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INNOVATIVE AND MORE EFFECTIVE AIR POLLUTION CONTROL STRATEGIES:

AN INTERIM SURVEY OF SELECTED STATE AND LOCAL AGENCIES

prepared by

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TASK I UNDER AGREEMENT NO. A8-169-10

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Preface

This report is prepared and presented by Schwartz & Connolly, Inc. in accordance with California Air Resources Board Agreement Number A8-169-10. That contract calls for the performance of four tasks, the first of which is as follows:

1. a. Survey state and local agencies (e.g. air pollution control, transportation, councils of government) to determine which propose implementing control measures more effective than the EPA New Source Performance Standards (NSPS), Reasonably Available Control Measures (RACM), or found in the Control Technology Guidelines (CTG).

   b. Collate list of more effective controls, the agency responsible, and agency contact for further information.

   c. Provide report with respect to this task.

In accordance with subsequent conversations with the CARB Executive Officer and Project Officer, this task was interpreted to include the compilation of information regarding innovative transportation control measures, air quality maintenance plans, land use requirements, ambient air standards, permit conditions or requirements and other pertinent strategies for control of pollutants to which national ambient air quality standards are applicable. In addition, while emphasis was not to be placed on this objective, if information could be developed on the regulation of non-criteria pollutants without undue time or expense, that was to be included in the Task I report.

Thus, as required by the contract and by subsequent oral interpretation, Schwartz & Connolly, Inc. undertook a survey of the activities of a number

of state and local air pollution agencies to identify the control strategies or regulations which officials considered more innovative, more effective or more restrictive than federal requirements. In this regard, it should be noted that no effort was made at this stage to verify the accuracy of the officials' perceptions regarding the relative stringency of their regulations and federal requirements. A total of fifteen states[1], two localities (Houston and New York), two public interest groups, EPA headquarters and a number of EPA regional offices have been contacted thus far. Only Iowa and New York State turned out not to have any regulations which they believed to be more restrictive than federal requirements. This report summarizes the results of this survey to date.

The main text of the report is divided into three sections. In the first section, the survey results are grouped into ten key issue areas which facilitate discussion and state-by-state comparisons. The second section gives a state-by-state summary which highlights each state's innovative or particularly stringent activities, and explores the topics discussed in Section I in greater depth. Also in this section is the name and telephone number of each person contacted. In the third section, areas for additional investigation and analysis are suggested. Appendix A provides a survey of state ambient air quality standards for TSP, NO_2 and SO_2. Appendix B provides a comparative table of federal and state standards for coal fired power plants.

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1. The fifteen states are Colorado, Florida, Georgia, Iowa, Massachusetts, Minnesota, Montana, Nevada, New Jersey, New Mexico, New York, Oregon, Pennsylvania, West Virginia and Wyoming.

SECTION I. SUMMARY BY ISSUE AREA

In this section, highlights of the survey are presented and grouped into the following issue areas:

- Sulfur Emission Limitations on Fossil Fuel Power Plants
- Particulate Emission Limitations
- Fine Particulates
- Visibility
- Offsets, Banking, and Related Issues
- Vehicle Inspection and Maintenance
- NO_x Emission Limitations and Short-term NO_2 Standards
- Ozone Standards and Hydrocarbon Controls
- Performance Standards for Sources Not Subject to Federal NSPS
- Hazardous Pollutant Standards

For each of these areas state-by-state comparisons are made whenever possible. Often reference is made to Section II for more detailed information on specific states.

1. Sulfur Emission Limitations on Fossil Fuel Power Plants

A number of states have developed very restrictive sulfur emission regulations for power plants. As a basis for comparison it is useful to recall the current EPA New Source Performance Standard (NSPS). This standard establishes an emission ceiling of 1.2 lbs/10^6 BTU for any type of coal used, but it also imposes minimum requirements for sulfur removal. The standard mandates 70% reduction in potential emissions when the final level of emissions is less than .6 lbs/10^6 BTU and 90% reduction when final emissions are in the range of .6-1.2 lbs/10^6 BTU. The most stringent requirements for new sources were found in the PSD permit granted for the Cholla #5 unit in Arizona, the PSD permit for the 1400 MW capacity addition to the Colstrip power plant in Montana, and in the Wyoming and New Jersey standards. The PSD permit for the Cholla #5 unit which is just 20 miles from the Petrified National Forest requires 94-95% sulfur removal. The Colstrip permit requires 94.8% reduction in sulfur emissions to meet a .1 lbs/10^6 BTU standard with a 30-day averaging period. This plant is

18 miles from the Northern Cheyenne Indian Reservation, a class I area. Wyoming requires new sources to comply with a .2 lbs/10^6 BTU standard. Given the average sulfur content in Wyoming coal, this is equivalent to an 80% sulfur removal requirement. New Jersey limits SO_2 emissions to .3 lbs/ 10^6 BTU for new coal fired generating stations. Since the adoption of this rule, there has been no construction of new coal fired facilities in New Jersey.

For existing coal fired power plants Wyoming and Pennsylvania have adopted tough standards and Georgia has recently reduced allowable emission levels to protect pecan groves. Wyoming has a number of sulfur emission limitations for existing plants which range from .3 to 1.2 lbs/10^6 BTU. The largest facilities must comply with the lower figure, while the oldest and smallest facilities must comply with the higher figure. In the Philadelphia area existing coal fired boilers are required to meet .6 lbs/10^6 BTU. This requirement is at least as stringent as the present federal NSPS. Georgia has lowered its maximum allowable percentage of sulfur in coal from 3% by weight to 1.5-1.7%. This applies to all sources having a heat imput greater than 100 million BTU/hr. This action is supported by a detailed study by plant pathologists on the effects of SO_2 levels on pecan groves.

No new source standards more restrictive than EPA's NSPS for oil fired power plants have been identified. However, for existing sources in or near non-attainment areas, New Jersey and Pennsylvania officials believe they have adopted very restrictive limitations. New Jersey has established .3% sulfur-in-fuel limitations for residual oil. Pennsylvania has established .5% sulfur-in-fuel requirements for residual oil and .2% requirements for distillate fuel.

Concerning ambient SO_2 standards, in addition to those standards listed in Appendix A, Minnesota has adopted the following more stringent SO_2 standards:

SULFUR DIOXIDE AIR QUALITY STANDARDS (ug/m^3)

Averaging Time	Minnesota	EPA
3-hour	715	1300
24-hour	285	365
Annual Average	30	80

2. Particulate Emission Limitations

Quite a number of state officials indicated that they had strict particulate controls in one form or another. Florida requires existing coal-fired power plants located in non-attainment areas to meet a .1 $lbs/10^6$ BTU standard which is equivalent to the old EPA NSPS. West Virginia requires certain existing coal fired power plants to comply with a .05 $lbs/10^6$ BTU standard. New Mexico has the most stringent particulate control levels requiring both new and existing coal fired boilers to meet a .02 $lbs/10^6$ BTU standard. By comparison, the EPA NSPS for particulate emissions from coal fired boilers is .03 $lbs/10^6$ BTU.

Pennsylvania has established industrial process regulations which range from .02-.04 gr/dry standard cubic foot (SCF) of particulates. Massachusetts has adopted what they believe are the most stringent state TSP process regulations. (They have come to this conclusion based on a partial survey of state TSP process regulations. Schwartz & Connolly, Inc. have requested a copy of this survey and it will be forwarded to the California Air Resources Board.) These regulations

vary for three categories of sources: (1) new sources, (2) existing sources, and (3) existing sources in critical areas of concern. (A formula to calculate the allowable emission rate is given in the Massachusetts review in Section II.) In general, however, new sources and sources in critical areas must meet allowable emission rates one-half the value for existing sources.

Georgia requires existing Kraft paper mills to meet particulate emission limitations about one-half the EPA NSPS of .05 gr/SCF. Oregon officials claim they have established restrictive particulate controls on their paper mills requiring recovery furnaces to comply with a 4 lbs/ton limit and lime kilns must meet a 1 lb/ton level. Colorado requires existing coke ovens to emit no more than .03 lbs particulate/ton of coke pushed.

Nevada has established particulate restrictions for a number of mining sources not covered by federal requirements. These include particulate regulations for molybdenum mining operations, berite mines and colmanite mining. Nevada also has innovative fugitive dust control strategies for mine tailings and unpaved roads, and is conducting promising experiments on fugitive particulate controls for the housing construction industry. Specific details on the particulate restrictions from mining operations and information of the innovative fugitive dust approaches are given in Section II.

New Jersey's particulate standard for new and existing glass plants is more stringent than what EPA is likely to promulgate as the NSPS for glass plants. EPA staff indicate the NSPS for glass plants will probably be .6-.7 lbs/ton. Also, we are advised that the Illinois NSPS for glass plants is .5 lbs/ton.

Although the subject of standards of performance for particulate matter from new incinerators was not specifically mentioned by any of the contacts, Schwartz & Connolly, Inc. is aware of at least one state (Massachusetts) which had incinerator standards more restrictive than the federal standard. The Massachusetts standard was 0.05 gr/SCF. This is below the federal standard of0.08 gr/SCF. We did not ascertain the legal status of this state standard in light of Massachusetts' enactment of its prohibition on standards which are more stringent than federal standards. Nor did we obtain information on the basis for the Massachusetts standard. Such information can be obtained if it is of interest to CARB.

3. Fine Particulates

A significant number of states have expressed concern over the fine particulate problem. Pennsylvania has promulgated a sulfate standard of 30 ug/m^3 for a 24 hour averaging period and annual average standard of 10 ug/m^3. New Mexico has established a very stringent particulate emission standard for coal fired power plants of .02 lbs/10^6 BTU. The standard was set to limit fine particulate emissions (less than 2 micrometers) such as sulfates and nitrates. Deterioration of visibility was the motivation for establishing this standard. Massachusetts, Florida, and Oregon are preparing fine particulate studies and will examine possible fine particulate standards. Massachusetts will consider a fine particulate standard for fossil fuel boilers. Florida and Oregon will consider fine particulate standards if EPA does not establish a fine particulate standard when it revises the TSP NAAQS.

4. Visibility

New Mexico, Colorado, Montana, and Wyoming are concerned about deteriorating visibility in their states. However, with the exception of Montana, they are taking a wait and see attitude until EPA proposes its visibility regulations as required by the Clean Air Act Ammendments of 1977. As mentioned in the previous section, New Mexico has established stringent particulate controls in part in order to protect visibility. Montana, on the other hand, has proposed a visibility standard which is stated in terms of the scattering coefficient ($b_{SCAT.}$). The exact level of the proposed standard was not known to our Montana contact. However, a final rulemaking package on this standard is being forwarded to Schwartz & Connolly Inc. The final standard may apply only to class I areas in the state. Montana has not yet decided how the standard will be implemented and enforced. For example, if a scattering measurement indicates a violation occurs, state officials are not sure which pollutants (e.g. sulfates, nitrates, fine particulates, etc.) would need to be controlled and by how much. State officials intend to make case-by-case determinations using the best information available.

Finally, the PSD permit for the Colstrip plant included conditions requiring the future review of plant controls when EPA's best available retrofit technology regulations are promulgated.

5. Offsets, Emission Banking and Related Issues

A number of cities and states are working on progressive emission offset approaches. Oregon requires offsets for sources as small as 5 tons/year (compared with EPA's 100 ton/year limit) in one air basin which has particularly poor ventilation. Houston has probably the most

sophisticated group in the country working on an emission banking approach. Pennsylvania has adopted in its SIP the "growth cushion" approach, which requires greater control of existing sources than needed to attain or maintain national ambient air quality standards in order to permit conservation of air resources for future new source growth. Buffalo, Chicago, Boston, Philadelphia and Minneapolis/St. Paul are all just beginning to work on offset schemes with the aid of Air Quality Technical Assistance Grants. Nevada has special fugitive dust offset requirements.

Houston is agressively pursuing an emission banking scheme for its metropolitan area. The city will initiate a demonstration banking scheme probably starting in 1980. In addition to acting as a broker to parties trading offsets, the bank would provide financing to existing sources to purchase pollution control equipment for the development of emission reductions (i.e. offsets). The Houston group claims the bank would minimize pollution control cost to industry. (See Section II for details)

The growth cushion concept as fostered by Pennsylvania applies to SO_2 in attainment areas, requiring control of emissions so that the resulting air quality will be 80% of the ambient standards. The concept is applied to TSP in non-attainment areas. Existing sources less than 100 tons/yr are required to adopt more restrictive controls than previously applicable regulations. New sources greater than 100 tons/yr are still required to obtain offsetting emission reductions.

The Technical Assistance Grant cities are just initiating their offset programs. For an outline of their work plan see Section II.

In Nevada, if a company plans to open up additional unpaved roads the state may require it to pave, gravel, rock, or treat some other unpaved road in the air basin. This decision is made on a case-by-case basis and requires a one for one tradeoff.

6. Vehicle Inspection and Maintenance Programs

New Jersey and New York City have comprehensive I/M programs. The New Jersey program applies to all passenger cars and requires annual inspections performed only at state operated inspection stations. The New York City program applies only to taxis, but requires tri-annual inspections. Both programs require the emission system to perform as well as when the car was originally pruchased from the manufacturer. That is, no deterioration factor is allowed, and the automibiles must meet the applicable emission standards for their entire useful life. New York City is also implementing a pilot VIM program for diesel buses.

The cost of the New Jersey inspection program is included in the motor vehicle registration fee. New Jersey figures indicate a failure rate of about 15-20% and an average repair cost of $20. New Jersey officials believe the I/M program has been successful. Carbon monoxide trends in New Jersey have dropped on the order of 14% since 1974, and large cities have reduced the number of excursions above the standard by 50% or more. How much this improvement is due to the I/M program and how much is due to the higher portion of new cars with better controls in the present fleet is unknown. (An analysis of the New York City I/M program such as that discussed above for New Jersey, is available to the public. However, the

analysis was not immediately available to our contact. If the California Air Resources Board is interested, Schwartz & Connolly, Inc. can obtain and transmit this analysis.

7. NO_x Emission Limitations and Short-term NO_2 Standards

The new addition (1400 MW) to the Colstrip, Montana coal-fired power plant is subject to more stringent NO_x controls than current federal NSPS requirements. The PSD permit requires these additional units to meet NO_x levels of .5 lbs/10^6 BTU. By comparison, the NSPS for NO_x emissions from facilities burning Montana-type coal is .6 lbs/10^6 BTU. The requirement to meet the more stringent NO_x level was imposed by EPA Region VIII, but the precise concern, legal basis, or motivation (i.e. whether necessary to meet Class I or Class II increments or for visibility reasons) was not ascertained.

Massachusetts was the only state in this survey which had established a one hour nitrogen dioxide standard-- actually called a "criterion" to be used as a guideline for control purposes. The concern over nitrogen dioxide emissions was initiated by a permit application for a 43 M.W. diesel powered co-generation facility to be located in the Boston metropolitan area. Estimates for the uncontrolled facility indicate the emission rates may be as high as 3000 lbs/hr of nitrogen oxides. After 16 days of extensive testimony on NO_2 health effects and control technology, the state proposed a one hour criterion of 190-320 ug/m3. State officials indicate the final NO_x emission limitation for that source will probably be 850 lbs/hr. (Please refer to Section II for more information on this issue.)

8. Ozone Standards and Hydrocarbon Control

Oregon and the city of Louisville have retained the old EPA standard of .08 ppm. The Oregon SIP requires that the .12 ppm standard be achieved by 1987 and that the .08 ppm level be achieved by 1992. EPA staff indicated that Louisville had also retained the .08 ppm standard. Minnesota has an ozone standard of .07 ppm. However, the SIP is written to attain the federal .12 ppm standard. Minnesota officials have resisted past pressure to relax the standard, but they now feel the standard will probably be revised to .1 ppm.

New Jersey has established more restrictive volatile organic carbon (VOC) controls for selected industries. (Our New Jersey contact did not have the specific information available at the time of the telephone conversation but is sending it to Schwartz & Connolly, Inc.)

Minnesota is using the bubble approach to allow more flexible VOC controls for the adhesive tape industry. One particular firm has four industrial plants in an AQCR. Minnesota has set a ton/yr hydrocarbon ceiling for this industrial category which allows the firm flexibility to minimize control costs in meeting the overall emission limit. State officials expect old production lines will be phased out and less solvent will be used in the manufacturing process.

(For further information on mobile source hydrocarbon controls, see the earlier section on VIM programs.)

9. Performance Standards for Sources Not Subject to Federal NSPS

New Mexico has developed what amounts to a new source performance standard for coal gasification facilities. The emission regulation includes limitations on SO_2, total reduced sulfur, hydrocarbons, HCN,

HC, NO_x, NH_3 and TSP. The regulations assume New Mexico coal will be used as well as the Lurgi gasification technology.

Colorado has developed particulate standards for coke ovens and Nevada has issued particulate regulations for berite, molybdenum, and colmanite mines. Massachusetts is developing nitrogen dioxide controls for a diesel powered co-generation facility.

10. Hazardous Pollutant Standards

A number of states have established air quality standards or emission limitations for what might loosely be called hazardous air pollutants. New Jersey has established restrictive emission standards for eleven toxic organic substances. These substances are all presumed to be carcinogenic. The scientific basis for regulating these chemicals was not known to our contact but additional information is being forwarded to Schwartz & Connolly, Inc. The eleven substances are listed in Section II.

Pennsylvania has established hazardous pollutant standards for sulfates, hydrogen sulfide, fluorides, beryllium and settled particulates. These standards are generally interpreted as desirable air quality goals rather than legally enforceable standards. The scientific rationale to support the standards has reportedly been misplaced. The specific limits are given in Section II.

Montana has established ambient air quality standards for fluorides and beryllium. These standards should soon be revised. The beryllium standard will be revoked as there are no beryllium sources in the state. The fluoride standard, which is currently a 30-day average standard, will

be revised to include a growing season standard, an annual standard and a short-term standard. More information is contained in Section II.

Colorado has promulgated a one-hour ambient standard for hydrogen sulfide (H_2S) of 142 ug/m^3 (0.1 ppm). The standard was based on information concerning the detectable odor threshhold of H_2S. Oregon has set fluoride emission limitations for new and existing primary aluminum plants at 1.3 lbs/ton with a monthly averaging time. Comparable EPA NSPS range from 1.9-2.0 lbs/ton. Massachusetts is considering PCB emission standards for facilities using synthetic oils containing PCBs as a fuel source. Florida is currently studying the need for additional controls to limit cadmium, mercury and sulfate emissions. More specific information on hazardous pollutant standards can be found in Section II.

SECTION II. SUMMARY OF DISCUSSIONS BY STATE, CITY OR ORGANIZATION CONTACTED

1. Colorado

Contact: Colorado Air Pollution Control Division

John Clouse (303) 320-4180
Stationary Source Control Branch

Colorado officials believe they have established stringent particulate and visibility emission standards for coke ovens. Colorado also has established an ambient standard for hydrogen sulfide and has a more stringent lead ambient air quality standard by virtue of a shorter averaging time used to measure compliance. However, most other state regulations which were more stringent than EPA rules have recently been relaxed to match federal requirements.

The particulate standard for coke ovens is .03 lbs of particulate/ton of coke pushed. The visibility emission standard prevents fugitive emissions from being visible during coke oven charging for more than 55 seconds over five consecutive charges (i.e. a period of 10-15 minutes). These standards apply to existing sources and are based on the economic capabilities of the firm and the availability of demonstrated control technology.

Colorado has set a one-hour ambient standard for hydrogen sulfide (H_2S) of 142 ug/m^3 (0.1 ppm). The standard applies to all stationary sources. The standard is to protect public welfare and is set on odor threshhold evidence. The lead ambient air quality standard is 1.5 ug/m^3 (the same as EPA), but compliance is measured using a one month rather than EPA's three month averaging time.

Colorado had hazardous air pollution regulations more restrictive than EPA, but due to legislative pressure these have been revoked. Similarly, Colorado had adopted a PSD approach which had smaller increments. These more stringent requirements were likewise rescinded by the state.

2. Florida

Bureau of Air Quality Management

Contact:

Steve Smallwood (904) 488-1344
Acting Director

Florida officials believe their TSP emission limitations are tighter than federal requirements. The need for further TSP controls and control of fine particulates is currently being assessed through a two year particulate test study. Mr. Smallwood indicated he was interested in a coalition with other states to exchange information and press for national legislative changes when necessary.

Florida has difficulty in meeting ambient TSP standards. The most stringent TSP emission limitations require existing power plants to meet EPA's old NSPS of 0.1 lbs/10^6 BTU. A two year particulate test study which will be initiated in January 1980 will reassess current particulate control strategies. The stimulus for this study was the belief among state officials that they may face a lack of "clean fuels" in the future. The study is to analyze the situation and determine if more stringent controls will be needed. The study will also assess the need for control of fine particulates, particularly cadmium, mercury, and sulfates.

We have received conflicting information regarding the existence or non-existence of more stringent SO_2 ambient standards for Florida. Further contact to clarify this situation will be required.

3. Georgia — Environmental Protection Division

Contact: Bob Collom (404) 656-6900
Chief
Air Protection Branch

Georgia has established special SO_2 emission requirements to protect pecan groves. In addition, Georgia claims to have innovative stack height regulations and stringent particulate control on Kraft paper mills. In the past Georgia established ambient standards which were more stringent than the Federal standards. However, political pressure resulted in the standards being relaxed to match federal standards. Georgia officials are interested in joining a group of states to press for innovative approaches to pollution control.

The special SO_2 emission limitations for protection of pecan groves reduces the maximum allowable percentage of sulfur in coal from 3% by weight to 1.5 - 1.7% by weight. This applies to all sources having a heat input of 100 million BTUs/hr or greater, the emissions from which may effect pecan groves. This limitation is also coupled with the stack height stipulation to be discussed below. The effect of this regulation was to force fuel burning sources to purchase cleaner coal.

The regulation was supported by an analysis of the effect changes in SO_2 levels had on new leaves of the pecan tree. Plant pathologists from the University of Georgia developed a study for the Air Protection Branch which showed that the existing control limitations allowed sulfur dioxide levels to fluctuate to such a degree that new leaves would be damaged. The study showed that fluctuations of 20% or more above normal would cause damage to the new leaves. The maximum allowable

percentage of sulfur in coal was reduced to 1.5 - 1.7% to minimize the damage to pecan groves.

Georgia has adopted stack height regulations which are coupled with emission limitations on sulfur dioxide and nitrogen oxides. The stack height regulations are based on modelling estimates and are intended to prevent the occurrence of high ground level concentrations of sulfur dioxide and nitrogen dioxide. The regulations apply to any emission source (e.g. chemical industry, electric power plant). Schwartz & Connolly, Inc. has these regulations on file.

Existing Kraft paper mills in Georgia are required to meet particulate control levels approximately one half of the EPA NSPS of .05 grains/dry standard cubic foot (SCF).

4. Houston — Gulf Coast Waste Disposal Authority

Contact:

George Alexander (817) 731-9371
Private Attorney, Advisor to the
Gulf Coast Waste Disposal Authority

Despite the name, the Gulf Coast Waste Disposal Authority (GCWDA) has a substantial amount of authority in air pollution control. The GCWDA is aggressively pursuing an emission banking scheme for the greater Houston area. Houston and two adjacent counties will probably initiate a demonstration banking project in 1980. In addition to acting as a broker to parties trading offsets, the bank would provide financing to facilitate development of offsets. EPA staff indicate that the Houston people are the most sophisticated group in the country dealing with emission banking approaches. In addition to innovative emission banking schemes, the state of Texas has proposed to use offsets to assure maintenance of ambient air quality standards as well as a tool to use in non-attainment areas.

The GCWDA proposes to establish a non-profit corporation that would act as a bank. The banking mechanism would facilitate the interaction of a) new industries which are required to obtain offsetting reductions for any emissions they are unable to control, and b) existing industries that could achieve a reduction in air pollution emissions over and above the level they are required to maintain by applicable regulations. The bank would act as an intermediary and would serve several purposes: a) buying deposits and keeping records of the amounts of offsets on deposit, b) providing financing to existing sources for purchase of pollution control equipment to facilitate the development of offset credits, c) selling offsets to new sources, and d) maintaining and making public the latest information on offset market prices.

The GCWDA claims the banking proposal has several advantages:

1. A net gain in air pollution control would be achieved equal to or greater than the amount of offsets on deposit.
2. The overall cost of pollution control to new industry would be minimized because:
   - Long delays in negotiating for offsets would be avoided.
   - The delay in new source construction caused by waiting for installation of pollution controls on existing sources to achieve the offsetting emission reductions would be eliminated.
   - Front end capital outlays by the new source for pollution controls on existing sources to achieve the needed offsetting emission reductions prior to construction of a new source (as would be needed without a bank) would be avoided.
   - Creation of a general market for offsets would encourage those existing sources to come forward which could achieve emission reductions most economically, thereby keeping pollution control costs to a minimum

The appropriate regulatory authority would probably need to review plans and grant construction permits for industries seeking to bank offsets and to obtain financing for pollution control equipment. When the equipment is installed the State would need to inspect the facility, grant an operating permit, and certify that the offsets could be credited to the depositor. Mr. Alexander believes that industries could bank offset credits for future use and even communities could bank offsets to attract more industry. It should be noted that Houston is not one of the EPA technical assistance grant cities and that the demonstration project will be funded entirely by non-federal funds.

5. Massachusetts — Department of Environmental Quality Engineering

Contact: Anthony Cortesi (617) 727-2690
Commissioner

Massachusetts state law prohibits rules and regulations more stringent than Federal requirements. However, the Department of Environmental Quality Engineering has issued a number of regulations and standards in areas where Federal rules have not been adopted. Most importantly, Massachusetts has adopted what they believe are the most stringent TSP process regulations, and they proposed a short-term nitrogen dioxide standard--legally a guideline for control purposes. Furthermore, the state is considering PCB emission limitations for certain activities which are not adequately controlled under the federal Toxic Substance Control Act. Finally, the state is preparing a staff study of alternative strategies for the control of fine particulates. Massachusetts is interested in a coalition with other progressive states to press for legislative changes.

The Massachusetts particulate process regulations apply to three categories of sources: 1) new sources; 2) existing sources; and 3) existing sources in critical areas of concern such as non-attainment areas. For industrial processes greater than 60,000 lbs/hr at existing sources, the formula used to calculate the allowable emission rate is:

Existing Sources: Emission rate (lbs/hr) = $(55 \times P^{.11}) - 40$
P = process production rate in tons/hr

New sources and existing sources in critical areas of concern must meet emission rates one-half this value. This formula applies to any industrial process except foundries and asphalt batching plants. The particulate regulations for foundries are as follows:

PARTICULATE REGULATIONS FOR FOUNDRIES

Continuous Production Processes	
Existing Sources	.13 gr/dry standard cubic foot
New Sources	.06 gr/dry standard cubic foot
Sources in Critical Areas	.06 gr/dry standard cubic foot
Batch Processes	.21 gr/dry standard cubic foot

Massachusetts has agreed to send Schwartz & Connolly, Inc. information on the asphalt batch process regulations and comparisons of Massachusetts' process regulations with those of other states.

The concern over short-term NO_2 ambient levels was initiated by a permit application for a 43 MW diesel powered co-generation facility. The co-generation facility, which is to be located in a highly urbanized area, is estimated to have the potential to emit oxides of nitrogen at levels equivalent to a 450 MW oil fired power plant. Estimates for the facility, if no controls are adopted, indicate emission rates may be as high as 3000 lbs/hr. The state held sixteen days of hearings on the health effects of nitrogen dioxide and on the efficacy and availability of NO_x control technologies. Testimony was given by internationally recognized health experts such as Dr. Shy, Dr. Von Nieding, and Dr. Hackney. Based on these hearings, criteria documents from the World Health Organization (WHO) and the EPA, and an independent staff analysis of nitrogen dioxide health effects, the state proposed a one-hour "criterion" of 190-320 ug/m^3. (The term "criterion" is used rather than standard to indicate that it is a guideline, not a strictly enforceable level.) The criterion level chosen is the same as the public health guideline recommended in the WHO criteria document.

The final decision on an emission limit for the co-generation facility has not been made, but state officials indicate they will probably set it at 850 lbs/hr of NO_x. It appears that the applicant will agree to use the best available control technology including water injection techniques and engine timing retard. Massachusetts has agreed to send Schwartz & Connolly, Inc. an information package on the co-generation facility and short-term NO_2 criterion decisions.*

The state is also considering PCB emission limitations for specified activities not covered under federal rules. There are no federally promulgated air emission or ambient standards for PCBs. However, the federal Toxic Substances Control Act prohibits the manufacture or use of PCBs in other than "a totally enclosed manner". TOSCA also directs EPA to regulate the disposal and incineration of PCBs presently in use. EPA rules under TOSCA exempt synthetic oils and other materials containing less than 50 ppm PCB from any incineration and disposal requirements. Material of this sort has been proposed to be burned as fuel in green houses in Massachusetts. The state staff is preparing an analysis of the need for PCB emission limitations for sources using such fuel. Another staff paper which will be prepared in the next few months will look at possible fine particulate standards for fossil fuel boilers.

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* It should be noted that emissions from diesel co-generation facilities are likely to grow in the next few years. Rules proposed by the Federal Energy Regulatory Commission under sections 201 and 210 of the Public Utilities Regulatory Policies Act of 1978 would create substantially greater incentives and opportunities to promote co-generation facilities of various types, including diesels.

6. Minnesota

Contact: Minnesota Pollution Control Agency

Brad Beckham (612) 296-7265
Deputy Director, Division of Air Quality

Minnesota has adopted more stringent ambient air quality standards for O_3 and SO_2. They have also adopted rather flexible volatile organic controls by using the bubble approach for one industrial source category. In this case Minnesota has set an emission ceiling for the tapes and adhesives industry in a particular A.Q.C.R.

The state ambient standard for O_3 is .07 ppm, which was established in the early 1970's. However, the current SIP is written to attain the federal ozone standard of .12 ppm. After the SIP has been approved by EPA the state will review the need for additional control to meet the state standard. The state has resisted past pressure from the legislature to roll back the O_3 standard to be identical to the federal standard. State officials indicated their view that the justification for the present state O_3 standard was somewhat meager. They felt it probably would be relaxed to .1 ppm.

The Minnesota ambient SO_2 standards are compared with the EPA standards in the chart below:

Sulfur Dioxide Air Quality Standards (ug/m^3)

AVERAGING TIME	MINNESOTA	EPA
3-hour	715	1300
24-hour	285	365
Annual Average	30	80

Minnesota officials believe these standards will probably be rolled back to be identical with the EPA standards. However they intend to wait until EPA's revised SO_2 standard is issued before revising their SO_2 standards.

Minnesota VOC controls, while generally following the EPA control technology guidelines, provide additional flexibility by adopting the bubble approach for the adhesive tape industry. The 3M corporation has four different plants involved in adhesive tape manufacture in one A.Q.C.R. Minnesota has set a ton/yr hydrocarbon ceiling for this industrial source category. This gives the 3M corporation the flexibility to meet the overall emission limit in a fashion which is most economical to them. Minnesota expects 3M to phase out old production lines and to use less solvent in their manufacturing processes.

7. Montana — Department of Health and Environmental Sciences

Contact: Dennis Haddow (406) 449-3454
Supervisor, Enforcement Section
Air Quality Bureau

Montana has adopted ambient air quality standards for fluorides and beryllium, which are not covered by the federal NAAQS. In addition, the state has recently proposed a visibility standard. Montana has also proposed changes to its regulation to make ambient air quality standards enforceable. Furthermore, EPA Region VIII staff indicate that the PSD permit for the Colstrip power plant contains very restrictive emission limitations and an innovative approach to consider future emission reductions to reduce any visibility impact.

Montana has existing ambient air quality standards for fluorides and beryllium. The fluoride standard is .3 ug/cm^2 with a 28-day averaging period. Montana has proposed modifications to this standard which will establish special standards during the growing season, an annual average standard and a short-term standard. Our contact could not recall the exact levels that were proposed. A copy of the final standards which will be issued in early January will be sent to Schwartz & Connolly, Inc. The fluoride standard is based on welfare effects (i.e. effects on vegetation) rather than health effects. The beryllium standard is .01 ug/m^3 for a 30 day averaging period. This standard will soon be revoked because Montana has no beryllium sources.

Montana's proposed visibility standard is stated in terms of a scattering coefficient ($b_{SCAT.}$). The exact level of the standard was unknown to our contact, but the final rulemaking package will be forwarded

to Schwartz & Connolly in early January. The proposed visibility standard would apply to all areas of the state. However, state officials believe the final rule may restrict the visibility standard to apply to just the ten Class I areas in the state. The state has not yet developed a plan for how this standard will be enforced. For example, if a scattering measurement indicates that a violation exists, state officials are not sure which pollutants (sulfates, nitrates, fine particulates, NO_x) would need to be controlled and by how much. At this time state officials intend to make case-by-case determinations using the best information available.

Montana has recently proposed to enforce directly ambient air quality standards. That is, if the state can prove that a source is causing a violation of ambient standards, the source is subject to fines of a maximum of $10,000 per day of violation. Montana has a number of isolated plants, such as smelters, phosphate plants and fluoride plants, and the state believes that violations of ambient standards could be easily attributable to particular sources. A draft EIS on this approach has been prepared and the final regulations will be sent to Schwartz and Connolly, Inc.

The Colstrip power plant received an EPA PSD permit for the addition of 1400 MW of new capacity, bringing the total capacity to 2100 MW. The Colstrip plant is located about eighteen miles from the Northern Cheyenne Indian Reservation. The Reservation was designated as a mandatory Class I area on August 6, 1977 by EPA at the request of the Cheyenne Indians. The PSD permit for the new units at Colstrip requires a 94.8% reduction in sulfur emissions in order to assure that Class I increments will not be exceeded in the Reservation. The required SO_2 levels are .1 lbs/106 BTU for a 30-day average and .18 lbs/10^6 BTU for a 24-hour averaging period. The NO_x emission limitation is .5 lbs/10^6 BTU. By comparison, the EPA NSPS for SO_2 requires 70% sulfur reductions for emission levels below .6 lbs/10^6 BTU and for NO_x, using Montana type coal, the NSPS standard is .6 lbs/10^6 BTU.

Thus, the SO_2 limitations are significantly more stringent than the federal NSPS, while the NO_x limitations are just slightly more stringent than the federal NSPS.

Concerning visibility, EPA, the Cheyenne Indians, and the operators of the Colstrip plant agreed that a visible plume would be seen from the nearby Class I area. The PSD permit for this plant included conditions requiring the future review of plant controls when the best available retrofit technology regulations are promulgated by EPA under section 169A of the Clean Air Act ("Visibility Protection").

8. New Jersey — Department of Environmental Protection

Contact:

Ray Dyba (609) 292-6722
Supervisor, Air Quality Management

The State of New Jersey initiated the first and probably has the most comprehensive statewide vehicle inspection/maintenance program. New Jersey has established very restrictive emission standards for eleven organic substances which pose carcinogenic hazards. Additionally, selective industrial sources have been identified for more restrictive controls than general VOC controls. New Jersey will soon begin testing "California" type automobiles. This testing is for the purpose of determining whether New Jersey should adopt the California new car emission standards. Finally, New Jersey has enacted very stringent new source SO_2 standards for coal burning facilities. Since their adoption, there has been no construction of new coal burning facilities in New Jersey.

The inspection/maintenance program was started in 1974. One to two years prior to that, voluntary inspections were encouraged. New Jersey requires that each automobile must meet the emission standards that were in effect when it was originally purchased from the manufacturer. That is, no deterioration factor is allowed and the emission standards must be met for the entire useful life of the car. Inspections are required annually and can only be performed at state operated inspection stations. Failure of the emission test requires the owner to repair or replace the emission control system. Specially licensed (but privately owned) service stations can repair and approve rejected emission systems.

The cost of the program is included in the motor vehicle registration fee. The inspection system now applies only to passenger cars. However, buses soon will be covered. The failure rate is about 15-20%. Repair costs average about $20.00.

New Jersey believes the I/M program has been successful. Carbon monoxide trends have been downward--on the order of 14% since 1974. The largest cities have reduced the number of excursions above the standard by 50% or more. This trend is attributable to replacement of older cars with new cars that have better emission controls and to the I/M program. How much is attributable to each is unknown.

Tampering with pollution control systems in New Jersey is less than the national average presumably because of the annual inspection. The actual New Jersey tampering rate and the national average were not known to our contact. However, this information and additional analysis of the Inspection/Maintenance program is available on request from other New Jersey officials. New cars are not inspected during the first two years provided the dealer certifies that the emission controls are in good working condition. This reduces the number of cars which need annual inspections and correspondingly reduces state operating costs.

The eleven hazardous substances for which New Jersey has established stringent emission limitations (requiring state-of-art control technologies) are listed below. These regulations are effective December 17, 1979.

New Jersey Hazardous Organic Substances

- Benzene
- Carbon tetrachloride
- Chloroform
- Dioxane
- Ethylenimine
- Ethylene dibromide
- Ethylene dichloride
- 1,1,2,2-Tetrachloroethane
- Tetrachloroethylene
- 1,1,2-Trichloroethane
- Trichloroethylene

The criterion used to select these substances was the existence of at least two good studies indicating evidence of carcinogenicity. The measures used to identify good carcinogenic studies were not known by the person we contacted. For example, it was not clear which substances were supported by animal studies and which (if any) by human studies. Finally, it was not known if the studies indicating carcinogenic effects considered only exposure to the lung or if other routes were examined. Many of these questions can be resolved by examining the supporting documentation. New Jersey has agreed to send us this and copies of the regulations. They have also agreed to send information on the industrial categories for which restrictive VOC controls have been adopted.

New Jersey has established very stringent SO_2 emission limits for new coal burning sources. The new facilities must emit no more than 0.3 lbs/ 10^6 BTU. This is quite a bit more stringent than the EPA NSPS of .6 lbs/ 10^6 BTU and 70% reduction in potential emissions. Since the adoption of these standards, no new coal fired power plants have been built in New Jersey. The most stringent sulfur emission limitation on residual oil fired boilers require these facilities to burn 0.3% sulfur fuel.

New Jersey is considering as an option the use of "California" new automobile standards. Some of these vehicles are currently being tested to check their emission levels and see if any problems occur. This technical study is expected to be completed in mid-1980. Finally, EPA staff indicate that New Jersey's particulate standard for new and existing glass plants is more stringent than what EPA is likely to promulgate as the NSPS for glass plants. (The EPA NSPS for glass plants will probably be .6-.7 lbs/ton. Also, we understand that Illinois' NSPS for glass plants is .5 lbs/ton.)

9. New Mexico

Contact: Environmental Improvement Agency

Ken Hargess (505) 827-5271
Director, Air Quality Division

Contact: New Mexico Citizens for Clean Air

John Bartlitt (505) 667-5419

New Mexico has taken a number of innovative steps in its air quality program. These include developing essentially a new source performance standard for coal gasification facilities, examining sulfur emission taxes for use on Navajo lands, and controlling fine particulates to improve visibility. Mr. Hargess indicated he was interested in a coalition with other states to exchange information and help each other politically.

The emission regulation for coal gasification plants includes limitations on SO_2, total reduced sulfur (e.g. H_2S, CS_2), hydrocarbons, HCN, HCL, NO_x, NH_3 and TSP. The regulations were developed in 1972 and were based on Lurgi gasification technology and assumed that New Mexico coal would be used. A BACT type approach was adopted which included a determination of what was economically feasible. The regulations also included particulate control from the mining operations and hydrocarbon storage handling. The specific coal gasification project that prompted development of the standards was eventually abandoned, but state officials do not believe this was because of too stringent environmental controls. It is their belief that the control levels were economically achievable. The regulations can be found in the New Mexico code of regulations #670 to 682.

New Mexico has been involved in the use of sulfur emission taxes proposed by the Navajos to control two power plants (the Four Corners plant

and the Navajo plant) operated on their land by Arizona Public Service (APS). The Navajos passed a tribal resolution to levy a tax on APS which was to initially start at 15¢ per pound of sulfur emitted and increase to 75¢ per pound after five years. The emission fees were based on an analysis of control technology costs and are intended to encourage the plants to reduce potential sulfur emissions by 90%. Currently the Four Corners plant controls only 8% of sulfur emissions and the Navajo plant is uncontrolled. The revenues gained from the tax will be used by the Navajos to improve their local health care system.

An obvious question is: Why don't the Navajos require 90% sulfur emission control instead of using the fee system? The problem is that in the original contract with APS the Navajos waived control over plant operations. The fee system is trying to encourage 90% control on both plants without specifically requiring it. In effect the Navajos are trying to finesse the contract with APS. At present the sulfur emission tax is being challenged in the courts by APS. Also, the Department of Interior under its authority granted by the lease provisions is reviewing the prospect of additional controls on these plants.

New Mexico has established a very stringent particulate emission standard for coal fired power plants of .02 lbs/10^6 BTU. This standard applies to both new and existing sources and is more restrictive than the EPA's NSPS for coal fired power plants of .03 lbs/10^6 BTU. This standard was set to limit emissions of fine particulates (less than 2 micrometers) such as sulfates and nitrates. Deterioration of visibility was the motivation for establishing this emission standard.

10. Nevada — Department of Human Resources

Contact:

Dick Serdoz (702) 885-4670
Chief, Air Quality Division
Environmental Protection Service

The state of Nevada has established particulate emission regulations for mining sources not covered by EPA NSPS. These regulations are designed to control process and fugitive emissions in order to prevent violations of the PSD increments. Nevada also has a number of innovative approaches to control fugitive emissions from unpaved roads, mine tailings and from the housing construction industry.

Nevada has established regulations for berite crushing and drying, molybdenum and colmanite mining and related operations. The specific details of the berite regulations were not readily available during our conversation, but if the Air Resources Board is interested, Schwartz & Connolly, Inc. can obtain this information. The molybdenum particulate emission limitations are as follows:

Crushing, grinding and screening operations	.018 lbs/ton
Drying operations	.15 lbs/ton

Special colmanite mining and operations emission regulations have also been developed. The particulate emission limitations range from .02-.6 lbs/ton. The specific reasons for the range were not indicated in the conversation but could be pursued if the Air Resources Board is interested.

Regarding fugitive dust emissions, Nevada requires each mining company to submit a plan for opening and operating the mine, and to develop an abandonment plan six months prior to abandonment. If a company plans to open additional unpaved roads, Nevada may require the company to pave,

rock, gravel or treat some other unpaved road in the air basin (100-600 square mile area). This decision is made on a case-by-case basis and requires a one for one tradeoff. In one community which has had high particulate ambient levels from an old tailings area, Nevada required the company to use a dust suppressant (granular smelter slag). In 1974, the company covered 10% of the tailings area with the dust supressant and TSP hi-vol readings were reduced by about 50% and local complaints were reduced by about 90%.

In another case in Clark County (Las Vegas), construction of two housing subdivisions was contributing to high ambient TSP levels. A comparative study of three different construction approaches was conducted by county air pollution officials with the help of local building contractors. The purpose of the study was to determine the availability of potential ways to minimize fugitive emissions from housing construction. The building contractors are carrying out the recommendations of this study to reduce fugitive dust levels. Basically these recommendations involve attempts to combine land clearing with early paving in a phased program so that, to the maximum extent feasible, construction equipment operates on paved surfaces. More details on this program can be obtained from Mr. Don Arkell, director of Clark County's air pollution control division, if the CARB would like Schwartz & Connolly to pursue the matter.

11. New York City — Office of the Mayor

Contact: Phil Hess (212) 566-1265
Transportation Specialist

Natural Resources Defense Council

Contact: Eric Goldstein (212) 949-0049

Our discussions focused on the innovative components in New York City's (NYC) transportation control plan. The innovative components include: 1) special regulations to reduce emissions from the city's taxi fleet: 2) a tri-annual inspection and maintenance program for the taxi fleet; 3) a pilot I/M program for the city diesel bus fleet, 4) strategies to reduce on-street parking; and 5) establishment of priority bus lanes.

Beginning about eighteen months ago, the NYC taxi fleet was required to purchase cars equipped with the California emissions package. Recently the taxi firms have negotiated with the city to substitute a taxi group riding program to reduce the amount of vehicle miles travelled in lieu of purchasing the California type cars. The taxi firms believed the California equipped vehicles were more expensive to maintain and less fuel efficient. The plan will allow taxis to accept multiple fares from major transportation terminals in the city (e.g. the airport, train station, the central bus station).

Taxis are also required to undergo tri-annual safety and emission system inspections. The emission inspection program requires each taxi to meet the emission standards that were in effect when the taxi was originally purchased from the manufacturer. That is, no deterioration factor is allowed and taxis must meet these emission standards for their

useful life. Information on failure rates and average cost of maintenance is available on request from the Mayor's Office.

The combined vehicle miles travelled from buses and taxis in NYC represent 40% of the total VMT. As part of a program to reduce emissions from this sector, a pilot I/M program for the diesel bus fleet will be designed in the next few months. The program will require every bus to be tested in the first year. From the information generated during the first year, city engineers will design a modified maintenance schedule to maximize emission reductions and keep engines in tune. Additional information is being sent to Schwartz & Connolly, Inc. by NRDC on this aspect of New York City's transportation control plans.

Two strategies will be implemented in 1980 to limit central city parking. The first strategy will encourage peripheral parking on the edge of the central city located near public transportation terminals. The second strategy will put a ceiling on the number of on-street privileged parking spaces (e.g. diplomats, city officials, state and federal officials). The NYC officials hope to see a 50% or more reduction in the number of official spaces and thereby justify an equal reduction in the number of public spaces.

Concerning bus priority avenues, the City intends to establish two separate lanes on major crosstown routes. The plan is to allocate the lanes for the sole use of buses--no taxis or private vehicles. The goal is that the bus lanes will run unhampered and encourage wider use of public transporation.

12. Oregon

Contact: Department of Environmental Quality

John Kowalcik (503) 229-6459
Air Quality Control Division

Oregon has decided to retain the .08 ppm ozone ambient air quality standard. The state has required offsets for sources as small as 5 tons/yr. Oregon officials believe they have established very restrictive standards for Kraft paper mills and aluminum mills. Finally, Oregon is very much concerned about fine particulates and will consider control options if EPA does not establish a fine particulate standard when it revises the current TSP NAAQS.

After EPA promulgated its new ozone standard of .12 ppm, Oregon air quality board decided to retain the old standard of .08 ppm although staff had recommended to the contrary. The Oregon SIP will be written to attain the .12 ppm standard by 1987 and the .08 ppm standard by 1992. Oregon requires offsets for sources as small as 5 tons/yr in one air shed which has particularly poor ventilation.

Oregon limits flouride emissions from primary aluminum plants to 1.0 lb/ton for an annual average and 1.3 lbs/ton on a monthly average. These emission limits are applied both to new and existing sources. Comparable EPA NSPS are 1.9-2.0 lbs/ton. Oregon officials also believe that particulate and total reduced sulfur emission limits on Kraft mills are quite restrictive. Particulate emission limitations are 4 lbs/ton on recovery furnaces and 1.0 lb/ton on lime kilns. Total reduced sulfur emissions are limited to 5 ppm on a daily average.

13. Pennsylvania — Bureau of Air Quality Control

Contact: Jim Salvaggio (717) 787-4310)
Chief, Air Quality Planning Section

Pennsylvania has established a number of standards which are believed to be more stringent than federal requirements, including standards for hazardous pollutants and other non-criteria pollutants, and sulfur emission limitations for fossil fuel steam generators. The state has also selectively adopted the "growth cushion" concept in both attainment and non-attainment areas.

The hazardous pollutant standards were established in the early 1970s for sulfates, hydrogen sulfide, flourides, beryllium and settled particulates (see table below). By and large, these standards are to be interpreted as desirable air quality goals rather than legally enforceable requirements. Significant enforcement action has been taken only with respect to beryllium. The scientific rationale for the standards was based on health assessments which reportedly have subsequently been misplaced. Recently there has been some pressure to retract these standards. The standards for the five pollutants are listed below:

PENNSYLVANIA HAZARDOUS AIR POLLUTANT STANDARDS

Substance	Level	Averaging Time
Sulfates (SO_4)	10 ug/m^3	30-day
	30 ug/m^3	24-hour
Hydrogen Sulfide (H_2S)	.005 ppm	24-hour
	.1 ppm	1-hour
Flourides	5 ug/m^3	24-hour
Beryllium	.01 ug/m^3	30-day
Settled Particulate*	.8 mg/cm^2	Annual average

* Settled particulate is defined as the particulate that falls in a dust jar collection device.

The most stringent sulfur emission limitations are in the Philadelphia area. Existing oil fired boilers using residual oil are required to burn 0.5% sulfur fuel. Distillate facilities must comply with 0.2% sulfur fuel limits. Existing coal fired boilers must meet 0.6 lbs./10^6 BTU for all facilities greater than 250 million BTU/hour heat input. This requirement is at least as stringent as the present federal standards for new coal fired steam generation, if not more so.

Stringent emission limitations were required in Philadelphia for two reasons. First, Philadelphia is a non-attainment area for sulfur dioxide and stringent emission limitations are needed to attain the national ambient standards in Philadelphia itself. Second, New Jersey instituted legal action against Pennsylvania and EPA to obtain revisions in the sulfur-in-fuel standards in the Philadelphia region to reduce the amount of sulfur oxide pollution transported into New Jersey. After a year long study by the EPA regional office, the final result was to relax New Jersey sulfur-in-fuel standards and tighten Philadelphia standards so that the two jurisdictions now have similar sulfur-in-fuel limitations. (The old New Jersey standard required the use of 0.3% sulfur residual fuel oil.)

The "growth cushion" concept requires air quality control regions to implement more strigent controls than needed to meet and maintain ambient standards thus providing available air resources for additional growth. The concept is applied by Pennsylvania to sulfur dioxide in attainment areas and total suspended particulate in non-attainment areas. Sulfur dioxide emissions are controlled so that the resulting air quality will be 80% of the ambient standards. This reserve provides room for additional growth and protects against worst case air pollution episodes which may occur due to meteorological variability and emissions variability. In non-

attainment areas the "growth cushion" concept applies to TSP sources smaller than 100 tons/yr (after control). For large sources (i.e. greater than 100 tons/yr) the offset requirement would still be applicable. Existing sources less than 100 tons/yr will need to achieve additional reductions over and above applicable requirements to provide the "growth cushion". Additional TSP control is targeted at non-traditional sources such as fugitive emissions. For example, industrial facilities are sometimes required to pave or control dust by chemical methods from unpaved lots or access roads.

Pennsylvania officials also believe that their TSP industrial process regulations are quite stringent. Sources greater than 300,000 ft^3/min must emit no more than .02 grains/dry standard cubic foot (SCF). Sources less than 150,000 ft^3/min must comply with .04 grains/SCF. A sliding scale is used for sources intermediate between these two values. These standards apply to all industrial processes.

14. West Virginia — Air Pollution Control Commission

Contact: Carl Beard (304) 348-2275
Director

West Virginia believes some of their TSP emission limitations are more stringent than federal requirements.

Existing coal fired power plants are required in certain areas to emit no more than .05 lbs particulate/10^6 BTU. This emission level is considerably more stringent than the old EPA NSPS of .1 lbs/10^6 BTU for coal fired powered plants. With the revision of this federal standard, new sources must now comply with .03 lbs/10^6 BTU. The reason West Virginia imposed such stringent controls on existing plants was because ambient particulate standards were being exceeded. Furthermore, West Virginia concluded that technology was available and economically feasible to control existing plants to this level. In addition, West Virginia requires existing industrial boilers greater than 250 million BTUs/hr to emit no more than .09 lbs particulate/10^6 BTU.

West Virginia previously had more stringent ambient SO_2 standards than the federal standards, but these were relaxed by state legislative action.

15. Wyoming — Department of Environmental Quality

Contact: Chuck Collins (307) 777-7391
Deputy Director, Division of Air Quality

Wyoming officials indicate they have stringent SO_2 emission limitations for coal fired power plants and for fugitive dust emissions from coal mines.

Wyoming promulgated SO_2 emission limitations for coal fired power plants in 1974. New sources must comply with an SO_2 standard of .2 lbs/10^6 BTU. Assuming the average sulfur content for Wyoming coal, this standard requires an average reduction of about 80% from uncontrolled levels. This standard is more stringent than the EPA NSPS which requires 70% reduction in potential emissions when SO_2 emissions are less than .6 lbs/10^6 BTU. Sources existing prior to 1975 must meet the following requirements:

SO_2 LIMITATIONS ON EXISTING POWER PLANTS

Source Size (10^6 BTUs/hr)	Emission Limitation (lbs/10^6 BTU)
250 - 2500	1.2
2500 - 5000	0.5
> 5000	0.3

For the mid- and large capacity generating facilities these standards are tighter than the old NSPS of 1.2 lbs of SO_2/10^6 BTUs. For the largest power generating stations (>5000), these requirements are about as stringent as the current SO_2 NSPS (i.e. 70% reduction in potential emissions when SO_2 emissions are less than .6 lbs/10^6 BTU).

Wyoming has also established regulations to control the amount of fugitive dust from coal mining operations. Wyoming requires operators to pave access roads and to use chemical stabilizers to control dust on haul roads.

16. Environmental Protection Agency Region IX

Contact: Lloyd Kowtow (415) 556-8005
Division of Air & Hazardous Materials

Discussions here focused on stringent PSD permits for coal fired power plants in Arizona and Nevada. The most stringent PSD permits require 94-95% SO_2 control. It was also noted that two refineries in non-attainment areas in Hawaii were required to use low NO_x burners. Further information could be gathered on this subject, if CARB wishes us to do so.

The most restrictive permit granted to date was to the Arizona Public Service for its Cholla #5 unit (350MW). This plant is located twenty miles from the Petrified National Forest. A combination of low sulfur coal and 94-95% sulfur removal is necessary to meet PSD increments in the park. Arizona Public Service proposed this emission limit in its PSD permit application, and it was accepted by EPA.

Modelling of the proposed Harry Allen Generating Station (four 500MW units) indicates that the Class II increments would be exceeded with the proposed level of emission controls. EPA is asking for 94-95% sulfur controls, but the power company was resisting it at the time of our contact.

17. Environmental Protection Agency — Headquarters, Washington, D.C.

Contact: John Hoffman (202) 755-2893
Policy Planning Division

We discussed the Air Quality Technical Assistance Demonstration Program which is sponsored by EPA, HUD and the Departments of Commerce and Transportation. This program is part of President Carter's Urban Policy and is to help cities learn how to continue economic development while meeting air quality standards. Three and a half million dollars have been awarded to eight cities selected from among seventy-five applicants. The cities are: Philadelphia; Chicago; Boston; Bridgeport/Waterbury, Connecticut; Buffalo; Portland; Elizabeth, New Jersey; and Minneapolis. The administration claims the demonstration program will test innovative and replicable ways to implement air quality plans and maintain the ability of large cities to attract and retain business and industry. Described below are highlights of the eight cities' proposals:

Philadelphia - $500,000 to the Philadelphia City Planning Commission to:

— identify industries beneficial for economic and pollution control reasons;

— determine methods such as low interest loans, for financing pollution control equipment for these industries;

— research a program for air quality offsets that would allow some pollution from new industries by cleaning up an even greater amount of pollution from existing plants;

— investigate whether improved air quality can be gained by "fees" related to the amount of pollution a firm or activity generates; and

— determine whether tighter controls on emissions from autos and other vehicles could create clean air bonuses that could be used to expand industrial development.

Chicago - $274,800 to the Department of Environmental Control and the Economic Development Commission to:

— establish a system for banking emission offsets for later distribution to existing or new industries;

— develop mechanisms for financial and technical assistance to companies with air pollution control problems; and

— incorporate clean air requirements into the existing "one stop" service for various permits needed for new construction.

Boston - $500,000 to the Boston Redevelopment Authority to:

— create clean air offsets by reducing emissions from city-owned or influenced facilities, such as municipal gasoline pumps for police and city vehicles;

— discourage large firms from buying out small concerns so that the air pollution they use to emit can be transferred to the big firms to expand their operations; and

— provide financial and technical assistance to small firms in need of pollution control knowledge or hardware, for example organizing dry cleaners to save money by purchasing pollution control equipment together.

Bridgeport/Waterbury, Connecticut - $500,000 to the Mayor's Office of Community Development to:

— study the state's policies for accomodating growth within air quality constraints;

— study three areas -- the Captain Neville Drive Industrial Park, the Chase Brass area, and the Boston Avenue Industrial Park -- for ways of balancing growth with clean air; and

— experiment with the cities' purchase of air quality improvements to be distributed later as the city sees fit.

Buffalo/Erie County, New York - $500,000 to the Department of Environment and Planning to:

— establish an "offset information center" to include data on air quality and geographic industrial profiles relevant to commercial siting and development;

— provide pollution control assistance for small and medium-sized firms; and

— prepare a waterfront development plan.

Portland, Oregon - $499,697 to the Office of Planning and Development to:

— design bus routes for the Swan Island Industrial District and to give transit subsidies to employees in this area whose firms will participate in long-range transit use programs; and

— conduct a "growth management study" to assess alternative approaches for maintaining air quality and economic development in the city's policy and planning activities.

Elizabeth, New Jersey - $331, 862 to the Metropolitan Council to:

— offset increased emissions from expanded industrial development by using "state-of-the-art" improvements in pollution control and by encouraging car pooling and improved mass transit.

Minneapolis/St. Paul - $231,862 to the Metropolitan Council to:

— begin work on establishing emission limits in the region's zoning process;

— develop procedures for incorporating air quality assessments into regional capital improvement programs; and

— create offset banking and an air quality ordinance as tools for long term air quality management.

SECTION III. SUGGESTED AREAS FOR FURTHER STUDY

In our view there are several potential approaches for supplementing and expanding the information contained in this report. One approach would be to expand the number of jurisdictions to be contacted. This would mean contacting additional states, such as Wisconsin, Illinois, Maine, Vermont, Connecticut, Texas, Alabama, Maryland, Washington, Hawaii and Alaska. It would also include contacting additional urban air pollution control agencies. Among those city governments and COG's which would be contacted would be: Chicago; Cincinnati; Minneapolis-St. Paul; Portland; Boston; Pittsburgh-Allegheny County; Miami-Dade County; Atlantic City; and Washington, D.C.

A second approach would be to seek more detailed information on some or all of the strategies referred to in this report. As needed, the agencies could be recontacted to determine the details of standards, regulations, studies, and programs which are in effect or have been proposed. Also in keeping with Task II a more complete articulation of the motives, purposes, findings, and bases for these regulations and strategies could be sought. In this regard the following areas for analysis are suggested for possible consideration:

1. New Jersey's emission standards for carcinogenic organic substances;

   — Determine what evidence was used to establish carcinogenicity;

   — Compare with lists of human and animal carcinogens from the International Agency for Research on Cancer (IARC) and the National Cancer Institute;

   — Provide (as much as possible) information on emission limitations to specific industries and information on how these control levels were chosen.

2. New Jersey's and New York City's vehicle I/M program:

   — Provide specific information on the emission testing program, operating procedures and other relevant program areas;

— Provide a summary of the cost of the NYC and New Jersey programs;

— Identify, based on their experience, some of the problems to anticipate and changes they would recommend when initiating an I/M program.

3. The Houston banking system for air pollution offsets:

— Provide more detailed information on the banking scheme such as how offset prices would be set and whether deposited offsets would be available indefinitely;

— Outline the regulations and operating procedures the relevant authorities would need to adopt to establish the offset market, to establish mechanisms for certification of emission reductions (i.e. offsets) and so forth;

— Indicate how financing through the emission bank would be different from ordinary construction loans.

4. The Massachusetts short-term nitrogen dioxide standard:

— Summarize the health basis for the standard by reviewing the record of the hearing examiner and testimony of key health experts;

— Summarize the technology and cost considerations in the decision.

5. New Jersey's VOC controls for selected industries:

— Determine which industries have been selected for application of restrictive VOC controls and the level of control required;

— Summarize the applicable technology for the major industries.

6. Air Quality Technical Assistance Demonstration Program:

— Conduct status review interviews with the technical assistance grant cities and summarize the innovative aspects of their program.

A third approach would be to investigate and summarize findings from several potentially valuable centralized sources of information. For example, the staff of the National Commission on Air Quality could be contacted in connection with their review of state implementation plans submitted in accordance with the 1977 Clean Air Act Amendments. Similarly,

the Environmental Protection Agency's BACT Clearinghouse in Research Triangle Park, North Carolina, should be contacted to identify promising control technologies as well as localities or states where more stringent BACT or LAER requirements are being adopted. In this step it would be possible not only to identify the most advanced or stringent regulations or technologies in EPA's Compilation of BACT/LAER Determinations, but also to update that publication and to suggest ways for the Clearinghouse to improve its information collection and dissemination functions to better respond to CARB's needs.

Another potential source of valuable information would be EPA's enforcement office. That office should be able to identify those sources which have sought and/or received innovative technology waivers under sections 111(j) or 113(d) of the Clean Air Act. The waiver application may provide significant information on new and potentially more effective pollution control technologies. Finally, EPA's Industrial Environmental Research Laboratory should be contacted to identify new control technologies which they are evaluating and testing.

A fourth approach would be to contact the environmental attache to Washington embassies for countries which have progressive environmental programs to identify innovative control technologies, strategies and regulations. Candidate countries would be Japan, Sweden, Switzerland, the Netherlands, Norway, the Federal Republic of Germany, Denmark and the USSR. Another source would be to contact Washington-based trade associations of pollution control manufacturers to identify promising control technologies.

These four approaches outline a number of items for further analysis. At this stage, we suggest the CARB, after reviewing this report, identify its priorities for future analysis and then Schwartz & Connolly, Inc. can prepare a workplan for Task II.

APPENDIX A

The State Ambient Air Quality Standards contained in the Appendix are taken from the Environmental Reporter, Vol. I, II, III State Air Laws (BNA). These standards were compiled in January/February 1978 and do not reflect changes since then.

STATE AMBIENT AIR QUALITY STANDARDS

State	TSP		SO_2	NO_2
Alabama	Primary NAAQS	Secondary NAAQS	NAAQS	NAAQS
Alaska		Secondary NAAQS	NAAQS	not availabl
Arizona	Primary NAAQS for AGM*	Secondary NAAQS for 24 hour	NAAQS	NAAQS
Arkansas		Secondary NAAQS for AGM 169 ug/m^3 24 hour	.5 ppm one hour .04 ppm 24 hour	.25 ppm one hour
California		Secondary NAAQS for AGM 100 ug/m^3 24 hour	.5 ppm one hour .04 ppm 24 hour	.25 ppm one hour
Colorado	nondesignated areas Secondary NAAQS for 24 hour (ST)** 45 ug/m^3 AAM (LT)*** designated areas 1973: 200 ug/m^3 (ST) 70 ug/m^3 (LT) 1976: 180 ug/m^3 (ST) 55 ug/m^3 (LT) 1980: 150 ug/m^3 (ST) 45 ug/m^3 (LT)		nondesignated areas 15 ug/m^3 24 hour designated areas 1973: 800ug/m^3 (1 hr) 300ug/m^3 (ST) 60ug/m^3 (LT) 1976: 300ug/m^3 (1 hr) 150ug/m^3 (ST) 25ug/m^3 (LT) 1980: 55ug/m^3 (ST) 10ug/m^3 (LT)	not available

*AGM = annual geometric mean
**ST = short term (24hours)
***AAM (LT) = annual arithmetic mean (long term)

STATE AMBIENT AIR QUALITY STANDARDS

State	TSP		SO_2		NO_2
Connecticut	Primary NAAQS	Secondary NAAQS	Primary NAAQS	Secondary NAAQS	NAAQS
Delaware	70 ug/m^3 AGM 200 ug/m^3 24 hour 500 ug/m^3 one hour	Secondary NAAQS	70 ug/m^3 AGM 80 ug/m^3 AAM 340 ug/m^3 24 hour	Secondary NAAQS	NAAQS
Florida		Secondary NAAQS		Secondary NAAQS	NAAQS
Georgia	not available		not available		not available
Hawaii	55 ug/m^3 AAM 100 ug/m^3 24 hour		20 ug/m^3 AAM 80 ug/m^3 24 hour 400 ug/m^3 3 hour		70 ug/m^3 AAM 150 ug/m^3 24 hour
Idaho	Primary NAAQS	Secondary NAAQS	NAAQS		NAAQS
Illinois	Primary NAAQS	Secondary NAAQS	not available		NAAQS
Indiana	Primary NAAQS	Secondary NAAQS	Primary NAAQS	Secondary NAAQS	NAAQS

STATE AMBIENT AIR QUALITY STANDARDS

State	TSP		SO_2		NO_2
Iowa	Primary NAAQS	Secondary NAAQS	Primary NAAQS	Secondary NAAQS	NAAQS
Kansas	not available		not available		not available
Kentucky	Primary NAAQS	Secondary NAAQS	NAAQS		NAAQS
Louisiana	Primary NAAQS	Secondary NAAQS	Primary NAAQS	Secondary NAAQS	NAAQS
Maine	50 ug/m^3 AGM 100 ug/m^3 24 hour		57 ug/m^3 AAM 230 ug/m^3 24 hour 1150 ug/m^3 3 hour		NAAQS
Maryland	serious 75 ug/m^3 AAM 160 ug/m^3 24 hour	adverse 65-75 ug/m^3 AAM 140-60ug/m^3 24 hour	serious 79 ug/m^3 AAM 262 ug/m^3 24 hour 920 ug/m^3 1 hour	adverse 60-79ug/m^3 AAM	NAAQS
Massachusetts	Primary NAAQS	Secondary NAAQS for 24 hour	NAAQS		NAAQS
Michigan	not available		not available		not available

STATE AMBIENT AIR QUALITY STANDARDS

State	TSP	SO_2	NO_2
Minnesota	Primary NAAQS / Secondary NAAQS	Secondary NAAQS for AAM & 24 hour 655 ug/m^3 3 hour	NAAQS
Mississippi	not available	not available	not available
Missouri	not available	not available	not available
Montana	Primary NAAQS for AGM 200 ug/m^3 1% days a year	.02ppm AAM .10ppm 24 hour .25ppm 1 hour	not available
Nebraska	not available	not available	not available
Nevada	Secondary NAAQS	Secondary NAAQS	NAAQS
New Hampshire	Secondary NAAQS	Secondary NAAQS	NAAQS
New Jersey	Primary NAAQS / Secondary NAAQS	Primary NAAQS / Secondary NAAQS	NAAQS

STATE AMBIENT AIR QUALITY STANDARDS

State	TSP	SO_2	NO_2
New Mexico	Secondary NAAQS 90ug/m^3 30 day 110 ug/m^3 7 day	.02 ppm AAM .10 ppm 24 hour	.05 ppm AAM .10 ppm 24 hour
New York	Class (AGM) I 45 ug/m^3 II 55 ug/m^3 III 65 ug/m^3 IV 75 ug/m^3 250 ug/m^3 24 hour	Primary NAAQS for AAM 260 ug/m^3 24 hour 365 ug/m^3 3 hour	NAAQS
North Carolina	Secondary NAAQS	Secondary NAAQS	NAAQS 250 ug/m^3 24 hour
North Dakota	Secondary NAAQS	Secondary NAAQS for AAM & 24 hour 715 ug/m^3 1 hour	NAAQS 200 ug/m^3 1 hour
Ohio	Secondary NAAQS	not available	NAAQS
Oklahoma	not available	not available	not available
Oregon	Secondary NAAQS	Secondary NAAQS	NAAQS

STATE AMBIENT AIR QUALITY STANDARDS

State	TSP	SO_2	NO_2
Pennsylvania	Primary NAAQS / Secondary NAAQS	NAAQS	NAAQS
Rhode Island	Primary NAAQS / Secondary NAAQS	NAAQS	NAAQS
South Carolina	Secondary NAAQS for AGM 250 ug/m^3 24 hour	NAAQS	NAAQS
South Dakota	Secondary NAAQS	Secondary NAAQS	NAAQS
[illegible]	[illegible]	[illegible]	250 ug/m^3 24 hour
Tennessee	Primary NAAQS / Secondary NAAQS	NAAQS	NAAQS
Texas	not available	not available	not available
Utah	not available	not available	not available
Vermont	45 ug/m^3 AGM	57 ug/m^3 AAM	not available
[illegible]	125 ug/m^3 24 hour	150 ug/m^3 24 hour	[illegible]
[illegible]	[illegible]	285 ug/m^3 1 hour	[illegible]
Virginia	Primary NAAQS / Secondary NAAQS	Primary NAAQS / Secondary NAAQS	NAAQS

STATE AMBIENT AIR QUALITY STANDARDS

State	TSP		SO_2	NO_2
Washington		Secondary NAAQS	.02 ppm AAM .10 ppm 24 hour .40 ppm 1 hour	NAAQS
West Virginia	Primary NAAQS	Secondary NAAQS	NAAQS	not available
Wisconsin	Primary NAAQS	Secondary NAAQS	NAAQS	NAAQS
Wyoming		Secondary NAAQS	Secondary NAAQS	NAAQS

APPENDIX B

Comparative Emission Standards for Coal Fired Electric Generating Stations

Summary of Restrictive Emission Standards for Coal Fired Electric Generating Stations (LBS/10^6BTU)

Standards of Performance for New Sources	TSP	SO_2	NO_x
EPA NSPS[1]	.03(.1)	.6-1.2[2](1.2)	.5-.6[3](.7)
New Mexico	.02	-	-
Wyoming	-	.2(80%)[4]	-
New Jersey	-	.3	-
PSD Requirements			
Colstrip Addition[5]	.05	.1(94.8%)[4]	.5
Cholla #5[5]	-	(94-95%)[4]	-
Standards of Performance for Existing Sources[6]			
New Mexico	.02	-	-
Wyoming	-	.3-1.2	-
West Virginia	.05	-	-
Florida	.1	-	-
Pennsylvania	-	.6	-
Georgia[7]	-	1.5-1.7%S by weight	-

[1] The figures in parentheses are the old EPA NSPS for coal fired generating stations.

[2] The current SO_2 NSPS requires both an emission limitation and a percentage reduction in total SO_2 emissions. A 90% SO_2 reduction is required if the final emission rate is in the range .6-1.2 lbs/10^6BTU. For emission rates below .6 lbs/10^6BTU, a 70% reduction is required.

[3] The range in the current NO_x NSPS reflects differences in the NO_x emission characteristics of the coal.

[4] The figure in parentheses indicates the percentage SO_2 reduction needed to achieve the emission standard assuming local coal is used.

[5] This new facility is not considered a new source for the purpose of the recently revised EPA NSPS. Thus, the applicable federal requirements are the old NSPS. More stringent controls were required in order to meet the PSD increments of nearby Class I areas.

[6] The state standards for existing sources do not necessarily apply to all areas fo the state. In some cases only specific regions in the state must meet these standards. For example, the 6 lbs/10^6 BTU SO_2 requirement for Pennsylvania applies only to the Philadelphia area.

[7] Georgia sulfur emission limitations define the sulfur quality of coal that could be burned, that is 1.5-1.7% sulfur by weight in areas near pecan groves. As the BTU quality of this coal is not known, we are unable to convert this emission limitation to units comparable with the other emission standards.