PACIFIC INSTITUTE

Research for People and the Planet

January 3, 2011

Jeffrey S. Young, Chairman of the Board
Roger Briggs, Executive Officer
California Regional Water Quality Control Board
Central Coast Region
895 Aerovista Place, Suite 101
San Luis Obispo, CA 93401

RE: SUPPORT WITH ESSENTIAL AMENDMENTS for the Central Coast Regional Board's 2011 Draft Conditional Waiver for Irrigated Agricultural Discharges

Dear Board Members:

We offer these comments on the **Draft Agricultural Order – November 19, 2010** (Draft Order). The Pacific Institute is supportive of the direction that staff has taken but strongly urges several essential amendments to ensure adequate protection of water quality, drinking water standards, associated public trust resources, and the wider range of beneficial uses that the CCRWQCB is required to safeguard.

The Pacific Institute is a non-profit, non-partisan research institute that works to advance environmental protection, economic development, and social equity. We are based in Oakland, California and have been researching California water issues for over twenty years. Over the last three years, we have published three reports specifically on agricultural water uses and have worked closely with the agricultural community to better understand both the successes and failures of current agricultural water management practices. For more information see: California Farm Water Success Stories (Pacific Institute 2010), Sustaining California Agriculture in an Uncertain Future (Pacific Institute 2009), and More with Less: Agricultural Water Conservation and Efficiency in California – A Special Focus on the Delta (Pacific Institute 2008).

The high levels of toxic substances in the Central Coast's waterways and soil erosion from prime farmlands demonstrate the need for decisive action to safeguard both valuable agricultural lands and freshwater resources. We strongly support the requirement that all dischargers implement mandatory best management practices immediately to minimize toxicity and pesticide discharges, nutrient and salt discharges, erosion, and stormwater runoff. The continued pollution of surface and groundwater resources is not sustainable, and represents a transfer of costs from polluters to the general public and environment. Moreover, the public health risks are severe and in many cases, irreversible. The Draft

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Order recognizes the clear risks to human and environmental health associated with current practices and requires growers to discharge below the drinking water standard within six years.

We support the Draft Order to the extent that it is an improvement on the 2004 Conditional Waiver which lacked a focus on water quality requirements, and did not contain any compliance or verification monitoring provisions. However, we are very disappointed that despite overwhelming evidence of human health and drinking water concerns, the Draft Order is significantly weaker than the Draft Recommendations released by the Regional Board Staff on February 1, 2010. Below we offer several essential amendments to the current Draft Order.

(1). REVISE THE TIER STRUCTURE

We support the idea of creating a tiered structure to regulate growers with differing water quality impacts; however, we find that the Tiers as they have been created in the Draft Order will not offer the level of protection needed in particularly sensitive areas because of the acreage requirements rather than the level of risk to human and environmental health. As it is currently written, the Draft Order places all dischargers with less than 1,000 acres into Tier 1 or 2, with minimal regulation, even if they are in areas with high levels of nitrate contamination and grow crops with high nitrate-loading potential.

Moreover, it has been reported that over 98% of farms on the Central Coast fall under the 1,000 acres limit. In fact only 33 farms out of 3,000 farming operations on the Central Coast are over 1000 acres, and it is likely that some of those are for grazing operations and are not growing crops with high nitrate-loading potential. Hence, the current Tier structure may put growers with the capacity to increase groundwater nitrate contamination in the low-risk tiers that are subjected to a relatively low level of regulation that will not safeguard the public trust resources that the CCRWQCB is charged with protecting.

Thus, it is critical that local levels of nitrate contamination are included as criteria for setting Tiers to ensure that the level of regulation is clearly linked to environmental and public health risks, rather than arbitrarily based on agricultural acreage. Farms in high nitrate contamination areas must automatically be classified as Tier 3 dischargers.

(2) ENSURE THAT LEVELS OF NITRATE CONTAMINATION ARE MEASURED AND UPDATED REGULARLY

Current levels of nitrate contamination are not necessarily indicative of future levels of nitrate contamination. Our analysis of the groundwater data from the Central Valley (also submitted to the Central Valley Regional Water Quality Control Board) shows that nitrate levels are increasing rapidly in many areas, and the number of wells where nitrate levels exceed federal health standards is likely to double in the next ten years.

Looking at wells monitored by the U.S. Geologic Survey's Groundwater Ambient Monitoring and Assessment (GAMA) Program in Kern County, we carried out a regression analysis to estimate the number of wells currently under the maximum contaminant level (MCL) that can be expected to rise above the 45 mg/L threshold in the next ten years. Using a database including all nitrate measurements from 1980 to present in the GAMA database for Kern County, we selected wells that had ten or more samples recorded (678 wells), and fit a trend line of nitrate concentration versus time, using ordinary least squares regression. We then calculated the percent likelihood of exceeding the MCL in 2010, 2015, and 2020.

Table 1. Trend analysis of nitrate levels in Kern County wells

Groundwater Basin	Total number of Wells	Number of wells with greater than 75% likelihood of exceeding MCL in 2010	Number of wells with greater than 75% likelihood of exceeding MCL in 2015	Number of wells with greater than 75% likelihood of exceeding MCL in 2020
Antelope Valley (6-44)	29	0	0	0
Brite Valley (5-80)	4	0	0	0
Castac Lake Valley (5-29)	6	0	0	0
Cuddy Canyon Valley (5-82)	5	0	0	0
Cuddy Ranch Area (5-83)	4	0	0	0
Cuddy Valley (5-84)	6	0	0	0
Cummings Valley (5-27)	14	2	2	3
Fremont Valley (6-46)	11	0	0	0
Indian Wells Valley (6-54)	36	0	0	0
Kern River Valley (5-25)	55	4	7	8
Mil Potrero Area (5-85)	2	0	0	0
No Basin Found	67	1	2	2
San Joaquin Valley - Kern County (5-22.14)	417	24	37	50
Tehachapi Valley East (6-45)	3	0	0	0
Tehachapi Valley West (5-28)	18	2	2	2
Walker Basin Creek Valley (5-26)	1	0	0	0
TOTAL	**678**	**33**	**50**	**65**

Based on our analysis, we found 33 wells where the likelihood of exceeding the MCL is 75%. In 2015, this increases to 50 and in 2020 rises to 65 (See Table 1). This is almost a doubling of the number of wells with nitrate levels above the MCL by 2020, an increase from 5% to 10% of monitored wells. Based on current trends, we estimate that the number of wells exceeding the MCL in Kern County will double in the next ten years. Therefore, it is critical that any inclusion of groundwater contamination levels be updated regularly.

(3). ENSURE THAT GROUNDWATER AND SURFACE WATER MONITORING PROGRAMS CAPTURE SEASONAL VARIATIONS ENDEMIC TO MEDITERRANEAN CLIMATES

Mediterranean climates throughout the world are defined as those that experience two distinct seasons – hot, dry summers and cool, wet winters. This intra-annual variation in precipitation and temperature results in varied water supply and demand conditions throughout the year. At minimum, groundwater monitoring should be required both in the fall and the spring to determine the impacts of summer water withdrawals and winter rains on the system. Similarly, individual discharge monitoring should also take into account seasonality and be required to occur in late fall/early winter after the first major rains, which mobilizes high concentration of contaminants at the beginning of the wet season and should be captured in monitoring efforts.

The current Draft Order does not specify when measurements intended to inform monitoring efforts should be taken, this could create a body of data that has little to no value, wasting time and resources. The Draft Order should be amended to take into account the seasonality of the Central Coast's Mediterranean climate.

(4). STRENGTHEN COMPREHENSIVE COST CONSIDERATIONS

The draft "Cost Considerations" (Appendix F) appropriately include a crucial discussion of the environmental health costs of contaminated groundwater borne by the public at large and disadvantaged communities in particular. However, based on our ongoing research on the impacts of nitrate contamination in the neighboring San Joaquin Valley, we believe the analysis ignores several categories of costs and underestimates others.

For example, several options for impacted water systems to treat or lower nitrate concentrations (Section 5.2.2.2.1) are not considered. In addition to replacing a well or treating nitrates, nitrate-contaminated water systems may elect to install pipelines and other infrastructure after obtaining permission to connect to and secure water from a nearby water system. Our review of nitrate mitigation projects for community water systems funded by the California Department of Public Health shows that the costs of consolidation to address nitrate contamination may range from $200,000 to $1.5 million, depending on the number of users and other variables (Pacific Institute, *forthcoming*). In addition to being cost-prohibitive for many small community water systems, many options for addressing nitrate contamination in the short-term may not be sustainable in the long-run. Several systems have reported that they dug deeper wells to avoid nitrates only to then find groundwater with high arsenic levels and, as a result, incurred the additional costs of treatment for arsenic.

The costs of avoiding nitrate-contaminated water at the household level are also largely understated. It has been well documented that households impacted by groundwater contamination incur significant costs to avoid contaminated tap water. A series of studies using the "avoidance cost" method—that is, "assessing the costs of actions taken to avoid

or reduce damages from exposure to groundwater contaminants"—have demonstrated that household responses to contamination of domestic water supplies is far from inexpensive and that these expenditures must be taken into consideration in valuing the costs and benefits of groundwater protection.[1,2,3] To avoid nitrate-contaminated tap water, households must install costly reverse osmosis filters, order domestic water service to their home, or buy gallons of vended and bottled water for consumptive household uses such as cooking and drinking.

In the summer of 2010, Pacific Institute conducted a survey of 21 out of the 28 households connected to the community water system, Beverly Grand Mutual Water Company in Tulare County, which was in violation of the 45 mg/L MCL for nitrate concentration. Respondents were asked a series of questions about household socioeconomic and demographic information, perception of contamination, household water use, and expenditures on tap water, filters, and alternative sources of water (such as vended and bottled water). Nearly half of the households surveyed reported exclusively using vended and bottled water for drinking and cooking. These households spent an average of $5.37 per person per month on alternative sources of water, or $258 per year for a family of four, which is 35% greater than the estimate put forth by the staff (Pacific Institute, *forthcoming*).

While the draft Cost Considerations recognizes that the cost of contaminated drinking water is disproportionately borne by disadvantaged communities, the Board could do more to characterize the burden of unsafe water on impacted households. Our survey demonstrated that 75% of households in Beverly Grand spend more than 2.5% of their income on water-related expenditures, exceeding U.S. EPA's threshold for drinking water affordability[4], with 30% of households exceeding the threshold based on expenditures on vended and bottled water alone.

Finally, the analysis fails to recognize an important group of stakeholders affected by nitrate contamination of groundwater: private domestic well owners. According to the Groundwater Ambient Monitoring & Assessment Program, there are an estimated 600,000 private domestic wells in California and 10 percent of those tested have nitrate levels above the legal limit.[5] According to the USGS, using 2000 census data, there is a population of 243,780 in Central Coast counties who rely on domestic wells (See Table 3).[6] While the percentage of domestic wells contaminated per county and the extent to

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[1] Abdalla, Charles W. *Measuring Economic Losses from Ground Water Contamination: An Investigation of Household Avoidance Costs.* Water Resources Bulletin Vol. 26 No. 3, 451-463.
[2] Collins, Alan R. and Scott Steinback (1993). *Rural Household Response to Water Contamination in West Virgina.* Water Resources Bulletin Vol. 29 No. 2, 199-209.
[3] Laughland, Andrew S., Musser, Lynn M., Musser, Wesley N., and James S. Shortle (1993). *The Opportunity Cost of Time and Averting Expenditures for Safe Drinking Water.* Water Resources Bulletin Vol. 29 No. 2, 291-299.
[4] U.S. EPA (2003) *Recommendations of the National Drinking Water Advisory Council to U.S. EPA on its National Small Systems Affordability Criteria.* Accessed online December 20, 2010 from http://water.epa.gov/infrastructure/drinkingwater/pws.
[5] State Water Resources Board, Groundwater Ambient Monitoring & Assessment Program (2010). *Summary of Detections Above a Drinking Water Standard, GAMA Domestic Well Project*. Accessed on September 20, 2010 from http://www.swrcb.ca.gov/gama/domestic_well.shtml.
[6] USGS (2000) Estimated Use of Water in the United States County-Level Data for 2000. Online at http://water.usgs.gov/watuse/data/2000/index.html

which contamination originates from agricultural runoff is unknown, in part due to a lack of systematic monitoring of run-off and groundwater quality, most researchers agree that agriculture is a leading source of nitrate contamination of ground water in California[7][8].

Table 3. Population Served by Domestic Wells in Central Coast Counties

County	Total Population	Population served by domestic wells	As percentage of total population
Monterey	401,760	69,790	17%
San Benito	53,230	6,310	12%
San Luis Obispo	246,680	53,090	22%
Santa Barbara	399,350	46,910	12%
Santa Clara	1,682,590	16,450	1%
Santa Cruz	255,600	35,000	14%
Ventura	753,200	16,230	2%
TOTAL	**3,792,410**	**243,780**	**6%**

The CCRWQCB should revise the analytical approach based on previous studies by government agencies and leading economists and scientists to better answer the following question: *What are the costs to water system operators, well owners, and drinking water consumers due to agricultural activities regulated under Agricultural Regulatory Program alternatives?* This approach to assessing public costs of different regulatory options for addressing nitrate contamination was undertaken by the U.S. EPA in 2002, for concentrated animal feeding operations. For each regulatory option being considered the EPA reported expected reductions in nitrates with nitrate-contaminated wells and estimated the economic benefit to these households[9].

(4). ENHANCE ENFORCEMENT

A second document should accompany the Draft Order, realistically detailing staff's plan to identify irrigated properties under production and how the owners or growers will be brought into compliance. The Enforcement Plan should detail how many farms will be inspected or audited each year, how quickly monitoring results will be made available to the public, how staff will handle the sheer volume of paperwork created from operations that are rotated annually, etc. The Enforcement Plan should have transparent, measurable goals. Finally, entities that guide and/or represent the Conditional Waiver should be inclusive and transparent. For example, it is critical that the Agricultural Monitoring Committee include non-industry stakeholders, particularly scientists, in order to preserve the integrity of the Draft Order and ensure its success.

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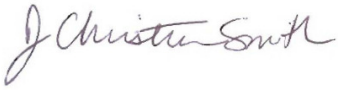
[7] United States Geological Survey (1995) *Water Quality in the San Joaquin-Tulare Basins, California, 1992-95.* Accessed on September 20, 2010 from http://pubs.usgs.gov/circ/circ1159/sec6.html.
[8] Harter, Thomas (2009) Agricultural Impacts on Groundwater Nitrate. Southwest Hydrology, volume 8, number 4.
[9] U.S. EPA (2002) *The Benefits of Reducing Nitrate Contamination in Private Domestic Wells Under CAFO Regulatory Options.* Accessed online September 20, 2010 from http://www.epa.gov/npdes/pubs/cafo_benefit_nitrate.pdf.

Sincerely,



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