

**STATE OF NEW MEXICO
ENVIRONMENTAL IMPROVEMENT BOARD**

**CITY OF ALBUQUERQUE AND COUNTY OF BERNALILLO
AIR QUALITY CONTROL BOARD**

IN THE MATTER OF PROPOSED 20.2.88 NMAC, NEW MOTOR VEHICLE EMISSION STANDARDS)	
)	EIB No. 07-9(R)
)	
IN THE MATTER OF 20.11.104 NMAC, EMISSION STANDARDS FOR NEW MOTOR VEHICLES)	AQCB 2007-3
)	
)	

NOTICE OF INTENT TO PRESENT TECHNICAL TESTIMONY

1000 Friends of New Mexico, American Lung Association of New Mexico, Conservation Voters New Mexico, Consumer Federation of America, Environment New Mexico, Environmental Defense, Land of Enchantment Clean Cities Coalition, Natural Resources Defense Council, New Energy Economy, New Mexico Chapter of the American College of Physicians, New Mexico Conference of Churches, New Mexico Interfaith Power and Light, New Mexico Medical Society, New Mexico Pediatric Society, New Mexico Physicians for Social Responsibility, New Mexico Public Interest Research Group, New Mexico Thoracic Society, New Voice of Business, Renewable Energy Partners of New Mexico, Sierra Club, Southwest Energy Alliance, Union of Concerned Scientists and Partnership for Earth Spirituality (hereinafter “Clean Air Advocacy Groups” or “CAAG”) hereby provide their requisite Notice of Intent to Present Technical Testimony before the New Mexico Environmental Improvement Board and the Albuquerque-Bernalillo County Air Quality Control Board regarding proposed new regulations establishing new motor vehicle emission standards. The rulemaking hearing is currently scheduled for November 14 and November 26-28, 2007.

I. STATEMENT OF INTEREST

1000 FRIENDS OF NEW MEXICO is a membership-based organization with 955 dues-paying members and communicating with over 2,000 concerned New Mexicans. 1000 Friends of New Mexico advocates for sustainable development and equitable growth that strengthens New Mexico's communities, cultures, economy and environment. 1000 Friends of New Mexico works with community leaders, neighborhoods and citizens to develop sensible alternatives to the unsustainable growth patterns that currently dominate our natural and built environments. Ensuring Cleaner Cars for New Mexico is part of a larger strategy to address New Mexico's stated commitments to sustainability and our collective responsibility to implement climate change solutions quickly. While the best solution would be to reinvent our communities in ways that substantially minimize the need for vehicular travel altogether, especially the Single-Occupant Vehicle, 1000 Friends recognizes that near-term and sensible approaches like a Clean Cars Program are an essential step to reduce greenhouse gases and other harmful pollutant emissions.

Gabriel Nims

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The AMERICAN LUNG ASSOCIATION OF NEW MEXICO's ("ALA NM") mission is to prevent lung disease and promote lung health. The American Lung Association of New Mexico and its 17,760 supporters throughout the state strongly support a safe, healthful environment for all. Environmental policies, such as the Clean Cars Program, must protect the public against acute and chronic adverse health effects. The American Lung Association of New Mexico is especially concerned about the effect of air pollution on the health of vulnerable populations, including people with lung diseases such as asthma, the elderly and children. The American Lung Association supports using clean cars and alternative fuels that produce the least harm to lung health to replace or supplement fossil fuels.

Bill Pfeifer

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CONSERVATION VOTERS NEW MEXICO ("CVNM") is a nonpartisan, nonprofit organization working to protect New Mexico's natural environment and our cherished way of life. Laws that protect our water, land and air are quietly under attack at all levels of government without regard for our children, our jobs or our future. CVNM works to defend both our jobs and our environment for generations to come. In concert with our PAC, Conservation Voters New Mexico Action Fund, we elevate the importance of conservation issues in the legislative process, empower people to participate in the political process and elect candidates that will fight to protect our water, land and air. CVNM advocates on behalf of sensible solutions to global warming, like the Clean Cars Program, which can help to reduce New Mexico's emissions.

Sandy Buffett
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The CONSUMER FEDERATION OF AMERICA ("CFA") is a non-profit association of approximately 300 consumer groups representing over 50 million Americans. CFA was established in 1968 to advance the consumer interest through research, advocacy and education. CFA is interested in the New Mexico Clean Cars Program because we believe that while this program is oriented toward greenhouse gas emissions from motor vehicles, there are also important and valuable consumer pocketbook benefits as well as overall citizen cost benefits in the form of externalities such as a stronger economy, enhanced national security and overall downward pressure on energy costs.

Mel Hall Crawford
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ENVIRONMENT NEW MEXICO is a nonprofit environmental advocacy organization representing over 5,000 members state-wide. Environment New Mexico works to gain protection for New Mexico's air, water and open spaces, working at the local, state and national levels. Environment New Mexico and its members are critically concerned about global warming. The Clean Cars Program would significantly decrease the state's emissions of global warming, and help New Mexico to be a leader in developing solutions to global warming.

Lauren Ketcham
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ENVIRONMENTAL DEFENSE is a leading national nonprofit organization representing more than 500,000 members across the United States. Since 1967, Environmental Defense has linked science, economics and law to create innovative, equitable and cost-effective solutions to society's most urgent environmental problems. Environmental Defense has actively supported state-level adoption of the Clean Cars Program, and have worked in states from California to Connecticut to build support for and ensure passage of this critical initiative. The Clean Cars Program offers the triple benefit of environmental, economic and public health benefits. It will be a cornerstone of efforts in New Mexico and across the country to reduce greenhouse gas emissions and combat global warming.

Derek Walker
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The LAND OF ENCHANTMENT CLEAN CITIES COALITION (“LOECCC”) strives to advance the nation's energy security by supporting local decisions to adopt practices that contribute to the reduction of petroleum consumption. Clean Cities has a network of approximately 90 volunteer coalitions around the country, which develop public/private partnerships to promote alternative fuels and advanced vehicles, fuel blends, fuel economy, hybrid vehicles and idle reduction. Clean Cities is part of the Office of Energy Efficiency and Renewable Energy's Vehicle Technologies Program under the Department of Energy. The Land of Enchantment Clean Cities Coalition was designated the 11th Clean City Community in 1994 by the Department of Energy. It serves the entire state of New Mexico in its outreach efforts and has roughly 70 members throughout the state. The NM Clean Car initiative is directly in line with the Coalition's goals of reducing petroleum use while helping to reduce transportation emissions. More efficient vehicles that use less fuel and in turn reduce tailpipe emissions are key goals of the National Clean Cities Coalition and the Land of Enchantment Clean Cities Coalition.

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The NATURAL RESOURCES DEFENSE COUNCIL ("NRDC") is a nonprofit organization of scientists, lawyers, and environmental specialists with over 12,000 members and online activists in New Mexico dedicated to protecting public health and the environment. NRDC has a long-standing interest in minimizing the societal costs of the energy and transportation services that a healthy economy requires. In this proceeding, NRDC is representing our New Mexico members' interest in reducing the environmental impact of greenhouse gas emissions by motor vehicles in New Mexico, which are significant and growing.

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NEW ENERGY ECONOMY ("NEE") is dedicated to creating opportunities for New Mexico by developing solutions to global warming. With abundant renewable energy resources and innovative building technologies, New Mexico has an extraordinary opportunity to benefit by creating a new direction for energy in America. New Mexico can also help our country become energy independent by becoming a leading exporter of clean renewable energy and new energy technologies.

John Fogarty, MD
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The NEW MEXICO CHAPTER OF THE AMERICAN COLLEGE OF PHYSICIANS ("ACP") is the nation's largest medical specialty society. Its mission is to enhance the quality and effectiveness of health care by fostering excellence and professionalism in the practice of medicine. Nationally, ACP membership includes about 124,000 members, including medical students. Members are physicians in general internal medicine and related subspecialties, including cardiology, gastroenterology, nephrology, endocrinology, hematology,

rheumatology, neurology, pulmonary disease, oncology, infectious diseases, allergy and immunology and geriatrics.

Donna Upson, MD
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The NEW MEXICO CONFERENCE OF CHURCHES (“NMCC”), is an organization of Christian Churches in New Mexico, representing over 500,000 New Mexicans state-wide. NMMC is involved in climate change issues because of the ethical principle that we must preserve the planet as a nurturing place for all life. NMMC sees this rule making process as one of the practical means of preventing the ruinous effects of climate change.

Robb Thompson
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NEW MEXICO INTERFAITH POWER AND LIGHT (“NMIPL”) is an alliance of faith communities committed to creation stewardship. NMIPL assists its thirty-one member congregations throughout the State of New Mexico in adopting energy-efficient policies and practices and educating people of faith in the moral implications of global warming.

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The NEW MEXICO MEDICAL SOCIETY (“NMMS”) is a nonprofit professional association of 2,800 medical doctors and osteopaths in New Mexico. Believing that clean air is imperative, NMMS works to improve health care for New Mexico’s citizens.

G. Randy Marshall
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The NEW MEXICO PEDIATRIC SOCIETY is a professional organization of pediatricians, with about 350 members from around the state, who are invested in improving health care for children in New Mexico. The New Mexico Pediatric Society also provides continuing education programs and engages in legislative advocacy. As a health promotion organization, the New Mexico Pediatric Society is committed to supporting work that will improve the health of our future leaders, our children.

Erin Damour
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NEW MEXICO PHYSICIANS FOR SOCIAL RESPONSIBILITY (“PSR”), awarded the Nobel Peace Prize in 1985 for its effort to promote nuclear security, is the medical and public health voice working to prevent the use or spread of nuclear weapons and to slow, stop, and reverse global warming and toxic degradation of the environment. Representing 30,000 healthcare professionals and doctors in the U.S., including New Mexico, Physicians for Social Responsibility draws on its expertise in medicine and public health to advocate for mandatory controls on emissions of the heat-trapping gases that drive global warming and fight for laws and regulations that protect human health from the dangers of global warming by reversing the current trends of increasing emissions and rising temperatures.

Robert Bernstein, MD
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The NEW MEXICO PUBLIC INTEREST RESEARCH GROUP (“NMPIRG”) is a state-wide public interest advocacy group. NMPIRG stands up to special interests advocating on behalf of consumers, conducting research, publishing reports and advocating for policies. NMPIRG supports the Clean Cars Program because it provides clear economic benefits to New Mexico’s drivers and helps to protect public health.

Joe Rupp
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The NEW MEXICO THORACIC SOCIETY (“NMTS”) is a non-profit, international, professional and scientific society for respiratory, critical care and sleep medicine. NMTS is committed to the prevention and treatment of respiratory disease through research, education, patient care and advocacy. The long-range goal of NMTS is to decrease morbidity and mortality from respiratory, critical care and sleep disorders and life threatening acute illnesses in people of all ages. NMTS members participate in activities whose aim is to prevent lung disease, promote lung health and enhance patient care worldwide. The NMTS is particularly concerned with the pulmonary effects of air pollution, especially exacerbations of asthma and chronic obstructive pulmonary disease (COPD) and lung development in children.

Donna Upson, MD
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NEW VOICE OF BUSINESS’s (“NVOB”) mission is to awaken, inspire, and mobilize the power and creativity of business and business people to play a new and positive leadership role in addressing the core challenges and opportunities of our times. Global warming is without question a core challenge to us all. As business people, NVOB believes it also offers new opportunity for economic development by eliminating the emissions that contribute significantly to our atmospheric imbalance. As such, NVOB strongly supports the Clean Car Initiative in New Mexico as one very important step toward producing a cleaner, more vibrant economy and a healthier place to live.

Bob Mang
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RENEWABLE ENERGY PARTNERS OF NEW MEXICO’s (“REP”) mission is to provide alternatives to non-petroleum fuels for transportation purposes and to promote the use of all forms of renewable energy. REP operates two biofuels stations in Santa Fe. One station offers E85 ethanol, the other offers E10, E85 and B20. REP is interested in Clean Cars because REP's mission is to promote the use of renewable fuels for transportation purposes.

Charles Bensinger
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The SIERRA CLUB's members and supporters are more than 1.3 million of your friends and neighbors. Inspired by nature, the Sierra Club's work together to protect our communities and the planet. The Club is America's oldest, largest and most influential grassroots environmental organization. Historically focused on wilderness issues, the Sierra Club has recently chosen to work on global warming issues, including all forms of energy use and transportation. Our more than 7,000 members in New Mexico are focused on a clean and carbon-neutral future for New Mexico, with clean renewable energy, clean cars and good public transportation.

Carol Oldham
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The SOUTHWEST ENERGY ALLIANCE ("SWEA"), with 20 member groups, is dedicated to researching, informing and advocating for the citizens of the southwest in all energy matters. The Alliance encourages and supports the responsible use of energy, and is committed to exploring and supporting the implementation of clean and renewable energy solutions. SWEA supports the Clean Cars initiative as advocates for conservation, lower operating costs for consumers, reduced fuel costs through reduced demand and addressing carbon emission and global warming.

Steve Fischmann
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The UNION OF CONCERNED SCIENTISTS ("UCS") is the leading U.S. science-based nonprofit working for a healthy environment and a safer world. UCS combines independent scientific research and citizen action to develop innovative, practical solutions to global warming and air pollution, and to secure responsible changes in government policy. The

UCS Clean Vehicles Program works to ensure that consumers receive the clean vehicles they want and deserve. Because transportation-related emissions contribute a large share of the nation's global warming pollution, automakers can make a significant contribution to slowing global warming by using currently existing technology to reduce emissions from their vehicles.

Erin Rogers
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The PARTNERSHIP FOR EARTH SPIRITUALITY is concerned about the care of sacred creation and works on education related to water, climate change and sustainability related to ethics and faith. Action and advocacy are also elements of engagement. The Partnership works in collaboration with diverse groups on issues such as clean water and clean air.

Sister Joan Brown
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II. DIRECT TESTIMONY

The Clean Air Advocacy Groups intend to call the following persons to present direct technical testimony: (A) Gerald L. Geernaert, Ph.D; (B) Stephen L. Pilon, M.D.; (C) Eric Skelton and (D) Lauren N. Ketcham. Total direct testimony, not including transition time between witnesses or board questions, is anticipated to take 5 hours.

A. Gerald L. Geernaert, Ph.D
19 Quedo Road
Santa Fe, New Mexico 87508

In May 2002, Dr. Gerald “Gary” Geernaert began his current position as director of the Institute of Geophysics and Planetary Physics (IGPP), at Los Alamos National Laboratory (LANL). In this position, his responsibilities include maintaining and strengthening the relationship between LANL and universities in the basic natural sciences (climate change, geoscience, space physics and astrophysics) and to help develop programmatic initiatives that

assure the Laboratory's excellence in the long term. In addition, he chairs the technical steering committees for Memorandums of Agreement between LANL and University of California San Diego, New Mexico State University, Florida State University and the National Center for Atmospheric Research. He is also the program manager for LANL's climate change activities that are based on support from LANL, the Department of Energy and other agencies. The climate portfolio includes climate prediction as well as interfacing with energy, water, societal and economic resilience on regional scales worldwide. Dr. Geernaert also participates in strategic planning involving biosecurity, energy security and water security.

Between 1994 and 2002, Dr. Geernaert was Director of the Department of Atmospheric Environment, at the National Environmental Research Institute, located near Copenhagen, Denmark. Responsibilities in this assignment included managing the technical component of the air quality monitoring and forecasting network for Denmark and Greenland; supporting air quality and climate policy research in Denmark, the European Union and the developing world; promoting joint ventures with industry and managing research in the basic and applied sciences and engineering. Primary clients included Danish and European Union research agencies and the World Bank. His department included a staff of approximately 90 scientists, engineers and Ph.D students.

Dr. Geernaert was the founder and subsequent president of the Danish Atmospheric Research Society that began in 1998. During his tenure as department head, he also served as an energy and environment policy advisor to the Nordic Council of Ministers.

From 1990 through 1994, Dr. Geernaert was program manager and science officer at the Office of Naval Research in Arlington, Virginia. His program supported research in air-sea interactions, boundary layers, geophysical fluid dynamics, satellite based remote sensing and atmospheric chemistry.

From 1985 through 1990, Dr. Geernaert was a staff scientist in the Navy Center for Space Technology and he had an additional responsibility as the space technology directorate's representative to the Naval Research Laboratory Office of Strategic Planning from 1988 through 1990. He was lead author on the US Navy's strategic plan for satellite-based security programs.

Dr. Geernaert received his Ph.D in atmospheric sciences in 1983 from the University of Washington, and held a NRC postdoctoral appointment for the next two years at the Naval Postgraduate School in Monterey, California. In his career, he has published four books and

over 80 scientific articles spanning meteorology, oceanography, air pollution, economics, remote sensing and system analysis.

Dr. Geernaert's testimony provides the Boards with important information on the nature and risks of global warming. As the regulation at issue was crafted in response to a recognition of these risks, understanding the nature of the regulation and its effects depends on an understanding of the science that underlies global warming and what the effects of a warming planet would be for New Mexico.

Dr. Geernaert's direct testimony is expected to read as follows:

Members of the Boards, thank you for allowing me this time to address you concerning this important issue. My name is Dr. Gerald Geernaert, and I am the Director of the Institute of Geophysics and Planetary Physics, Los Alamos National Laboratory (LANL). In this capacity, I also serve as the LANL program manager for climate sciences. In previous appointments, I served as the Director of the Atmospheric Environment Department, Environmental Institute of Denmark between 1994 and 2002. I served as the Program Manager of Applied Atmospheric Sciences, U.S. Office of Naval Research in Washington D.C., between 1989 and 1994. **Please see Exhibit 1 (Dr. Gerald Geernaert Resume).**

Background to climate science and prediction: The Earth's climate is a dynamic system, and is always undergoing change. **Please refer to Slide #1 of Exhibit 2 (Dr. Geernaert Testimony Power Point Slides 1-8).** Ice Ages have dominated most of Earth's history during the past millions of years, and shorter periods (on geological scales) between the Ice Ages are associated with warmer periods such as what we have experienced during the past 10,000 years. The climate system is controlled in large part by the slow variations in the energy output of the sun, and more rapid changes in the climate are due to phenomena such as: disruption of ocean currents, changes in albedo due to cloudiness and atmospheric aerosols (e.g., due to volcanic eruptions) and changes in the concentrations of the atmospheric greenhouse gases (e.g., carbon dioxide, water vapor, nitrous oxide, ozone, etc.) that act to trap heat in the earth's atmosphere. The ability of the atmosphere to behave with characteristics of a greenhouse has allowed life to evolve into the forms we observe today. Conversely, without a greenhouse, the earth's surface would have been dramatically colder than we experience today and life as we know it would not have been sustainable in its current form.

Please refer to Slide #2 of Exhibit 2 (Dr. Geernaert Testimony Power Point Slides 1-8). During the past half century, observations have revealed that the primary natural greenhouse gas, i.e., water vapor, has shown a small and noticeable increase, while carbon dioxide and other anthropogenic greenhouse gases have shown a steady upward rapid rise in concentration due to fossil fuel emissions. The rise in water vapor concentration is primarily a consequence of the warming oceans. This has resulted in a net increase in the greenhouse strength; thus, it is logical to assume that the increase in anthropogenic emissions gave a forewarning to eventual global warming. Numerous programs were initiated to monitor trends in global meteorological data bases, and analyses have produced an observed steady warming during the past century, most notably during the past few decades. However, because the climate has an internal natural variation, it was important to determine if the observed warming could justifiably be attributed to the increasing anthropogenic emissions or if the observed warming was simply an artifact of natural variability that coincidentally correlated with increasing concentrations of atmospheric greenhouse gases. Models were assembled as early as the 1960's to address this question as well as make future predictions, and the sophistication of models has dramatically increased over the intervening years. The critical question to ask of the scientific community and policymakers is: Are the models now of sufficient quality for society and policy makers to believe in their predictions? If the models were able to reproduce present day trends, using initial conditions derived from data up to a century ago, then it would make sense to trust the predictions of the future based on current initial conditions. On the other hand, if the models cannot reproduce the trends we observe today using historical initial conditions, then we should be wary of their predictive capability. I will address this question shortly, but first we need to take a closer look at the global warming trends based on the observational data base that we have collected during the past decades and centuries.

Is the climate really warming? – a closer look at the data During the past few centuries, the scientific community has been monitoring climatic conditions in many regions of the globe, and more recently, satellites have been able to provide high resolution global coverage of the more critical proxies affecting the climate, e.g., solar energy output; concentration of greenhouse gases; concentration and type of aerosols, albedo due to cloudiness, sea ice, land cover, etc., atmospheric temperature at different altitudes and ocean temperatures. **Please refer to Slide #3 of Exhibit 2 (Dr. Geernaert Testimony Power Point Slides 1-8).** Analysis of data collected by

surface and satellite observations has proceeded with great care, resulting in the so-called hockey stick pattern of global temperature increase during the past few decades. Corrections of a small subset of the data during recent months has not made any significant change to the hockey stick pattern. Thus, with the added scrutiny of the observational data base over the past year, we are now even more confident than before that the past several decades has witnessed unparalleled global warming.

Some terrestrial regions of the planet have experienced greater warming than others and there is evidence that there are changes in precipitation patterns in some regions. This has been most notable in regions such as east Asia, where the recent trends of climate change have influenced the strength of the monsoonal circulations. Regions such as these are also predicted to become both significantly drier and significantly warmer than the global average, with impacts most noticeably to be observed in future water supplies. Ironically, the regions that are expected to have reduced water supplies may also experience enormous population growth rates in coming decades.

Please refer to Slide #4 of Exhibit 2 (Dr. Geernaert Testimony Power Point Slides 1-8). The more dramatic climatic warming has been observed in the Arctic, where glaciers have retreated, permafrost regions are rapidly thawing and sea ice thinning. During recent months, scientists have shown, based on both in-situ and satellite observations, that the Arctic ice pack coverage has declined dramatically; and all indications suggest that the late summer Arctic Ocean may be ice-free within 30-40 years. To complicate things more, the observed reduction in Arctic sea ice has been more rapid than all previous predictions have suggested; thus, the Arctic albedo is lower than has been predicted with models as recently as a year ago. This lowering of Arctic albedo would imply that the Earth may be warming at an even faster pace than was reported in the Intergovernmental Panel on Climate Change (IPCC) report published early in 2007. **Please refer to Exhibit 4 (Pew IPCC Summary).** If true, we have cause for alarm, since our current predictions for global warming may be under-predicted. Consequences of a more rapid Arctic sea ice retreat and ice sheet thinning (as on Greenland) have immediate implications for sea level; the rate of sea level rise has been much faster during the past two decades—of order two times the rate that was observed during the 20th century.

The globally averaged ocean surface temperature has also shown a steady increase, based on in-situ and satellite observations derived from the US Navy, the National Oceanic and

Atmospheric Administration (NOAA) and the National Aeronautics and Space Administration (NASA), as well as foreign data sources. Overall, given the data analysis of ocean surface and land surface temperatures, it is a generally accepted conclusion that: there has been a rapid warming during the past few decades with 11 of the 12 warmest years on record occurring during the most recent decade, and global warming continues to increase at a rate that shows no change in the near future.

How good are the climate models, and how believable are the predictions? Climate models were first assembled in the 1960's, on computers that could be viewed as archaic by today's standards. **Please refer to Slide #5 of Exhibit 2 (Dr. Geernaert Testimony Power Point Slides 1-8).** Even by the 1980's, climate models lacked an understanding of cloud and aerosol processes, yet they were making very dire predictions of the future based on a rapid warming. Predictions were based on very coarse grid simulations, e.g., where each grid represented at best 250 mile by 250 mile scales. Such coarse grid resolutions were inadequate to make useful predictions, insofar that mountains become smoothed in many cases; and ocean currents such as the Gulf Stream are poorly resolved. **Please refer to Slide #6 of Exhibit 2 (Dr. Geernaert Testimony Power Point Slides 1-8).** At the time, our understanding of the role of aerosols and clouds in the earth's climate was poorly understood. However, by the 1990's and increasingly evident through the present day, climate models were able to exploit the increasing computer power that was needed to make climate predictions useful to policy makers. During the intervening years, major programs supported by federal agencies were dedicated to clouds and air chemistry research, as it affects climate change. This was necessary to improve the quality of the predictions. Unfortunately, there became no doubt that policymakers and the general public would not trust climate predictions unless they could foretell information on temperature and precipitation on regions that were well within their own states and jurisdictions, e.g., where more advanced climate models could use grids that were of order 50 miles on each side. The computer power that was required to make such calculations did not emerge until this decade.

As mentioned earlier, our confidence in climate models and predictions relies on a couple of steps: (a) they must at the least reproduce temperature trends that closely corroborate patterns in meteorological observations collected by in-situ or satellite sensors and (b) they must reproduce patterns of dynamical phenomena (such as monsoonal circulations and other

convergence zones) that are important to the earth's climate. Even by 2005, the climate models had failed to overcome some of the major criticisms raised by key scientists. For example, as recently as a few years ago, climate models did not adequately reproduce the observed vertical temperature profile in the lower atmosphere, and the climate models failed to describe a major tropical convergence zone in the Pacific that influences tropical rainfall patterns. However, in 2006, the first of the major concern was overcome, based on a re-derivation of the temperature processing algorithms used by the NASA climate community. Using the improved algorithm, the climate models were able to closely corroborate observations of the vertical temperature profiles in the atmosphere. The second obstacle to overcome occurred in 2007—adequately resolving the dynamics of the tropical convergence zone in the Pacific Ocean. **Please refer to Slide #7 of Exhibit 2 (Dr. Geernaert Testimony Power Point Slides 1-8).** This obstacle was overcome not exclusively by any improved algorithm; it was overcome by increasing the resolution of the climate models to a much finer grid size using computer power that was not available only a half decade ago. Now that these two obstacles are overcome, the scientific community has reached unprecedented consensus on the ability of climate models to be used as a predictive tool, as long as the resolution is extended to much finer scales than has been used in the past. To convince policymakers, climate models have been used to test the importance of anthropogenic emissions as a cause of recent global warming and the models show unequivocally that the combination of natural variability with anthropogenic emissions is able to reproduce the trend of real world observations. **Please refer to Slide #8 of Exhibit 2 (Dr. Geernaert Testimony Power Point Slides 1-8).**

While the adequacy of climate models for policymaking may have achieved a major success, this still does not mean that climate models are perfect, on scales relevant to a city or county. Climate models still lack the capability to accurately predict the nature of extreme weather phenomena in the future, e.g., hurricanes, droughts and floods. This is because, for example, the climate models still lack detail on hydrological, ecological, and land use processes and efforts are currently underway to address these shortcomings. However, in spite of this, the climate models are able to make convincing but general statements on global trends in temperature and precipitation associated with a steady warming of the climate, on scales that describe continents as well as regions such as New Mexico and the American Southwest. **Please refer to Slides # 9 and 10 of Exhibit 3 (Dr. Geernaert Testimony Power Point Slides 9-16).**

It is expected that the future will involve much more frequent weather extremes: stronger hurricanes, more severe floods, more severe droughts, etc. **Please refer to Slides # 11, 12 and 13 of Exhibit 3 (Dr. Geernaert Testimony Power Point Slides 9-16).** On the regional scale, climate models suggest that the American Southwest will experience a warming that is much faster than the global average; and future climate precipitation will be noticeably less in the American Southwest. Superimposed on the future trends described anthropogenic greenhouse gas emissions, the cycles of natural variability will remain; for New Mexico, this suggests the re-emergence of a long term drought that will face this region as was observed early in the last century. Furthermore, the climate change predictions for New Mexico will result in a future mountain snowpack that will be much less than we experienced during recent decades; this will also result in a reduction of available water resources in the late summers of the future.

For the future, the models predict varying strengths of warming and/or precipitation change, and the degree of change is closely associated with the future projections of anthropogenic greenhouse gas emissions. Under the business-as-usual scenario, i.e., with no policy and/or new technologies to reduce the greenhouse gas emissions per capita, the temperature increase will be dramatic over the next century, up to 10 degrees Fahrenheit temperature increase in New Mexico alone. **Please refer to Slide #14 of Exhibit 3 (Dr. Geernaert Testimony Power Point Slides 9-16).** Such a change in temperature over the next century will result in major restructuring of water infrastructure, energy infrastructure, agricultural activity and economic opportunity; there will also be noticeable changes in demographics, such that migrations from water starved regions (in both the U.S. and developing world) will likely proceed towards regions where water supplies and economic opportunity become more readily available. Furthermore, the risks of climate induced conflict increase, if unwelcome and/or forced migrations conflict with geopolitical goals.

The Arctic will experience an even more dramatic increase in temperature when compared to the tropics and mid-latitudes and the melt rate of Greenland's glaciers is highly likely to show noticeable acceleration in the 22nd century. For the business as usual scenario, sea levels have been predicted to rise by around 12 inches during the next century; however, the latest satellite observations of Greenland melting when coupled with new advances in models of glacier sliding suggest that sea level in the next century is more likely to be substantially higher than 12 inches above the present-day sea level.

Path forward. Model simulations suggest that the rate of global warming is sensitive to the emission reduction policies that can be formalized, and the timing of the emission reductions. The problem is that emissions continue to increase each year both in the U.S. and the rest of the world. At the present time, the U.S. and the European Union constitute about half the global emissions; the rest is dominated by China and India. Given business as usual economic growth scenarios, China and India are likely to heavily dominate global greenhouse gas emissions within a decade, if they continue on their existing economic development strategy. Given this, and if the business as usual scenario holds over the next century, we should expect of order 8 to 10 degrees Fahrenheit warming globally, with much larger warming over land. On the other hand, if an emission reduction policy was designed and enacted such that global greenhouse gas emissions peaked by the year 2050 and declined thereafter, then we should expect of order 5 degrees Fahrenheit increase globally, over the next century. If the global greenhouse gas emissions peaked in the year 2020 and then decline thereafter, then we should expect a much smaller rate of climate change with approximately 3 degree Fahrenheit warming above pre-industrial levels.

Please refer to Slide #15 of Exhibit 3 (Dr. Geernaert Testimony Power Point Slides 9-16). Policies to reduce anthropogenic emissions must target the traffic, industrial and commercial sectors in order to decrease the rate of global temperature increase and avert the risks associated with energy, water, socioeconomics and migration. Until now, the U.S. and the European Union have been the dominant greenhouse gas emitters, and these two regions have been aggressive in developing emission reduction policies. For the EU, policies have been both nationally and Union-wide, with quick implementation by member states; for the U.S., the policies have relied on regional initiatives such as those associated with the Western Governors Initiative, individual states and cities. We must note, however, that within a decade, economic development in China and India are likely to lead to much higher emissions; and they are likely to pursue a climate emissions and technology policy to avert the potential for deleterious impacts in their own countries. Thus, any aggressive emission reduction policy within the U.S. or European Union must involve technology developments that can expand into Chinese and Indian markets, to be effective in curbing global warming. All countries and industries are well aware of this opportunity, thus there are major industrial initiatives to develop innovation strategies early enough to exploit global markets.

Impacts of climate change will have a substantial national security implication, and the degree of security concern increases with the rate of global warming; this in turn is dependent on the technical innovations that are developed to decrease greenhouse gas emissions from the various emitting sectors (traffic, energy, etc.). Los Alamos National Laboratory has conducted studies that show that the stability of the U.S. energy infrastructure is sensitive to future predictions of global warming and the associated water supplies. Furthermore, the stability of electrical grid choke points (associated with blackouts), the lifetime of existing infrastructure and the management of water reserves for regions of major population pressure, are highly sensitive to the predictions of temperature increase and changing precipitation patterns, both regionally and globally. On the macroscale, the diminishing availability of water supplies in regions that are near or have even exceeded their carrying capacity for available water reserves, e.g., the Nile Basin, are often associated with geopolitical pressures where even a small change in regional politics (such as a policy resulting in an unwelcome migration) produces ripple effects into the global energy supply and energy prices. The United States economy is significantly dependent on geopolitical stability, and future changes in climate are becoming a noticeable pressure that policymakers agree may have deleterious impacts on U.S. security. These particular issues are not often included in the IPCC and other reports that describe climate impacts; we believe that the vulnerability of US infrastructure cannot be separated from the globalized economic, energy and water infrastructures that influence our way of life.

Conclusions. Take home points:

1. Climate change is real, and the cause of the climate change can be attributed primarily to human activity, most notably anthropogenic greenhouse gas emissions.
2. Emission reduction policies will have dramatic effect in reducing the rate of global warming; and if started soon with an aggressive policy, there is a high probability that climate will stabilize during this century. If we delay even by a decade or two to enact serious carbon emission policies, we will observe a global warming throughout the 21st century and stabilization will not be achievable until at least the 22nd century.
3. The longer we wait to implement a carbon emission reduction policy, the more difficult it will be to address global warming in an affordable way.

4. The impacts of delaying an aggressive emission reduction policy have implications on national security, most notably in disruptions of regional water supplies, socioeconomics and demographics.
5. Emission reductions should be targeted at the more important sectors that are presently based on fossil fuels, e.g., transport and energy. The carbon footprint of these sectors is somewhat overlapped, therefore approaches to reduce emissions from one sector will propagate into the other.
6. **Please refer to Slide #16 of Exhibit 3 (Dr. Geernaert Testimony Power Point Slides 9-16).** Research and development of the required technologies must be aggressive, and industries must be willing to adopt the technologies in partnership.

Dr. Geernaert's direct testimony will take about 45 minutes and will require the use of a projector, screen and laptop for his Power Point presentation. Dr. Geernaert's direct testimony will utilize and reference the following materials. Due to length, these exhibits and those referenced hereafter are attached to this notice on compact disk and one printed copy of each has been submitted with this notice to both the Environmental Improvement Board Administrator and the Albuquerque-Bernalillo County Air Quality Control Board Administrator.

Exhibit 1: Dr. Gerald Geernaert Resume

Exhibit 2: Dr. Geernaert Testimony Power Point Slides 1-8

Exhibit 3: Dr. Geernaert Testimony Power Point Slides 9-16

Exhibit 4: Pew IPCC Summary (Pew Center on Global Climate Change, *Highlights from Climate Change 2007: The Physical Science Basis Summary for Policy Makers, Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, February 2007.)

B. Stephen L. Pilon, M.D.

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Dr. Pilon is a practicing emergency room physician for Presbyterian Health Systems. Dr. Pilon has also worked as an emergency room physician for Lovelace Health Systems in Albuquerque. He has also practiced as an emergency room physician in Harrisonburg, Virginia

and Gallup, New Mexico for the Gallup Indian Health Service Hospital and the Rehoboth McKinley Christian Hospital.

Dr. Pilon received his M.D. in 1992 and has studied at the University of California, John Hopkins University, California State University and the University of New Mexico.

Dr. Pilon served as a board member and chairman for the Albuquerque-Bernalillo County Air Quality Control Board from 2000 to 2006. He has advocated for transportation reform, including bicycle transportation improvements and Rapid Ride bus rapid transit in Albuquerque.

Dr. Pilon's testimony provides the Boards with important information on the connections between the transportation sector and public health. As the regulation at issue was crafted in response to a recognition of these risks, understanding the nature of the regulation and its effects depends on an understanding of the impacts that transportation pollution has on public health in New Mexico.

Dr. Pilon's direct testimony is expected to read as follows:

Members of the Boards, thank you for allowing me this time to address you concerning this important issue. My name is Dr. Stephen Pilon and I am an emergency physician who treats patients with respiratory illnesses that are caused or exacerbated by air pollution. In addition to practicing medicine I have worked on both air quality and transportation issues. I was twice appointed by Mayor Chavez to the Albuquerque-Bernalillo County Air Quality Control Board, which I chaired for 2 years. I am a former board member of Bike ABQ, the bicycle transportation advocacy group. And, I assisted NMPIRG in introducing Rapid Ride bus rapid transit to Albuquerque. **Please refer to Exhibit 5 (CV for Dr. Stephen Pilon).**

Air pollution from cars, trucks and SUVs presents a significant health risk to the people of New Mexico. Thanks to regulation and technical advances, today's vehicles produce significantly less pollution per mile than they did three decades ago; however air pollution remains significant because there are so many more cars, each one being driven vastly more miles. Mobile sources (including on-road sources, like cars and trucks, and off-road sources, like lawn mowers and construction equipment) are the largest single source of hazardous air pollutants nationwide. On-road mobile sources were responsible for 30 percent of the 4.6 million tons of air toxics released nationally in 1996. And, in New Mexico, on-road mobile sources emitted nearly 13,000 tons of toxic emissions into our air in 1999.

A number of studies document an association between traffic exposure or proximity to major roadways and a variety of diseases and health ailments. For example, close proximity to a major roadway leads to adverse respiratory health effects and increases the risk of breathlessness, phlegm and wheezing. Other studies indicate that children face an increased risk of lifetime asthma when they live within 80 yards of a major road. Several studies have reported significant associations between proximity to highly trafficked streets and the occurrence of childhood cancers and childhood leukemia. A 2007 study demonstrated an association between long-term exposure to traffic and a risk of acute myocardial infarction. A 2005 study concluded that exposure to particulate matter and ozone rapidly increases the diastolic blood pressure in healthy adults. As a result, subjects living close to a major road have an increased risk of mortality.

The smog-forming and toxic emissions produced by cars, trucks and SUVs include: benzene, 1,3-butadiene, formaldehyde, acetaldehyde, carbon monoxide, ground level ozone, lead, nitrogen oxides, particulate matter, sulfur dioxide, arsenic, biphenyl, cadmium, chlorine, chromium compounds, cobalt compounds, dioxins, mercury compounds and hydrocarbons. Mobile sources are among the largest contributors of four hazardous air pollutants—benzene, 1,3-butadiene, acetaldehyde and formaldehyde—in urban areas.

Benzene: The Environmental Protection Agency (EPA) has classified benzene as a known human carcinogen. It is well established that exposure to benzene causes leukemia and is also associated with anemia and damage to the immune system. In addition to leukemia, benzene can also cause a variety of other cancers, as well as central nervous system depression at high levels of exposure. Several occupational studies suggest that benzene may impair fertility in women. While the available human data on the developmental effects of benzene are inconclusive, adverse effects on the fetus, including low birth weight, delayed bone formation and bone marrow damage, have been observed in animal studies. In 1996, mobile sources in New Mexico emitted more than 2,000 tons of benzene, 63% of total benzene emissions in the state.

1-3, Butadiene: 1-3, Butadiene, a probable human carcinogen, is suspected of causing respiratory problems. Epidemiological studies of workers in the rubber industry suggest that exposure to 1,3-butadiene is associated with an increased incidence of leukemia and cardiovascular and blood diseases. In 1996, cars, trucks and non-road engines released almost

33,000 tons of 1,3-butadiene into the environment, or 63% of total 1,3-butadiene emissions. New Mexico emitted 400 tons per year of 1,3-butadiene, 44% of which came from mobile sources.

Formaldehyde: Formaldehyde is a probable human carcinogen with respiratory effects. In 1996, New Mexico emitted about 2,000 tons of formaldehyde from mobile sources, which accounted for 36% of the state's formaldehyde emissions.

Acetaldehyde: Acetaldehyde is a probable human carcinogen that has caused reproductive health defects in animal studies. Mobile sources in New Mexico emitted nearly 1,000 tons of acetaldehyde in 1996.

Nitrogen Oxides, Volatile Organic Compounds and Smog: Smog is formed as a result of a chemical reaction involving sunlight, nitrogen oxides (NO_x) and volatile organic compounds (VOCs). Children, people with lung diseases such as asthma, and people who work or exercise outside are particularly susceptible to adverse effects such as damage to lung tissue and reduction in lung function. In addition, nitrogen oxides contribute to fine particle pollution.

Exposure to smog has been linked to increased hospital emergency room visits, asthma attacks and perhaps the onset of asthma itself. For normal, healthy adults, exposure to high levels of ozone can cause chest pain and burning, coughing, throat irritation and congestion. For children, the elderly and those with chronic lung diseases, including asthma, exposure to high ozone levels can cause shortness of breath, wheezing and coughing, increased susceptibility to infection, asthma attacks, visits to the emergency room and even hospitalization. Short-term exposure to ozone has also been linked to aggravation of chronic obstructive pulmonary disease.

With rising temperatures from global warming, it is likely that hotter summers will increase ground-level ozone and smog levels and pose a greater threat to health. Already, Bernalillo County, Rio Rancho, Sunland Park, Dona Ana and San Juan County have elevated ozone levels which are approaching federal health standard limits.

Nationally, cars, trucks and SUVs are a major contributor to smog, responsible for nearly one-half of all NO_x and VOC emissions. In New Mexico in 2001, nearly 60,000 tons of VOCs were emitted from mobile sources (44 percent of total VOC emissions) and nearly 114,000 tons of NO_x were emitted from mobile sources (37 percent of total NO_x emissions).

Carbon Monoxide: Carbon monoxide (CO) is a colorless, odorless and poisonous gas produced by incomplete burning of carbon in fuels. When CO enters the bloodstream, it reduces the delivery of oxygen to the body's organs and tissues. Exposure to elevated CO levels can

cause impairment of visual perception, manual dexterity, learning ability and performance of complex tasks. Transportation sources account for 77 percent of the nation's CO emissions, with the largest contribution coming from highway motor vehicles.

Exposure to these toxics and others have profound health consequences for New Mexico's citizens. I'll talk about just two of these impacts: asthma and cancer.

Asthma: Asthma is reaching epidemic proportions in the United States. In 2006, over 90,000 people in New Mexico had asthma, or about 8.9 percent of the adult population.

In 2003, 8.8 percent of New Mexico children had asthma and approximately 27,500 children had asthma attacks. A leading cause of absences from school, asthma can reduce lung capacity and, if left untreated, can be fatal.

Children directly exposed to traffic pollution can develop severe respiratory problems. Researchers in California found that children living closer to a highway are more likely to have asthma, more likely to wheeze and more likely to use asthma medication.

Damage caused by air pollution in early life can have permanent consequences. In fact, evidence suggests that children exposed to high levels of ozone are more prone to develop asthma and have lungs with less flexibility and capacity than normal. Children who exercise frequently in smoggy areas are three times as likely to develop asthma as those in cleaner parts of the country. Studies of first year students at University of California-Berkeley and Yale showed that students who grew up in more polluted areas could not breathe as well as those from cleaner areas.

Cancer: The EPA has established National Ambient Air Quality Standards (NAAQS) to ensure that its regulations for major sources of hazardous air pollutants "provide an ample margin of safety to protect public health." For carcinogens, Congress defined this margin of safety as an added lifetime cancer risk "to the individual most exposed" of less than one-in-one million. EPA has used this one-in-one million cancer benchmark in reports evaluating the health risks posed by air toxics.

Despite this goal, in 1996, cancer rates per million people exceeded these exposure goals in 21 of New Mexico's counties, with Bernalillo County suffering the highest cancer rates – 190 cancer incidents per million people.

Residents of several New Mexico counties are at particular risk. Bernalillo County ranks in the worst 5 percent of the nation's counties for cancer risk from airborne toxics. Sandoval

County ranks in the worst 10 percent, and Santa Fe, Dona Ana and Grant counties are only slightly better, ranking in the worst 25 percent. **Please refer to Exhibit 6 (US EPA Toxics Assessment Map).**

In 1996, benzene exposure in New Mexico exceeded the health-protective threshold for cancer by a factor of 10, 66 percent of which came from mobile sources. EPA estimates that 0.13 micrograms per cubic meter is associated with the one in one million cancer risk. New Mexico's average human exposure concentration was 1.35 micrograms per cubic meter.

Lifetime exposure to 1,3-butadiene at concentrations of above 0.033 micrograms per cubic meter is associated with a potential cancer risk greater than one-in-one million. New Mexico ranked 6th in the nation for its concentrations of 1,3-butadiene, with mobile sources accounting for 87 percent of the added cancer risk.

New Mexicans' exposure to formaldehyde was 8 times more than allowed by health-based thresholds, with 58 percent of this added cancer risk from mobile sources. Acetaldehyde exposure in New Mexico was also outside of the health-based range, with 92 percent of the added cancer risk attributable to mobile sources.

The national average cancer risk from breathing hazardous air pollutants in the outdoor air was one-in-2,100 in 1996. This is nearly 500 times greater than the one-in-one-million health-protective threshold. Emissions from cars, trucks, and non-road engines accounted for 93% of the added cancer risk. **Please refer to Exhibit 7 (US PIRG Dangers of Diesel Pgs 13, 20, 22, 23, 25, 26, 28, 29, 31).**

Briefly, vehicles also present a health risk in another way—their contribution to global warming. Transportation is New Mexico's second largest source of carbon dioxide pollution—responsible for more than one-quarter of the state's emissions in 2000. Nationally, cars, trucks, vans and SUVs are the second largest source of greenhouse gas emissions.

Rising temperatures associated with global warming increase the risk of some infectious diseases, particularly those that appear only in warm areas. Deadly diseases often associated with hot weather, like the West Nile virus, cholera and Lyme disease, are spreading throughout North America because increased temperatures in these areas allow disease carriers like mosquitoes, ticks, and mice to thrive.

In addition to disease, heat-related death is also a concern. The death toll from extreme heat will increase significantly by mid-century as global warming drives up summertime

temperatures. The average summer season could see a doubling of heat-related deaths, going from about 908 heat-related deaths per summer now to almost 1,900 mid-century.

Heat already ranks as the top weather-related killer in the United States, killing more people than hurricanes, lightning, tornadoes, floods and earthquakes combined.

The increased frequency and severity of future heat waves will impact the elderly the most, with young children, people with certain medical conditions and people who work or exercise outdoors also being at elevated risk. In addition, the urban poor, many of whom do not have air conditioning and lack access to air-conditioned public places, are vulnerable to heat-related illnesses.

Given all of this, the Clean Cars Program offers three primary health advantages over current federal standards.

First, the more protective standards will eliminate more smog, evaporative emissions (emissions that occur while the vehicle is not running) and toxic local pollution than the federal standards alone.

Secondly, the Clean Cars Program, in contrast to federal standards, will promote the development of advanced technology vehicles, ensuring that each new generation of vehicles is cleaner and more efficient than its predecessor.

Third, the program will reduce global warming emissions which may help to alleviate public health threats associated with rising ozone levels, increased heat waves and the spread of infectious disease.

In the remainder of my testimony, I would like to focus primarily on the first of these benefits.

Clean car standards reduce dangerous auto emissions that aggravate asthma and contribute to lung diseases, cancer and heart disease. First, when fully implemented, toxic emissions of benzene, 1,3-butadiene, formaldehyde, and acetaldehyde will also be reduced by 12 percent. **Please refer to Exhibit 8 (Meszler Testimony)**. Second, the Clean Cars Program will reduce VOC emissions by 5 percent and nitrogen oxide emissions by 11 percent, compared to federal standards. **Please refer to Exhibit 9 (NESCAUM Letter)**. Third, the Northeast States for Coordinated Air Use Management (NESCAUM) concluded that the program will reduce hydrocarbon emissions by 16 percent, compared to the federal standards. **Please refer to Exhibit 10 (NESCAUM Comparison, Pg. ES-2)**. Fourth, as a result of the Zero Emission Vehicle

program, the Clean Car standards will reduce evaporative emissions by 80 percent, while federal standards reduce these emissions by only 50 percent. Lastly, the federal standards allow higher emissions of particulate matter than the Clean Car standards. **Please refer to Exhibit 11 (Cleaner Cars Cleaner Air, Pg. 20).**

Because the Clean Cars Program would reduce air pollution—that affects rates of asthma, cancer, heart disease and immune systems, making people more susceptible to bronchitis and pneumonia—a reduction in state medical costs could also be expected. Health care costs from ozone, smog and air toxics put a burden on the state health care system. Reducing emissions that trigger asthma attacks and increase cancer will inevitably lead to fewer sick days and reduced health care costs for business and government.

The American Lung Association estimated that national annual health costs from motor vehicle pollution could be as high as \$93 billion. Asthma alone costs New Mexicans over \$38 million in direct medical costs and almost \$30 million in indirect costs (including lost productivity due to missed days at school and work) in one year alone.

As a doctor in Albuquerque for 15 years, I've seen children with asthma or elderly patients with emphysema flock to the ER when air quality deteriorates.

In the end, the Clean Cars Program is about public health. Although today's vehicles emit far less pollution than their 1960s counterparts, cars and trucks remain a leading source of air pollution because of the dramatic growth in the number of cars and the number of miles traveled in motor vehicles. Between 1960 and 2001, per capita annual vehicle miles traveled (VMT) increased from 4,198 miles per person to 12,701 miles per person. As such, air pollution from the transportation sector continues to greatly impact public health.

We have the technology at our fingertips to cut global warming and improve our air quality and public health. I would respectfully request the Boards to approve the Clean Cars regulations that would enable us to achieve these gains. I thank you for your time.

Dr. Pilon's testimony will take about 40 minutes. Dr. Pilon's direct testimony will utilize and reference the following materials (attached to this notice on compact disc):

Exhibit 5: CV for Dr. Stephen Pilon

Exhibit 6: US EPA Toxics Assessment Map (United States Environmental Protection Agency, National Air Toxics Assessment, 1996 Estimated County Median Cancer Risk All Carcinogens-

New Mexico Counties, http://www.epa.gov/cgi-bin/broker?geo=STNM&pol=_&rsk=c&city=1&typ=r&_service=nata&_program=nata.scl.xrmap.scl&_debug=2&nata2=1)

Exhibit 7: USPIRG Dangers of Diesel (Emily Figdor, *Dangers of Diesel: How Diesel Soot and Other Air Toxics Increase Americans' Risk of Cancer*, U.S. PIRG Education Fund, October 2002)

Exhibit 8: Meszler Testimony (Dan Meszler, Meszler Engineering Services, *Testimony in Support of SB 51 and SB 103 Maryland Clean Cars Act of 2007*)

Exhibit 9: NESCAUM Letter (Northeast States for Coordinated Air Use Management Letter to K. John Homes, Ph.D of the National Research Council, May 2005)

Exhibit 10: NESCAUM Comparison (Northeast States for Coordinated Air Use Management, *Comparing the Emissions Reductions of the LEV II Program to the Tier 2 Program*, October 2003)

Exhibit 11: Cleaner Cars Cleaner Air (Elizabeth Ridlington, Tony Dutzik and Brad Heavner, *Cleaner Cars, Cleaner Air: How Low Emission Vehicle Standards Can Cut Air Pollution in Maryland*, MaryPIRG Foundation, February 2005)

C. Eric Skelton

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Eric Skelton has been a Senior Policy Analyst for the Mobile Source Team for the Northeast States for Coordinated Air Use Management (NESCAUM) since 2005. There, he analyzes pending and recently adopted legislation and policies affecting mobile air emission sources, fuels and transportation programs; assists member states by developing model regulations to reduce mobile source emissions and researches, compiles and summarizes available technical and policy-related information on mobile air emissions sources, fuels and transportation programs.

NESCAUM is an association of the eight Northeast state air pollution control programs which includes Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island and Vermont. NESCAUM provides technical assistance and policy guidance to its member states. Since the 1980's NESCAUM has published dozens of studies on light duty motor

vehicle emissions, heavy-duty highway and nonroad vehicle emissions, reformulated gasoline, health effects of exposure to gasoline and gasoline vapors, mobile source air toxics and other topics related to motor vehicle pollution. Among those studies are nine analyses of the Low Emission Vehicle Program (LEV). The LEV studies NESCAUM has conducted provided valuable technical information to member states as they evaluated adoption of the California LEV program.

Skelton has also acted as the Executive Director for the Spokane County Air Pollution Control Authority, Co-chair of the Mobile Sources and Fuels Committee with the Association of Local Air Pollution Control Officials (STAPPA/ALAPCO), Section Manager for Rule Development and Air Toxics for the Sacramento Metropolitan Air Quality Management District and an Air Pollution Control Specialist for the Sacramento County Air Pollution District

He has also acted as the state chairman for the Washington Air Quality Managers Group, national president of the Association of Local Air Pollution Control Officials and the general conference chair of the Air and Waste Management Association of the Pacific Northwest.

Skelton received his Bachelors in 1974 from Humboldt State University in Arcata, California.

Skelton's testimony provides the Boards with important information on the experience of the Northeast states, many of which, in varying stages, have adopted the original LEV program, the LEV II and ZEV programs and the global warming pollution standards. Skelton will also be able to provide valuable information provided by NESCAUM and NESCAFF analyses that have been utilized by CARB and other state agencies and decision-makers.

Skelton's direct testimony is expected to read as follows:

Chairwoman Dillingham, Chairmen Deichmann, members of the boards, my name is Eric Skelton and I am representing the Northeast States for Coordinated Air Use Management, or NESCAUM. **Please refer to Exhibit 12 (Skelton Resume).** NESCAUM is an association of the eight Northeast state air pollution control programs which includes Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island and Vermont. NESCAUM was formed in 1967 by the New England Governors for the purpose of assisting the Northeast states in coordinating work on air pollution issues. We provide technical assistance and policy guidance to our member states. Since the 1980's we have published dozens of studies

on light duty motor vehicle emissions, heavy-duty highway and nonroad vehicle emissions, reformulated gasoline, health effects of exposure to gasoline and gasoline vapors, mobile source air toxics and other topics related to motor vehicle pollution. Among those studies are five analyses of the Low Emission Vehicle Program (LEV) included as exhibits to this testimony.

Please refer to Exhibits 13 through 17 (Summary of NESCAUM CA GHG Analysis, Summary of NESCAUM LEVII NOx HC CO, Adopting LEV in NE, Adopting California Program in NE, Federal Motor Vehicle Program). Two additional studies on the Low Emission Vehicle Program and the Zero Emission Vehicle (ZEV) mandate have also published by NESCAUM.¹ The LEV studies NESCAUM has conducted provided valuable technical information to our member states as they evaluated adoption of the LEV program.

Seven of the eight NESCAUM member states have adopted the LEV program, and three have had the program in place for over ten years. Recently Pennsylvania also joined bringing the number of LEV states in the East to eight. Maryland has also recently joined. Each of these states is in non-attainment with the National Ambient Air Quality Standards for ozone (with the exception of Vermont). The LEV program in the Northeast is a part of a comprehensive effort to improve air quality in the Northeast that includes controls on a vast array of pollution sources. Standards have been implemented for large industrial sources such as power plants and boilers; fuel distribution systems ranging from gas station vapor recovery to portable fuel containers; industrial coatings and household paints and personal care products, including hair sprays and deodorants. There are more. Virtually every potential source of pollution is regulated, and included in State Implementation Plans (SIPs). It is only logical and fair that states would also adopt the most stringent motor vehicle emissions program possible.

Since the late 1980's as the Northeast states first began evaluating the LEV program for adoption, a number of arguments have been raised by automobile manufacturers against the program. These include: 1) the LEV program does not provide any emissions reductions over and above the federal program; 2) the LEV program will limit consumer choice and 3) the program is expensive to consumers and to states.

First, with regard to the emissions reductions achieved from LEV program adoption, I will describe NESCAUM's modeling work on criteria pollutants and greenhouse gas (GHG)

¹ "Comparing the Emissions Reductions of the LEV II Program with the Tier 2 Program," NESCAUM 2003 and "Impact of Battery-Powered Electric Vehicles on Air Quality in the Northeast States, Final Report," NESCAUM, 1992.

emissions. NESCAUM and NESCAUM's sister organization - NESCCAF - modeled the criteria emissions benefits of the California emission standards and conducted a comprehensive analysis of the feasibility and costs associated with the introduction of technologies to reduce GHGs from passenger cars.²

For criteria pollutants, NESCAUM's analysis was performed using standard EPA-recognized modeling tools and guidance on modeling the LEV program combined with climatic, vehicle and fuel data applicable to the Northeast states. **Please refer to Exhibit 14 (Summary of NESCAUM LEV II NO_x, HC, and CO).** This analysis compared emissions from a Tier 2 fleet with emissions from a LEV II fleet. Using recommended EPA methods in conjunction with state-specific input data, NESCAUM estimates that, when fully implemented, the California program will reduce motor vehicle VOC and NO_x emissions by 8 and 16 percent respectively. The health effects of ozone range from respiratory irritation to asthma, reduced lung function and death.

As a result of LEV program adoption, this year approximately 33 fewer tons of nitrogen oxides and hydrocarbons will be emitted into the air each day. By 2025, approximately 50 tons per day of smog forming pollutant will be avoided every day. These emission benefits are critical to improving public health and to ensure that transportation funds are not interrupted as a result of non compliance with federal air quality standards.

States in the Northeast have adopted the LEV program because the program delivers substantial air quality benefits, the cleanest cars in the nation and advanced technology vehicles and it will continue to do so. The most recent available sales data indicates that 25 percent of many manufacturers' new vehicles sold are ultra clean advanced technology vehicles (PZEVs). These vehicles come with a warranty up to 150,000 miles - a benefit for consumers as well as for air quality.

Greenhouse gas emissions from motor vehicles are a major concern of air quality regulators and public health officials. Passenger cars emit more than one quarter of all anthropogenic GHG emissions in the Northeast states. To assist the states in evaluating the potential to reduce motor vehicle GHG emissions, NESCCAF conducted a comprehensive study on the feasibility and costs of reducing GHGs from vehicles. **Please refer to Exhibit 18**

² NESCCAF stands for Northeast States Center for a Clean Air Future. NESCCAF is a non-profit organization whose Board of Directors includes air quality regulators, members from academia, industry, and consultants. The NESCAUM Board is made up entirely of air quality regulators.

(Reducing LD GHG Emissions). NESCCAF's analysis provided the main technical support document for the California Air Resources Board GHG regulation. The NESCCAF study team used state-of-the-art computer simulation modeling software to evaluate 75 different technology packages on five vehicle types. The study team also conducted a comprehensive cost analysis on the technologies evaluated. The study found that cost effective technologies exist to reduce motor vehicle GHGs for a range of reductions of up to 55 percent.

The NESCCAF study found that technologies currently in production such as improved air conditioning, variable valve timing and lift, 6-speed automatic transmissions and cylinder deactivation can be used to reduce motor vehicle GHGs by 25 percent. Much greater reductions - of up to 55 percent - can be achieved through the use of more advanced technologies such as stoichiometric gasoline direct injection, hybrid electric and diesel vehicles. The Chrysler Hemi and many other vehicles are equipped with cylinder deactivation. The Toyota Matrix and Honda Accord have variable valve lift and timing. These are just a few examples. In short, the technologies needed to meet the California GHG standards are here today in production.

NESCAUM's modeling estimates that in the seven NESCAUM LEV states, the GHG standards will reduce 39 million metric tons of CO₂ per year in 2030. **Please refer to Exhibit 13 (Summary of NESCAUM CA GHG Analysis).** The GHG standards and the ZEV mandate combined will reduce passenger car GHG emissions by 27 percent. This reduction is an essential component of climate action plan goals adopted by Governors in the region.

To summarize: The LEV program provides critically needed criteria pollutant and GHG emissions reductions.

With regard to the concern that the LEV program will limit consumer choice - this has not been an issue in the Northeast. Models of vehicles available in other parts of the country have been available in the Northeast since the LEV program was implemented in 1994. Furthermore, steady growth in vehicle registrations have been seen since LEV program adoption and consumer complaints about vehicle choice have not been received. In fact, the LEV program has been largely transparent to Northeast consumers - most people are not even aware of the fact that the states have adopted the California standards.

Manufacturers have never been out of compliance with the emissions requirements (the NMOG fleet average standard) since adoption of the LEV program. This is true in all of the NESCAUM states – even the early adopting states of New York, Massachusetts and Vermont.

We expect the same will be true with the introduction of the GHG standards for the following reasons.

First, California's GHG standards were specifically tailored to address the needs of the automotive company that will have the most difficulty meeting their requirements - they are set at a level which allows the company with the highest fleet GHG emissions to comply (GM). Furthermore, the standards allow for a gradual phase-in of technologies. Initially, only a 1-2 percent reduction in GHGs will be required - that will ramp up gradually to 30 percent by 2016. The opportunity to earn early introduction credits provides a further cushion for compliance with the standards. The standards were also designed so that manufacturers can plan for the introduction of new technologies as part of their regular re-design cycle for manufacturing, thus lowering the cost to manufacturers.

Some manufacturers won't need to do anything to comply with the standards for the first few years. Honda and Toyota, for example, met the 2009 standards in the 2003 and 2004 model years.

In addition, technologies needed to comply with the GHG standards are available in the global market today – many are in high volume production. According to the California Air Resources Board, this standard is far less “technology forcing” than the successful LEV standard itself.

Finally, because of the way the GHG standards are structured - with a separate fleet requirement for trucks, we do not anticipate any reduction in truck availability in the Northeast.

With regard to costs to consumers, LEV II vehicle incremental costs as compared to Tier 2 vehicle costs are negligible. With the introduction of the light-duty GHG standards vehicle purchase prices will increase from \$260 to \$1,000 per vehicle. However, the NESCCAF study found that GHG reducing technologies will benefit consumers given the significant savings that can be achieved in fuel costs. **Please refer to Exhibit 18 (Reducing LD GHG Emissions).** For example, the study found that consumers will save up to \$2,000 over the life of a lower emitting vehicle, given the cost savings in fuel that will be realized. These savings assume a gasoline cost of \$2.00 per gallon and a vehicle life of 150,000 miles. An analysis conducted by the California Air Resources Board found that consumers will realize an economic benefit from purchasing a lower emitting GHG vehicle in the first month of ownership because lower operating costs will more than offset the slightly higher monthly car payment.

The issue of competition from dealers in neighboring non-LEV states has been raised in the Northeast, but it has not proved to be a problem. First, many states have registration denial as an enforcement mechanism which means that any non-LEV vehicle cannot be registered in a LEV state. Some states, however, do not have registration denial. Maine for example, does not and it borders a non-LEV state (New Hampshire). Maine recently conducted an audit of 60,000 vehicles sold over a two-year period and found that less than five vehicles of the 60,000 vehicles registered during that time period were not LEV vehicles. Thus, the problem of vehicles being purchased in neighboring New Hampshire and brought into Maine has not materialized as a problem. There are other examples; this is just one of them.

Regarding the administrative workload related to LEV, in the context of our mobile source control programs, the administrative workload of the LEV program is small. In the Northeast between one and four staff people are routinely involved in program implementation (depending on the size of the state). Much of that effort is directly related to the evaluation of changes made to California's program and any regulatory revisions needed to keep the program identical with California's. The LEV program has proven to be one of the most cost effective programs the Northeast state air pollution control agencies have put into place.

To conclude, the LEV program, in the final analysis, is about public health. In spite of the great improvements in emission controls over the past thirty years, motor vehicles still emit approximately one third of pollutants that contribute to unhealthy air quality in our region, especially in urban areas. And, motor vehicles contribute more than a quarter of total man-made GHG emissions in the region. These GHG emissions must be addressed if we are to reduce the impacts of global warming. Given the continuing health and environmental risk posed by motor vehicle pollution, the LEV program is a critical component of motor vehicle pollution control programs in the Northeast.

Skelton's direct testimony will take about 1 hour and 30 minutes. Skelton's direct testimony will utilize and reference the following materials (attached to this notice on compact disc):

Exhibit 12: Skelton Resume

Exhibit 13: Summary of NESCAUM CA GHG Analysis (NESCAUM, *Northeast State Greenhouse Gas Emission Reduction Potential from Adoption of the California Motor Vehicle Greenhouse Gas Standards*, 2005)

Exhibit 14: Summary of NESCAUM LEV II NO_x HC CO (NESCAUM, *Summary of NESCAUM Analysis Comparing the NO_x, HC and CO Emission Reduction Potential from Adoption of the California Low Emission Vehicle (LEV II) Standards*, 2005)

Exhibit 15: Adopting LEV in NE (NESCAUM, *Adopting the California Low Emission Vehicle Program in the Northeast States, An Evaluation*, 1991)

Exhibit 16: Adopting Cal Program in NE (NESCAUM, *An Evaluation of Adopting the California Mobile Source Control Program in the Eight Northeast States*, 1989)

Exhibit 17: Federal Motor Vehicle Program (NESCAUM, *Critical Analysis of the Federal Motor Vehicle Program*, 1988)

Exhibit 18: Reducing LD GHG Emissions (NESCCAF, *Reducing Greenhouse Gas Emissions from Light-Duty Motor Vehicles*, November 2007)

D. Lauren N. Ketcham

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Lauren Ketcham is the Acting Executive Director of Environment New Mexico and the Environment New Mexico Research & Policy Center, state-wide environmental advocacy and research nonprofits with more than 5,000 members state-wide. Environment New Mexico is affiliated with U.S. PIRG, the state PIRGs and state environment groups, who have worked to adopt the Clean Cars standards in many of the states that now have the program. Environment New Mexico has written and released four reports dealing with the Clean Cars Program (two of which Ketcham was the lead author for), and the affiliated state PIRGs and environmental groups have written and researched numerous other related reports.

In addition to writing two relevant reports, Ketcham has done extensive research and guest lectured on the Clean Cars Program, in addition to related advocacy, research, citizen outreach, public education and grassroots organizing. Ketcham also manages the organization's preservation, water, energy and global warming programs and related staff.

Prior to working at Environment New Mexico, Ketcham conducted social research at

New Mexico State University. She received her Masters from New Mexico State University in 2005 and her Bachelors from Ohio University in 2003.

Ketcham's testimony provides the Boards with important general information on the Clean Cars Program, New Mexico-specific data and benefits, a description of the historical context in which these and other emission standards have been developed and a summary of a recent Court finding related to the Program's global warming pollution standards.

Ketcham's direct testimony is expected to read as follows:

Chairwoman Dillingham, Chairmen Deichmann, members of the boards, my name is Lauren Ketcham and I am a global warming and energy advocate and Acting Executive Director with Environment New Mexico. Environment New Mexico is the new home of NMPIRG's environmental work, which has been working on environmental issues in New Mexico for over 30 years. We have more than 5,000 members state-wide. Environment New Mexico is affiliated with U.S. PIRG, the state PIRGs and state environment groups, who have worked to adopt the Clean Cars standards in many of the states that now have the program. Environment New Mexico has written and released four reports dealing with the Clean Cars Program, and the affiliated state PIRGs and environmental groups have written and researched numerous other related reports. **Please refer to Exhibits 19-22. (ENM Clean Car Economic Report, ENM Ready to Roll, ENM CC National and CV for Lauren Ketcham).**

Environment New Mexico and our members are critically concerned about global warming.

As you've heard, the consensus view of climate scientists holds that global warming is real, that it is being caused by human-made emissions and that we need to act quickly and boldly to avoid the worst effects of a warming planet and achieve 80 percent emission reductions by 2050.

In a December 2005 speech, James Hansen, director of NASA's Goddard Institute for Space Studies, stated, "The Earth's climate is nearing, but has not passed, a tipping point, beyond which it will be impossible to avoid climate change with far ranging undesirable consequences." These consequences, he said, would "constitute practically a different planet."

Yet, New Mexico's emissions continue to rise. In 1960, New Mexico emitted 18.2 million metric tons of carbon dioxide; by 2001, the state was emitting 57.8 million metric tons—more than three times as much as in 1960.

The transportation sector is the second largest source of carbon dioxide pollution in New Mexico, making up nearly one-quarter of the state's emissions in 2000. More importantly, it is the fastest growing source of new emissions. Transportation sector global warming emissions in New Mexico could increase by more than 50 percent between 2000 and 2020. In Albuquerque, cars, trucks and SUVs are the largest source of global warming emissions.

The pollution performance of just a handful of corporations has a dramatic impact on the air we breathe and the climate we will pass on to future generations. The six largest automakers in the U.S. market—General Motors, Ford, DaimlerChrysler, Toyota, Honda and Nissan—are responsible for more than 90 percent of the heat-trapping and smog-forming emissions from new automobiles today.

With New Mexicans driving more each year, unless action is taken to bring cleaner cars to New Mexico's roads, the transportation sector's contribution to the state's air pollution and global warming problems will only get worse.

The Clean Cars Program

Well before the federal government began to take action, California was regulating pollution from automobiles. Following in California's footsteps, the federal government made its first comprehensive attempt to deal with air pollution by passing the Clean Air Act of 1970. One provision of the law barred individual states from regulating automobile emissions – a move intended to protect automakers from having to manufacture 50 separate models for 50 states. However, the law preserved a special place for California, allowing the state to adopt tougher emission standards.

By 1977, the Clean Air Act provided that almost any state could adopt the California standards provided that they are identical to standards for which California has been granted a waiver and that the state allows two model years before the standards are applied, following adoption.

The federal vehicle emission standards New Mexico currently follows are called Tier 2. Although Tier 2 is significantly stronger than the federal government's previous Tier 1 program, the Clean Cars Program offers clear advantages. First, the Tier 2 program does not include the

technology-driving Zero Emission Vehicle (ZEV) program, which, for example, requires zero emission vehicles (ZEVs), advanced-technology partial zero emission vehicles (AT-PZEVs) and PZEVs to meet a zero evaporative emission standard and longer extended warranties that ensure performance of the emissions system over time. Second, the federal program does nothing to reduce greenhouse gas emissions. **Please refer to Exhibit 23 for a comparison of Tier 2 and Clean Car Low Emission Vehicle (LEV II) standards (Cleaner Cars Cleaner Air, Pg. 16 Table 3 and Pg. 17 Table 5).**

Currently, twelve states have adopted the program: California, Connecticut, Maine, Maryland, Massachusetts, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, Vermont and Washington. Others, like New Mexico and Arizona, are considering adoption.

The Clean Cars Program has three components: the Low Emission Vehicle II (LEV II) program, the Zero Emission Vehicle (ZEV) regulations and Global Warming Pollution Standards (GWPS).

LEV II

The Low Emission Vehicle (LEV II) Program, first adopted in the early 1990s, sets smog-forming and toxic emission standards. As you have heard, some of the pollutants produced by vehicles include: benzene, 1-3 butadiene, formaldehyde, acetaldehyde, volatile organic compounds, nitrogen oxide and hydrocarbon evaporative emissions.

Standards need to be achieved fleet-wide within two categories. Passenger cars and lighter light duty trucks (PC/LDT1), which includes all cars and trucks less than 3,750 pounds, must achieve a fleet average of 0.035 grams per mile (g/mi) non-methane organic gases (NMOG) in 2010 and later. Heavier light duty trucks (LDT2) between 3,751 and 8,000 pounds must meet an NMOG fleet average requirement of 0.043 g/mi in 2010 and later. **Please refer to Exhibit 23 (Cleaner Cars Cleaner Air, Pg. 16).**

NMOG is a class of pollutants that includes hydrocarbons (except methane) and various other reactive organic substances such as alcohols, ketones, aldehydes and ethers. Like the federal government's Tier 2 vehicle emission classifications, cars, trucks and SUVs must be certified to different classifications: LEV (Low Emission Vehicle), ULEV (Ultra Low Emission Vehicle), SULEV (Super Ultra Low Emission Vehicle) or ZEV. Within these categories, other benchmark pollutants include nitrogen oxide (NO_x), carbon monoxide (CO), formaldehyde and particulate matter (PM). **Please refer to Exhibit 23 (Cleaner Cars Cleaner Air, Pg. 17).**

ZEV

The ZEV portion of the Clean Cars Program ensures a supply of clean vehicles and an appropriate investment in the infrastructure and research needed to develop the next generation of clean cars.

The ZEV requirement technically requires that 10 percent of vehicles be ZEVs in 2010, rising to 16 percent in 2018 and after. **Please refer to Exhibit 20 (ENM Ready to Roll, Pg. 44).** Manufacturers may meet their pure ZEV requirements, however, by selling advanced-technology partial zero emission vehicles (AT-PZEVs), like hybrids and dedicated alternative fuel vehicles, and PZEVs or clean, conventional vehicles, which earn partial ZEV credit.

Large volume manufacturers are allowed to comply with either a base compliance path (2 percent ZEV, 2 percent AT-PZEV, 6 percent PZEV) or with an alternative compliance path. The alternative compliance path allows up to two-fifths of AT-PZEVs and three-fifths of PZEVs to meet pure ZEV obligations.

Manufacturers choosing the alternative compliance path would also need to sell small amounts of fuel cell vehicles, possibly rising in the future pending a California Air Resources Board (CARB) feasibility study. These vehicles could be placed in any state, not necessarily New Mexico.

There are currently 21 auto manufacturers subject to the ZEV regulation. Six are defined as large volume manufacturers: General Motors, Toyota, Ford, Honda, DaimlerChrysler and Nissan. The remaining 15 are intermediate volume manufacturers, who can meet the regulation entirely with PZEVs. Small-scale manufacturers need not comply with the ZEV requirements at all.

According to an Environment New Mexico analysis, under an alternative compliance path, the ZEV program would require automakers to sell approximately 5,100 hybrid-electric vehicles and 21,700 clean conventional gasoline-powered vehicles in New Mexico in model year 2011, with the numbers increasing over time. **Please refer to Exhibit 20 (ENM Ready to Roll, Pg. 44 and 55).**

In the early years of the program, any cost associated with the LEV II and ZEV standards does not appear to have been passed on to consumers.

For example, an analysis by the Pennsylvania Department of Environmental Protection in 2006 compared the cost of vehicles meeting federal Tier 2 standards in Ohio and those meeting

LEV II California standards in Pennsylvania and New York. In almost every case, the Manufacturer's Suggested Retail Price (MSRP) was identical. **Please refer to Exhibit 24 (PA DEP LEV II, Table 1).**

Global Warming Pollution Standards

In 2002, the Clean Cars Program was expanded to include regulations to address greenhouse gas emissions. Assembly Bill 1493 required the California Air Resources Board (CARB) to develop regulations that would achieve the maximum feasible reduction of greenhouse gases for light-duty vehicles. The bill strictly prohibited CARB from imposing additional fees or taxes or a ban on the sale on any vehicle category, mandating a reduction in vehicle weight or limiting the speed limit or vehicle miles traveled. The bill required flexibility, such as alternative methods of compliance, provided that maximum reductions were still achieved. The regulations were structured so that manufacturers can trade credits both internally and externally and so that manufacturers would have five years to equalize any debits without penalty. Credits can also be earned for early compliance.

Assembly Bill 1493 also required CARB to consider the economic impacts in developing the regulation, including job creation, business expansion, business competition and state economic impacts. Beyond that, CARB was also required to ensure that any added technological cost to a car to reduce its emissions would not raise the cost by more than the amount consumers will save in operating costs. **Please refer to Exhibit 25 (AB 1493).**

As a result, CARB developed win-win regulations that not only achieve significant, but feasible, gains for our air and environment, but also save consumers money and strengthen our economy.

The global warming pollution standards, finalized in 2005, go into effect model year (MY) 2009 and ramp up each year until full phase-in by MY 2016, when new cars and lighter light duty trucks will emit 34 percent less global warming emissions and new heavier trucks will emit 25 percent less. Intermediate volume manufacturers are exempted completely until model year 2016 and even then will face somewhat less stringent requirements. **Please refer to Exhibit 26 (CARB ISOR, Pg. iv).**

Because manufacturers' fleet composition differs based on weight, sales of trucks and other factors, manufacturers will need to comply in different ways to meet the reduction requirements. Overall, CARB estimates that global warming pollution standard compliance costs

for large manufacturers would be \$17 to \$36 per vehicle in MY 2009, up to \$1,029 to \$1,064 in MY 2016. **Please refer to Exhibit 27 (CARB Addendum ISOR, Pg. 16).**

While the technological changes needed to meet the global warming pollution reduction standards may increase vehicle prices, those up front costs will easily be recovered by consumers in the form of reduced operating costs.

Although manufacturers have flexibility in how they choose to comply with the standards, it is likely that they will choose to meet the requirements by incorporating technologies that reduce operating costs for consumers. CARB identified many technologies that reduced emissions and would save consumers money over the lifetime of the vehicle, including discrete variable valve lift, dual cam phasing, turbocharging with engine downsizing, automated manual transmissions, camless valve actuation and air conditioning improvements such as variable displacement compressors with revised controls, reduced leakage systems and alternative refrigerants.

So, while vehicles would cost about \$1,000 more in 2016 as a result of incorporated technology, a consumer buying a new car in 2016 and paying \$20 more per month on the car loan, would save an average of \$43 per month due to fuel savings for a total of \$23 net savings/month (assuming gas prices of \$3.00 per gallon). The increased cost of the vehicle is entirely offset by operating cost savings. **Please refer to Exhibit 28 (Meszler PowerPoint, Pg. 10, 12).**

To determine the environmental justice impacts of the program on low-income communities, CARB evaluated the effects of the regulation on used vehicle prices. CARB concluded that the regulations should not negatively impact low-income used vehicle car purchasers. **Please refer to Exhibit 26 (CARB ISOR, Pg. 167-170).**

As a result of these operational savings, roughly 214 million gallons of gasoline would be saved in New Mexico by 2020 as a result of the program, saving New Mexico consumers \$623 million annually.

These benefits are crucial given that New Mexico is disproportionately vulnerable to gasoline cost increases, in part because of New Mexico's low per capita income and higher than average gas prices. For example, in July 2007, while the national average price for a gallon of regular unleaded gas was \$2.95, the average New Mexico price was \$3.17.

A History Lesson

Despite the Clean Car Program's clear environmental and public health advantages, manufacturers, dealers and their trade associations argue that the program will cost too much, isn't technologically feasible and will hurt consumers, among other things.

Of course, the Clean Cars Program is not the first time that automakers have been faced with regulations. At numerous points throughout the automobile's history, decision-makers have required industry to install technology that improves safety (like seat belts and air bags), increases fuel economy (like Corporate Average Fuel Economy or CAFE), or decreases air pollution emissions (like under the 1970 Clean Air Act). Many of the claims levied against the Clean Cars Program today are quite similar to those made in other cases.

The 1970 Clean Air Act created emission standards for hydrocarbons and carbon monoxide for new cars in 1975 and a standard for nitrogen oxides in 1976, both designed to achieve a 90 percent reduction in emissions. The 1975 standards essentially required installation of catalytic converters.

Industry immediately said the standards couldn't be met. Lee Iacocca of Ford said that a one year extension was needed to "keep us in business for another year." A General Motors executive named Ernie Starkman told the EPA that requiring catalytic converters on its 1975 MY vehicles would pose "unreasonable risk of business catastrophe" and could conceivably lead to "complete stoppage of the entire production."

In response to the Clean Air Act, Lee Iacocca at Ford issued a press statement saying that the provisions "could prevent continued production of automobiles after January 1, 1975. Even if they do not stop production, they could lead to huge increases in the price of cars. They could have a tremendous impact on all of American industry and could do irreparable damage to the American economy. And yet, in return for all of this, they would lead to only small improvements in the quality of air."

As it later turned out, auto industry cost estimates for the 1970s catalytic converter requirements were two times higher than the actual cost. Industry estimates claimed a price tag of nearly \$3,000, but actual costs turned out to be only about \$1,300. **Please refer to Exhibit 29 (NRDC Cost of Compliance).**

In 1975, with the passage of the Environmental Policy and Conservation Act, CAFE standards further changed the face of the American automobile, and led to reductions in size and weight to improve fuel economy. Fuel economy was increased by 40 to 50 percent by MY 1980.

General Motors and Ford quickly filed protests, contending the standards would require new, unproven technologies and would negatively impact consumers. The National Highway Traffic Safety Administration rejected the automakers' claims and concluded that the standards could be met without a significant change in the mix of cars being sold.

Later, when the Clinton Administration proposed stricter CAFE standards, manufacturers claimed that it would cost them 150,000 to 300,000 jobs. The Los Angeles Times investigated the number and found that they were based on the idea that instead of redesigning the cars, the automakers would need to close down all of their assembly lines for all cars that did not meet the standards.

The car companies' spurious claims continued when California tightened its emissions through the original LEV program in the 1990s.

Sierra Research, who provides cost analyses for the auto industry, estimated costs that were 10 times higher than the actual cost of compliance for the original LEV program. For example, in 1994 the automakers claimed the cost of meeting the LEV standard to be as high as \$788. As shown in **Exhibit 29 (NRDC Cost of Compliance)**, however, the actual costs were significantly lower—only \$83.

Similar predictions were made during the LEV II and ZEV rulemakings with automakers suggesting that the standards were not technically feasible, were too expensive and that CARB staff's costs analyses were underestimated and did not allow for sufficient lead time. Most recently, California adopted the Global Warming Pollution Standards component of the Clean Cars Program. Automakers have said that the regulations will be too costly and that they will have to stop selling some of their largest vehicles, like SUVs, because they will not be able to cost-effectively reduce emissions enough to bring their fleet into compliance. As a result, they allege, consumer choice will be dampened and the industry and its dealers will suffer.

Ronald Harbour, a private consultant who testified on behalf of the automakers said during the Vermont hearings where automakers challenged the Vermont standards, "I'm not sure I'm optimistic about the industry's future in total. They'll all suffer sales declines because the cost of compliance is so high."

Similarly, at that same hearing, Reginald Modlin of DaimlerChrysler, testified the only car his company would be able to sell in Clean Car states by 2016 would be a tiny, two-person Mercedes Smart car developed for use in European cities.

Sierra Research, commissioned by the Alliance of Automobile Manufacturers found that the average vehicle cost, under the global warming pollution standards, would increase by about \$3,000. However, there were several flaws in the study, which led CARB to conclude that the industry's cost estimate numbers were unreliable. CARB does a thorough job in addressing the cost discrepancies in its Final Statement of Reasons. **Please refer to Exhibit 30 (CARB FSOR, Pg. 168-170).**

Similarly, a District Court in Vermont also analyzed the numbers and found that the manufacturer's price estimates were "unsupported by the evidence." The court went on to say that the automakers have "failed to carry their burden to demonstrate that the regulation is not technologically feasible or economically practicable... given the flawed assumptions and overly conservative selection of technologies" utilized. Instead, the Court found that "compliance is possible in the time period provided at a relatively reasonable cost." **Please refer to Exhibit 31 (Vermont Opinion and Order, Pgs. 155-202; Quote from Pg. 201).**

Industry's current estimate for \$3,000 per vehicle is three times higher than CARB's. **Please refer to Exhibit 29 (NRDC Cost of Compliance).** Historically, CARB's estimates have also been higher than actual observed costs, although not as high as predictions made by industry. As a result, even CARB's estimates may be too high.

With this comparison in place, with my remaining time, I would like to address several specific opposition arguments in more detail.

One common argument has been that because the program increases vehicle prices, sales will take a hit and dealers will be hurt as a result.

First, there is no evidence under the existing Clean Cars Program that vehicle sales have suffered or that automakers have been passing on the additional cost of the vehicles to consumers. The Northeast States for Coordinated Air use Management (NESCAUM) has documented no negative vehicle sales impact resulting from the program in the Northeast; instead, sales of vehicles have been steadily increasing.

Second, as I've mentioned, at other times over the past thirty years, manufacturers made similar claims about regulations. Nonetheless, vehicles sales in the United States have hovered between 13 and 17 million annually for the past two decades, with most year to year fluctuation attributable to changes in the general economy, as opposed to year to year price changes in the cost of vehicles themselves. Even during model years where prices increased dramatically,

vehicle sales remained high if other economic conditions remained positive. Using history as a guide, there is no indication that regulatory improvements have caused vehicle prices to exceed what consumers are able to pay. Instead, it demonstrates that the automobile industry is resilient and adaptable at being able to comply with needed regulations, while producing vehicles that consumers want and are able to afford.

Third, in an era of increasing gasoline prices and growing concern about global warming, there is consumer demand for vehicles that can lower operating costs and reduce our carbon footprint. Dealers and manufacturers may stand to benefit by selling cleaner vehicles. Remarks by Adam Lee, a third generation car dealer and President of Lee Automalls, bear this out. Lee owns 11 Chrysler, General Motors, Honda, Nissan and Toyota dealerships in Maine. He said at an EPA hearing earlier this year, “If American car manufacturers don’t start making more fuel-efficient cars, and quickly, not only will global warming continue to get worse, there may no longer be a domestic car industry.”

Lee goes on to say, “I have been selling Priuses since they came out six years ago. And since that time every Toyota dealer has been selling them for list price and making a very nice profit on them. Until recently, no one even asked for a discount. Demand was so strong that people stopped negotiating. This is a car dealer’s dream. A car people want so badly they don’t negotiate.” He compares this to his sales of other vehicles. “Right now rebates on large cars, trucks and SUVs have never been higher.” As of May at his dealerships in Maine, there was a \$4,000 rebate on the Ford Superduty, a \$5,000 rebate on the Dodge Ram truck, a \$6,000 rebate on the Chevy Suburban and GMC Yukon, a \$6,500 rebate for the Hummer and an \$8,000 rebate for the Cadillac STS.

Further supporting the idea that emissions reductions are consistent with business success, between 1990 and 2005, BMW’s fleet average carbon dioxide emissions dropped 12 percent as its U.S. sales volume increased fourfold.

Fourth, in its analysis on the impacts of the global warming regulations on industry, CARB found only a negligible impact on automobile-affiliated businesses and expects no change in dealership profitability.

Lastly, although there are concerns that requiring different vehicles in New Mexico as compared to bordering states will make cross-border dealer trading more difficult, the EPA allows dealers in Clean Cars states to sell California-certified vehicles to customers in any state.

In addition, dealers in states adjacent to Clean Car states can stock and sell California-certified vehicles rather than federally-certified vehicles if they would want to capture the New Mexico market.

Opponents also claim that regulations are not needed to make less polluting vehicles available to New Mexico drivers and that this can be done voluntarily.

However, in the absence of such regulations, most improvements in automotive technology in recent decades have been channeled into increased power, acceleration and size rather than reducing emissions.

Practically every recent move by U.S. automakers to adopt advanced features to reduce pollution can be traced to the influence of government regulations. In 1972, John DeLorean, Corporate Vice President for General Motors, said, “In no instance, to my knowledge, has GM ever sold a car that was substantially more pollution-free than the law demanded—even when we had the technology. As a matter of fact, because the California laws were tougher, we sold “cleaner” cars there and “dirtier” cars throughout the rest of the nation.”

Not surprisingly then, most automakers have chosen to market PZEV-compliant vehicles only in states that have adopted the Clean Cars Program. More than 25 models of clean vehicles sold in California and other clean car states are not generally available in New Mexico. Adopting the Clean Cars Program would mean that New Mexicans get better choices and have more access to cleaner, conventional cars and advanced-technology vehicles.

Opponents have also claimed that cleaner cars are less safe.

Vehicle can be built to be cleaner, while maintaining safety. A lot of safety research has been done as it relates to Corporate Average Fuel Economy (CAFE) that is beginning to break down the correlation between weight of vehicles and safety.

American Honda Motor Co. has done at least four recent studies on the size, weight and safety of vehicles and concludes design and technology are the most critical issues. A 2002 study by the National Academy of Sciences found that engine and transmission technology is available that can cut global warming emissions without compromising safety. This finding is borne out by crash data: the Honda Civic and Volkswagen Jetta have lower driver fatality rates than the Ford Explorer, Dodge Ram or Toyota 4Runner.

Nonetheless, CARB, in developing the Clean Cars Program, was strictly prohibited from using weight reduction to meet the standards. As a result, weight reduction is not needed to comply with the Clean Cars Program.

Moreover, history indicates that cars are getting more safe, not less, even as emissions regulations have gotten tighter. The fatality rate per hundred million vehicle miles traveled has dropped from 5.7 in 1966 to 1.6 in 2001. Traffic fatalities totaled 53,041 in 1966 but decline to 43,000 in 2001 despite nearly 130 million additional vehicles and nearly 90 million additional drivers.

Finally, a Vermont federal court heard testimony from both Plaintiffs and Defendants regarding safety and concluded that the greenhouse gas emission standards would not present a significant threat to public safety. **Please refer to Exhibit 31 (Vermont Opinion and Order, Pg. 216-222).**

Opponents have also argued that because New Mexico has such a high truck to car ratio, in order to meet the standards, manufacturers will have to reduce or eliminate sales of popular trucks and SUVs (“mix shifting”). As a result, consumers won’t be able to access the vehicles they want.

According to the Alliance of Automobile Manufacturers’ own numbers, 63 percent of registrations in New Mexico were trucks in 2004. At least one Clean Car state has a higher percentage of trucks than New Mexico—Maine at 64 percent. Sixty three percent of Vermont’s registrations were trucks, with Oregon close behind at 62 percent, also both Clean Car states. **Please refer to Exhibit 32 (AAM Light Truck Country, Pg. 3).**

In Vermont—a state with a comparable ratio of trucks to cars—automakers filed a lawsuit against the state to block its adoption of the global warming pollution standards. After weeks of testimony in the Vermont District Court, Judge Sessions concluded that the auto industry can make any vehicle reduce its greenhouse gas emissions. The Court thoroughly reviewed the issue of consumer choice and did “not find convincing the claims that consumers will be deprived of their choice of vehicles, or that manufacturers will be forced to restrict or abandon their product lines.” **Please refer to Exhibit 31 (Vermont Opinion and Order, Pg. 140, 203-216).**

Given that there are a comparable amount of light trucks in Vermont as compared to New Mexico, the same conclusion would hold true.

Beyond this, from a design standpoint, the global warming pollution standards are not expected to reduce vehicle availability, as separate standards are set for passenger cars and light weight light duty trucks, on the one hand, and heavier trucks on the other. Standards for heavier trucks are considerably less stringent. This fleet-averaging ensures the continued availability of trucks and SUVs.

Under the existing Clean Cars Program, reduced vehicle availability has not been a problem and farmers and ranchers have not had any problems accessing vehicles they need for work.

Similarly, there is concern that diesel vehicles will not be available in Clean Car states.

Despite concerns that farmers and small businesses reliant on diesel pick up trucks and vans will not be able to access such vehicles under the program, pick up trucks or vans currently certified with a diesel engine option with a Gross Vehicle Weight Rating of more than 8,500 pounds are not effected. Some of the most common diesel trucks used for agriculture and business weigh over 8,500 pounds and include the F-250 Super Duty, GMC Sierra 3500 and Dodge Ram 2500. Moreover, the standards allow an exemption for diesels classified as “work trucks” and do not apply to heavy-duty vehicles, like semis and buses.

Diesel passenger vehicles, like the Volkswagen Golf TDI, are not CARB-certified. But, diesel car makers are beginning to produce cleaner diesel engines, in large part because the federal tailpipe standards for diesel are being tightened up as well. The chairman of DaimlerChrysler announced at the North American International Auto Show in January 2006 that the company will market diesels soon that “meet emissions regulations in all 50 states.” Therefore, there seems little factual evidence to support the notion that the standards would hurt diesel availability.

Opponents also claim that ZEV is unneeded and too costly.

The ZEV program is critically, important, however.

From a technology-driving standpoint, the ZEV standards have already been a rousing success. The ZEV program requirements for AT-PZEVs, particularly hybrids, help to develop pure ZEV technologies by accelerating the development and deployment of advanced ZEV technologies. For example, this will improve the batteries needed in future pure ZEV technologies, including fuel cell vehicles and battery electric vehicles.

Beyond this, given consumer demand for cleaner vehicles, there is reason to believe that consumers will want to purchase the PZEVs and AT-PZEVs that manufacturers bring to the market. Hybrid sales in 2007 are steadily growing as gasoline prices have again topped \$3 per gallon, with projections for continued high prices. With this trend in sales and with the projection for gasoline prices, CARB staff expect sales of hybrid AT-PZEVs to remain healthy.

Moreover, there is no reason to believe that the ZEV standards that have been in place have been unachievable and could not be met in New Mexico. All manufacturers are currently fully compliant with the ZEV regulation. In fact, the number of AT-PZEVs and PZEVs currently being produced exceed production requirements and many of the large manufacturers have banked enough AT-PZEV credits to comply with the program several years into the future. In 2005, there were twice as many AT-PZEVs and 40 percent more PZEVs produced than were required to meet the standards. As a result, between 1994 and 2005, manufacturers sold 130 fuel cell vehicles; 4,400 battery electric vehicles; 26,000 neighborhood electric vehicles; 70,000 hybrid and compressed natural gas vehicles and 507,000 conventional PZEVs.

As for rising ZEV requirements in the future, CARB has demonstrated its willingness to revise ZEV if manufacturers can make the case that the technology is not ready. A few examples include: In 1996 CARB reevaluated the program and for cost and performance-based reasons, eliminated the 1998 requirements to allow for additional time for research and development. In 2003, finding prices that still were too high even at higher production levels, CARB revised the program again to allow manufacturers to meet their ZEV requirements through the sale of AT-PZEVs and PZEVs, and delaying any pure ZEV requirements until 2012. Currently, CARB is considering whether it will again delay this requirement until 2015.

Yet another benefit of the program is the extended warranties and stronger emission standards that accompany cleaner vehicles. Vehicles that meet PZEV standards would need to meet zero evaporative emission standards and have extended warranties of 15 years or 150,000 miles on emission controls and related equipment, providing a solid consumer benefit and preventing the deterioration of the emission system over time, which increases pollution.

Finally, opponents claim that there is not adequate cost-effective technology available to meet the standards.

However, off-the-shelf technology exists that can be used so that every manufacturer can cost-effectively meet the standards.

CARB staff used a number of conservative assumptions in developing the regulations, such that they could be cost-effectively achievable for even manufacturers with the heaviest fleets. First, the regulations were developed so that General Motors—the manufacturer with the heaviest fleet—could meet the standards. Second, CARB ensured that multiple feasible technological packages were available in each category. Third, CARB excluded any greenhouse gas reductions due to hybridization or weight. And, fourth, CARB assumed a fuel price of only \$1.74 to determine cost-effectiveness of the technologies.

To support CARB's analysis, engineers at the Union of Concerned Scientists (UCS) have demonstrated that large emission reductions are possible using technology available today at a net savings to consumers. The UCS Vanguard minivan incorporates E85 flex fuel, stoichiometric direct injection, dual cam phasing, turbocharging, automated manual transmission, electric power steering, an improved efficiency alternator and an improved efficiency low leak air conditioner. Changes added \$299 to the purchase price, but resulted in a lifetime consumer savings of \$1,333 and reduced global warming emissions by 43 percent.

A number of vehicles currently on the market take advantage of the Vanguard's technologies. The Dodge Durango, Chevrolet Impala and GMC Sierra, for example, use flex fuel technology. The Chevrolet Tahoe, Pontiac Grand Prix and Jeep Commander use cylinder deactivation. The Chevrolet Silverado, Dodge Ram, GMC Sierra, Jeep Cherokee, Saturn Ion and Volkswagen Jetta, for example, use stoichiometric direct injection. The Dodge Ram, GMC Sierra and Volkswagen Jetta, for example, use turbocharging. The Volkswagen Jetta also uses automatic manual transmission. A number of vehicles use 6 speed transmissions, including the Chevrolet Silverado, Mercury Milan, GMC Yukon, Toyota Camry and the Ford Explorer. The Acura NSX and most Fiats use electric power steering. These are just some examples; there are more.

Beyond this, automakers—regardless of the Clean Cars Program—will need to produce cleaner cars to comply with standards in other countries. Nine major regions (United States, European Union, Japan, Canada, Australia, China, South Korea, Taiwan and California) around the world have implemented or proposed various fuel economy and greenhouse gas emission standards. The European Union and Japan have the most stringent standards in the world. When the California greenhouse gas standards go into effect, they will narrow the gap between the United States and European standards, but the California standards would still be less stringent.

This and the fact that Honda produces 18 percent less heat trapping gas emissions than the other major automakers is evidence that automakers can produce vehicles with significantly less emissions, and in fact, already are.

Finally, in its recent Opinion and Order, the Vermont District court spent considerable time analyzing the modeling, technologies and costs utilized by both proponents and opponents of the program. Thomas Austin, a senior partner at Sierra Research, an industry expert at the hearings contended that no manufacturer could meet the Clean Car standards without the use of a large percentage of hybrids and even considering that, three manufacturers—Ford, General Motors and DaimlerChrysler—would find it so costly that they would need to become truck-only companies in Clean Car states (seemingly contradicting other industry concerns that the standards would reduce availability of trucks and SUVs). Austin estimated that the standards would add between \$2,500 and \$4,500 to the cost of vehicles.

The Court found that Austin neglected to include many currently available and cost-effective technologies in his analysis, such as gasoline direct injection/turbo, camless valve actuation, rolling resistance improvements, reducing aerodynamic drag, continuously variable transmission and electronic power steering, making his estimates unreliable.

The Court wrote, “[Austin] eliminated several low-cost technologies from his analysis. In addition, some technologies excluded from his analysis as not cost-effective are nonetheless being used in increasing numbers independent of any attempt to comply with the regulations... Overall, a major flaw in Austin’s analysis, and Plaintiffs’ case, is his failure to justify the technologies and fuel that seem... to offer the most viable means currently to achieve reductions in greenhouse gas emissions.” **Please refer to Exhibit 31 (Vermont Opinion and Order, Pgs. 140-202; Quote from Pg. 187).**

Conclusion

In conclusion, the Clean Cars Program offers many distinct benefits to the state of New Mexico.

The Clean Cars Program, in contrast to federal standards, will promote the development of advanced technology vehicles, ensuring that each new generation of vehicles is cleaner and more efficient than its predecessor.

Perhaps most importantly, the program would achieve significant reductions in global warming emissions.

The twelve states that have adopted the Clean Cars Program will cut global warming pollution from cars, light trucks and SUVs by 74 million metric tons per year in 2020. Cumulative global warming emission reductions from the program for those twelve states between 2009 and 2020 is 392 million metric tons, the equivalent of taking 74 million of today's cars off the road for one year. Environment New Mexico conservatively estimates that New Mexico alone could reduce its carbon dioxide emissions by 1.4 million metric tons or 12.3 percent by 2020 compared to projected emissions.

Although we'll hear that we should delay adoption and slow down this process, the Clean Cars Program has been studied extensively. There are thousands of pages of research that are relevant to New Mexico. New Mexico, itself, has been studying the program since the beginning of the Governor's Climate Change Advisory Group (CCAG) process. The CCAG stakeholders voted unanimously in support of the program in October 2006. The regulations drafted by the New Mexico Environment Department and the Albuquerque Air Quality Division are sound and well put together.

Global warming is an urgent and pressing problem deserving immediate attention; New Mexico should not wait another model year to begin to reduce its emissions from the transportation sector. Each year's production of vehicles at the current pollution standard really means ten or more years of pollution locked in at those levels.

Automakers have already invested in research and production facilities necessary to comply with Clean Cars Program standards in other states, which represent nearly 36 percent of the national vehicle market.

In the end, New Mexico has a choice. We can take action now to reduce our greenhouse gas emissions to the level scientists say we need to, by implementing policies like the Clean Cars Program, or we can choose a course of inaction, leaving our citizens at risk in the future as temperatures rise.

I strongly encourage the Boards to support the New Mexico Environment Department and Albuquerque Air Quality Division regulations and all three parts of the Clean Cars Program.

Ketcham's direct testimony will take about 2 hours. Ketcham's direct testimony will utilize and reference the following materials (attached to this notice on compact disc):

Exhibit 19: ENM Clean Cars Economic Report (Lauren Ketcham, *Dollars and Sense: The Economic Impacts of Adopting a Clean Cars Program in New Mexico*, Environment New Mexico Research & Policy Center, October 2007)

Exhibit 20: ENM Ready to Roll (Lauren Ketcham and Elizabeth Ridlington, *Ready to Roll: The Benefits of Today's Advanced-Technology Vehicles for New Mexico*, Environment New Mexico Research & Policy Center, Spring 2007)

Exhibit 21: ENM Clean Cars National (Elizabeth Ridlington and Rob Sargent, *The Clean Cars Program: How States are Driving Cuts in Global Warming Pollution*, Environment New Mexico Research & Policy Center, May 2007)

Exhibit 22: CV for Lauren Ketcham

Exhibit 23: Cleaner Cars Cleaner Air (Elizabeth Ridlington, Tony Dutzik and Brad Heavner, *Cleaner Cars, Cleaner Air: How Low Emission Vehicle Standards Can Cut Air Pollution in Maryland*, MaryPIRG Foundation, February 2005)

Exhibit 24: PA DEP LEV II (Kathleen A. McGinty, *Secretary of the Department of Environmental Protection on Pennsylvania Clean Vehicle Program Before the House Environmental Resource and Energy Committee*, February 2006, <http://www.depweb.state.pa.us/dep/cwp/view.asp?a=3&q=487616>)

Exhibit 25: AB 1493 (California Assembly Bill 1493)

Exhibit 26: CARB ISOR (California Environmental Protection Agency Air Resources Board, *Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Public Hearing to Consider Adoption of Regulations to Control Greenhouse Gas Emissions from Motor Vehicles*, August 2004)

Exhibit 27: CARB Addendum ISOR (California Environmental Protection Agency Air Resources Board, Addendum Presenting and Describing Revisions to *Staff Report: Initial Statement of Reasons for Proposed Rulemaking, Public Hearing to Consider Adoption of Regulations to Control Greenhouse Gas Emissions from Motor Vehicles*, August 2004)

Exhibit 28: Meszler Power Point (Dan Meszler, Meszler Engineering Services, *Greenhouse Gas Emission Standards for Vehicles: An Overview of California's Pavley Requirements*, April 2005)

Exhibit 29: NRDC Cost of Compliance (Roland Hwang, *Cost of Motor Vehicle Pollution Control: Estimated vs. Actual*, Natural Resources Defense Council)

Exhibit 30: CARB FSOR (California Environmental Protection Agency Air Resources Board, *Regulations to Control Greenhouse Gas Emissions from Motor Vehicles: Final Statement of Reasons*, August 2005)

Exhibit 31: Vermont Opinion and Order (United States District Court for the District of Vermont, Opinion and Order, Case No: 2:05-cv-302)

Exhibit 32: AAM Light Truck Country (Alliance of Automobile Manufacturers, *Light Truck Country*, 2004)

III. REDIRECT, REBUTTAL AND PUBLIC TESTIMONY

The Clean Air Advocacy Groups reserve the right: to offer testimony and evidence upon redirect of its witnesses in response to cross examination; to call any person and offer exhibits to respond to or rebut the testimony or exhibits offered by any other person; and to have staff, members or consultants of the Clean Air Advocacy Groups present public testimony.

Respectfully submitted this ____ day of November, 2007,

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