	\$ 329,139,545	83	\$ 774,464	0.24%	234	\$ 2,222,172	0.68%

Source: Appendix F: Cost Considerations Concerning Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Draft Agricultural Order No. R3-2010-0006)

The RWQCB staff estimated that the total value of all irrigated crops is \$5.7 Billion with an average of \$9,387 per acre and a total of 609,444 irrigated acres in the region. Since different counties across the region have such ranging land values it is important to consider the locations of the majority of the Tier 3 operations that are expected to be impacted the most by this requirement of establishing a riparian buffer zone since the current draft only requires the Tier 3 operations to implement these. An extremely imperative observation of these tables is that they use the average gross value per acre of select crops instead of the net income per acre for select crops. Since costs of production are not included in the estimations this offsets the true value of the crops per acre. A policy with an annual price tag to growers of nearly \$71 million may seem relatively minimal in comparison the total value of all crops, however if the total value is much less than \$5.7 Billion, than this \$71 million annual cost may appear to be a much more substantial amount to growers across the Central Coast.

Significant cost evaluations of this aspect of the Ag Waiver are shown in Table 10, in which the gross production value and crop acreage for operations 1,000 acres or larger and adjacent to or including water bodies impaired for temperature, sediment or turbidity (State of California 2010a). The estimated total operation acres in this table seems very low compared to the amount of acres in the region, however because it only considers acreage for Tier 3 growers it may be reasonable that there is only a total of 34,255 acres in Monterey, SLO, and SB counties. It is mentioned that the staff selected operations over 1,000 acres using the GIS crop maps distributed by the Agriculture Commissioner's Office in each Central Coast County except San Benito and Ventura (State of California 2010b).

Table 14: Water Board Staff Annual Cost to Administer Program

Classification	Cost/Position	Positions	Total Cost
Environmental Scientist	\$123,360	2.5	\$308,400
Senior Environmental Scientist	\$142,080	0.2	\$28,416
Environmental Program Manager	\$136,620	0.4	\$65,449
Engineering Geologist	\$181,920	0.5	\$90,960
Senior Engineering Geologist	\$193,644	0.5	\$96,822
Supervisory Engineering Geologist	\$212,592	0.2	\$42,518
Water Resource Control Engineer	\$180,984	1	\$180,984
Supervisory Water Resource Control Engineer	\$212,592	0.2	\$42,518
Office Technician, Typing	\$70,500	0.2	\$14,100
Office Assistant, Typing	\$61,044	0.2	\$12,208
All Positions:			\$882,375

Source: Appendix F: Cost Considerations Concerning Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (Draft Agricultural Order No. R3-2010-0006)

The last table developed by the Central Coast RWQCB staff that I believe is considerable to the costs associated with the newly proposed updates to the Ag Waiver is table 14. This table displays the water board’s staff annual cost to administer the program. Many growers are upset with the amount that it costs just to administer the program and with an estimated price tag of \$822,375 it seems evident that this policy is overly complicated and expensive to the administer. California is facing a “\$25.4 billion deficit—far larger than state officials were projecting only days ago” (Parker 2010), and considering that this is one of 9 water boards in the state, this policy is an extremely hefty expense for taxpayers. Page 37 of Appendix F states that, “with the current staffing and budget, staff cannot review information from, nor inspect, most of the operations in the region” (State of California 2010b). From this table we can see that almost every staff position costs at least \$100,000 or more and although many of the positions are not full time, this is still a considerable amount of funds to allocate to the annual cost of this policy. With the high costs to administer this program and a large state budget deficit it is critical that legislators and the public determine if policies such as the Ag Waiver are worth it or how the goals of the policy can be reached with less costs.

Lastly, an essential consideration of this policy will be the significance of price elasticity on total revenue in the region. Growers may attempt to pass on increased costs of production to consumers in the form of higher prices. According to the USDA Economic Research Service “most agricultural commodities are characterized by relatively inelastic demand (<1)” (Parker 2010)

Figure 2 Own-Price Elasticity Demand

$$\text{Price elasticity of demand} = \frac{\text{Percent change in quantity demanded of good X}}{\text{Percent change in price of good X}}$$

Source: Economic Research Service, Commodity and Food Elasticities

Figure 2 shows the of the percentage change in quantity demanded of good X divided by the percentage change of good X in price. Based on the Water Board’s findings, the market for most agricultural commodities is characterized by relatively inelastic demand. Therefore if products in the region have a relatively inelastic demand than increased food prices due to increases in costs of production will create a smaller change in quantity demand than the percentage change in price, thus when prices rise, so too will total revenues for farmers and ranchers in the region (State of California 2010b). In general there are several factors that affect elasticity including the availability of substitute goods, necessity, and brand loyalty. For agricultural commodity elasticity the “primary determinant is likely necessity: the more necessary a good, the lower the elasticity, since consumers will attempt to buy it no matter the price” (Parker 2010). Growers affected by the Ag Waiver are concerned that the prices they receive for their commodities will not reflect the increased costs of production and if they attempt to raise their prices they may not be able to sell their entire crop.

Chapter 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The cost considerations presented in Appendix F are critical to the evaluation of the impacts that this policy will have all across the Central Coast. Determining the ultimate costs that will be incurred by growers to comply with the regulations set forth by this policy is important because when it comes down to it, the men and women of this region that produce and grow our food will be the ones who pay for it. Mike Broadhurst, owner of Dragon Springs Farm in Cambria, mentioned that for small farmers like him, generally those that fall into tier 1, the most onerous provision appears to be the well monitoring provision (Broadhurst 2011). The ability of growers and ranchers to pass on these costs is somewhat hard to evaluate because although the price elasticity of agricultural commodities in the region are relatively inelastic, it is impossible to determine the increases or decreases in total revenue until the produce or livestock are sold. The new Ag Waiver will be expensive to administer and to comply with. It will affect one of the most productive agricultural regions in the nation and has the possibility of removing productive farmland and thus decreasing food production for global consumption. Financial incentives through funding for conservation programs such as the Environmental Quality Incentive Program (EQIP) and the Agricultural Water Enhancement Program authorized by the 2008 Farm Bill (Department of Agriculture 2010b) may greatly assist growers to implement better management practices and comply with the Ag Waiver, however as Kenneth MacIntyre, owner of MacFarm in Morro Bay, stated in his letter of concern to the water board “a lot of it is

up in the air until we have a final waiver” (MacIntyre 2010), and ultimately we will not be able to really quantify the costs until after the Ag Waiver updates are in place.

Conclusion

The implementation of the updated Conditional Ag Waiver will be expensive. It will affect growers all across the region, however it is necessary to have some form of monitoring of nitrates in groundwater and guidelines of how to prevent future contamination of water resources. Growers will have to spend countless hours to monitor, update, and implement suitable management practices to control their discharges. The development of the tier system will make the tasks required by the Ag Waiver easier for small operations and growers that fall under Tier 1, but complying with the regulations will still be no easy task no matter which tier an operation falls under. Although the costs are heavy, excessive nitrate concentration in drinking waters is a significant public health issue. Water is the one of the most important resources to our society and therefore it is paramount that the Central Coast RWQCB has a policy to regulate the discharges of runoff that may contain pollutants. Thousands of people in agricultural areas of Central Coast Region rely on wells with high levels of contaminants. It is necessary that measures be implemented to control the flow of agriculture runoff in order to ensure a safe and clean drinking water supply for future generations.

Recommendations

After extensive review and consideration of the enormous amount of material associated with the Ag Order, it is my recommendation that the RWQCB, Central Coast Region, further consider adoption of the Agriculture Alternative Proposal set forth by the Water Quality Coalition and the Agriculture Community or continue to revise the Draft Waiver in order to make it more feasible. Implementing an updated regulatory system and guidelines should not be merely based on the size of the operation or location, but rather on the areas of significant contamination. These areas should be focused on immediately and the management practices evaluated to observe their effectiveness in controlling agricultural discharges. The agricultural community has always been committed to being stewards of the land and with the right guidance and proper amount of time, the public can be sure that water quality will improve in the years to come.

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Appendix

AG Waiver Questionnaire

- 1) How many years have you been directly involved in agriculture on the Central Coast?

- 2) What are the main crops or livestock that you grow or raise?

- 3) How does the Central Coast Regional Water Quality Control Board's new Agricultural Regulatory Program financially affect you?

- 4) How feasible is it for you to adopt more sustainable practices to comply with the new regulations of the Agricultural Regulatory Program?

- 5) Would incentives and subsidies from the state or local governments encourage you to alter your operations to decrease discharges?

- 6) What alterations would you prefer or make to the Ag Waiver in order to make sure the regulations are feasible? Any other suggestions or concerns please describe.

Cost Considerations of the Ag Waiver

*(Based on Appendix F: Cost Considerations of the the Regional Water Quality Control Board's Staff Recommendation for Renewing the Conditional Waiver for Agricultural Discharges)

Cost Evaluation Spreadsheet

Operator Burden	Grower Time	Consultants	Totals
Cost of Filing a Notice of Intent (NOI)	\$[REDACTED] -	\$[REDACTED] -	\$[REDACTED] -
Costs of Preparing a Nutrient Budget	\$[REDACTED] -	\$[REDACTED] -	\$[REDACTED] -
Costs of Consultants on Nutrient Budget (signing off on it)	\$[REDACTED] -	\$[REDACTED] -	\$[REDACTED] -
Mapping of Riparian Habitat Cost	\$[REDACTED] -		
Cost of Installing Riparian Buffer (150ft for Cool Season Vegetables)*	\$[REDACTED] -	\$[REDACTED] -	\$[REDACTED] -
Cost of Erosion Control Plan	\$[REDACTED] -	\$[REDACTED] -	\$[REDACTED] -
Predicted Yield and Quality Losses	\$[REDACTED] -	\$[REDACTED] -	\$[REDACTED] -
Groundwater/Surface Sampling Costs	\$[REDACTED] -	\$[REDACTED] -	\$[REDACTED] -
Loss of Productive Farm Ground Due to Buffer Zone	\$[REDACTED] -	\$[REDACTED] -	\$[REDACTED] -
Increased Costs of Weed and Insect/Disease Control	\$[REDACTED] -	\$[REDACTED] -	\$[REDACTED] -
Changes in Property Taxes Paid to County	\$[REDACTED] -	\$[REDACTED] -	\$[REDACTED] -
Liability to Fire with Buffer Zones	\$[REDACTED] -	\$[REDACTED] -	\$[REDACTED] -
Additional Comments or Considerations	\$[REDACTED] -	\$[REDACTED] -	\$[REDACTED] -

*Riparian Buffer for higher threat dischargers, presumably Tier 3 and 4 operations contain or are adjacent to a waterbody identified on the Clean Water Act Section 303(d) List of Impaired Waterbodies