ENVIRONMENTAL WORKING GROUP

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Mary D. Nichols, Chairman
California Air Resources Board Members & Staff
California Air Resources Board
1001 I Street
PO Box 2815
Sacramento, CA 95812

Re: The role of agriculture must grow;
Comments on the Climate Change Proposed Scoping Plan.

Dear Ms. Nichols, Members of the Board, and ARB Staff,

Environmental Working Group is a research and advocacy nonprofit with considerable expertise in U.S. agriculture. We are perhaps best known in agriculture policy circles for our Farm Subsidy Database (farm.ewg.org/sites/farmbill2007/), which lists all the nation's farm subsidy recipients and their share of the $165 billion taxpayers have spent on the programs since 1995. Our recent agriculture-related reports have focused on issues like the impact adverse weather may have on a food supply already stretched thin by the federal ethanol production mandate, and the impact America's ethanol gold rush has had on environmental disasters like the Gulf of Mexico 'Dead Zone.'

With this letter, we direct the Board's attention to deficiencies in the Climate Change Proposed Scoping Plan with respect to agriculture. At present, the Plan undervalues both the current role of agriculture in global warming emissions, and the capacity of the sector to reduce these emissions. While the Plan ascribes just 6% of the state's greenhouse gas emissions to the agricultural sector, this value does not take into account several significant sources of energy consumed by agriculture, including the energy used to irrigate California farmland, and the energy used to produce synthetic fertilizers and pesticides. In addition, recent modeling efforts funded by the California Energy Commission's PIER program indicate that enteric fermentation may produce twice the level of greenhouse gas emissions estimated previously (Salas 2008), suggesting agriculture in California may contribute far more toward global warming than suspected in the past.

Similarly, the Plan undervalues the role that modifications to California agriculture can play in reducing the state's global warming emissions. The Plan lacks a variety of voluntary and mandatory measures that should be applied immediately to the agricultural sector to reduce greenhouse gas emissions before 2012. As it stands now, ARB neglects key opportunities regarding improved water, water pump, and fertilizer efficiency in California's fields. Significant data gaps must be filled to

improve understanding of California's complex agricultural systems, especially our state's growing organic agricultural movement, in order to foster further reductions in global warming gases. Instead, the Plan outlines limited research goals on nitrous oxide, just one of many subjects essential to meeting the larger objectives described in AB 32, and entirely ignores organic agricultural techniques. Finally, agricultural offsets may play an important role in an emerging cap and trade program – but only if these offsets are considered reliable and of high quality. As the economic sector most affected by our climate, agriculture will undoubtedly be hardest hit by climate change; therefore, agricultural measures designed to reduce emissions must be well-aligned with efforts to promote adaptive, sustainable farming practices.

We also wish to address a broader issue with preparation of this Plan and any subsequent policies: We must insist that the Board make every effort to provide transparency as it evaluates potential measures to reduce global warming emissions in California. Plan appendices provide limited information, and while staff report extensive conversations with stakeholders concerning a variety of agricultural measures in addition to those listed in the Plan, they provide no written records of these conversations, or their assessments of these measures. Without documented evaluations of the many measures under consideration, ARB staff deny themselves the valuable input of stakeholders statewide, who may be able to fill data gaps or direct research and development in key directions identified by these evaluations. Furthermore, transparency in decision-making is essential to the "open public process" specifically required by AB 32.

We submit to Air Resources Boardmembers and staff a series of specific recommendations for agricultural measures to be included in the Scoping Plan and implemented statewide:

- Amend the Plan to include many readily available voluntary or mandatory actions to reduce global warming emissions from agriculture before 2012.
- Develop clear, detailed tools and protocols necessary for use of high quality agricultural offsets within a cap and trade program.
- Advance research efforts to quantify the effects of numerous land, water, and nutrient management techniques on agricultural emissions of greenhouse gases.
- Establish an outreach program to educate farmers concerning anticipated changes to California's climate, and to guide them towards crops and farming techniques better aligned with existing and future resource constraints.
- Amend the Plan to include land use measures that encourage sustainable farming practices on prime farmland, and discourage conversion to housing developments.
- Encourage federal agricultural programs to prioritize measures to reduce greenhouse gas emissions.
- Provide prompt updates on the progress of agricultural measures implemented as part of AB 32, and ongoing assessments of measures under consideration, to ensure California meets the goals of the legislation.

Details regarding each of these points are provided below.

Amend the Plan to include many readily available voluntary or mandatory actions to reduce global warming emissions from agriculture before 2012. We urge staff to conduct a comprehensive evaluation of agriculture in California to identify readily available means to reduce global warming emissions from the sector before 2012. In addition to methane digesters, ARB must identify the large number of already established technological solutions and management practices that can be included as voluntary and mandatory measures in the near future. In particular, reductions in use of water, irrigation energy, and synthetic nitrogen fertilizer, as outlined in the first 2 points below, will produce immediate reductions in California's emissions of global warming gases. It is vital that we begin to set targets and create regulatory and policy incentives that reduce emissions at once to meet the goals of AB 32 and diminish the severity of global warming.

Examples of such measures include:

- **Increase water pump efficiency and improve water conservation:** 4% of California's electricity is used to pump irrigation water (along with 88 million gallons of diesel and 18 million therms of natural gas), and 90% of the electricity used by the agricultural sector is expended on irrigation (CEC 2005; Navigant Consulting 2006). Voluntary or mandatory measures to reduce water use and improve pump efficiency could lead to a significant decline in global warming emissions. A recent publication in the Proceedings of the National Academy of Science specifically cites the success of water-marketing efforts between southern California cities and California's Imperial Irrigation District in achieving water conservation in agriculture while providing incentives for more efficient water use in all sectors (Ward 2008). We recommend establishing targets for reduced water use and increased pump efficiency, and creating a policy framework that allows the agricultural sector to meet these targets.
- **Reduce use of synthetic nitrogen fertilizer:** Production of the ammonia used in fertilizer currently consumes up to 5% of the natural gas produced globally (Ritter 2008). A portion of the nitrogen fertilizer applied to soils in excess of plant requirements is naturally converted to the potent global warming gas nitrous oxide – and much of the rest leaches from soils to pollute nearby bodies of water. Educational efforts, incentives, fertilizer taxes, and regulations have been used successfully in other regions of the U.S. and many parts of the world to reduce application of excess synthetic nitrogen fertilizer to soils, thus reducing nitrous oxide emissions and nutrient pollution, and limiting the natural gas consumed by fertilizer production. The Board should establish a target of reduced use of synthetic nitrogen fertilizers and craft policies appropriate to California agriculture that prevent wasteful over-fertilization and promote state-of-the-art nutrient management and conservation systems.
- **Increase efficiency of farm equipment:** Existing ARB programs designed to reduce smog-forming air contaminants can be used as models for voluntary or mandatory measures to reduce global warming emissions. For example, the Carl Moyer program provides financial incentives to encourage purchase of cleaner-

than-required engines and equipment used in agriculture and other sectors. During the first 6 years of the program, the Sacramento Metropolitan Air Quality Management District used program funds to aid purchase of 1,059 cleaner engines, which reduce smog-forming nitrogen oxides (NOx) emissions by 3,169 tons and diesel particulate matter (PM) by 130 tons over the life of the projects (ARB 2006). Expansion of the mandate and funding of the Carl Moyer program to include energy efficiency is but one of many possible policies that could be used to reduce the energy used by farm equipment.

- **Promote "buy local" food programs:** California imports 40% of the food we consume, which translates to over 250,000 tons of greenhouse gases (NRDC 2007). Food programs that promote local and organic agriculture support our state's agricultural sector, and reduce global warming emissions related to transportation. Through institutional commitments, government agencies can take the lead in the effort to buy locally-grown and organic food products. Education and information can help consumers select lower carbon food options as well.
- **Promote development of renewable energy sources on farms:** Solar and wind power projects provide excellent means for individual farms to reduce power consumption. For example, heating water can account for up to 40% of the energy used on a dairy (Collar 2008). Solar water heating systems may be used to supply all or part of these hot water requirements. Wind turbines benefit farmers and rural communities, even when farmers don't own them. Currently, farmers and other landowners get an annual income of around $2000 for each large wind turbine installed on their land, and local governments receive tax dollars that fund schools and other public programs in rural areas (Harper 2008).
- **Reach out to the agricultural sector:** The Board must prioritize education and outreach to the agricultural community. Farmers and dairymen are concerned about global warming, and must understand the role their businesses play in greenhouse gas emissions. Necessary outreach will include information on management techniques that reduce global warming emissions while providing co-benefits to farms and dairies, and on the incentive-based agricultural policies that grow out of the AB 32 implementation process. The Board must involve agricultural stakeholders in crafting pollution-reducing measures appropriate to California.

If ARB does not endorse these policies or others under consideration as means to reduce global warming emissions, staff must supply written documentation explaining why such measures have been rejected. Such records are a necessary component of an "open public process," allowing Californians to track the progress of the Board in its mission to reduce global warming emissions, and providing an opportunity for stakeholders to provide richer feedback to staff concerning scientific and regulatory issues.

Develop clear, detailed tools and protocols necessary for use of high quality agricultural offsets within a cap and trade program. If agricultural offsets are to be used in a cap and trade system, ARB staff must develop appropriate tools and protocols to define these offsets immediately. Tools and protocols must ensure such

agricultural offsets are scientifically valid, technologically feasible, verifiable, and represent new or additional measures that reduce emissions from the agricultural sector. In addition, authorized offsets must produce co-benefits associated with improved air and water quality and sustainable agricultural practices. We ask the Board to learn from existing carbon trading systems and make every effort to avoid ambiguity during rule-making, as major changes to such protocols result in regulatory burden, as well as instability in the carbon market.

Advance research efforts to quantify the effects of numerous land, water, and nutrient management techniques on agricultural emissions of greenhouse gases. We support the Board's current research program concerning nitrous oxide emissions in agriculture, but are convinced we must accelerate agricultural research to fully characterize global warming emissions from numerous crops and management regimes, including organic agricultural production systems and a variety of land, water, and nutrient management techniques. Such research would foster further voluntary and mandatory measures to reduce greenhouse gas emissions in the agricultural sector. Research should focus on those management techniques aligned with significant co-benefits supporting sustainable and organic agriculture and healthy communities.

Examples of data gaps in agricultural research include:

- **Organic agriculture:** Decreased use of pesticides and synthetic fertilizers can reduce the significant energy inputs required to produce these chemicals, while simultaneously reducing harmful chemical exposures to farm workers. Preliminary research also indicates organic farms sequester more carbon within the soil, and may release similar amounts of nitrous oxide (Burger 2005). We recommend immediate implementation of a targeted research program to quantify the overall global warming footprint of organic versus conventional farm practices.
- **Irrigation:** Different methods of irrigation can have a dramatic effect on soil nitrous oxide emissions, and on agricultural water use and associated energy use. Agricultural research is needed to identify irrigation methods associated with lower greenhouse gas emissions and significant co-benefits.
- **Composting of dairy waste:** Composting may be a less expensive dairy waste management alternative to methane digesters, and may produce similar emissions reductions. Research to assess the global warming emissions of manure composting facilities is needed, as are assessments of economic and regulatory issues concerning these facilities.
- **Farmscaping:** Agroecological management techniques including use of hedgerows and restoration of riparian corridors may increase soil carbon storage, and provide additional co-benefits with respect to enhanced pest management and reduced soil erosion. Research similar to that conducted to quantify carbon storage in California's forests could characterize the contribution of these techniques to global warming emissions reductions.
- **Cover crops:** Incorporation of organic material from cover crops into soil results in increased soil carbon storage, and provides numerous co-benefits

including improved soil structure and nutrient status. Research to assess the utility of cover crops in reducing global warming emissions is needed.

- **Urban agriculture:** Community gardens in urban areas can sequester carbon in the soil, increase food security, and reduce the amount of fuel used to transport fresh produce to urban areas. Decreasing the size of inner city areas known as "food deserts," areas in which the only food available is expensive, highly processed and packaged, or low quality, would benefit minority, immigrant, and low-income communities. Environmental justice co-benefits include improved nutrition and health of the communities served, and creation of welcoming public spaces for local residents to enjoy. Model programs include Oakland's Food Policy and Plan (Oakland City Council Resolution No. 79680).
- **Pasture-based dairies:** Smaller dairies that allow cattle to graze in pastures may produce fewer net greenhouse gas emissions per gallon of milk than large-scale confined dairies, even those dairies with methane digesters. Detailed calculations are needed to assess the relative global warming impact of pasture-based dairies versus confined dairies.
- **Improved animal feed:** The quality of cattle feed influences the level of methane emissions produced through enteric fermentation. Generally, lower feed quality and higher feed intake lead to higher methane emissions (Takle 2008). Further investigation may reveal feed characteristics that would significantly reduce the enteric emissions of California's dairies.

Establish an outreach program to educate farmers concerning anticipated changes to California's climate, and to guide them towards crops and farming techniques better aligned with existing and future resource constraints. Education and outreach can help California's farmers stay ahead of the curve regarding predicted changes to the state's climate as a result of global warming. For example, current climate models predict California will experience less snow and more rain as a result of global warming. This change will dramatically reduce the state's water supply during the dry season. Well-informed farmers that take preemptive steps by investing in water conservation measures, or evaluating crops and varieties that are drought- or salt-tolerant, can weather changes to the climate with greater success. Maintaining a vibrant agricultural community in California is essential to the state's economic health, and to the goals of emissions reduction.

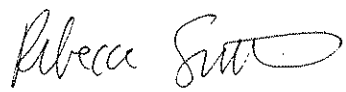
Amend the Plan to include land use measures that encourage sustainable farming practices on prime farmland, and discourage conversion to housing developments. Conversion of agricultural land to suburbs results in reduced opportunities for emissions reductions. Anti-sprawl measures like SB 375 are one of many steps the state can take to ensure that rich farmland is preserved for agricultural use and associated global warming emissions reductions. The Board should evaluate property tax measures and a variety of other policies that can be used to reward sustainable and organic farming practices that reduce greenhouse gas emissions, and reduce development pressure.

Encourage federal agricultural programs to prioritize measures to reduce greenhouse gas emissions. Federal conservation dollars are best directed toward efforts to reduce high-energy inputs in agriculture. The Board should submit a request to the Natural Resources Conservation Service's state technical committee regarding a focus on global warming emissions reductions and water conservation as a priority resource concern in the Environmental Quality Incentives Program (EQIP) and the Conservation Security Program (CSP). Furthermore, ARB should work with EQIP and CSP to harmonize their reporting procedures with protocol development so that farmers adopting more sustainable agricultural practices can participate in future agricultural offset programs. Cooperation between state and federal programs will ensure better results and lower greenhouse gas emissions.

Provide prompt updates on the progress of agricultural measures implemented as part of AB 32, and ongoing assessments of measures under consideration, to ensure California meets the goals of the legislation. We ask the Board to commit to producing a biennial update concerning the role of agriculture in California on global warming emissions, and similarly accelerating review of voluntary or mandatory measures currently included in the Plan or under investigation. A 5-year evaluation period for voluntary and regulatory programs is far too lengthy given our ambitious emissions reduction timeline. We understand that the Plan's current 5-year review cycle does not actively limit the measures the Board can take to reduce global warming emissions, but suggest that prompt monitoring and evaluation will lead to rapid progress towards achieving the goals of California's Global Warming Solutions Act, especially with respect to agriculture.

We are pleased to have the opportunity to provide public comments for the Board's consideration. We ask that the Board provide a clear and detailed account of the reasoning it uses to identify and evaluate measures to reduce global warming emissions in agriculture and all other sectors in California. Comprehensive communication of the decision-making process will allow stakeholders to provide more useful information to the Board, and will result in better policy. Thank you for your efforts to tackle this pressing environmental problem.

Sincerely,



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