State of California
AIR RESOURCES BOARD

Resolution 82-24

May 27, 1982

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705;

WHEREAS, a request for budget augmentation of a research study, contract AQ-079-32, entitled "Correlative and Sensitive Discriminants for Air Quality Control" has been submitted by Professional Staff Association of Los Angeles County, University of Southern California Medical Center to the Air Resources Board; and

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 954-79(a) entitled "Correlative and Sensitive Discriminants for Air Quality Control", submitted by Professional Staff Association of Los Angeles County, University of Southern California Medical Center, for a total amount not to exceed $8,255;

WHEREAS, the Governor's Executive Order B97-82 has prevented the Executive Officer from awarding a number of research contracts already approved for funding by the Board during FY 81-82;

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1107-90 entitled "Correlative and Sensitive Discriminants for Air Quality Control", submitted by Professional Staff Association of Los Angeles County, University of Southern California Medical Center, for a total amount not to exceed $8,255;

I certify that the above is a true and correct copy of Resolution 82-24, as as passed by the Air Resources Board.

Harold S. S. Holmes Jr.
Board Secretary

State of California
AIR RESOURCES BOARD

ITEM NO: 82-11-2b(1)
DATE: May 27, 1982

ITEM: Research Proposal No. 954-79 (a) entitled Correlative and Sensitive Discriminants for Air Quality Control

RECOMMENDATION: Adopt Resolution 82-24 approving Research Proposal No. 954-79 (a) for funding in an amount not to exceed $8,255.

SUMMARY:

The purpose of the study for which augmentation is requested is to investigate 1) alveolar cell changes after inhalation of ozone alone and an ozone-NO_2 combination and 2) the reversibility of alveolar cell damage after intermittent NO_2 exposure. The investigator is completing the second group of experiments in which newborn mice were exposed to 0.3 ppm NO_2 for 12 weeks and sacrificed at intervals of 4, 10, 20 and 32 weeks after exposure. These studies involve the removal, sectioning and examination of lung tissue for reversibility of Type 2 cell changes as well as air space measurement. The study is uniquely suited to delineate the implications of long-term air pollution exposures. The request for augmentation is necessitated by unexpected cost increases.

The investigator requests additional money to cover increased daily maintenance costs of the experimental animals and to provide service contracts for equipment essential to the experiment. The largest amount of money requested is for animal care and chamber maintenance which nearly doubled in cost to $14,154.00 (only $7,349.00 was originally budgeted). This unexpected increase left the investigator with a deficit of $6,805.00. The remaining $1,450.89 is requested to cover service contracts for routine preventive maintenance of the Quantimet (image analyzer), computer terminal, spectrophotometer and telephone answering machine. These costs were to have been borne by other funding sources that have been depleted. They are intensively employed in this study. Staff views this as a valuable effort, one that justifies this small augmentation.

BE IT FURTHER RESOLVED, that should the prohibition on awarding new contracts contained in the Governor's Executive Order B97-82 be partially removed so that some portion, but less than the full amount, of the remaining 1981-82 extramural research funds is made available for expenditure by the Board, the staff is directed to present to the Board the recommendations of the Research Screening Committee regarding which of the projects already approved are to be supported with those funds; and

BE IT FURTHER RESOLVED, that, should the prohibition in awarding new contracts contained in Executive Order B97-82 be removed in its entirety, the Executive Officer is authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $8,255.

State of California
AIR RESOURCES BOARD

Resolution 82-25

May 27, 1982

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705;

WHEREAS, a solicited research Proposal Number 1125-91 entitled "Formaldehyde: A Survey of Airborne Concentrations and Sources", has been submitted by Science Applications, Inc., to the Air Resources Board; and

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1125-91 entitled "Formaldehyde: A Survey of Airborne Concentrations and Sources", submitted by Science Applications, Inc., for a total amount not to exceed $174,519; and

WHEREAS, the Governor's Executive Order B97-82 has prevented the Executive Officer from awarding a number of research contracts already approved for funding by the Board during FY 81-82;

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1125-91 entitled "Formaldehyde: A Survey of Airborne Concentrations and Sources", submitted by Science Applications, Inc., for a total amount not to exceed $174,519; and

BE IT FURTHER RESOLVED, that should the prohibition on awarding new contracts contained in the Governor's Executive Order B97-82 be partially removed so that some portion, but less than the full amount, of the remaining 1981-82 extramural research funds is made available for expenditure by the Board, the staff is directed to present to the Board the recommendations of the Research Screening Committee regarding which of the projects already approved are to be supported with those funds; and

BE IT FURTHER RESOLVED, that, should the prohibition in awarding new contracts contained in Executive Order B97-82 be removed in its entirety, the Executive Officer is authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein in an amount not to exceed $174,519.

STATE OF CALIFORNIA
AIR RESOURCES BOARD

ITEM: 82-11-2b(2)
DATE: May 27, 1982

ITEM: Research Proposal entitled "Formaldehyde: A Survey of Airborne Concentrations and Sources"

RECOMMENDATIONS: Adopt Resolution 82-25 approving Research Proposal 1125-91 for funding not to exceed $174,519.

SUMMARY: This research project is a continuation of a program initiated by the Research Division to inventory and quantify the carcinogens of greatest potential concern as pollutants in the ambient air in California.

Recent studies from both the Chemical Industry Institute of Toxicology (CIIT) and the Institute of Environmental Medicine, New York University, have found evidence of nasal cancer in rats exposed to concentrations of formaldehyde. The California Department of Health Services (DOHS) has estimated that the formaldehyde exposure level, at which 40% of the rat test population developed nasal cancer is only five times the current maximum allowable worker exposure concentration in California. These results underscore the urgent need for a reliable inventory of formaldehyde emissions and the assessment of population exposure.

The contractor will inventory formaldehyde emissions from point, area, and residual/fugitive sources and estimate ambient concentrations using data culled from validated published and unpublished literature. Using these data the contractor will identify the most probable sources of formaldehyde emissions to the ambient air and rank these in order of probable average emissions. The contractor will quantify formaldehyde emissions from those sources for which data may be lacking or considered deficient, researching analytical methods for sampling and assaying the emissions from those sources.

The objectives of this research project are to measure and to inventory formaldehyde emissions from stationary, area and fugitive/residual sources and to establish worst-case ambient concentrations in a representative cross section of California locations. Areas with high concentrations of

formaldehyde and a small exposed population, as well as areas with low concentration of formaldehyde and a large exposed population, are to be included in the study. In addition, since considerable levels of exposure to formaldehyde have been found in residences and elsewhere indoors, the contractor also will quantify fugitive/residual concentrations and emissions in the indoor environment under a range of conditions including but not limited to residential and commercial settings.

State of California
AIR RESOURCES BOARD

Resolution 82-26
May 27, 1982

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705;

WHEREAS, a solicited research Proposal Number 1129-92 entitled "Diagnosis of Emission Control Component Malfunctions on Catalyst Equipped Motor Vehicles" has been submitted by Energy and Environmental Analysis, Inc. for an amount not to exceed $120,725;

WHEREAS, the Research staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1129-92 entitled "Diagnosis of Emission Control Component Malfunctions on Catalyst Equipped Motor Vehicles" submitted by Energy and Environmental Analysis, Inc. for an amount not to exceed $120,725;

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1129-92 entitled "Diagnosis of Emission Control Component Malfunctions on Catalyst Equipped Motor Vehicles" submitted by Energy and Environmental Analysis, Inc. for an amount not to exceed $120,725;

BE IT FURTHER RESOLVED, that the Executive Officer shall initiate administrative procedures and shall execute all necessary documents and contracts for the research effort proposed in an amount not to exceed $120,725.

I certify that the above is a true and correct copy of Resolution 82-26 as passed by the Air Resources Board.

Harold Holmes
Board, Secretary

State of California

AIR RESOURCES BOARD

ITEM NO.:
DATE: May 27, 1982

ITEM: Research Proposal 1129-92 entitled "Diagnosis of Emission Control Component Malfunctions on Catalyst-Equipped Motor Vehicles"

RECOMMENDATION: Adopt Resolution 82-26, approving Research Proposal 1129-92 for funding in an amount not to exceed $120,725.

SUMMARY: The introduction of electronic emission controls on many post-1979 domestic vehicles brought about a major change in the cause of high vehicular emission and the methods required to identify and correct malfunctions in most high emitting vehicles. Maintenance of 1975-1980 model year vehicles consisted primarily of readjusting idle setting to the manufacturer's specifications. Maintenance of many post-1979 vehicles will consist primarily of replacing malfunctioning or defective components. Furthermore, in later model year vehicles the failure modes induced by some defective components cannot be identified by the idle exhaust measurements presently used in inspection and maintenance (I/M) programs.

The objective of this study is to develop simple standardized diagnostic procedures to be used by service industry mechanics for detecting malfunctions of each of the contemporary emission control system components (air pumps, exhaust gas recirculation systems, oxidation and three-way catalyst systems, including electronic microprocessors, sensors and actuators) without the need for extensive training or use of specialized diagnostic equipment.

In the first phase of the study, emission control technologies will be organized into groups having common components and diagnostics. Malfunction/emission control technology combinations will be ranked according to emissions impact and the automobile manufacturer's recommended diagnostic procedures will be organized into a matrix of common procedures. On site interviews will be

conducted with mechanics at 60 repair facilities (dealerships, chain and independent), to determine the diagnostic equipment and procedures used by field mechanics for identifying emission control component malfunctions. The recommended procedures will be organized into an iterative framework. Initially, a preliminary diagnosis will be made based upon idle emissions measurements, visual inspection, and owner complaints regarding driveability. Second, the mechanic will be directed to the appropriate detailed prcedures for diagnosis of the secondary air, EGR, fuel, and catalyst systems. Separate chemical tests will be developed for evaluating catalyst operation.

The newly developed procedures will be validated in the second phase of the study after ARB review and approval. This phase will consist of three parts: pretest, training of mechanics and validation. The pretest will involve four cars that will be disabled by EEA and sent to one experienced mechanic. The proposed diagnostic procedures and the training program will be modified based on the reactions of the mechanics and the observations of EEA engineers. Following this pretest, five journeymen mechanics with varying experience will be selected in the SCAB area. After a short training course each mechanic will diagnose ten vehicles that have been intentionally disabled. Final validation will consist of analysis and documentation of results from testing of the trained mechanics.

State of California
AIR RESOURCES BOARD

Resolution 82-27
May 27, 1982

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705;

WHEREAS, an unsolicited research Proposal Number 1135-92 entitled "Characterization of Reactants, Reaction Mechanisms and Reaction Products in Atmospheric Water Droplets: Fog, Cloud, Dew and Rain Water Chemistry" has been submitted by the California Institute of Technology for an amount not to exceed $404,130;

WHEREAS, the Research staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1135-92 entitled, "Characterization of Reactants, Reaction Mechanisms and Reaction Products in Atmospheric Water Droplets: Fog, Dew and Rain Water Chemistry" submitted by the California Institute of Technology, for a total amount not to exceed $404,130;

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1135-92 entitled, "Characterization of Reactants, Reaction Mechanisms and Reaction Products in Atmospheric Water Droplets: Fog, Dew and Rain Water Chemistry" submitted by the California Institute of Technology, for a total amount not to exceed $404,130;

BE IT FURTHER RESOLVED, that the Executive Officer shall initiate administrative procedures and shall execute all necessary documents and contracts for the research effort proposed in an amount not to exceed $404,130.

I certify that the above is a true and correct copy of Resolution 82-27 as passed by the Air Resources Board.

Harold Holmes
Board, Secretary

ITEM NO.:
DATE: May 27, 1982

ITEM: Research Proposal No. 1135-92 entitled "Characterization of Reactants, Reaction Mechanisms and Reaction Products in Atmospheric Water Droplets: Fog, Cloud, Dew and Rain Water Chemistry"

RECOMMENDATION: Adopt Resolution 82-27 approving Proposal No. 1135-92 for funding in an amount not to exceed $404,130

SUMMARY: Fog water collected in Los Angeles and Bakersfield has been found to have higher concentrations of major chemical species than previously observed in atmospheric water droplets. The level of pH values found thus far has been in the range of 2.20 to 5.78, with values about pH 3 most common. The extreme pH value of an individual fog water sample from Upland, 2.20, is more than 2500 times more acidic than "background" CO_2 equilibrium solubility in pure water. The chemistry of fog water at the several locations sampled to date, has tended to reflect available emissions inventory data for the respective air basins.

Major objectives of this project are to: 1) explain the mechanisms for the incorporation of chemical species into atmospheric water droplets; 2) determine relationships between fog and smog-derived aerosol in the South Coast Air Basin; 3) monitor fog, rain, and cloud water and pollution precursors in various California locations; 4) develop and calibrate fog and dew collectors and atmospheric liquid water content devices; 5) develop physical thermodynamic and kinetic models for fog, cloud and rain water chemistry.

During this two-year study, ground-based sampling will be carried out during conditions appropriate for fog and dew formation in several California locations such as the South Coast Air Basin, Bakersfield, San Francisco, San Nicolas Island and San Diego. Previously developed fog water collectors will be employed in the study, and new dew collection devices will be fabricated. Acid precursors will be measured before, during and after fog episodes in order to provide information on the oxidation of nitrogen and sulfur oxides and their incorporation into atmospheric water droplets.

This work will help the ARB to elucidate mechanisms for the formation of acid precipitation and acidic aerosols in the atmosphere. The research will enable quantitation of the flux of atmospheric acidity by rainfall, fog and dews in the South Coast Air Basin. The results from this study will assist the Board and the districts in developing plans to avoid potential damage from acid precipitation and atmospheric acidity.

State of California
AIR RESOURCES BOARD

Resolution 82-28
May 27, 1982

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705;

WHEREAS, an unsolicited research Proposal Number 1137-92 entitled "Identification of Particulate Mutagens in California" has been submitted by the University of California, Riverside for an amount not to exceed $169,484;

WHEREAS, the Research staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1137-92 entitled, "Identification of Particulate Mutagens in California" submitted by the University of California, Riverside, for a total amount not to exceed $169,484;

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1137-92 entitled, "Identification of Particulate Mutagens in California" submitted by the University of California, Riverside, for a total amount not to exceed $169,484;

BE IT FURTHER RESOLVED, that the Executive Officer shall initiate administrative procedures and shall execute all necessary documents and contracts for the research effort proposed in an amount not to exceed $169,484.

I certify that the above is a true and correct copy of Resolution 82-28 as passed by the Air Resources Board.

Harold Holmes
Board, Secretary

ITEM NO.:
DATE: May 27, 1982

ITEM: Research Proposal No. 1137-92 entitled "Identification of Particulate Mutagens in California"

RECOMMENDATION: Adopt Resolution 82-28 approving Proposal No. 1137-92 for funding in an amount not to exceed $169,484.

SUMMARY: Previous studies by this investigator have shown that mutagenic and carcinogenic chemicals are present in the urban atmosphere in California. This has raised concerns as to potential adverse effects of these chemicals on the health of the general public. Unfortunately, there is now little information available on the sources, ambient levels, and chemical composition of these potentially harmful chemicals. In the absence of this information, it is impossible to assess reliably the risks to the general public and to specified populations having an elevated incidence of cancers which may be linked to atmospheric pollutants.

The proposed study is a logical extension of current research into the chemical nature of particulate atmosperic mutagens in California's South Coast Air Basin and would complement studies of the mutagenicity of ambient aerosols in Contra Costa County in northern California.

The first objective of the study would include a broadened search for specific mutagenic compounds, including nitroarenes and lactones, using state-of-the-art analytical and isolation techniques.

The second objective would include simultaneous twenty-four hour sampling with three-hour resolution at two sites. One site would be close to a heavily-travelled freeway and the other site would be removed from local sources of particle emissions. The collected samples would be assayed for mutagenicity, lead and elemental carbon. This information will be used to determine the exposure of several million freeway commuters to primary freeway aerosol emissions. In addition, the aerosol signatures would be compared at the two sites to determine the mutagenicity changes that may occur during aerosol transport and aging.

The third objective is to establish the effect of long distance transport upon aerosol mutagenicity in the eastern portion of the South Coast Air Basin. In this experiment, suspended particulate matter would be sampled as it leaves

the Basin in a northerly, northeasterly or easterly direction, in an area where the injection of fresh primary aerosols is low. The changes in mutagenic loading thus should reflect whether mutagenic aerosols are created, destroyed, or remain constant during longer transport regimes in polluted urban atmospheres.

The proposed research is needed to provide to the ARB, to the Department of Health, and to others concerned with air pollution risks to public health, detailed chemical characterizations of atmopheric mutagens, including quantitative information necessary for risk assessment.

State of California
AIR RESOURCES BOARD

Resolution 82-29
May 27, 1982

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705;

WHEREAS, a solicited research Proposal Number 1148-92 entitled "Air Pollution Studies on Ozone and Sulfur Dioxide", has been submitted by the University of California at San Francisco, to the Air Resources Board; and

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1148-92 entitled "Air Pollution Studies on Ozone and Sulfur Dioxide", submitted by the University of California at San Francisco, for a total amount not to exceed $107,246;

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1148-92 entitled "Air Pollution Studies on Ozone and Sulfur Dioxide", submitted by University of California at San Francisco, for a total amount not to exceed $107,246;

BE IT FURTHER RESOLVED, that the Executive Officer shall initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed in an amount not to exceed $107,246.

I certify that the above is a true and correct copy of Resolution 82-29 as passed by the Air Resources Board.

Harold Holmes
Board, Secretary

State of California
AIR RESOURCES BOARD

ITEM NO: 82-29
DATE: May 27, 1982

ITEM: Research Proposal No. 1148-92 entitled "Air Pollution Studies on Ozone and Sulfur Dioxide".

RECOMMENDATION: Adopt Resolution 82-29 approving Research Proposal No. 1148-92 for funding in an amount not to exceed $107,246.

SUMMARY: Sulfur dioxide has long been known to affect adversely the human respiratory system. Persons with existing lung diseases appear to be most sensitive to this pollutant. The proponent has been pursuing research with low levels of SO_2 employing normal and asthmatic subjects. Work to date has produced some striking findings that have raised questions regarding the adequacy of the protection provided by current SO_2 standards. These key results have been obtained in asymptomatic asthma subjects performing light exercise. Ten minute exposures employing as low as 0.1 ppm SO_2 produced significant bronchoconstriction in two asthmatics and 0.25 ppm resulted in a significant bronchoconstriction for a small group of asthmatics.

Animal studies have also been underway for many years at UCSF to determine the mechanisms that produce bronchoconstriction. The results of this work with both ozone and SO_2 have contributed greatly to our knowledge of bronchoconstriction. Dr. Nadel has employed dogs for many of these experiments and had done so in a fashion that is painless to the animals.

The proponent recently received (Feb. 82) RSC approval to carry out studies of how subjects with more severe asthma respond to low-level SO_2 exposures, how higher levels of exercise enhance the effects of a given SO_2 exposures i.e., face mask, mouthpiece or open chamber.

The investigators are at the forefront of the SO_2 controversy. The results of their studies, done under ARB funding, have stirred the scientific and regulatory communities. Several new and important aspects of the SO_2 broncho constriction are now identified for study and are the subject of this proposal. The ideas are important extensions of what has been completed or is planned for the near future. In addition to human studies, animal studies are proposed to help explain the nature of hyper-reactivity through the study of cell changes and inflammation. The specific cells observed after inflammation are called

neutrophils. Such cellular influx is a common factor in inflammation-induced asthma. Inflammation can be induced by respiratory infection and by SO_2 and ozone. These pilot studies also indicate a link between inflammation of airways and hyperactivity. ?

Two main study areas are proposed. The first and largest consists of human exposure studies to determine the implications of combines low humidity, cold air and SO_2 ? protocols on the bronchoconstriction response in asthmatics. Previous studies have carefully avoided the effects of cold dry air on the bronchoconstriction response, since the factors can induce asthma attacks in many subjects. Warm humidified air is often provided for subjects to breathe. This procedure may well impose artificial conditions that prevent the observation of asthma responses at even lower SO_2 levels than seen at present. Cold, dry air conditions are, of course, common in ordinary environments.

The second study group consists of protocols designed to clarify the mechanisms that elicit hyperreactivity, a dominant characteristic of asthmatics. Hyperreactivity is a condition where many common agents such as cold, allergens, irritants (ozone, SO_2, etc.) induce bronchoconstrictions while in the absences of these agents, no such responses are seen. Recent findings have shed considerable light on what may be an underlying factor to explain hyperreactivity. Further studies are needed to understand more completely how these agents cause the asthma response.

State of California
AIR RESOURCES BOARD

Resolution 82-30
May 27, 1982

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705;

WHEREAS, a solicited research Proposal Number 1138-92 entitled "Health Effects from the Inhalation of Oxidant Air Pollutants as Related to the Immune System", has been submitted by University of California, Davis, to the Air Resources Board; and

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1138-92 entitled "Health Effects from the Inhalation of Oxidant Air Pollutants as Related to the Immune System", submitted by University of California, Davis, for a total amount not to exceed $105,843;

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1138-92 entitled "Health Effects from the Inhalation of Oxidant Air Pollutants as Related to the Immune System", submitted by University of California, Davis, for a total amount not to exceed $105,843;

BE IT FURTHER RESOLVED, that the Executive Officer shall initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed in an amount not to exceed $105,843.

I certify that the above is a true and correct copy of Resolution 82-30 as passed by the Air Resources Board.

Harold Holmes
Board, Secretary

State of California
AIR RESOURCES BOARD

ITEM NO:
DATE: May 27, 1982

ITEM: Research Proposal No. 1138-92 entitled "Health Effects from the Inhalation of Oxidant Air Pollutants as Related to the Immune System"

RECOMMENDATION: Adopt Resolution 82-30 approving Research Proposal No. 1138-92 for funding in an amount not to exceed $105,843.

SUMMARY:

Ozone is a powerful oxidizing agent which damages the membranes of epithelial cells that line the respiratory tract. These membranes provide an effective barrier to the entrance of antigens or foreign substances from the air into the body. When the integrity of these membranes is lost, leakage of antigens or other substances into the under lying tissues of the respiratory tract can occur. This may cause an immunological response of increased antibody production against the foreign substance. In fact, injury to the tissue of the respiratory system can be assessed by the response of the immune system. The lung produces antibodies upon exposure to antigens and they can be classified into four distinct groups - IgM, IgG, IgA, and IgE.

This investigator was the first to provide proof that immunological activity is increased upon exposure to ozone. His group has used mice for their experimental model, since immunological mechanisms have been thoroughly studied in the mouse and knowledge of the immune responses of man has been derived from studies using this animal. They observed that concentrations of ozone as low as 0.16 ppm caused immunological changes in the lungs of mice, changes manifested by elevated amounts of IgA antibodies, IgA producing cells, and accumulations of new lymphoid tissue in the airways. IgA antibodies are also called "secretary antibodies" because they are found in lung secretions, they are produced by the cells that line the respiratory tract and they function to neutralize viruses.

IgE is an antibody which is responsible for asthma. After stimulation with an antigen, IgE is synthesized by cells which line the respiratory tract and are "fixed" to mast cells which then become "sensitized" to the allergen. The

investigator has found that ozone can increase the allergic response to obalbumin by increasing the amount of cells that produce IgE by 34.2 fold. Furthermore, if mice are dosed with an inactivated proparation of Bordetella pertussis (whooping cough bacteria), the IgE-antibody response after continuous ozone inhalation is exaggerated. The investigator has observed that this can occur at concentrations of ozone as low as 0.1 ppm. Since many individuals are exposed to this bacterium either during pediatric immunization or via the ambient air, the investigator proposed to lower the ozone exposure concentration to 0.07 ppm and repeat the experiment in order to establish a threshold for increases in the IgE allergic reaction to inhalation of this bacterium.

The protocol of previous experiments utilized a continuous inhalation of 0.16 ppm ozone for a period of 10 days before administration of the allergen. Under these conditions, the animals showed an increased allergic response. Since human exposure to ozone is not continuous but intermittent, a more realistic exposure is suggested. The investigator proposes to study the effects of alternate and intermittent ozone and filtered air exposure on the sensitization to ovalbumin.

Finally, ozone can also change the pattern of defenses against an infecting virus. Fatal influenza infections have been observed by the investigator to be less frequent in mice breathing 0.4 ppm and 0.64 ppm ozone than those breathing ambient air. The investigator by hypothesized that this resulted from inactivation of virus with continuous high ozone concentrations. The edema which results from a viral infection is believed to have an important role in the death of mice infected by influenza. Since ozone also causes edema the investigators propose to conduct an experiment on the effects of lower concentration of ozone administered after the virus on the progression of the infection. The RSC recommended approval of this proposal to allow for completion of this multi-year project.

State of California
AIR RESOURCES BOARD

Resolution 82-31
May 27, 1982

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705;

WHEREAS, a solicited research Proposal Number 1149-92 entitled "The Effect of Heavy, Sustained Exercise in Combination with Low Levels of O_3 Concentration in Inducing Acute Pulmonary Function Impairment in Humans: Interaction of Ambient Heat and Multiple Pollutant Exposures", has been submitted by the University of California, Davis, to the Air Resources Board; and

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1149-92 entitled, "The Effect of Heavy, Sustained Exercise in Combination with Low Levels of O_3 Concentration in Inducing Acute Pulmonary Function Impairment in Humans: Interaction of Ambient Heat and Multiple Pollutant Exposures", submitted by University of California, Davis, for a total amount not to exceed $118,787;

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1149-92 entitled "The Effect of Heavy, Sustained Exercise in Combination with Low Levels of O_3 Concentration in Inducing Acute Pulmonary Function Impairment in Humans: Interaction of Ambient Heat and Multiple Pollutant Exposures", submitted by University of California, Davis, for a total amount not to exceed $118,787;

BE IT FURTHER RESOLVED, that the Executive Officer shall initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed in an amount not to exceed $118,787.

I certify that the above is a true and correct copy of Resolution 82-31 as passed by the Air Resources Board.

Harold Holmes
Board, Secretary

State of California
AIR RESOURCES BOARD

ITEM NO: 82-31
DATE: May 27, 1982

ITEM: Research Proposal No. 1149-92 entitled "The Effect of Heavy, Sustained Exercise in Combination with Low Levels of O_3 Concentration in Inducing Acute Pulmonary Function Impairment in Humans: Interaction of Ambient Heat and Multiple Pollutant Exposures"

RECOMMENDATION: Adopt Resolution 82-31 approving Research Proposal No. 1149-92 for funding in an amount not to exceed $118,787.

SUMMARY:

Very limited information is available on the effects of ozone on pulmonary function (PF) during exercise. Exercise changes the ventilatory pattern and increases the total amount of ventilation to meet elevated metabolic demands. Therefore, during exercise, the amount of ozone inhaled also increases, thus enhancing the adverse effects. Many persons whose occupations require vigorous physical activity are thus subject to elevated ozone inhalation. In addition, the trend to vigorous outdoor exercise in recreation has stimulated a more complete knowledge of ozone effects during exercise, as needed for reviewing our ambient air quality standards.

Most of the knowledge of ozone and exercise effects has come from studies on young adult males exposed at room temperature. There is an absence of information on potentially more sensitive groups of the population, i.e., females and older individuals. Furthermore, episodes of high ozone levels are generally accompanied by high ambient temperature on pulmonary function is of relevant application in light of the Olympics planned for the summer of 1984 in Los Angeles. Athletic and other exercise activities are also common in the high ozone areas, such as Los Angeles.

The air of populated areas contains, in addition to ozone, nitrogen dioxide, carbon monoxide and other compounds. The effects of a combination of ozone and these other air pollutants on pulmonary function during exercise are essentially unknown and relevant to an understanding of air pollution effects on the general population.

The investigator proposes a series of experiments to study the effects of ozone on pulmonary function during exercise in males and females and in combination with heat stress, carbon monoxide and nitrogen dioxide. Funds will also be provided to upgrade the investigators facilities to allow for future studies that could be carried out using multiple pollutants.

State of California
AIR RESOURCES BOARD

Resolution 82-32
May 27, 1982

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705;

WHEREAS, an unsolicited research Proposal Number 1139-92 entitled "Determination of Acidity in Ambient Air" has been submitted by the Air and Industrial Hygiene Laboratory, California Department of Health Services to the Air Resources Board for an amount not to exceed $291,222;

WHEREAS, the Research staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1139-92 entitled "Determination of Acidity in Ambient Air" submitted by the Air and Industrial Hygiene Laboratory, California Department of Health Services, for a total amount not to exceed $291,222;

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1139-92 entitled "Determination of Acidity in Ambient Air" submitted by the Air and Industrial Hygiene Laboratory, California Department of Health Services, for a total amount not to exceed $291,222.

BE IT FURTHER RESOLVED, that the Executive Officer shall initiate administrative procedures and shall execute all necessary documents and contracts for the research effort proposed in an amount not to exceed $291,222.

I certify that the above is a true and correct copy of Resolution 82-32 as passed by the Air Resources Board.

Harold Holmes
Board, Secretary

ITEM NO.:
DATE: May 27, 1982

ITEM: Research Proposal No. 1139-92 entitled "Determination of Acidity in Ambient Air"

RECOMMENDATION: Adopt Resolution 82-32 approving Proposal No. 1139-92 for funding in an amount not to exceed $291,222.

SUMMARY: Efforts to elucidate the causes and levels of acidity in the atmosphere have been frustrated by the lack of a fully satisfactory analytical technique(s) for determining the concentrations of sulfuric, nitric and hydrochloric acids in ambient air. In addition, several of the newly reported sampling techniques, while improved in accuracy, are labor intensive and sample analysis is extremely expensive. Atmospheric acidity is significant as a general class of air pollution for several reasons: as a health-related inhalation hazard, as a precursor of visibility-degrading particles, as a contributor to acid precipitation, and (acids formed from NOx emissions) as a nitrating agent in forming airborne mutagenic compounds.

The objectives of this proposed research project are to: 1) develop a continuous measurement technique for sulfuric acid which does not require filters; 2) develop a method for nearly real time measurement of nitric acid and ammonia, 3) evaluate techniques for the determination of ammonia and hydrochloric acid; 4) measure gaseous and aerosol acids and total particulate acidity in the South Coast Air Basin; and 5) assess the contribution of sulfuric, nitric and hydrochloric acids to aerosol total strong acidity.

A two-year study is proposed to develop and validate real time measurement techniques for atmospheric acidity. During the first eighteen months, sampler development and calibration will be performed under laboratory conditions, and the final six months of the project will be devoted to atmospheric sampling and analysis.

A major benefit of the work will be to provide a sampling technique(s) and chemical analyses for the sum of all the acidic species present in the Los Angeles atmosphere using up to date sampling and analytical capabilities. This information is needed to help establish a basis for evaluating and avoiding the adverse consequences of atmospheric acidity.

State of California
AIR RESOURCES BOARD

Resolution 82-33
May 27, 1982

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705;

WHEREAS, an unsolicited research Proposal Number 1140-92 entitled "Dry Acid Deposition on Materials and Vegetation: Particulate Concentrations in Ambient Air" has been submitted by the Air and Industrial Hygiene Laboratory, California Department of Health Services for an amount not to exceed $322,825;

WHEREAS, the Research staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1140-92 entitled, "Dry Acid Deposition on Materials and Vegetation: Particulate Concentrations in Ambient Air" submitted by the Air and Industrial Hygiene Laboratory, California Department of Health Services for a total amount not to exceed $322,825;

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1140-92 entitled, "Dry Acid Deposition on Materials and Vegetation: Particulate Concentrations in Ambient Air" submitted by the Air and Industrial Hygiene Laboratory, California Department of Health Services for a total amount not to exceed $322,825;

BE IT FURTHER RESOLVED, that the Executive Officer shall initiate administrative procedures and shall execute all necessary documents and contracts for the research effort proposed in an amount not to exceed $322,825.

I certify that the above is a true and correct copy of Resolution 82-33 as passed by the Air Resources Board.

Harold Holmes
Board, Secretary

ITEM NO.:
DATE: May 27, 1982

ITEM: Research Proposal No. 1140-92 entitled " Dry Acid Deposition on Materials and Vegetation: Particulate Concentrations in Ambient Air"

RECOMMENDATION: Adopt Resolution 82-33 approving Proposal No. 1140-92 for funding in an amount not to exceed $322,825.

SUMMARY: Acid precipitation has been linked to serious ecological damage in Scandinavia and the Northeast. Recent studies have documented the occurrence of acid rain in California. Nearly all studies to date have measured wet deposition, because dry deposition--that occurring in the absence of rain or snow--is difficult to measure. A recently released ARB report on acid deposition in California estimates that dry deposition of sulfate in Orange County was nearly five times larger in magnitude than the wet sulfate flux during a two-year period. Since rainfall occurs only 3.5 percent of the total time during an average year in Los Angeles, dry deposition may be the significant pathway for the flux of acidic materials in California. Moreover, dry deposition of acidic particles is expected to impart a strong, localized dose of acid to a receptor surface.

The objectives of this two-year research program are: 1) to investigate surface damage to various surface types resulting from acid deposition; 2) investigate dry acid deposition on plants; 3) develop and calibrate a technique for measuring the size distribution of ambient acidic particles. This study, which is the continuation of a study previously funded by the ARB, will provide important information on the magnitude and extent of the dry flux of acidic particles and gases in California. The proposed study also will increase our understanding of the formation and occurrence of atmospheric acidity. The data obtained during this study will enable the Board to develop standards and strategies to avoid potential damage.

State of California
AIR RESOURCES BOARD

Resolution 82-34
May 27, 1982

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705;

WHEREAS, an unsolicited research Proposal Number 1141-92 entitled "A New, Single Particle Approach to Source Identification and Apportionment: Particulate Matter Analysis by Electron Microscopy" has been submitted by the Air and Industrial Hygiene Laboratory, California Department of Health Services for an amount not to exceed $100,000;

WHEREAS, the Research staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1129-92 entitled, "A New, Single Particle Approach to Source Identification and Apportionment: Particulate Matter Analysis by Electron Microscopy" submitted by the Air and Industrial Hygiene Laboratory, California Department of Health Services for an amount not to exceed $100,000;

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1129-92 entitled, "A New, Single Particle Approach to Source Identification and Apportionment: Particulate Matter Analysis by Electron Microscopy" submitted by the Air and Industrial Hygiene Laboratory, California Department of Health Services for an amount not to exceed $100,000;

BE IT FURTHER RESOLVED, that the Executive Officer shall initiate administrative procedures and shall execute all necessary documents and contracts for the research effort proposed in an amount not to exceed $100,000.

I certify that the above is a true and correct copy of Resolution 82-34 as passed by the Air Resources Board.

Harold Holmes
Board, Secretary

ITEM NO.:
DATE: May 27, 1982

ITEM: Research Proposal No. 1141-92 entitled "A New, Single Particle Approach to Source Identification and Apportionment: Particulate Matter Analysis by Electron Microscopy"

RECOMMENDATION: Adopt Resolution 82-34 approving Proposal No. 1141-92 for funding in an amount not to exceed $100,000.

SUMMARY: In order to develop a cost-effective control strategy for reducing the concentrations of airborne particles, a thorough understanding of their multiple origins is necessary. This can be done by measurement and chemical analysis of particulate matter and precursors at sources and correspondingly detailed analysis of samples from receptor locations. Recent technological advances with computer controlled scanning electron microscopy and related analytical capabilities now make single particle identification and elemental analysis a computerized, rapid analytical tool. Accordingly, this technique can become a powerful aid in the development of source apportionment models, which relate ambient concentrations of particles at a receptor site to sources of airborne particles from pollution point sources.

In the first phase of this project, aerosol samples will be taken at a major primary particle emission source in the State. The samples will be subjected to automated particle analysis with the scanning electron microscope. Computer programs and statistical analysis capabilities will be developed for obtaining the emission source "fingerprint" from the source samples. In the project's second phase, airborne particle samples will be obtained at a receptor site downwind of the emission source whose particulate emissions were previously sampled. Source apportionment techniques will then be applied to determine the impact of that particular emission source on the ambient aerosol composition at the designated receptor site.

This study is needed to assist the ARB and local districts in developing cost-effective control strategies for primary particle emissions which are a major contributor to excessive particulate concentrations in California's highly polluted urban areas.

State of California
AIR RESOURCES BOARD

Resolution 82-35
May 27, 1982

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705;

WHEREAS, an unsolicited research Proposal Number 1142-92 entitled "Carcinogens and Mutagens in Ambient Air Particulate Matter: Identification of Sources in Contra Costa County" has been submitted by the California Department of Health Services for an amount not to exceed $290,000;

WHEREAS, the Research staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 1142-92 entitled, "Carcinogens and Mutagens in Ambient Air Particulate Matter: Identification of Sources in Contra Costa County" submitted by the California Department of Health Services for an amount not to exceed $290,000;

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

> Proposal Number 1142-92 entitled, "Carcinogens and Mutagens in Ambient Air Particulate Matter: Identification of Sources in Contra Costa County" submitted by the California Department of Health Services for an amount not to exceed $290,000;

BE IT FURTHER RESOLVED, that the Executive Officer shall initiate administrative procedures and shall execute all necessary documents and contracts for the research effort proposed in an amount not to exceed $150,000 (year 1) and $140,000 (year 2), a total amount not to exceed $290,000.

I certify that the above is a true and correct copy of Resolution 82-35 as passed by the Air Resources Board.

Harold Holmes
Board, Secretary

ITEM NO.:
DATE: May 27, 1982

ITEM: Research Proposal No. 1142-92 entitled "Carcinogens and Mutagens in Ambient Air Particulate Matter: Identification of Sources in Contra Costa County"

RECOMMENDATION: Adopt Resolution 82-35 approving Proposal No. 1142-92 for funding in an amount not to exceed $290,000;

SUMMARY: The proposed study is an extension of work being performed by the contractor under ARB sponsorship to identify the nature and sources of chemical mutagens and carcinogens in ambient air collected in Contra Costa County. Contra Costa has been identified as one of 39 industrial counties in the U.S. which has an unusually high mortality rate from lung cancer. This proposal addresses the problem of identifying the nature and, potentially, the sources of chemical mutagens and carcinogens in ambient particulate matter collected in Contra Costa County.

The specific objectives of the proposal are:

1. To collect aerosol samples at four Contra Costa locations during seasonal pollution episodes when conditions for source reconciliation are favorable;

2. To measure the mutagenic activity of particulate extracts using standard tester strains and nitroreductase-deficient strains in the Ames/Salmonella assay;

3. To validate a new, modified microsuspension Ames test with greatly increased sensitivity and to apply it to obtain diurnal mutagenicity patterns;

4. To develop improved chromatographic methods for the detection of mutagens and carcinogens;

5. To determine the inorganic "signatures" of particulate samples through multielement analyses using X-ray fluorescence;

6. To characterize particulate samples by means of automated scanning electron microscopy;

7. To integrate mutagenic and chemical results with gaseous pollutant data and meteorological information by means of computerized statistical procedures in order to better resolve sources of particulate mutagens and carcinogens; and

8. To integrate the chemical and mutagenic data base into the ongoing epidemiological cancer study in Contra Costa County.

The proposed study will entail intensive sampling and analysis designed to investigate sources and possible atmospheric formation of airborne mutagens and carcinogens. Sampling will be carried out at four sites in Contra Costa County (Richmond, Martinez, Concord and Pittsburg) when meteorological conditions are favorable. Samples will be analyzed for mutagenic activity using a new protocol with high sensitivity. Samples will be characterized chemically for organic compounds (e.g., polycyclic aromatic hydrocarbons and their nitro-derivitives) and for inorganics (e.g., nitrates, sulfates and forty trace elements). Selected particulate samples will be analyzed using powerful, new automated scanning electron microscopic methods.

These data will be combined with meteorological information and evaluated by statistical analysis, including multivariate correlation and factor analysis, to better resolve sources and possible chemical transformation of atmospheric mutagens and carcinogens. The results will be made available to the Department of Health Services Resource for Cancer Epidemiology for integration into ongoing cancer studies in Contra Costa County.

State of California
AIR RESOURCES BOARD

Resolution 82-36

May 27, 1982

WHEREAS, James N. Pitts, Jr., has served as Director of the Statewide Air Pollution Research Center of the University of California, Riverside since 1970;

WHEREAS, Dr. Pitts has had a long and distinguished career in research in the fields of chemical kinetics and photochemistry;

WHEREAS, he has worked tirelessly and effectively to apply the results of scientific research to the solution of air pollution problems in California by serving as an advisor to the State Legislature, the Governor, and the Air Resources Board; and

WHEREAS, he has been selected by the Air Pollution Control Association to receive the Frank A. Chambers Award for "Outstanding Achievement in the Science and Art of Air Pollution Control";

NOW, THEREFORE, BE IT RESOLVED that the Air Resources Board extends its commendation and deep appreciation to James N. Pitts, Jr., for his outstanding research, accomplishments in the field of atmospheric chemistry and his dedicated service to the State of California, and we offer our heartfelt congratulations upon his selection as recipient of the Frank A. Chambers Award.

Mary D. Nichols, Chairperson

Laurence S. Caretto, Member

Alvin S. Gordon, Member

James G. Leathers, Member

Alfred A. McCandless, Member

Sam T. Chapman, Member

Gary A. Patton, Member

Intro [for Pitts resolution]

Post

April 6, 1982

TO: SAPRC Personnel

FROM: Arthur M. Winer
Edgar R. Stephens

It is a pleasure to announce that, at its March 16th meeting, the Board of Directors of the Air Pollution Control Association selected Dr. Pitts as the 1982 recipient of the Frank A. Chambers Award of APCA. This Award is for "outstanding achievement in the science and art of air pollution control" and recognizes "achievement in lines of technical endeavor in air pollution from pure research to applied science." Selection for the Frank A. Chambers Award "requires accomplishment of a technical nature on the part of the recipient which is considered to be a major contribution to the science and art of air pollution control, the merit of which has been widely recognized by persons in the field." Frank A. Chambers was the principal driving force behind the establishment of the present Air Pollution Control Association, an organization primarily for professionals from industry and control agencies, as well as from universities and research institutions.

Among the distinguished past recipients of this award were Professor Arie Jan Haagen-Smit (1958), Professor Philip A. Leighton (1961), Sir Oliver Graham Sutton (1968), and Dr. A. Paul Altshuller (1970).

Dr. Pitts was nominated for the Frank A. Chambers Award in part for "his vigorous program of research in photochemistry and kinetics over the past 25 years and for the application of these fundamental studies, particularly during the past decade, to answering a number of crucial questions relevant to major air pollution problems."

The Award will be presented to Dr. Pitts at the 75th Annual Meeting of the Air Pollution Control Association in New Orleans. The formal presentation will be made on June 21st at the President's Luncheon to be held at the New Orleans Hilton Hotel.

I am sure that all of you will join us in congratulating Dr. Pitts on receiving this prestigous award.

NEWS

University of California, Riverside
OFFICE OF PUBLIC INFORMATION • RIVERSIDE, CA 92521 • (714)

IMMEDIATE RELEASE

SUBJECT: SCIENTIST WINS AIR POLLUTION CONTROL AWARD

RIVERSIDE -- James N. Pitts, director of the Statewide Air Pollution Research Center of the University of California, Riverside campus, has been selected to receive one of the Air Pollution Control Association's highest honors.

Pitts will receive the 1982 Frank A. Chambers Award, for "outstanding achievement in the science and art of air pollution control," at the APCA's 75th annual meeting in New Orleans on June 21.

The Chambers Award recognizes "achievement in lines of technical endeavor in air pollution from pure research to applied science." The selection is based upon "accomplishment of a technical nature on the part of the recipient, which is considered to be a major contribution to the science and art of air pollution control, the merit of which has been widely recognized by persons in the field."

The award's namesake was the principal driving force behind the establishment of the present Air Pollution Control Association, an organization primarily composed of professionals from industry and control agencies, universities and research institutions.

Previous Chambers Award winners include Dr. Arie Jan Haagen-Smit (1958), Dr. Philip A. Leighton (1961), Sir Oliver Graham Sutton (1968) and Dr. A. Paul Altshuller (1970).

--more--

The APCA Board of Directors cited Pitts for "his vigorous program of research in photochemistry and kinetics over the past 25 years and for the application of these fundamental studies, particularly during the past decade, to answering a number of crucial questions relevant to major air pollution problems."

Pitts, 61, has been a member of the Chemistry Department at UCR since 1954, when the campus opened. He served as chairman of the department in 1961-63 and since 1970 has been director of the Statewide Air Pollution Research Center at UCR.

For more than 30 years, he has conducted fundamental and applied research in the areas of photochemistry, atmospheric chemistry and photochemical smog. In addition to his teaching and research functions, he has served in an advisory capacity on numerous regional and national pollution and environment committees. His scientific publications number more than 200.

-30-

EDITORS NOTE: PHOTO AVAILABLE ON REQUEST

April 16, 1982

Ron Kolb

8

The APCA Board of Directors cited Pitts for "his vigorous program of research in photochemistry and kinetics over the past 25 years and for the application of these fundamental studies, particularly during the past decade, to answering a number of crucial questions relevant to major air pollution problems."

Pitts, 61, has been a member of the Chemistry Department at UCR since 1954, when the campus opened. He served as chairman of the department in 1961-63 and since 1970 has been director of the Statewide Air Pollution Research Center at UCR.

For more than 30 years, he has conducted fundamental and applied research in the areas of photochemistry, atmospheric chemistry and photochemical smog. In addition to his teaching and research functions, he has served in an advisory capacity on numerous regional and national pollution and environment committees. His scientific publications number more than 200.

-30-

EDITORS NOTE: PHOTO AVAILABLE ON REQUEST

April 16, 1982

Ron Kolb