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IMPLEMENTATION PLAN REVIEW

FOR

IDAHO

AS REQUIRED

BY

THE ENERGY SUPPLY

AND

ENVIRONMENTAL COORDINATION ACT

U. S. ENVIRONMENTAL PROTECTION AGENCY

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PREPARED BY THE FOLLOWING TASK FORCE:

U. S. Environmental Protection Agency, Region X
1200 6th Avenue
Seattle, Washington 98101

Environmental Services of TRW, Inc.
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U. S. Environmental Protection Agency
Office of Air and Waste Management
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

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1.0 EXECUTIVE SUMMARY

The enclosed report is the U. S. Environmental Protection Agency's (EPA) response to Section IV of the Energy Supply and Environmental Coordination Act of 1974 (ESECA). Section IV requires EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interfering with the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). In addition to requiring that EPA report to the State on whether control regulations might be revised, ESECA provides that EPA must approve or disapprove any revised regulations relating to fuel burning stationary sources within three months after they are submitted to EPA by the States. The States may, as in the Clean Air Act of 1970, initiate State Implementation Plan revisions; ESECA does not, however, require States to change any existing plan.

Congress has intended that this report provide the State with information on excessively restrictive control regulations. The intent of ESECA is that SIPs, wherever possible, be revised in the interest of conserving low sulfur fuels or converting sources which burn oil or natural gas to coal. EPA's objective in carrying out the SIP reviews, therefore, has been to try to establish if emissions from combustion sources may be increased. Where an indication can be found that emissions from certain fuel burning sources can be increased and still attain and maintain NAAQS, it may be plausible that fuel resource allocations can be altered for "clean fuel savings" in a manner consistent with both environmental and national energy needs.

In many respects, the ESECA SIP reviews parallel EPA's policy on clean fuels. The Clean Fuels Policy has consisted of reviewing implementation plans with regards to saving low sulfur fuels and, where the primary sulfur dioxide air quality standards were not exceeded, to encourage States to either defer compliance regulations or to revise the SO_2 emission regulations. The States have also been asked to discourage large scale shifts from coal to oil where this could be done without jeopardizing the attainment and maintenance of the NAAQS.

To date, EPA's fuels policy has addressed only those States with the largest clean fuels saving potential. Several of these States have or are currently in the process of revising SO_2 regulations. These States are generally in the Eastern half of the United States. ESECA, however, extends the analysis of potentially over-restrictive regulations to all 55 States and territories. In addition, the current reviews address the attainment and maintenance of <u>all</u> the National Ambient Air Quality Standards.

There are, in general, three predominant reasons for the existence of overly restrictive emission limitations within the State Implementation Plans. These are: (1) the use of the example region approach in developing State-wide air quality control strategies; (2) the existence of State Air Quality Standards which are more stringent than NAAQS; and (3) the "hot spots" in only part of an Air Quality Control Region (AQCR) which have been used as the basis for controlling the entire region. Since each of these situations affect many State Plans and in some instances conflict with current national energy concerns, a review of the State Implementation Plans is a logical follow-up to EPA's initial appraisal of the SIPs conducted in 1972. At that time SIPs were approved by EPA if they demonstrated the attainment of NAAQS <u>or</u> more stringent state air quality standards. Also, at that time an acceptable method for formulating control strategies was the use of an example region for demonstrating the attainment of the standards.

The example region concept permitted a State to identify the most polluted air quality control region and adopt control regulations which would be adequate to attain the NAAQS in that region. In using an example region, it was assumed that NAAQS would be attained in the other AQCRs of the State if the control regulations were applied to similar sources. The problem with the use of an example region is that it can result in excessive controls, especially in the utilization of clean fuels, for areas of the State where sources would not otherwise contribute to NAAQS violations. For instance, a control strategy based on a particular region or source can result in a regulation requiring one percent sulfur oil to be burned state-wide where the use of three percent sulfur coal would be adequate to attain NAAQS in some locations.

EPA anticipates that a number of States will use the review findings to assist them in making the decision whether or not to revise portions of their State Implementation Plans. However, it is more important for those States which desire to submit a revised plan to recognize the review's limitations. The findings of this report are by no means conclusive and are neither intended nor adequate to be the sole basis for SIP revisions; they do, however, represent EPA's best judgment and effort in complying with the ESECA requirements. The time and resources which EPA has had to prepare the reports has not permitted the consideration of growth, economics, and control strategy tradeoffs. Also, there has been only limited dispersion modeling data available by which to address individual point source emissions. Where the modeling data for specific sources were found, however, they were used in the analysis.

The data upon which the reports' findings are based is the most currently available to the Federal Government. However, EPA believes that the States possess the best information for developing revised plans. The States have the most up-to-date air quality and emissions data, a better feel for growth, and the fullest understanding for the complex problems facing them in the attainment and maintenance of quality air. Therefore, those States desiring to revise a plan are encouraged to verify and, in many instances, expand the modeling and monitoring data supporting EPA's findings. In developing a suitable plan, it is suggested that States select control strategies which place emissions for fuel combustion sources into perspective with all sources of emissions such as smelters or other industrial processes. States are encouraged to consider the overall impact which the potential relaxation of overly restrictive emissions regulations for combustion sources might have on their future control programs. This may include air quality maintenance, prevention of significant deterioration, increased TSP, NO_x, and HC emissions which occur in fuel switching, and other potential air pollution problems such as sulfates.

Although the enclosed analysis has attempted to address the attainment of all the NAAQS, most of the review has focused on total suspended particulate matter (TSP) and sulfur dioxide (SO_2) emissions. This is because stationary fuel combustion sources constitute the greatest source of SO_2 emissions and are a major source of TSP emissions.

Part of each State's review was organized to provide an analysis of the SO_2 and TSP emission tolerance within each of the various AQCRs. The regional emission tolerance estimate is, in many cases, EPA's only measure of the "over-cleaning" accomplished by a SIP. The tolerance assessments have been combined in Appendix B with other regional air quality "indicators" in an attempt to provide an evaluation of a region's candidacy for changing emission limitation regulations. In conjunction with the regional analysis, a summary of the State's fuel combustion sources (power plants, industrial sources, and area sources) has been carried out in Appendix C, D, and E.

The major findings evolving from the study are:

- The review indicates that SO_2 fuel combustion emission regulations may be revised in the Idaho and Metropolitan Boise AQCRs without jeopardizing attainment and maintenance of NAAQS. In addition, it is possible that SO_2 fuel combustion emission regulations are over-restrictive for most of of the area within the Eastern Idaho and Eastern Washington-Northern Idaho (Idaho portion) AQCRs. The review also indicates that present fuel burning practices are in over-compliance with SO_2 emission regulations (due to the use of low sulfur fuels and natural gas), and that there is room to increase SO_2 emissions before violating the emission regulations in each of the AQCRs.

- Particulate fuel combustion emission regulations do not appear to be overly restrictive in any of the four Idaho AQCRs. In each of the regions, fugitive dust, suspended by traffic, construction, and industrial activities, is the major contributor to high levels of suspended particulate matter. In rural areas, where fugitive dust does not pose the same problem as in urban areas, it may be possible to revise particulate emission regulations from fuel burning sources. However, revisions of particulate regulations in areas of worst air quality (urban areas) would only aggravate the existing and projected air pollution problems for particulates.

- Areas in which SO_2 or particulate fuel combustion emission regulations may be revised without jeopardizing attainment of federal air standards, are candidates for clean fuel savings. In addition, there are regions where significant fuel savings may be accomplished within the constraints of the regulations emission limits, and without jeopardizing attainment of federal air standards. The review analysis indicates that SO_2 emissions may be increased significantly (to obtain clean fuel savings) without violation of emission regulations or interference with attainment of air quality standards in the Idaho and Metropolitan Boise AQCRs, and in most of the Eastern Idaho and Eastern Washington-Northern Idaho AQCRs. The analysis shows that particulate emissions may be significantly increased without violation of combustion emission regulations in all regions by 1975, but that potential clean fuel savings programs which would cause such an increase in particulate emissions would probably conflict with air quality attainment goals in the urban areas of all regions.

2.0 STATE IMPLEMENTATION PLAN REVIEW

A revision of fuel combustion source emissions regulations will depend on many factors. For example:

- Does the State have air quality standards which are more stringent than NAAQS?
- Does the State have emission limitation regulations for control of (1) power plants, (2) industrial sources, (3) area sources?
- Did the State use an example region approach for demonstrating the attainment of NAAQS <u>or</u> more stringent State standards?
- Has the State initiated action to modify combustion emission regulations for fuel savings; i.e., under the Clean Fuels Policy?
- Are there proposed Air Quality Maintenance Areas?
- Are there indications of a sufficient number of monitoring sites within a region?
- Is there an expected 1975 attainment date for NAAQS?
- Based on reported (1973) air quality data, does air quality meet NAAQS?
- Based on reported (1973) air quality data, are there indications of a tolerance for increasing emissions?
- Based on the State Implementation Plan, are there indications of a tolerance for increasing emissions in 1975?
- Are the total emissions from stationary fuel combustion sources less than those from all other sources?
- Must emission regulations be revised to accomplish significant fuel switching?
- Do modeling results for specific fuel combustion sources show a potential for a regulation revision?
- Is there a significant clean fuels savings potential in the region?

Table 2-1. State Implementation Plan Review (Summary) for Idaho

"INDICATORS"	STATE TSP	STATE SO_2	EASTERN IDAHO TSP	EASTERN IDAHO SO_2	IDAHO PORTION, E.WASH. N.IDAHO TSP	IDAHO PORTION, E.WASH. N.IDAHO SO_2	IDAHO TSP	IDAHO SO_2	METRO-POLITAN BOISE TSP	METRO-POLITAN BOISE SO_2
• Does the State have air quality standards which are more stringent than NAAQS?	No	No								
• Does the State have emission limiting regulations for control of: 1. Power plants 2. Industrial sources 3. Area sources	 Yes Yes No	 Yes Yes No								
• Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards?	No	No								
• Has the State initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy?	No	No								
• Are there proposed Air Quality Maintenance Areas?			No	No	No	No	No	No	No	No
• Are there indications of a sufficient number of monitoring sites within a region?			Yes	No	Yes	Yes	Yes	No	Yes	No
• Is there an expected 1975 attainment date for NAAQS?			No[d]	Yes	No[d]	No	No[d]	Yes[c]	No[d]	Yes[c]
• Based on reported (1973) Air Quality Data, does air quality meet NAAQS?			No	f	No	No	No	f	No	f
• Based on reported (1973) Air Quality Data, are there indications of a tolerance for increasing emissions?			No	f	No	No	No	f	No	f
• Based on the State Implementation Plan, are there indications of a tolerance for increasing emissions in 1975?			Yes[a]	Yes[a]	Yes[a]	Yes[a]	Yes[a]	Yes[a]	No	Yes[a]
• Is the fraction of total emissions arising from stationary fuel combustion sources lower than from all other sources combined?			Yes	Yes	No	Yes	Yes	No	Yes	No
• Do modeling results for specific fuel combustion sources show a potential for a regulation revision?			← NO MODELING RESULTS AVAILABLE →							
• Do emission regulations need to be relaxed to obtain significant clean fuel savings?			No	No	No	No	No	No	No	No
• Based on the above indicators, what is the potential for revision fuel combustion source emission limiting regulations?			Marginal[b]	Marginal[b]	Marginal[b]	Marginal[b]	Marginal[b]	Good	Poor	Good
• Is there a significant Clean Fuels Saving[e] potential in the region?			No	Yes	No	Yes	No	Yes	No	Yes

[a] A "yes" assessment in these instances indicates there are various counties within the region which are expected to possess an emission tolerance in 1975. These counties are removed from the areas where worst air quality levels are recorded.

[b] The region has been rated "marginal" rather than "poor," because some portions (or counties) of the region are able to tolerate regulation revisions without jeopardizing attainment of federal air standards.

[c] This refers to AQCRs where ambient concentrations are already (as of 1973) in compliance with federal air quality standards.

[d] The plan includes a control strategy which aims for attainment by 1975, but it is not clear whether the plan can provide the required degree of control for fugitive dust to meet the standards. Additional controls will be added if necessary, but it is doubtful they would be implemented in time to meet the 1975 deadline.

[e] "Clean fuel savings" refers to the replacement of current fuel schedules with "dirtier" fuels. (Whenever emissions from fuel burning sources can be increased without jeopardizing attainment of NAAQS, it may be plausible that fuel resources allocations can be altered for "clean fuel savings.")

[f] No SO_2 monitoring data was reported for these regions.

The following portion of this report is directed at answering these questions. An AQCR's potential for revising regulations is then determined by a consideration of the air quality indications represented in the responses to the above questions.

The initial part of the SIP review report, Section 2 and Appendix A, was organized to provide the background and current situation information for the State Implementation Plan. Section 3 and the remaining Appendices provide an AQCR analysis which helps establish the overall potential for revising regulations. Emission tolerance estimates have been combined in Appendix B with other regional air quality "indicators" in an attempt to provide an evaluation of a region's candidacy for revising emission limiting regulations. In conjunction with the regional analysis, a characterization of the State's fuel combustion sources (power plants, industrial sources, and area sources) has been carried out in Appendix C, D, and E.

Based on an overall evaluation of EPA's current information, AQCRs have been classified as good, marginal, or poor candidates for regulation revisions. The following table summarizes the State Implementation Plan Review. The remaining portion of the report supports this summary with explanations.

2.1 AIR QUALITY SETTING - STATE OF IDAHO

The following discussion provides a characterization of the various AQCRs in terms of air quality. It includes an examination of ambient air standards, emission inventories, and air-monitoring networks.

2.1.1 Air Quality Control Regions

The State of Idaho has been divided into four federal air quality control regions to provide a basis for the adoption of regional air quality standards and the implementation of these standards. One of these regions is interstate and includes adjacent counties of Washington and Idaho. The four regions and their boundaries are shown in Figure A-1.

The geographical limits of the Eastern Idaho AQCR contains 14 counties in the southeastern part of Idaho, 23 percent of the area of the state, and 30 percent of the population. The major population centers are located along the Snake River Valley which runs southwestward from Idaho Falls (population - 35,776) to Pocatello (population - 40,036). The region is classified Priority I for particulates. In addition to the generally high particulate levels within the urban centers of the valley, regions of maximum concentration are located in the vicinity of the FMC and J. R. Simplot Company phosphorus and fertilizer plants near Pocatello, and in the vicinity of Becker Industries in Conda. The Eastern Idaho AQCR is classified 1A for sulfur dioxide because of the release of SO_2 from (1) the two sulfuric acid plants operated by Simplot, and (2) the Becker industrial complex in Conda.

The Idaho portion of the Eastern-Washington-Northern Idaho Interstate AQCR contains five Idaho counties which comprise 8 percent of the area of the state and contain approximately 15 percent of the population. The largest cities are Lewiston (population - 26,068), Coeur d'Arlene (population - 16,228) and Moscow (population - 14,146). The region is classified Priority I for particulates. The largest known sources of particulates are from solid waste disposal, principally slash burning and conical burners, and from operations at the Potlatch Forest, Inc. mill in Lewiston and the Bunker Hill Company smelters in Kellogg. Lesser amounts are contributed by the processing of agricultural products, grass burning, and other agricultural activities. The region is classified 1A for sulfur dioxide because of the high concentrations of the gas found in the Coeur d'Arlene valley near the Bunker Hill Company smelters.

The principal sources of particulates within the Idaho AQCR are solid waste disposal (slash burning and conical burners) and fuel combustion (coal and wood burning). The region is classified priority III for sulfur dioxide. The principal city of concern in the region is Twin Falls, with a population of 21,914. The largest single known source of particulates in the vicinity of Twin Falls is the Amalgamated Sugar Plant.

The areas of principal concern in the Metropolitan Boise AQCR are the cities of Boise (74,990), Nampa (20,768), and Caldwell (14,219). The largest sources of particulates by category are fuel combustion and process losses. The region is classified priority III for sulfur dioxide, and II for particulates.

The air pollution priority classification for each of the air quality control regions for particulates, SO_2 and NO_x, is presented in Table A-2. Table A-2 also provides an identification of counties which have been proposed as Air Quality Maintenance Areas. The data indicate that the most pressing air pollution problem involves particulates. Three of the four AQCRs have been designated as priority I for particulates, and none of the regions are presently in compliance with the federal secondary standards for particulates. Table A-3 shows the expected attainment dates for federal air quality standards in the four AQCRs. It can be seen that there is uncertainty regarding the attainment schedules for both particulates and SO_2.

2.1.2 Ambient Air Quality Standards

Ambient Air Standards for the State of Idaho are as shown in Table A-4. The state standards for particulates and SO_2 are equivalent to the federal standards.

2.1.3 Air Quality Status

The 1973 air quality status for suspended particulates in the various AQCRs is given in Table A-5. Table A-5 summarizes the worst cases of particulate concentrations for each of the regions in 1973. Violations of the federal air standards (on a 24-hour and annual basis) for suspended particulates occurred in all the AQCRs. Based on proportional model criteria, each of the regions will require more than 60% reduction in emissions to attain the standards based on the 1973 air quality levels.

As is typical of regions containing both rural and urban areas, the AQCRs in Idaho are subject to uneven distributions of source loading. The uneven distribution causes consistent high particulate measurements at monitoring sites in the areas of greatest emission density, while the remainder of the region usually reflects a much lower particulate profile. Monitoring studies performed throughout the State of Idaho have shown that the particulate problem is a city-wide phenomena, and that rural locations experience substantially lower concentrations of particulates which are generally in compliance with the federal standards.

The surveillance network for SO_2 is characterized by the use of sulfation plates in all AQCRs except the Eastern-Washington-Northern Idaho Interstate. Data from these sulfation plate networks is not reported through the SAROAD system, and therefore air quality status for SO_2 levels is somewhat unclear through most of Idaho. In the Idaho portion of the Eastern-Washington-Northern Idaho Interstate AQCR, the highest second highest 24-hour concentration of SO_2 recorded was 1248 $\mu g/m^3$. This concentration indicates an emission reduction of 71% is necessary to attain the standards in this Interstate AQCR. Due to the absence of SO_2 air quality data, it is not known if SO_2 levels in the Eastern Idaho AQCR are also presently in violation of SO_2 federal air standards. Therefore, the degree of emissions reduction now needed to attain SO_2 standards in the Eastern Idaho AQCR is not precisely known. While recent measurements of atmospheric levels of SO_2 in the Idaho and Metropolitan Boise AQCRs are also unavailable, emissions of SO_2 are known to be relatively insignificant in these regions, and it is presumed that SO_2 levels there are in substantial compliance with federal standards.

While Table A-8 does not provide a complete summary of the particulate emissions generated in the Idaho regions (the inventory does not include fugitive emission sources), it does include an indication of the quantity and types of fuel combustion particulate emissions in the various regions. It is seen that fuel combustion sources account for 9 to 60% of the total inventoried particulate emissions in the various regions. Most of the fuel combustion particulate emissions arise from industrial and commercial point sources. Because nearly all electrical energy consumed by the state of Idaho is generated by hydroelectric power plants, particulate emissions generated from electrical generating facilities are insignificant in all the AQCRs. The quantity of particulate emissions generated by area sources is also relatively small, ranging from 4.4% to 8.1% of the combustion source category particulate emissions.

Table A-7 lists the number of combustion emission sources in each of the AQCRs. These are the number of emission sources which have been inventoried in the NEDS and/or the Federal Power Commission Data System. Only one power plant has been identified as a significant emission source throughout the State. The most substantial portion of the fuel burning emission sources are industrial-commercial fuel burning units.

Table A-9 provides a summary of SO_2 emissions generated throughout the various Idaho AQCRs. The role of fuel combustion in SO_2 emissions varies greatly from region to region. In the Eastern Idaho and Eastern Washington-Northern Idaho Interstate AQCRs, fuel combustion sources account for 10 to 12% of the total SO_2 emissions, while in the Idaho and Metropolitan Boise AQCRs, 72 to 80% of the SO_2 emissions originate from fuel burning. As expected, very little SO_2 is generated from power plant activity (predominantly hydroelectric). In all the AQCRs, combustion area sources account for the most substantial portion of the fuel combustion SO_2 emissions inventory. The area source emissions arise primarily from residential space heating and the burning of fuel oils in small commercial applications.

The actual quantity of SO_2 emissions from fuel combustion sources is relatively insignificant throughout the regions. In the two regions designated priority I for SO_2, fuel combustion emissions exercise a minor role in the buildup of ambient SO_2 levels, accounting for only 2.2 tons (out of a total of 18.4 tons) of SO_2 in the Eastern Idaho AQCR, and 3.5 tons (out of a total of 34.7 tons) of SO_2 in the Eastern Washington-Northern Idaho AQCR. The impact of fuel revisions or relaxation of combustion source emission regulations on atmospheric levels of SO_2 in these areas would be very minor.

2.2 BACKGROUND ON THE DEVELOPMENT OF THE STATE IMPLEMENTATION PLAN

This section provides a characterization of the Implementation control strategies, a reconciliation evaluation between air quality/emissions relationships assumed at the time of the strategy development and those which can be assumed from more recent data, and an evaluation of the tolerance each of the AQCRs possesses for increased emissions of particulates and SO_2.

2.2.1 General

The State of Idaho developed a control plan for achievement of the federal air standards for particulates and SO_2 by addressing the specific air pollution problems in each of the regions. Special focus was directed to the various "hot spots" of each AQCR. Emission reductions were sought for those local sources which could be demonstrated as contributors to the worst air quality of the regions. The impact of candidate control strategies were investigated by developing projected emission inventories, and calculating emission reductions expected to result from application of the strategies. These emission reductions were then related to the expectant air quality by means of proportional model rollback calculations and area model diffusion calculations.

2.2.2 Particulate Control Strategy

In the development of the control strategy for attainment of the ambient air standards for particulates, the State of Idaho discovered that known inventoried sources of particulates are not entirely responsible for the high ambient particulate levels throughout the state. Modeling techniques were used to determine the contribution of inventoried emission sources to the measured particulate levels. These models showed that only a small percentage of the total measured particulate values in any area could be accounted for in terms of known (inventoried) emissions.

A recent study by the State has indicated that the major source of high ambient particulate levels is fugitive dust. Accordingly, the most recent amendments to the Idaho air program implementation plan include provisions for control of fugitive dust sources. This control strategy is directed at the control of 1) industrial fugitive dust sources, 2) dust from construction and demolition operations, and 3) dust from unpaved streets. This strategy, in addition to available control technology which will be applied to known existing sources, is to be applied in all four AQCRs in an attempt to attain the federal air standards by 1975. However, in view of the analytical difficulties associated with the quantification of fugitive dust sources and the reductions expected to occur as a result of the newly adopted strategies, it is not possible to show clearly that the secondary standards for particulates will be achieved by 1975 (Table A-3) in any of the regions.

Table A-10 summarizes pertinent data used in the development of particulate control strategies for the various AQCRs, and identifies the major known emission sources of the "hot spot" which are to be selectively controlled with reasonable available control technology.

2.2.3 Sulfur Oxide Control Strategy

The control strategy for SO_2 addresses the area in the state where the federal standards for ambient SO_2 levels are violated: (1) in the immediate vicinity of the Simplot Fertilizer Company near Pocatello, (2) in the vicinity of the Bunker Hill Company smelters at Kellogg, and (3) in the vicinity of the Becker Industrial complex in Conda.

In the Eastern Idaho AQCR, the most difficult SO_2 pollution problem will be mitigated by an SO_2 emission reduction of 45% by the Simplot Company acid plants. (Reduction of other SO_2 emissions in the Pocatello area would incur insignificant impact on the SO_2 air quality levels in the vicinity.) A compliance program implementing the necessary reduction of SO_2 emissions through installation of a scrubbing system, or equivalent emission reduction measure, will be negotiated with the company. This control plus other measures applied to the Becker Industrial Complex in Conda, should enable the region to meet the Federal ambient SO_2 standards.

In the Idaho portion of the Eastern Washington-Northern Idaho Interstate AQCR, SO_2 emission reductions of 85% would be required by the Bunker Hill smelters to meet the secondary standards in the area of worst air quality. The current control strategy to attain the SO_2 standard consists of 1) application of reasonable available control technology, and 2) implementation of plant operational changes. It is doubtful that the control strategy can achieve the standards by 1975, since present technology is inadequate to provide the degree of emission control needed, and the impact which plant operational changes will have on air quality is unclear.

Because emissions of SO_2 are insignificant in the Idaho and Metropolitan Boise AQCR (classified priority III with respect to SO_2), the control strategy for SO_2 there consists only of fuel specifications limiting sulfur content in fuel oils and coal.

Table A-11 summarizes pertinent data used in the development of SO_2 control strategies for the various AQCRs. The air quality measurements selected as the controlling value for rollback determination for the Eastern Idaho AQCR were constituted on annual values estimated from a mathematical model. Air quality data for SO_2 in the Idaho and Metropolitan Boise was known to be in compliance with SO_2 standards, based on modest sulfation plate data obtained in the region.

2.2.4 Emission Tolerance Evaluation

Table A-10 and A-11 provide an assessment of the tolerance which each of the AQCRs possesses for increased emissions of particulates or SO_2. If a region has a tolerance for more emissions, then this indicates: 1) it is possible that fuel burning schedules may be revised so that clean fuel savings may be accomplished, and 2) it is possible that fuel combustion emission regulations may be (but not necessarily) relaxed. The methodology used in calculating the emission tolerance is explained in detail in Tables A-10 and A-11. There are basically two ways in which the tolerance is derived: 1) by a comparison of allowable region wide emissions with the actual emissions forecast in 1975, using the data from the Implementation Plan analysis, or 2) by a comparison of allowable region wide emissions with the actual 1973 emissions as determined using 1973 air quality/emissions data. The former method is chosen when the Implementation Plan forecasts appear to be reconcilable with recent air quality/emissions data. In this case, forecasts of the plan are considered valid, and used to develop an emissions tolerance. If justified, this method is preferable, since the emission tolerance developed in this way reflects the full impact of the control strategies after their implementation is complete in 1975. The emission tolerance becomes a measure of the degree of "over-cleaning" accomplished by the plan, or in cases where the region was already within air quality standards and did not require additional pollution controls, the tolerance is an expression of the degree of degradation possible before federal air quality standards are jeopardized. However, if irreconcilabilities exist from the comparison of Implementation Plan forecasts with more current air quality and emissions data,it will be necessary to abort the first approach discussed above, and determine the emission tolerance based on 1973 air quality status in the region, which reflects the estimation before many substantial controls have been fully implemented from the control strategy.

Table A-10 provides the summary of data used to generate a particulate emission tolerance in each of the AQCRs. None of the regions possess a tolerance for increased emission of particulates in the vicinity of the areas of worst air quality. However, air monitoring studies throughout the State of Idaho indicate that rural areas possess air quality in compliance with ambient air standards. It is probably therefore, that rural areas within the regions possess a significant tolerance for increased particulate emissions. However, the existence of these "rural tolerances" would carry limited implications for the regions existing sources, most of which are located in the vicinity of urban areas.

Table A-11 provides a summary of the data used to determine an SO_2 emission tolerance in the various AQCRs. Substantial tolerances appear to exist throughout the Idaho and Metropolitan Boise AQCRs, and the same would appear to be true in the Eastern Idaho and Eastern Washington-Northern Idaho Interstate AQCRs, with the exception of areas in the vicinity of the hot spots. Data was unavailable to permit the quantification of the SO_2 tolerances.

2.2.5 Fuel Combustion Emission Regulations Summary

Table A-12 provides a summary of emission regulations for fuel combustion equipment which have been adopted as a part of the control strategy of the Idaho State Air Program Implementation Plan. The regulations are applicable throughout the state. SO_2 emissions from combustion units are limited by restricting the sulfur content in fuels. Particulate emissions from existing fuel combustion equipment are limited according to the size of the combustion equipment (see Figure A-2).

2.3 SPECIAL CONSIDERATIONS

This section provides a brief narrative on special considerations which effect final assessments to be developed in this report.

2.3.1 Planned Revisions to the Implementation Plan

It has been recognized that limited information was available to characterize the fugitive dust problems throughout the urban areas of Idaho at the time of the control strategy formulation. Therefore, allowances have been made in the plan to provide for ongoing development of control strategies as may be indicated appropriate by new data obtained from an expanding air monitoring network and special study efforts. This policy is exemplified by current study efforts to quantify the impact of fugitive dust sources on particulate loadings in each of the AQCRs, and to assess the impact of candidate control measures designed to eliminate these dust loadings. As a result of these studies, the State will evaluate the adequacy of regulations scheduled to be implemented under the control strategy of the State air program, and revise them as needed to insure attainment of federal air standards.

2.3.2 Special Problems

The enforcement of regulations limiting particulate emissions from all fuel combustion sources will force: 1) the use of control equipment on wood burning boilers, or 2) the use of alternative fuels. It is expected that most wood burning operations will be adapted for compliance with particulate regulations by installation of boiler stack emission control equipment.

2.3.3 Fuels and Anticipated Fuel Conversions

The vast majority of energy consumption in the State of Idaho is produced by hydroelectric power plants. Of the current fuel energy used in the State of Idaho in 1972, 17% was petroleum, 46% was natural gas and the remainder (22%) was coal or wood (see Table E-1). This distribution of fuel usage is expected to change substantially over the next few years. The use of fuel oils is expected to increase drastically due to increasing curtailment of Canada's supply of natural gas to the Northern States. This would indicate that a significant portion of the fuel combustion equipment in Idaho will be converted to burn fuel oil, and consequently, emissions of SO_2 and particulates will increase significantly.

Under the imposed gas curtailments (which in effect, amounts to clean fuel savings), it is unclear whether industry will be capable of providing the controls needed to comply with the emission regulations of the control strategies. (Of course this uncertainty is present even if fuel schedules do not change, as many industries are now operating in variance with regulations until they can provide control installations.) Particulate control devices can probably be supplied in time to meet the compliance deadline for particulate control, but a current trend toward shortage of low sulfur fuel oils may create difficult fuel compliance problems since increasingly larger quantities of the low sulfur fuel will be needed (in place of curtailed gas) to meet the regulations. Flue gas desulfurization systems loom as a future emission control alternative (as opposed to fuel sulfur limitations) for SO_2 emissions, but because of their limited application to date, these systems are not expected to be available as a means of meeting 1975 attainment deadlines.

3.0 AQCR ASSESSMENTS

This section provides: 1) an assessment of the feasibility for accomplishing clean fuel savings in the various AQCRs, and 2) an assessment of fuel combustion emission regulations to determine if they are overly restrictive for the attainment of National Ambient Air Quality Standards in the various AQCRs.

The first assessment is carried out with an evaluation of various regional air quality indicators developed in Section 2 and compiled in Appendix B (and then again by evaluation of the impact of a reasonable fuel switch as determined in Appendix F). The regional air quality indicators considered are comprised of criteria shown in Table B-1 and B-2, and include: 1) the breadth of air quality violations, 2) expected attainment dates, 3) proposed AQMA designations, 4) total regional emissions, 5) portion of emissions from fuel combustion, 6) and regional tolerance for emission increase. The emission tolerance possibly provides the most important indicator, since, if it is known, it provides a measure of the over-cleanliness of the region, now or projected, and indicates how much additional pollution (from dirtier fuels) can be permitted.

The assessment of the restrictiveness of fuel combustion regulations was performed with an evaluation of the impact of fuel burning operations on air quality when those operations emit at a level equivalent to the ceiling limit of the emission regulations. These emissions are calculated in Appendices C,D, and E for power plants, industrial/commercial point sources, and area sources, and then summarized in Appendix F.

The assessment of the various AQCRs is discussed below.

3.1 ASSESSMENT BY REGIONAL AIR QUALITY INDICATORS

Table B-1 indicates that three of the four AQCRs can be considered a marginal candidate for clean fuel savings (or possibly regulations relaxation) without jeopardizing compliance with particulate ambient air quality standards. These regions are marginal candidates because their potential for clean fuel savings depends on the specific area of consideration within the region. Urban areas are poor candidates for fuel savings because of the uncertain adequacy of the present control strategy to attain standards in these hot spots (urban areas), and rural areas are good candidates because they possess significant tolerance for increased particulate emissions. (It should be noted that a relatively small number of significant particulate combustion sources are located in the rural areas of these regions, hence, the impact of clean fuel savings programs there would probably be minimal.) The Metropolitan Boise AQCR is judged to be a poor candidate for clean fuel savings because of the relatively even distribution of particulate emission sources which contribute to consistently high ambient particulate levels throughout this small region.

Table B-2 shows that both the Idaho and Metropolitan Boise AQCRs appear to be good candidates to accomplish clean fuel when they are constrained by attainment of the SO_2 air standards only. This evaluation results from the fact that these AQCRs are presently demonstrating attainment with the standards, and that substantial SO_2 emission tolerances exist in these regions. The remaining regions have been judged marginal candidates for clean fuel savings or possibly, regulations relaxation. In these regions, there are areas in the vicinity of the single hot spot of each region where an attempt to develop clean fuel savings would jeopardize attainment of the standards there. However, in the remainder of these regions, it appears there is a potential for clean fuel savings since substantial tolerance for increased SO_2 emissions exists there.

3.2 ASSESSMENT BY SOURCE ANALYSIS OF POWER PLANTS/INDUSTRIAL-COMMERCIAL/ AREA SOURCES

As over 90% of all power generation in Idaho is hydro-electrically produced, there are only a limited number of fuel burning power plants in the State of Idaho. Fuel use and emission data for the only significant fuel burning power plant in Idaho is shown in Table C-1. This plant is coal fired, and the emissions of SO_2 and particulates arising from their operation is virtually insignificant in the overall emission inventories of the affected AQCRs.

Table D-1 provides a summary of the major industrial/commercial fuel combustion point sources in the various AQCRs. The number of these sources which have been identified in the NEDs emission inventory is reported on Table A-7. In Table D-1, wood burning plants in each county have been aggregated together as a single source, since it was not expected that clean fuel savings objectives would be applicable to wood burners. The emissions summary of Table D-1 shows that industrial sources of all AQCRs are in substantial compliance with the SO_2 emission regulations. This is achieved through a combination of the burning of natural gas and wood. With respect to compliance to particulate regulations however, the point sources are found to be significantly deficient in all regions. However, based on the assessment of emission tolerance in the various AQCRs, compliance of those sources located in the rural areas with particulate regulations may not be necessary for the attainment of ambient air standards. For example, the relatively large emission of particulates generating from the county of Bonneville in the Eastern Idaho AQCR may possibly be maintained at status quo without the need of additional air pollution controls to attain the standards. The same example can be made for rural portions of the Eastern Washington-Northern Idaho Interstate and Idaho AQCRs.

The significance of the fuel combustion area source varies greatly from region to region (Tables A-8 and A-9), and often accounts for a large portion of the SO_2 emissions inventory. The relative significance of the area source in the generation of particulate emissions is far less pronounced (Table A-8). Area sources are comprised largely of residential and industrial space heating units, and small industrial and commercial boilers, burning distillate and residual fuel oils. These units are exempt from emission control, and are not constrained to consume "clean" fuels. Therefore, it does not appear that significant clean fuel savings can be accomplished from the area source sector of the fuel consuming categories.

Table F-1 and F-2 combine the analysis of Appendix C and D (power plants and industrial/commercial point sources) to provide an assessment of the restrictiveness of fuel burning emission regulations. The assessment is carried out by evaluating the difference between the projected fuel combustion emissions in 1975 and those emissions which are emitted at the level of emission regulations. This difference constitutes the additional emissions which would result if, after compliance with regulations in 1975, all fuel burning sources were to alter fuels or operations, causing emissions to rise up to the level of the regulations. It is clear that if the additional emissions calculated are more than the emission tolerance compiled for the region (Tables A-10 and A-11), the emission regulations are not overly restrictive, and they should not be relaxed.

The concepts associated with the assessment of restrictiveness of fuel combustion regulations are illustrated in Figure 3-1. It can be seen that there are two distinct levels of emissions which are "allowable." One of these allowable levels corresponds to the total region-wide emissions which are generated when all regulated fuel combustion sources emit at the ceiling level of the emission regulations, and the other allowable level corresponds to the maximum region-wide emissions which can be permitted before air quality standards would be violated. In Figure 3-1, the emissions allowable when fuel burning equipment emits at the level of the fuel combustion regulations (Curve C) are shown to be less than that emission total which would jeopardize compliance with the federal air standards (Curve A). This would constitute a case in which fuel combustion emission regulations may be relaxed. Depending on the circumstances of an AQCR, it may be possible for curve C to be above or below the curves A and B in Figure 3-1. When curve C is above A after 1975, fuel combustion emission regulations are possibly less stringent than necessary to insure compliance with the standards.

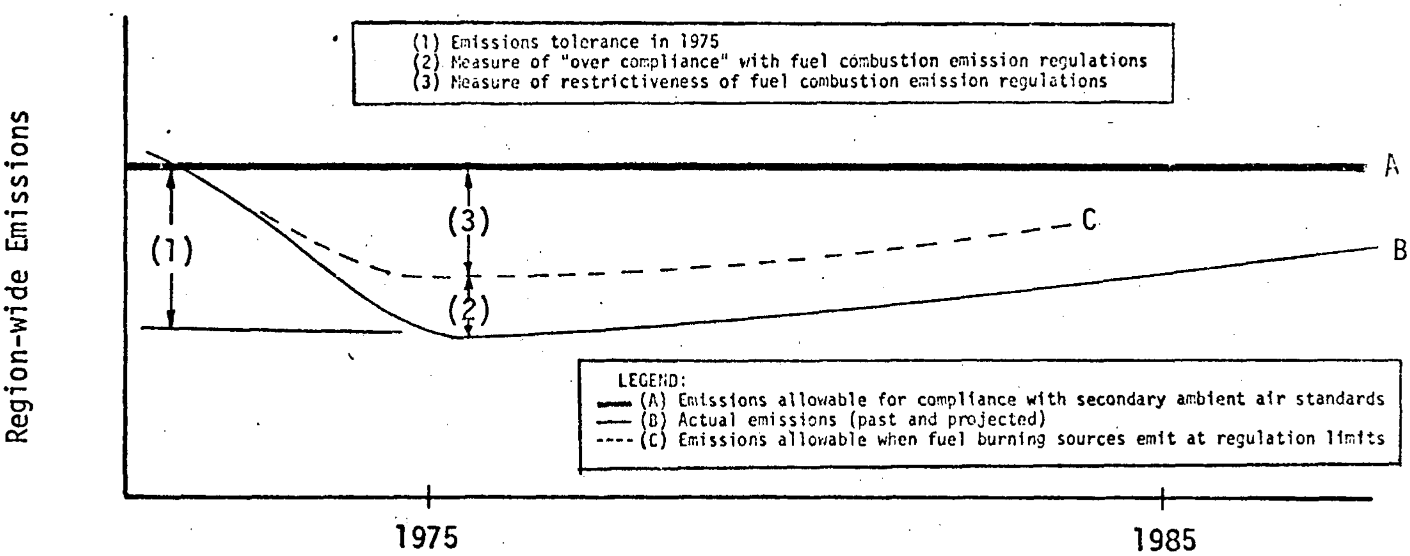

Figure 3-1. Evaluation of Restrictiveness of Fuel Combustion Emission Regulations

In Table F-1, it can be seen that fuel particulate emission regulations for fuel combustion operations appear to be overly restrictive only in the rural areas of the Eastern Idaho, Eastern-Washington-Northern Idaho, and Idaho AQCRs. In these regions (the rural areas) it may be possible for fuel combustion equipment to emit at the ceiling rate of the particulate emission regulations without jeopardizing attainment (or maintenance) of the air quality standards for ambient particulate concentrations. In the Metropolitan Boise AQCR, high particulate levels exist throughout the region, and it does not appear that particulate emission regulations should be relaxed to any extent in this region.

In Table F-2, it is demonstrated that it would be possible to incur substantial relaxation of the SO_2 emission regulations in the Idaho and Metropolitan Boise AQCRs without interfering with attainment of ambient air quality objectives. It also appears that regulations may be overly restrictive in areas removed from the single SO_2 hot spots of the Eastern Idaho and Eastern Washington-Northern Idaho AQCRs. Practically all the regional SO_2 emissions are concentrated in the two hot spots, hence the remaining portions of the region possess a significant tolerance for increased SO_2 emissions. In addition, due to a high degree of over-compliance with regulations, stemming from the use of natural gas and wood as fuels, there is substantial room to increase SO_2 fuel combustion emissions without violating emission regulations. This suggests that significant clean fuel savings (in low sulfur fuel oil and natural gas) can be accomplished without the need of revising regulations.

The impact of a feasible fuel switch to obtain clean fuel savings in the State of Idaho is summarized in Table F-3. It was assumed that all gas burning combustion equipment would be converted to burn high sulfur (2%S) residual fuel oil, and that all use of residual fuel oil would be converted to the high sulfur (2%S) type. Plants operating with both coal and gas were assumed to be convertible to 100% coal use. The switch is assumed to occur in 1975, after compliance with emission regulations has been attained (by particulate emission controls and use of low sulfur fuels). For those units which are converted for the fuel switch, it is assumed that no additional emission control equipment is installed. Hence, for all units converted from gas only to fuel oil, there will undoubtedly be accompanying emission regulation violations. Also, since it was assumed that SO_2 emission compliance is attained in 1975 through use of low sulfur fuels, conversion of these fuels to higher sulfur (2%S) oil will also incur emission regulation violations. While such a conversion scheme is obviously imaginary, it would theoretically constitute a reasonable fuel switch, resulting in only minimal economic dislocation. The switch would accomplish clean fuel savings for low sulfur oils and natural gas. Table F-3 shows that, with regard to particulate emissions in three of the regions, impact of the fuel switch is less than that which would be caused by all fuel burning sources in the region emitting at the ceiling rate of the emission regulation (Table F-1). In other words, while the suggested fuel switch of Table F-3 would result in violations of the particulate emission regulations for the emission sources switched, the overall impact of this switch is diminished by the degree of over-compliance of other combustion sources (wood, oil) non-affected by the switch. On the basis of the preliminary findings of Table F-3, it would appear that the reasonable fuel switch outlined here could be accomplished with only minor impact on the attainment of secondary standards for particulates in all regions except possibly the Eastern Idaho AQCR. Table F-3 shows that for the case of the Eastern Idaho AQCR, the clean fuel savings scheme would result in a regionwide particulate emissions increase of 3,356 tons/yr, far in excess of the aggregate emissions increase allowable under the ceiling rate of the emission regulations. This increase in particulate emissions would undoubtedly jeopardize the attainment of air quality standards in the urban areas of the Eastern Idaho AQCR.

The impact of the fuel switch (Table F-3) on SO_2 emissions in the various AQCRs is less than that which would result if all fuel burning sources in the region emitted at the ceiling rate of the emission regulations (Table F-2). If the fuel switch were implemented, violations of the emission regulations for SO_2 would occur for all fuel combustion sources presently burning residual oil or gas. These violations occur because of the conversion to a fuel oil with sulfur content of 2%, higher than the lower sulfur fuels now available to the State of Idaho, and slightly higher than the fuel oil sulfur content needed to meet the emission regulation in the various regions. The net increase of SO_2 emissions caused by the fuel switch is probably less than the SO_2 emission tolerance in each of the regions except possibly the limited portion of the Eastern Idaho and Eastern Washington-Northern Idaho AQCRs in the vicinity of the SO_2 hot spots. Hence, it appears that the fuel switch can be accomplished without jeopardizing air quality attainment goals in practically all of the State of Idaho.

APPENDIX A

Tables of this appendix provide a summary of original and modified state implementation plan information, including original priority classifications, attainment dates, ambient air quality standards, and fuel combustion emission regulations. 1973 SAROAD data for SO_2 and particulate monitoring stations are summarized for the various AQCRs in the state. NEDS emissions data are tabulated for the various fuel burning categories in each of the AQCRs.

Tables A-10 and A-11 show a comparison of emission inventories in the original SIP and those from the NEDS. The tolerance a region possesses for measuring emissions without violation of national secondary ambient air quality standards is calculated for SO_2 and particulates. The intent of this calculation is to indicate candidate regions for clean fuel savings. The tolerance estimate was based on either the degree of control expected by the SIP or upon air quality/emission relationships which are calculated from the more recent NEDS and SAROAD data (see Section 2.2.4). The value of the emission tolerance provides an indication of the degree of potential an AQCR possesses for clean fuel savings and regulation relaxation.

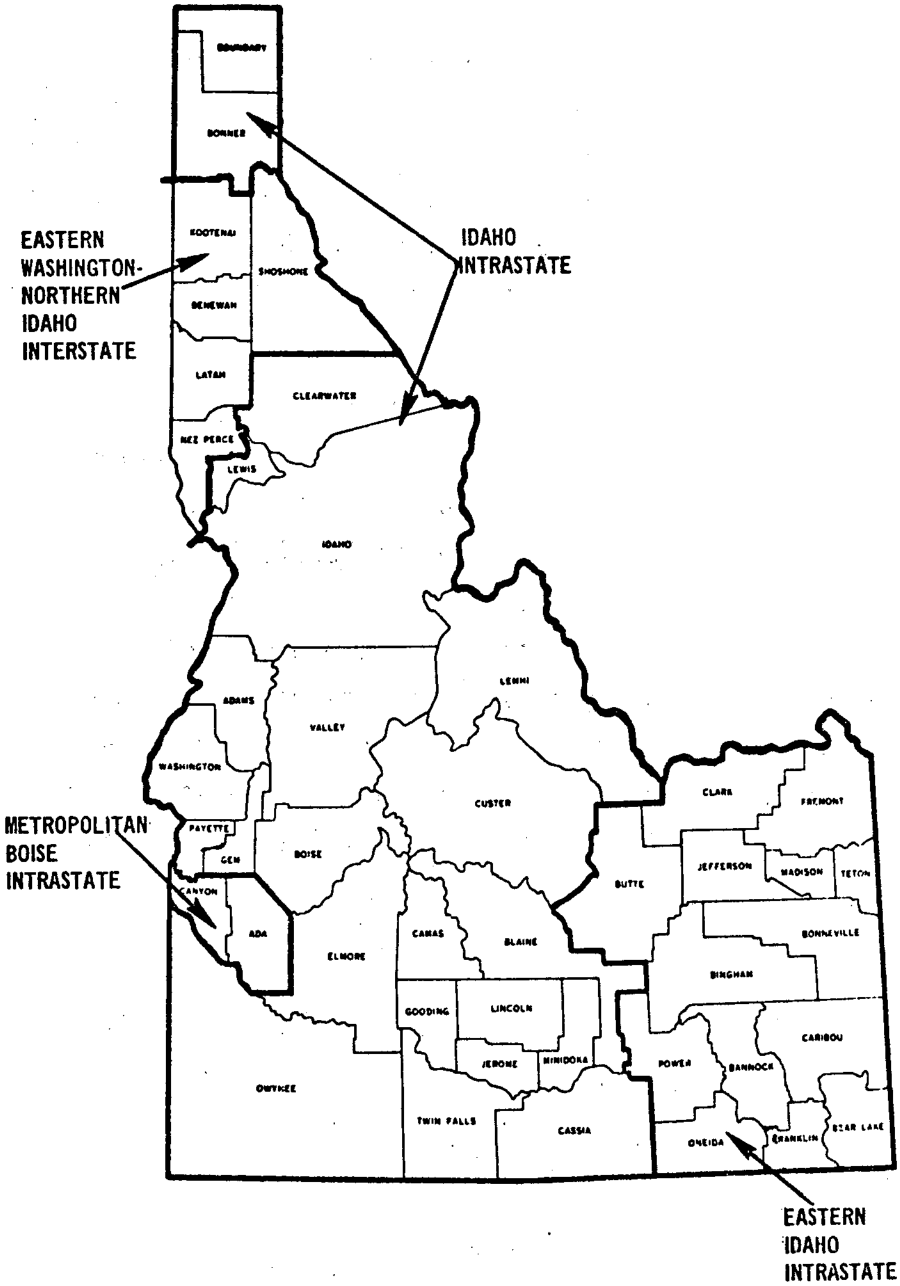

Figure A-1. Air Quality Control Regions in Idaho

Table A-1. Idaho Air Pollution Control Areas

Air Quality Control Region	Priority Classification[a]			Proposed AQMA Designations[b]	
	Particulate	SO_x	NO_x	TSP Counties	SO_2 Counties
Eastern Idaho (#61)	I	IA	III	None	None
Eastern Washington-Northern Idaho Interstate (#62)	I	IA	III	"	"
Idaho (#63)	I	III	III	"	"
Metropolitan Boise (#64)	II	III	III	"	"

[a] Criteria Based on Maximum measured (or estimated pollution concentration in area) as shown below:

Priority	I Greater than	II From-To	III Less than
Sulfur oxide:			
Annual arithmatic mean..	100	60-100	60
24-hour maximum........	445	260-455	260
Particulate matter:			
Annual geometric mean...	95	60- 95	60
24-hour maximum........	325	150-325	150
Nitrogen dioxide	110		110

[b] Federal Register, August 1974 SMSA's showing potential for NAAQS violations due to growth.

Table A-2. Regional Summary Information

Air Quality Control Region	Number of Counties	Area (Square Miles)	1970 Population	Population Density (Per square mile)
Eastern Idaho (#61)	14	18,852	201,179	10.7
Eastern Washington-Northern Idaho Interstate (#62), Idaho Portion	5	6,580	116,554	17.7
Idaho (#63)	23	55,555	221,586	4.0
Metropolitan Boise (#64)	2	1,621	173,518	107

*Source: Newspaper Enterprise Association, World Almanac, 1973.

Table A-3. Air Quality Attainment Dates

AQCR Name	Particulates Attainment Dates		Sulfur Dioxide Attainment Dates	Nitrogen Oxides Attainment Dates
	Primary	Secondary		
Eastern Idaho (#61)	7/75	b	7/75	a
Eastern Washington-Northern Idaho (#62)	7/75	b	7/77[c]	a
Idaho (#63)	7/75	b	a	a
Metropolitan Boise (#64)	7/75	b	a	a

[a] Air quality levels are currently meeting federal air quality standards

[b] Attainment dates cannot be ascertained until studies can be performed to:
1) develop reliable emissions estimates of the fugitive dust sources believed to be contributing significantly to the particulate air quality problem, and
2) determine the degree of emission reduction attainable from the control strategy for fugitive dust control.

[c] Attainment of federal air standards for SO_2 cannot be attained solely by application of reasonable available technology in this region. Attainment will therefore be delayed until improved technology is available.

Table A-4. Federal and State Ambient Air Quality Standards

		All Concentrations in $\mu gms/m^3$				
		Total Suspended Particulate		Sulfur Dioxide		
		Annual	24-Hour	Annual	24-Hour	3-Hour
Federal	Primary	75 [G]	260[a]	80 [A]	365[a]	-
	Secondary	60 [G]	150[a]	-	-	1300[a]
State	Primary	75 [G]	260[a]	80 [A]	365[a]	-
	Secondary	60 [G]	150[a]	-	-	1300[a]

a Not to be exceeded more than once per year

[A] Arithmetic mean

[G] Geometric mean

Table A-5. Summary of 1973 Air Quality Status for Suspended Particulates[a]

AQCR Name	# Of Stations Reporting	TSP Concentration (ug/m³) Highest Reading		Highest 2nd Highest Reading	Number of Stations Exceeding Ambient Air Quality Standards Primary		Secondary		Emission Reductions Required to Meet Secondary Standards[c]	
		Annual	24 hr	24 hr	Annual	24 hr[b]	Annual	24 hr[b]	Annual	24-hr
Eastern Idaho (#61)	7	85	656	452	1	5	1	6	45.5%	71.3%
Eastern Washington-Northern Idaho (#62), Idaho Portion	8	140	558	497	3	5	4	7	72.7%	74.3%
Idaho (#63)	3	---	508	390	0	2	-	2	--	66.7%
Metropolitan Boise (#64)	7	126	452	363	4	4	4	7	68.8%	64.0%

1. Blank (-) indicates value is indeterminate due to absence of air quality data.

[a]Compiled from 1973 air quality data in National Air Data Systems as of July 7, 1974.

[b]Violations are based on readings which exceed the value of the NAAQS after the first time.

[c]Reduction required = $\frac{A-C}{A-B}$ x 100. Where A = 2nd highest measured air quality for period of standard
B = background concentration (30 μg/m³ was assumed as a representative value for all four AQCRs. An ongoing research program being conducted by the State, will provide more accurate estimates for background levels)
C = the concentration value of the standard.

Table A-6. Summary of 1973 Air Quality Status for SO_2[a]

AQCR Name	# Stations Reporting 24-Hr. (Bubbler)	# Stations Reporting (Contin.)	SO_2 Concentration $\mu g/m^3$			# Stations Exceeding Ambient Air Quality Stds.			Emission Reduction Required to Meet 24-Hour Standard[c]
			Highest Reading			Primary		Secondary	
			Annual	1st 24-Hr.	2nd Highest 24-Hr.	Annual	24-Hr.[b]	3-Hr[b]	
Eastern Idaho (#61)	0	0	--	--	--	-	-	-	d
Eastern Washington-Northern Idaho (#62), Idaho Portion	4	4	40	1498	1248	-	4	4	71%
Idaho (#63)	0	0	--	--	--	-	-	-	d
Metropolitan Boise (#64)	0	0	--	--	--	-	-	-	d

1. Blanks (-) indicate value is indeterminate due to absence of air quality data. However, for the Idaho and Metropolitan Boise AQCRs, the plan indicates that air quality is in substantial compliance with the federal air standards for SO_2.

[a] Compiled from 1973 air quality data in National Air Data System as of June 7, 1974.

[b] Violations are based on readings which exceed the value of the NAAQS after the first time.

[c] % reduction required = $\frac{A-C}{A}$ x 100. Where A = 2nd highest measured air quality for period of standard.
C = the concentration value of the standard.

[d] Air quality presently in attainment with standards (no emission reductions are necessary).

Table A-7. Fuel Combustion Source Summary

AQCR Name	Number of Power Plants[a]	Number of Industrial or Commercial Point Sources[a] for	
		Particulates	SO_2
Eastern Idaho (#61)	0	6	5
Eastern Washington Northern Idaho Interstate (#62) Idaho Portion	0	10	9
Idaho (#63)	1	14	14
Metropolitan Boise (#64)	0	2	1

[a]This represents the total number of combustion point sources inventoried in the NEDS 1973 Rank-Order Source Summary. Only emission sources of 1 ton/year or greater are reported.

Table A-8. Fuel Combustion Emissions Summary for 1973, Particulates[a]

AQCR	Total 10^3 Tons/Year	Total from Fuel Combustion (10^3 Tons/Year)	Percent Fuel Combustion	Electricity Generation		Indust-Commercial Fuel Combustion		Area Source Fuel Combustion	
				10^3 Tons/Year	%	10^3 Tons/Yr	%	10^3 Tons/Yr	%
Eastern Idaho (#61)	17.5	1.6	9.3%	0	0%	.8	4.7%	.8	4.6%
Eastern Washington-Northern Idaho (#62), Idaho Portion	12.5	7.6	60.8%	0	0%	7.0	56.0%	.6	4.8%
Idaho (#63)	25.0	6.6	26.4%	0	0%	5.5	22.0%	1.1	4.4%
Metropolitan Boise (#64)	6.2	1.1	17.8%	0	0%	.6	9.7%	.5	8.1%

[a]Emission figures were extracted from NEDS, "1972 National Emissions Report."

Table A-9. Fuel Combustion Emissions Summary for 1973, SO_2[a]

AQCR	10^3 Tons/Year	Total from Fuel Combustion (10^3 Tons/Year)	Percent Fuel Combustion	Electricity Generation 10^3 Tons/Year	Electricity Generation %	Indust-Commercial Fuel Combustion 10^3 Tons/Yr	Indust-Commercial Fuel Combustion %	Area Source Fuel Combustion 10^3 Tons/Yr	Area Source Fuel Combustion %
Eastern Idaho (#61)	18.4	2.2	12.1%	0	0%	.9	5.0%	1.3	7.1%
Eastern Washington-Northern Idaho (#62), Idaho Portion	34.7	3.5	10.1%	0	0%	.5	1.4%	3.0	8.7%
Idaho (#63)	4.3	3.1	72.1%	0	0%	1.5	34.9%	1.6	37.2%
Metropolitan Boise (#64)	2.5	2.0	80.0%	0	0%	.9	36.0%	1.1	44 %

[a] SO_2 emission figures were extracted from NEDS, "1972 National Emissions Report."

Table A-10. Assessment of Emission Tolerance, Particulates

AQCR	Baseyear and Forecasted Information from State Implementation Plan: Level of Air Quality Selected As Control Value for SIP (ug/m^3)	Emission Reduction Required for Attainment Based on Selected Values	Region-wide Baseyear 1970 Emissions of Total Particulate (10^3 tons/yr)	Allowable Region-wide Emissions (Total Particulates) for Attainment (10^3 tons/yr)	Region-wide Emissions (Total Particulates) Forecasted Under SIP In 1975 (10^3 tons/yr)	Comments on Control Strategy and Area of Greatest Impact	Air Quality and Emissions Data From SAROAD and NEDS[e]: Level of Worst Air Quality In 1975 (ug/m^3)	Emission Reduction Required for Attainment	Region-wide Emissions (Total Particulates) In 1972 (10^3 tons/yr)	Region-wide Allowable Emissions (Total Particulates) (10^3 tons/yr)	Summary of Emission Tolerance of AQCR for Total Particulates
Eastern Idaho (#61)	154 (Annual)	76%	8.9[c]	Indeterminate	4.7[c,d]	Selective control of two largest point sources (Simplot Fertilizer and FMC Phosphorous Plant) will reduce emissions in the area of worst air quality (Pocatello). The overall control strategy, including state regulations for other large sources, will reduce known regional emissions by 47%, and a control program has recently been adopted in the Implementation Plan to mitigate the significant effect of fugitive dust emissions on high ambient particulate levels in the urban hot spots of this region. Additional controls which may be needed for attainment will be formulated under the provisions for ongoing studies outlined in the Implementation Plan.	452 (24 hr)	72%	17.5[c]	Indeterminate	None indicated in vicinity of areas of worst air quality. However it appears that substantial emission tolerance may exist in areas removed from pollution of hot spots. These "clean" rural areas comprise a significant portion of the geographic area of the State.
Eastern Washington-Northern Idaho Interstate (#62), Idaho portion	104 (Annual)	60%	16.0[c]	Indeterminate	6.5[c,d]	Selective control of two largest point sources (Bunker Hill Smelters, Potlatch Forests Pulp Mill) will reduce emissions substantially in the areas of worst air quality (Kellogg & Lewiston). The overall control strategy, including state regulations for other sources, will reduce known regional emissions by 60% and a control program has recently been adopted in the Implementation Plan to mitigate the significant effect of fugitive dust emissions on high ambient particulate levels in the urban hot spots of this region. Additional controls which may be needed for attainment will be formulated under the provisions for ongoing studies outlined in the Implementation Plan.	497 (24 hr)	74%	12.5[c]	Indeterminate	Same as above.
Idaho (#63)	109 (Annual)	62%	32.0[c]	Indeterminate	13.6[c,d]	Control of slack burning and replacement of conical burners with improved technology will provide most substantial reduction in area of worst air quality (Twin Falls). The overall control strategy will achieve a 58% reduction of known regional emissions, and a control program has recently been adopted in the Implementation Plan to mitigate the significant effect of fugitive dust emissions on high ambient particulate levels in the urban hot spots of this region. Additional controls which may be needed for attainment will be formulated under the provisions for ongoing studies outlined in the Implementation Plan.	390 (24 hr)	67%	25.0[c]	Indeterminate	Same as above.
Metropolitan Boise (#64)	99 (Annual)	61%	3.1[c]	Indeterminate	1.4[c,d]	Fuel combustion and process controls provide the most significant reductions of emissions anticipated in the area of worst air quality (Boise-Nampa-Caldwell). The overall control strategy will achieve a 55% reduction of known regional emissions, and a control program has recently been adopted in the Implementation Plan to mitigate the significant effect of fugitive dust emissions on high ambient particulate levels in the urban hot spots of this region. Additional controls which may be needed for attainment will be formulated under the provisions for ongoing studies outlined in the Implementation Plan.	126 (Annual)	55%	6.2[c]	Indeterminate	None indicated throughout the region.

[a]Refers to the highest 2nd high 24 hour average value in region, or to highest annual value measured in the region (whichever constitutes the worst air quality relative to the air standard). See Table A-4 for definition of federal air quality standards.
[b]Air quality data is for the year of 1973 for SAROAD. Emissions data was available from NEDS for the year 1972.
[c]This includes known inventoried emissions only. On the basis of area model calculations by the State, it has been estimated that these inventoried sources contribute to only a portion of the measured particulate levels. Fugitive dust is believed to contribute substantially to ambient particulate levels, but more study is needed to develop reliable emission estimates and to assess the adequacy of the complete control strategy proposed for attainment of the federal air standards.
[d]Adjustments for growth were not considered in the forecasted projections.

Table A-11. Assessment of Emission Tolerance for SO_2

	Baseyear and Forecasted Information from State Implementation Plan						Air Quality and Emissions Data from SAROAD and NEDS[e]				
AQCR	Level of Air Quality Selected As Control Value for SIP (ug/m^3)	Reduction Required for Attainment Based on Selected Values	Region-wide Baseyear Emissions (10^3 tons/yr)	Allowable Region-wide Emissions for Attainment[a] (10^3 tons/yr)	Region-wide Emissions Forecasted for AQCR Under SIP for 1975 (10^3 tons/yr)	Comments on Control Strategy	Level of Worst Air Quality In 1975 (ug/m^3)	Emission Reduction Required for Attainment	Region-wide Emissions in 1972 (10^3 tons/yr)	Region-wide Allowable Emissions[a] (10^3 tons/yr)	Summary of Emission Tolerance of AQCR for SO_2[b]
Eastern Idaho (#61)	93[c]	36%				Control of the primary SO_2 emission source (the Simplot Co. acid plants) will reduce SO_2 emissions by 45% in the area of worst air quality (Pocatello). The other hot spot (Becker Industries in Conda) will also be controlled	Not available	Indeterminate[f]	18.4	Indeterminate[f]	NR. No emissions tolerance in area of worst air quality (Pocatello). However tolerance is probably substantial in all other areas of region (where emissions of SO_2 are relatively insignificant.
Eastern Washington-Northern Idaho-Interstate (#62), Idaho portion	2660[g]	85%	85.9[h]	12.9	21.3	Selective control of the primary SO_2 emission source (Bunker Hill Smelters, representing 99% of all SO_2 generated in area of worst air quality) by application of reasonable available technology and plant operational changes may enable ambient air standards for SO_2 to be met. Emissions of SO_2 in other areas of the region are not significant.	1248 (24 hr)	71%	34.7	10.1	R. No emissions tolerance in vicinity of worst air quality (Kellogg). Tolerance is probably substantial in all other areas of region (where emissions of SO_2 are relatively insignificant).
Idaho (#63)	Not available[i]	0%		Indeterminate	Not available	Limitations on sulfur content in fuels will insure maintenance of air quality standards for SO_2 in this region.	Not available[i]	0%	4.3	Indeterminate[f]	NR. Not quantifiable because of absence of air quality data. Emission tolerance is probably substantial in view of relatively insignificant emissions of SO_2 in this region.
Metropolitan Boise (#64)	Not available[i]	0%		Indeterminate	Not available	Limitations on sulfur content in fuels will insure maintenance of air quality standards for SO_2 in this region.	Not available[i]	0%	2.5	Indeterminate[f]	NR. Same as above.

[a]Allowable emissions for attainment of secondary standards are computed by assuming that applicable emissions contribute proportionately to the air quality at the site reporting the worst air quality readings. The allowable level is calculated using the reduction (or increase) from the worst air quality reading which corresponds to attainment of the federal air quality standards.

[b]The basis for assessing a region's tolerance for emission increase is determined by a judgment of the degree of reconciliation between the SIP information and the 1973 NEDS/SAROAD data. If the allowable emissions determined after the SIP development is in accord (within 20%) with the allowable emissions calculated from 1973 air quality and emission data, the forecasts of the SIP are considered valid, and emission tolerances can be computed by taking the difference between allowable emissions and those emissions forecast for 1975. However, in the case where reconciliation of the two data sources is difficult, it is assumed that the SIP may be based on untenable grounds, and that the more current NEDS/SAROAD data is a more valid indicator of the air quality/emissions relationship. Hence, the emissions tolerance is tabulated for either the year 1975 (based on forecast of the Implementation Plan), or for 1973 (based on 1973 air quality/emissions data). In this case the emission tolerance expected in 1975 can only be roughly estimated based on the 1973 air quality quality-emissions status. Note: NR indicates "not reconcilable," and R indicates "reconcilable".

[c]Based on diffusion modeling estimates for the area containing the primary SO_2 emission sources.

[d]Refers to highest 2nd high 24 hour average value in region, or to highest annual value measured in the region (whichever constitutes the worst air quality relative to the air standard). See Table A-4 for definition of federal air quality standard violations.

[e]Air quality data is for the year of 1973 from SAROAD. Emissions data was available from NEDS for the year 1972.

[f]Indeterminate due to absence of air quality data.

[g]Based on continuous monitors located in vicinity (Bunker Hill) of worst air quality in Kellogg.

[h]These are emissions arising from activities of Bunker Hill plants, and comprise all but approximately 1% of the SO_2 emissions affecting the air quality in the region.

[i]Air quality known to be in compliance with ambient air quality standards for SO_2.

Table A-12. Fuel Combustion Emission Regulations in Oregon

Governing Authority	Applicable Region	SO_2 Emission Regulations	Compliance Date	TSP Emission Regulations	Compliance Date
Idaho Department of Health	All AQCRs in Idaho	Sulfur content limitation in fuels			
		1.75 % S residual oil	Jan. 1974	See Figure A-2	April 1972
		.3 % S distillate #1	Jan. 1973		
		.5 % S distillate #2	Jan. 1973		
		1.0 % S coal Jan. 1973			

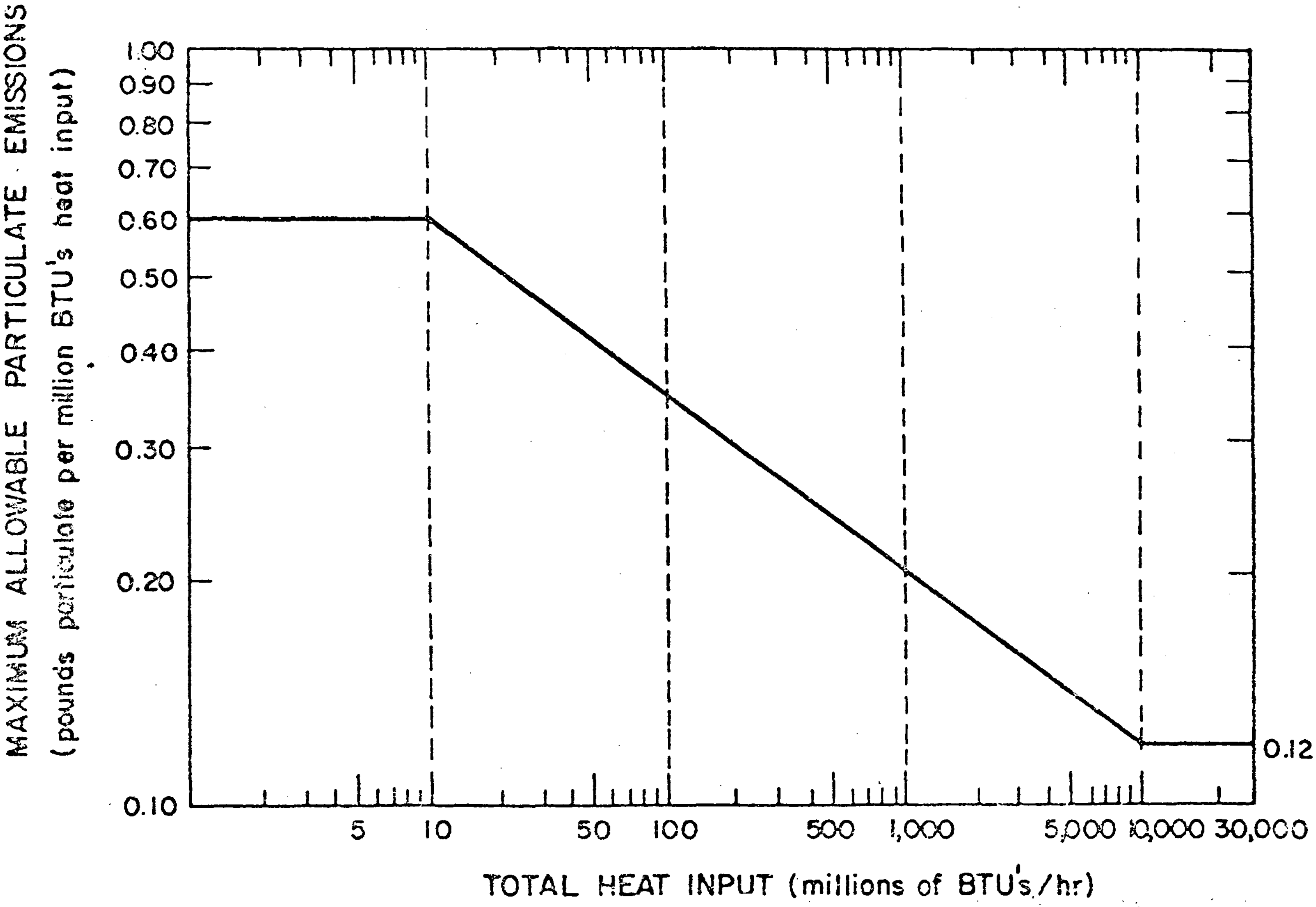

Figure A-2. Maximum Allowable Particulate Emissions for Fuel Combustion Equipment

APPENDIX B

The purpose of Appendix B is to provide an assessment of the feasibility for accomplishing clean fuel savings and regulation relaxation. This assessment is carried out with an evaluation of various regional air quality indicators developed in Section 2 and compiled in Appendix A. The regional air quality indicators considered are comprised of criteria shown in Table B-1 and B-2, and include: (1) the breadth of air quality violations, (2) expected attainment dates for NAAQS, (3) proposed AQMA designations, (4) total regional emissions, (5) portion of emissions from fuel combustion sources, and (6) regional tolerance for emissions increase. When it is quantifiable and suitably applied, the emission tolerance possibly provides the most important indicator, since it provides a measure of the over-cleanliness of the region, now or projected, and indicates how much additional pollution (such as from dirtier fuels) can be permitted without resulting in violations of federal air standards.

Table B-1. Candidacy Assessment for Clean Fuel Savings/Relaxation of Particulate Regulation

AQCR	Fraction of Counties in AQCR with Air Quality Violations in 1973[b]	Expected Attainment Date	Counties with AQMAs Proposed	Total Particulate Emissions in AQCR(1973) 10^3 tons/yr.	% Emission from Fuel Combustion	Tolerance for Particulate Emissions Increase (Table A-10) (10^3 tons/yr)	Overall Regional Evaluation
Eastern Idaho (#61)	2/14	c	None	17.5[d]	9.3%	None in area of worst air quality, but substantial tolerance in rest of the region.	Marginal[d]
Eastern-Washington-Northern Idaho Interstate (#62), Idaho portion	3/5	c	None	12.5[a]	60.8%	Same as above	Marginal[d]
Idaho (#63)	1/23	c	None	25.0[a]	26.4%	Same as above	Marginal[d]
Metropolitan Boise (#63)	2/2	c	None	6.2[a]	17.8%	None	Poor Candidate

[a]This includes only those emission sources known and inventoried at the time. Area model calculations indicate these sources contribute to only a portion of the measured ambient particulate levels.

[b]It should be notedthat air monitoring stations do not exist in several of the counties. In most of these counties, air quality is believed to be in compliance with federal air standards.

[c]Attainment dates are uncertain until new control strategies proposed by the state for control of fugitive dust may be assessed.

[d]A marginal rating has been assigned because the candidacy varies depending on the specific area within the region. (Emissions of particulates should not be increased in the hot spot areas, while it is feasible that emissions may be increased in the remaining areas of the region.)

Table B-2. Candidacy Assessment for: Clean Fuel Savings/Relaxation of SO_2 Regulations

AQCR	Fraction of Counties in AQCR with Air Quality Violations[b] in 1973	Expected Attainment Date	Counties with AQMAs Proposed	Total SO_2 Emissions in AQCR(1973) 10^3 tons/yr.	% Emission from Fuel Combustion	Tolerance for SO_2 Emissions Increase (Table A-10) (10^3 tons/yr)	Overall Regional Evaluation
Eastern Idaho (#61)	1/14[c]	1975	None	18.4	12.1%	None in area of worst air quality, but substantial tolerance throughout rest of region	Marginal Candidate[d]
Eastern Washington - Northern Idaho Interstate (#62), Idaho portion	1/5	1977	None	34.7	10.1%	Same as above	Marginal Candidate[d]
Idaho (#63)	0/23	a	None	4.3	72.1%	Not quantifiable but believed to be appreciable throughout region	Good Candidate
Metropolitan Boise (#64)	0/2	a	None	2.5	80.0%	Same as above	Good Candidate

[a] Air quality levels were within standards in 1973 and are expected to remain so through 1975.

[b] It should be noted that air monitoring stations do not exist in several of the counties. However, in most counties where air monitoring is not performed, it is believed that air quality there is in compliance with the federal air standards for SO_2.

[c] No monitoring data was available to characterize ambient levels of SO_2 in 1973, but based on compliance scheduling, it was believed that violations were still occurring in the vicinity of the Simplot Co. acid plants near Pocatello.

[d] A marginal rating has been assigned because the candidacy varies depending on the specific area within the region. (Emissions of SO_2 may be increased throughout the region, except in the area of the hot spot).

APPENDIX C

This section provides a characterization of individual power plants by AQCR. Current power plant information used to prepare Table C-1 were obtained from three main sources: (1) Federal Power Commission computerized listings of power plants and their associated fuel use, (2) the National Coal Association "Steam Tables" listing of power plants and fuel use in 1972, and (3) emission data in the NEDS data bank as of 1974. 1973 fuel schedules were extracted from the FPC (1 above) data, or when this was not available, 1972 fuel schedules were reported in Table C-1 from values extracted from the Steam Tables. Heat inputs were calculated based on the fuel heating values obtained from either (1) or (3) above. The SO_2 and particulates emissions reported in Table C-1 correspond to the fuel schedules reported, and were extracted from (1) or (3) above. When emissions and fuel schedule figures were not available for the same year, emissions were scaled proportionately to reflect the 1973 fuel schedule.

Also shown in Table C-1 are the 1975 regulations which are currently applicable to the given plant, taken from Table A-12.

It might be cautioned that AQCR total emissions calculated in the tables of Appendix C (and also Appendix D) may not agree exactly with total emissions represented in Appendix A (Tables A-8, A-9). This is a result of both differing fuel schedules in 1973 compared to previous years and the relative "completeness" of the NEDS data bank.

Table C-1. Power Plant Characterization

County	Plant Name	Fuel Use			Emissions							
					SO_2				Particulates			
					Existing		Allowable		Existing		Allowable	
		Type % Sulfur % Ash	Annual Quantity	Heat Input (10^6 Btu/hr)	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu
IDAHO AQCR (#63):												
Elmore	Mountain Home Air Force Base	Coal 0.6%S 4.1%A	15000	30.8	104	0.77	205	1.52	83	0.62	62.1	0.46

[a]Allowable emissions refers to the maximum emissions permitted by emission regulations.

NOTE:

Data was extracted from information in NEDS as of 1974, from Federal Power Commission tabulations of power plant fuel use, and from the National Coal Association "Steam Tables." Calculation and conversion of units of emission rates were facilitated by reference to "How to Convert Air Pollution Data with Seven Simple Curves," KVB Engineering, July 1974 issue of Electric Light and Power.

APPENDIX D

This section provides a characterization of individual industrial/commercial/institutional fuel combustion emission sources. The data was derived from a NEDS rank order emissions listing, and from emissions data in the NEDS data bank as of June 1974.

Table D-1. Industrial-Commercial Fuel Combustion Point Source Characterization

County	Plant Name	Fuel Use: Type, % Sulfur, % Ash	Fuel Use: Annual Quantity[b]	Fuel Use: Heat Input (10^6 Btu/hr)	Emissions: SO_2 Existing tons/yr	Emissions: SO_2 Existing lbs/10^6 Btu	Emissions: SO_2 Allowable[a] tons/yr	Emissions: SO_2 Allowable[a] lbs/10^6 Btu	Emissions: Particulates Existing tons/yr	Emissions: Particulates Existing lbs/10^6 Btu	Emissions: Particulates Allowable[a] tons/yr	Emissions: Particulates Allowable[a] lbs/10^6 Btu
EASTERN IDAHO AQCR (#61):												
Bonneville	Utah Idaho Sugar	Coal 0.72%S 4. 5%A	20000	57.1	274	1.10	380	1.52	765	3.06	100	0.40
		Gas	2090	251	1	--	2012	1.83	19	0.02	307	0.28
Butte	U.S. Atomic Energy Comm.	R. Oil 1.7%S	4488	76.8	607	1.80	617	1.83	30	0.09	124	0.37
Caribou	Monsanto	D. Oil 0.42%S.	117	1.9	14	1.68	3.3	0.4	1	--	5.0	0.6
		Gas	72	8.6	1	--	68.9	1.83	1	--	22.6	0.6
Freemont	Wood Burning Plants	Wood	34000	38.8	26	0.15	26	0.15	9	0.05	74.8	0.44
Power	FMC Corporation	Gas	239	27.3	1	--	219	1.83	2	0.02	56.2	0.47
	JR Simplot	D. Oil 0.2%S	600	9.6	9	0.21	17.0	0.4	5	0.12	25.2	0.6
	TOTALS			471.1	930		3343		830		715	

Table D-1. Industrial-Commercial Fuel Combustion Point Source Characterization

County	Plant Name	Fuel Use: Type % Sulfur % Ash	Fuel Use: Annual Quantity[b]	Fuel Use: Heat Input (10^6 Btu/hr)	Emissions: SO_2 Existing tons/yr	Emissions: SO_2 Existing lbs/10^6 Btu	Emissions: SO_2 Allowable[a] tons/yr	Emissions: SO_2 Allowable[a] lbs/10^6 Btu	Emissions: Particulates Existing tons/yr	Emissions: Particulates Existing lbs/10^6 Btu	Emissions: Particulates Allowable[a] tons/yr	Emissions: Particulates Allowable[a] lbs/10^6 Btu
EASTERN WASHINGTON-NORTHERN IDAHO INTERSTATE (IDAHO PORTION) AQCR (#62):												
Benewah	Wood Burning Plants	Wood	80000	91.3	60	0.15	60	0.15	385	0.96	144	0.36
Kootenai	Burns Yaak Inc.	Gas	155	18.5	1	--	148	1.83	1	0.01	42	0.52
	Wood Burning Plants	Wood	329800	376	2547	1.55	2547	1.55	247	0.15	428	0.26
Latah	Bennett Lbr.	D. Oil 0.2%S	141	2.3	2	0.20	4.0	0.4	1	--	6.0	0.6
		Wood	12400	14.2	9	0.14	9	0.14	85	1.37	34	0.55
	Wood Burning Plants	Wood	73000	83.3	55	0.15	55	0.15	674	1.84	135	0.37
Nez Perce	Potlatch Forests	Other	548000	813	13	.01	6517	1.83	404	0.11	783	0.22
		R. Oil 1.2%S	3400	58	320	1.26	467	1.83	39	0.15	101	0.40
		Gas	2405	288	1	--	2308	1.83	22	0.17	341	0.27
		Wood	862800	985	647	0.15	647	0.15	4054	0.94	906	0.21

Table D-1. Industrial-Commercial Fuel Combustion Point Source Characterization

County	Plant Name	Fuel Use: Type % Sulfur % Ash	Fuel Use: Annual Quantity[b]	Fuel Use: Heat Input (10^6 Btu/hr)	Emissions: SO_2 Existing tons/yr	Emissions: SO_2 Existing lbs/10^6 Btu	Emissions: SO_2 Allowable[a] tons/yr	Emissions: SO_2 Allowable[a] lbs/10^6 Btu	Emissions: Particulates Existing tons/yr	Emissions: Particulates Existing lbs/10^6 Btu	Emissions: Particulates Allowable[a] tons/yr	Emissions: Particulates Allowable[a] lbs/10^6 Btu
Shoshone	Bunker Hill	Gas	252	30.2	1	--	242	1.83	1	0.01	60.8	0.46
	TOTALS			2759.8	3653		13004		5912		2981	
IDAHO AQCR AQCR (#63):												
Idaho	Wood Burning Plants	Wood	57800	66.0	44	0.15	469	1.6	514	1.78	113	0.39
Lemhi	Wood Burning Plants	Wood	6070	6.9	5	0.16	50.0	1.6	17	0.56	18.1	0.6
Lewis	Wood Burning Plants	Wood	544800	622	408	0.15	4352	1.6	606	0.22	627	0.23
Minidoka	Amalgamated Sugar	Coal 0.72%S 8. 0%A	42500	121	581	1.10	807	1.52	735	1.39	180	0.34
Twin Falls	Amalgamated Sugar	Coal 0.75%S 8. 0%A	30350	86.6	432	1.14	577	1.52	2341	6.17	137	0.36

Table D-1. Industrial-Commercial Fuel Combustion Point Source Characterization

County	Plant Name	Fuel Use			Emissions							
					SO_2				Particulates			
					Existing		Allowable[a]		Existing		Allowable[a]	
		Type % Sulfur % Ash	Annual Quantity[b]	Heat Input (10^6 Btu/hr)	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu
Valley	Wood Burning Plants	Wood	36500	62.5	28	0.10	448	1.6	90	0.33	107	0.39
Boise	Wood Burning Plants	Wood	37500	42.8	28	0.15	28	0.15	15	0.08	80.6	0.43
Bonner	Louisiana Pacific	Gas	176	21.0	1	--	168	1.83	2	0.02	46.0	0.50
	Merritt Brothers	D. Oil 0.2%S	1500	25.7	21	0.19	42.6	0.4	11	0.10	54.0	0.48
	Wood Burning Plants	Wood	44000	50.2	33	0.15	352	1.6	65	0.30	90.1	0.41
Boundry	Wood Burning Plants	Wood	524000	598	393	0.15	393	0.15	468	0.18	602	0.23
Clearwater	Potlatch Forest	Gas	268	32.1	1	--	257	1.83	1	--	64.7	0.46
		Wood	354000	404	266	0.15	266	0.15	1114	0.63	442	0.25
	Potlatch Corp.	R. Oil 1.2%S	740	12.7	70	1.26	101	1.83	3	0.05	31.7	0.57
		Wood	152000	174	114	0.15	114	0.15	732	0.96	236	0.31

Table D-1. Industrial-Commercial Fuel Combustion Point Source Characterization

County	Plant Name	Fuel Use			Emissions							
					SO_2				Particulates			
		Type % Sulfur % Ash	Annual Quantity[b]	Heat Input (10^6 Btu/hr)	Existing		Allowable[a]		Existing		Allowable[a]	
					tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu	tons/yr	lbs/10^6 Btu
Gen	Wood Burning Plants	Wood	72000	123	55	0.10	55	0.10	133	0.25	178	0.33
	TOTALS			2448.5	2478		8480		6846		3007	
METROPOLITAN	BOISE AQCR (#64):											
Canyon	JR Simplott	Gas	2281	260	1	--	2084	1.83	21	0.02	319	0.28
	Amalgamated Sugar Nampa	Coal 0.72%S 8. 0%A	68500	195	937	1.10	1301	1.52	681	0.08	256	0.30
		Gas	16	29.2	1	--	234	1.83	1	--	60.1	0.47
	TOTALS			484.2	937		3619		702		635	

[a]Allowable Emissions refers to the maximum emissions permitted by emission regulations. For fuel burning equipment operating on gas, the allowable emissions was considered to be those which would be permitted if the equipment used residual oil instead.

[b]Oil - 10^3 gallons, Gas - 10^3 MCF, Coal - 10^3 tons.

NOTES:

1. Data was extracted from information in NEDS as of 1974. Calculation and conversion of units of emission rates were facilitated by reference to "How to Convert Air Pollution Data with Seven Simple Curves." KVB Engineering, July 1974 issue of Electric Light and Power.

APPENDIX E

Table E-1 shows area source fuel use for the entire state of Oregon. The approximate energy values are compared for each fuel along with the percent of overall energy derived from each fuel. The bottom row entitled "all fuels, all sources" may not match totals from Appendices A, C, and D, exactly, since neither the NEDS or individual appendix totals are all-inclusive. Also fuel schedules may change from one year to the next.

Table E-1. Total State Area Fuel Use[a], Idaho

Source	COAL 10^3 tons	COAL 10^9 Btu	RESID. OIL 10^3 gal	RESID. OIL 10^9 Btu	DIST. OIL 10^3 gal	DIST. OIL 10^9 Btu	GAS 10^6 ft^3	GAS 10^9 Btu	WOOD 10^3 tons	WOOD 10^9 Btu	TOTAL 10^9 Btu
AREA SOURCES:											
Residential	94.3	2174	0	0	98170	13745	13160	13160	54.4	652	29731
Industrial	0	0	0	0	32350	4529	26530	26530	0	0	31059
Commercial/ Institutional	0	0	5020	703	14000	1960	12950	12950	0	0	15613
AREA SOURCES:											
Total	94.3	2174	5020	703	144520	20234	52640	52640	54.4	652	76403
% By Fuel		2.8		0.9		26.5		68.9		0.9	
AREA AND POINT SOURCES:											
Total Fuel Use	270.7	6238	13177	1845	147070	20591	60847	60847	3617.1	43348	132869
% By Fuel		4.7		1.4		15.5		45.8		32.6	

[a] Fuel use figures are taken from data in NEDS data bank as of September 1974.

APPENDIX F

The Tables F-1 and F-2 illustrate the effect on emissions of particulates and SO_2 when power plant and industrial fuel burning sources listed in Appendices C and D are allowed to emit at the ceiling rate permitted by emission regulations. It was assumed that heat input remains the same, and existing regulations are applied to gross heat input for each AQCR. It is emphasized that this table is hypothetical in that no fuel mix may exist to allow all sources to emit exactly at regulation levels. The calculations do give some insight into adequacy of existing regulations for allowing air quality standards to be achieved if a fuel schedule different from the one at present were in effect.

Table F-3 shows the impact of a feasible fuel switch to obtain clean fuel savings in the State of Idaho. It was assumed that all gas burning combustion equipment would be converted to burn high sulfur (2%S) residual fuel oil, and that all use of residual fuel oil would be converted to the high sulfur (2%S) type. Plants operating with both coal and gas were assumed to be convertible to 100% coal use. The switch is assumed to occur in 1975, after compliance with emission regulations has been attained (by particulate emission controls and use of low sulfur fuels). For those units which are converted for the fuel switch, it is assumed that no additional emission control equipment is installed. Hence, for all units converted from gas only to fuel oil, there will undoubtedly be accompanying emission regulation violations. Also, since it was assumed that SO_2 emission compliance is attained in 1975 through use of low sulfur fuels, conversion of these fuels to higher sulfur (2%S) oil will also incur emission regulation violations. While such a conversion scheme is obviously imaginary, it would theoretically constitute a reasonable fuel switch, resulting in only minimal economic dislocation. The switch would accomplish clean fuel savings for low sulfur oils and natural gas.

Table F-1. Assessment of Restrictiveness of Particulate Emission Regulations for Fuel Burning Equipment

AQCR	Fuel Burning Emissions, 1972[a] 10^3 tons/yr	Fuel Burning Emissions Projected for 1975 [b] 10^3 tons/yr	1975 Fuel Burning Emissions at Regulation Limit Rates[c] 10^3 tons/yr	Increase in 1975 Emissions in AQCR When Fuel Burning Units Emit at Regulation Limits: 10^3 tons/yr	Increase in 1975 Emissions in AQCR When Fuel Burning Units Emit at Regulation Limits: Percentage of Total Emission Inventory 1973	Tolerance for Particulate Emissions Increase in AQCR in 1975 10^3 tons/yr	Assessment of Restrictiveness of Fuel Burning Emission Regulations[d]
Eastern Idaho (#61)	.8	.2	.7	.5	2.9%	None except in rural areas of region	Not overly restrictive, except possibly in rural areas.
Eastern Washington-Northern Idaho Interstate (#62), Idaho portion	5.9	1.9	3.0	1.1	8.8%	None except in rural areas of region	" " " "
Idaho (#63)	6.9	2.6	3.1	.5	2.0%	None except in rural areas of region	" " " "
Metropolitan Boise (#64)	.7	.3	.6	.3	4.8%	None throughout region.	Not overly restrictive.

[a] Calculated as sum of point sources from Appendix C and D.

[b] Projected fuel combustion emissions for 1975 were assumed to be the sum of those tabulated for point sources in Appendix C and D with the following adjustment: Those sources which were out of compliance with emission regulations were assigned a 1975 level equivalent to source operation at the emission regulation limit. Emissions from area sources (Appendix E) were neglected in the assessment as they were expected to remain constant. Also, zero growth was assumed to apply to all point sources.

[c] These emissions have been calculated as "allowable emissions" in Tables C-1 and D-1.

[d] The restrictiveness of the combustion emission regulations is judged by comparing the increase in 1975 fuel burning emissions caused by operation at regulation limits with the "emission tolerance" the AQCR is appraised to have (Table A-10). If the increase exceeds the emission tolerance, then it is clear that the regulations are not overly restrictive. When the increase does not exceed the emission tolerance, the regulations may be relaxed to allow higher emission rates without interfering with the attainment of federal air standards. When no emission tolerance has been determined, a qualitative assessment of the regulations is included.

Table F-2. Assessment of Restrictiveness of SO_2 Emission Regulations for Fuel Burning Equipment

AQCR	Fuel Burning Emissions, 1972[a] 10^3 tons/yr	Fuel Burning Emissions Projected for 1975[b] 10^3 tons/yr	1975 Fuel Burning Emissions at Regulation Limit Rates[c] 10^3 tons/yr	Increase in 1975 Emissions in AQCR When Fuel Burning Units Emit at Regulation Limits		Tolerance for Particulate Emissions Increase in AQCR in 1975 10^3 tons/yr	Assessment of Restrictiveness of Fuel Burning Emission Regulations[d]
				10^3 tons/yr	Percentage of Total Emission Inventory 1973		
Eastern Idaho (#61)	.9	.9	3.3	2.4	13.1%	Probably substantial in all areas except near hot spot (Pocatello and Conda)	Probably overly restrictive except in area of hot spots.[e]
Eastern Washington-Northern Idaho Interstate (#62), Idaho portion	3.7	3.7	13.0	9.3	26.8%	Probably substantial in all areas except near hot spot (Kellogg)	Probably overly restrictive except in area of hot spot.[e]
Idaho ##63)	2.6	2.6	8.7	6.1	142 %	Probably substantial throughout region	Probably overly restrictive.[e]
Metropolitan Boise (#64)	.9	.9	3.6	2.7	108 %	Probably substantial throughout region.	Probably overly restrictive.[e]

[a]Calculated as sum of point sources from Appendix C and D.

[b]Projected fuel combustion emissions for 1975 were assumed to be the sum of those tabulated for point sources in Appendix C and D with the following adjustment: Those sources which were out of compliance with emission regulations were assigned a 1975 level equivalent to source operation at the emission regulation limit. Emissions from area sources (Appendix E) were neglected in the assessment as they were expected to remain constant. Also, zero growth was assumed to apply to all point sources.

[c]These emissions have been calculated as "allowable emissions" in Tables C-1 and D-1.

[d]The restrictiveness of the combustion emission regulations is judged by comparing the increase in 1975 fuel burning emissions caused by operation at regulation limits with the "emission tolerance" the AQCR is appraised to have (Table A-10). If the increase exceeds the emission tolerance, then it is clear that the regulations are not overly restrictive. When the increase does not exceed the emission tolerance, the regulations may be relaxed to allow higher emission rates without interfering with the attainment of federal air standards. When no emissions tolerance has been determined quantitatively, a qualitative assessment of the regulations is included above.

[e]Fuel combustion operations are presently emitting SO_2 well below the ceiling permitted by regulations. In raising these emissions to the regulation limit (by the use of higher sulfur fuels), substantial increases of SO_2 would be released to the atmosphere. Based on the assumption that atmospheric levels of SO_2 are very low in all areas except the hot spots, it would appear that these increases may be tolerated without jeopardizing maintenance of air quality standards in the "clean" areas.

Table F-3. Fuel Switch Evaluation

AQCR	Source Category	Fuel Type	Projected Usage in 1975[b]				Gas and Oil Switch to Coal				Gas and Oil Switch to 2% S Oil				Tons/Yr Emission Increase in AQCR Due to Fuel Switch	
			Quantity[a]	Heat Input 10^6 Btu/Hr	Emissions (Tons/Yr) TSP	SO_2	Quantity Switched[a]	Heat Input 10^6 Btu/Hr	Resulting Emis. Incr. TSP	SO_2	Quantity Switched[a]	Heat Input 10^6 Btu/Hr	Resulting Emis. Incr.[c] TSP	SO_2	TSP	SO_2
Eastern Idaho (#61)	Industrial and Commercial	Coal	20000	57.1	765	274										
		Oil	5205	88.3	35	619					5205	88.3	0	198	0	157
		Gas	2401	286	21	1	2090	251	3343	1204	311	35.9	13.2	403	3356	1607
		Wood	34000	38.8	9	26										
Total				470.2	830	919			3343	1204			13.2	601	3356	1764
Eastern Wash-ington-Northern Idaho Interstate (#62) Idaho portion	Industrial and Commercial	Oil	3541	60.3	39	322					3541	60.3	0	221	0	221
		Gas	2812	337	24	1					2812	337	203	3099	203	3099
		Wood	1358000	1550	1466	3318										
		Other	548000	813	404	13										
Total				2760.3	1933	3653							203	3320	203	3320
Idaho (#63)	Industrial and Commercial	Coal	72850	207	3076	1013										
		Oil	2240	38.4	14	91					2240	38.4	0	131	0	131
		Gas	444	53.1	2	1					444	53.1	10.5	488	10.5	488
		Wood	1828670	2149	2120	1205										
	Power Plant	Coal	15000	30.8	83	104										
Total				2478.3	5295	2413								619	10.5	619
Metropolitan Boise (#64)	Industrial and Commercial	Coal	68500	195	681	937										
		Gas	2297	289	21	1	16	29.2	102	140	2281	260	40	2388	142	2528
Total				484	702	937			102	1204			40	2388	142	2528

[a]Quantity is in units as follows: Oil - 10^3 gallons, gas - 10^9 CF, Coal - 10^3 tons.

[b]The projected usage for fuel burning sources in 1975 are the same as in those tabulated in Appendix C, and D. Growth was assumed to be non-increasing, based on non-employment trends in the State.

[c]The emissions increase due to the fuel switch is calculated by comparing the projected compliance emissions in 1975 for a given fuel type with those that occur when fuel switches are made (calculated by utilization of emission factors from EPA Document AP-42).

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16. ABSTRACT

Section IV of the Energy Supply and Environmental Coordination Act of 1974, (ESECA) requires EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interferring with the attainment and maintenance of the national ambient air quality standards. This document, which is also required by Section IV of ESECA, is EPA's report to the State indicating where regulations might be revised.

17. KEY WORDS AND DOCUMENT ANALYSIS

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