TITLE 35: ENVIRONMENTAL PROTECTION
SUBTITLE B: AIR POLLUTION
CHAPTER II: ENVIRONMENTAL PROTECTION AGENCY

PART 291
RULES FOR THE PERFORMANCE OF AIR QUALITY IMPACT ANALYSES TO BE USED IN SUPPORT OF PERMIT APPLICATIONS

SUBPART A: GENERAL PROVISIONS

SUBPART B: ELEMENTS OF THE AIR QUALITY ANALYSIS

SUBPART C: CONTENTS OF THE AIR QUALITY STUDY

AUTHORITY: Implementing and authorized by Sections 4 and 39 of the Environmental Protection Act (Ill. Rev. Stat. 1981, ch. 111 1/2, pars. 1004 and 1039).

SOURCE: Filed and effective December 30, 1977; codified at 8 Ill. Reg. 870.

SUBPART A: GENERAL PROVISIONS

Section 291.101 Statutory Authority

These rules are promulgated pursuant to authority conferred on the Illinois Environmental Protection Agency (Agency) by Sections 4 and 39 of the Environmental Protection Act (Ill. Rev. Stat. 1981, ch. 111 1/2, pars. 1004 and 1039) (Act).

Section 291.102 Purpose

a) These rules were developed by the Agency to provide guidance to sources that choose to show compliance with Section 9(a) of the

Act or Rule 102 of the Pollution Control Board Rules and Regulations, Chapter 2: Air Pollution (codified as 35 Ill. Adm. Code 201.141), by performing comprehensive air quality impact evaluations.

b) These rules were formulated in response to the remand by the Illinois Supreme Court to the Pollution Control Board (Board) of the adoption of Rules 203(g)(1), 204(a)(1) and 204(c)(1)(A) (codified as 35 Ill. Adm. Code 212.201 through 212.205, 214.121(a) and 214.141), which established particulate and sulfur dioxide emission standards for new and existing fuel combustion sources. Commonwealth Edison v. Pollution Control Board, 62 Ill. 2d 494 (1976). The Court's decision, however, did not eliminate the requirement of construction or operating permits for solid fuel emission sources; it also did not eliminate the prohibition of air pollution contained in Section 9(a) and Rule 102 nor the prohibition of ambient air quality violations contained in Rule 102.

c) Thus, for any period that Rules 203(g)(1), 204(a)(1) or 204(c)(1)(A) are not effective, construction and operating permit applications for solid fuel combustion sources will be evaluated on the basis of comprehensive air quality impact evaluations performed by the applicant and designed to enable the Agency to determine the status of compliance with respect to the air quality provisions of Section 9(a) and Rule 102.

d) In lieu of performing comprehensive air quality impact evaluations in accordance with these rules, the applicant may elect to show compliance with the emission limitations contained in Rules 203(g)(1), 204(a)(1) and 204(c)(1)(A), even if those rules are not currently effective. Compliance with these emissions limitations will usually be deemed by the Agency to be sufficient to assure compliance with the air quality provisions of Section 9(a) of the Act and Rule 102. Of course, for any period of time in which Rules 203(g)(1), 204(a)(1) or 204(c)(1)(A) are in effect, the permit applicant must show compliance with these rules, without regard to comprehensive air quality analysis done pursuant to these rules. Compliance with these rules may only be used to support permit applications when Rules 204(g)(1), 204(a)(1) or 204(c)(1)(A) are not effective.

Section 291.103 Overview of Procedures

a) These procedures are designed to serve as guidelines for applicants desiring to develop particulate and sulfur dioxide emission limitations for a subject emission source.

b) The procedures consist of two phases. The first phase requires an analysis of the air quality in the vicinity of the subject source for a base year. For the base year analysis a point and area source emissions inventory, consisting of emission rates and stack parameters for all point sources and emission rates for county-wide area sources affecting the study areas, are

required. Base year air quality, meteorolgical data and the necessary sub-county allocation parameters (i.e., employment, population, etc. used to allocate county-wide area source emissions to sub-county grid squares) are required to be valid for the time frame for which the emissions inventory is valid.

c) The point and area source emissions inventory data, along with air quality data and meteorological data, should be input to an acceptable air quality dispersion model. This simulation model should be validated and calibrated by the applicant. Procedures for and results of this effort should be carefully documented. After calibration, the simulated air quality in the vicinity of the subject source should be compared with the ambient air quality standards as shown in the following table. If a violation is indicated with the subject source operating at the proposed emission rates, the source must reduce the emission rates so that the AAQS are not exceeded. If a violation is not indicated, the source should proceed to Phase II.

Ambient Air Quality Standards

Pollutant	Time of Average	Primary Standard	Secondary Standard
Particulate Matter	Annual Geometric Mean	75 ug/m3	60 ug/m(3)
(TSP)	24 hour	260 ug/m(3)	150 ug/m(3)
Sulfur Dioxide	Annual Geometric Mean	80 ug/m(3)	None
(SO(2))	24 hour	365 ug/m(3)	None
	3 hour	None	1300 ug/m(3)

d) Phase II of the analysis is designed to assess the impact of the subject source on the ambient air quality for the year 1980, as a minimum. The base year point and area source emissions should be multiplied by appropriate growth factors developed by the applicant for the specific study area. When determining future annual air quality, meteorological data averaged over a minimum period of five consecutive years and model calibration data developed for the base year analysis should be utilized. Dispersion modeling should again be performed to determine if violations of the AAQs are indicated for the projection year(s). If a violation is indicated, the subject source must revise its emission rates so that the AAQS are not violated. If no violation of the AAQS are indicated by dispersion modeling, the subject facility should submit the proper application to the Agency for evaluation.

SUBPART B: ELEMENTS OF THE AIR QUALITY ANALYSIS

Section 291.201 Study Area and Background Concentrations

a) The study area shall include all territory surrounding the subject facility which encompasses a common aggregation of sources, usually an urbanized/industrial area bounded by areas which are now undeveloped. The analysis must consider the following:

1) All point and area source emissions originating within the urbanized/industrial area must be considered in the analysis.

2) Any emission source located beyond the undeveloped boundary of the urbanized/industrial area if such source contributes one microgram per cubic meter or more to the sulfur dioxide and/or particulate annual average; 10 micrograms per cubic meter or more to the maximum sulfur dioxide and/or particulate 24hour concentration; or, 50 micrograms per cubic meter or more to the maximum 3 hour sulfur dioxide concentration within the study area.

3) The effect of the subject facility outside of the territory defined above when such facility contributes the same annual and/or short-term concentrations in other urbanized/industrial areas located outside of the study area.

4) The influence of topography and geography on the dispersion of air pollutants when performing the analyses to determine the study area or impacted areas outside the study area.

b) Background concentrations contained in the "clean" air entering the study area may be considered to be 40 micrograms per cubic meter for particulates and 10 micrograms per cubic meter for sulfur dioxide when calculating annual average concentrations. When calculating the second highest short-term concentration for purposes of comparison to the short-term primary standards, the critical meteorological conditions associated with such second highest concentration must be identified. The background concentration associated with these meteorological conditions shall be estimated using available air quality data and information pertaining to emission sources located outside of the study area.

Section 291.202 Point Source Emissions Inventory Data

a) A detailed point source emissionsinventory must be used to assess the ambient air quality. The following point sources shall be identified:

1) All point sources outside the subject facility and within the study area which emit 25 tons per year or more of the

specified pollutant per year to the ambient air.

2) All point sources of the specified pollutant within the subject facility.

b) Data for each point source should be valid for the same period of time as the meteorological and air quality data and should include, as a minimum:

1) The facility name and address.

2) The location of all the emission sources in the subject facility and their relationship to each other.

3) The maximum hourly controlled emission rate, which is the greatest quantity of emissions that a source is expected to produce during any onehour of operation.

4) The annual average hourly controlled emission rate, which is the total controlled emissions for a 12month period divided by the total hours of operation for the same period.

5) Stack height, stack diameter, exit gas temperature, and exit gas velocity.

c) The point source emissions inventory data should be obtained whenever possible from the Division of Air Pollution Control, Illinois Environmental Protection Agency, 2200 Churchill Road, Springfield, Illinois, 62706. If the Agency does not have what it considers to be complete data for all sources affecting the study area, the data should be obtained from facilities in question.

Section 291.203 County-Wide Area Source Emissions Inventory

An area source emissions inventory, valid for the same time period as the point source emissions inventory, should be used to determine the contribution to the ambient air quality of sources other than those identified in the point source emissions inventory. A countywide area source emission inventory for any county within Illinois should be obtained from the Division of Air Pollution Control, Illinois Environmental Protection Agency, 2200 Churchill Road, Springfield, Illinois 62706. For counties outside the State of Illinois, county-wide area source emissions inventory information from the National Emissions Data System (NEDS) may be obtained through the Air Surveillance Branch, Region V, United States Environmental Protection Agency, 230 South Dearborn, Chicago, Illinois 60604.

Section 291.204 Meteorological Data

a) Meteorological data is required for input to the various annual and short-term dispersion models as well as for the identification of the frequency and duration of conditions when

short-term, high air pollution concentrations may be expected to exist. Hourly meteorological data shall be acquired from:

1) Acceptable on-site meteorological monitoring equipment physically located within the study area or

2) The nearest National Weather Service weather reporting station which can be justified as having meteorological conditions representative of the study area.

b) On-site monitors. To be acceptable, the monitoring site must have been maintained and operated as a continuous meteorological sensing network designed to determine the wind and temperature structure controlling downwind transport and the dispersion of pollutants.

1) The system shall contain adequate instrumentation for measuring the following parameters at or near 10 meters above ground-level: wind speed, wind direction and dry bulb temperature. A determination of the wind speed, wind direction and air temperature in the mixing layer must have been made at least twice every 24-hour period by use of remote sensing techniques such as pibals, radiosondes, acoustic sounders or aircraft.

2) A record of the maintenance and service schedule must be available to allow the determination of acceptability of on-site meteorological monitoring equipment. The service and maintenance should have been performed at a frequency necessary to maintain a minimum of 90% data recovery per parameter per quarter. Maintenance should have included periodic cleaning, testing and calibration of all sensors and recorder.

3) Justification should be submitted with the operating application including that the meteorological parameters measured at the on-site monitor(s) are representative of the meteorology in the study area. Included in this justification should be a discussion of the effects of local terrain, bodies of water, heat islands and any other conditions which could substantially affect the meteorology of the area.

c) No on-site monitors. If on-site meteorological monitoring equipment is unavailable or not selected for use, a justification must be submitted indicating that the meteorological parameters which are utilized are representative of the study area. Meteorological data may be obtained from the following sources:

1) Seasonal and annual wind speed, wind direction, and atmospheric stability. The National Climatic Center (NCC) in Asheville, North Carolina has wind speed and wind direction data available as part of hourly or three-hourly

weather records. Data for wind speed and wind direction are combined with atmospheric stability in a joint frequency distribution called a STAR Program. Various forms of stability wind rose data are available from NCC in tabular form, on punched cards, and on magnetic tape. The tapes include the hourly or three-hourly observations upon which the stability wind rose is based. Five-year, annual, seasonal and monthly stability wind roses are available.

2) Mixing height. Climatological summaries of mixing heights based on radiosonde observations are available in Mixing Height, Wind Speeds, and Potential for Urban Air Pollution Throughout the Contiguous United States (AP-101) by George Holzworth of the U.S. Environmental Protection Agency (USEPA). Data contained in this text are acceptable for utilization with annual dispersion modeling analyses. Mixing height data for use in determining short-term air quality levels may be computed from measured meteorological parameters using the methods outlined in the USEPA's AQMA Guideline Document 10 or the USEPA's Interim User's Guide to a Computation Technique to Estimate Maximum 24-Hour Concentrations from Single Sources. Radiosonde observation data is available for selected meteorological sites from the NCC.

3) Temperature. Hourly, three-hourly and annual mean temperature records for meteorological reporting sites are available from the NCC.

4) Hourly atmospheric stability. The atmospheric stability data may be estimated from other meteorological parameters by Turner's Method, which is explained in AQMA Guideline Document 10. The method requires: solar altitude, cloud cover, ceiling and wind speed. The solar altitude can be obtained from Table 170 entitled "Solar Altitude and Azimuth" in the Smithsonian Meteorological Tables. Cloud cover and ceiling are available as hourly or three-hourly observations from the NCC. The solar altitude, time of day, cloud cover and ceiling can be used to index the solar radiation intesity which, together with the wind speed, determines the atmospheric stability.

Section 291.205 Air Quality Data

All available ambient air quality monitoring data for the subject pollutant in the study area shall be assembled by the applicant in a form suitable for comparison with the AAQS and for calibration of the various air quality simulation models which are a necessary portion of the air quality study.

a) Air monitoring data collected by federal, state, or certain local agencies in Illinois may be obtained from the Division of Air Pollution Control, Illinois Environmental Protection Agency,

2200 Churchill Road, Springfield, Illinois, 62706. Monitoring data collected by a governmental agency in a state other than Illinois or by any private industry should be obtained from the organization responsible for the monitoring site.

b) Monitoring data which is used by the applicant should have been collected by air montiroing reference and equivalent methods published by the USEPA in 40 CFR 50 (Appendices) and 40 CFR 53 and revisions thereto or by an equivalent method approved by the Agency.

Section 291.206 Dispersion Modeling

a) Several dispersion models are available for determining the annual and short-term impacts of pollutant emissions on ambient air quality. The dispersion models which are available from the Agency for use in annual analyses are the Climatological Dispersion Model (CDM) and the Climatological Dispersion Model revised by the Agency (Revised CDM). The Agency model available for short-term analyses is the Air Quality Short-Term Model (AQSTM) developed by the Agency's Division of Air Pollution Control. All of these models are based on the Gaussian diffusion equation and utilize the Brigg's plume rise formulae.

b) Facilities utilizing the models mentioned in subsection (a) to perform the attainment and maintenance analyses do not need to submit a description of the dispersion and plume rise formulae other than those listed above, then the following information shall be submitted to the Agency in support of the techniques which are selected:

1) A complete computer program listed of the model;

2) A detailed description of all model equations;

3) A model flow chart; and

4) A justification for the use of such model and equations.

c) Annual Analysis. The basic objective of the annual dispersion analysis is to determine the maximum ground-level concentrations of sulfur dioxide and total suspended particulate for comparison with annual air quality standards.

1) The location of pollutant sources in each facility within the study area shall be accurately identified so that their relative positions can be input to the dispersion model.

2) For the attainment portion of the annual analysis, the average annual controlled emission rate from each source in the base year and the annual meteorological parameters determined for the base year shall be utilized. Both the controlled source emission rates and the meteorological parameters should be valid for the same one-year period.

3) The annual analysis for the 1980 projection year and for other Projection years as deemed necessary by the applicant must be conducted utilizing projected annual average emissions for the year analyzed and the mean annual meteorological paramters which have been determined based on historical data from a period of at least five consecutive years.

d) Short-Term Analysis. For short term analyses, ground-level concentrations should be determined for periods of time associated with those meterorological conditions giving rise to maximum ground-level concentrations, considering the actual physical stack height and diameter and operating characteristics of the facilities.

1) Consistent with the annual modeling, the location of the various pollutant emission sources in each facility affecting the study area must be accurately identified.

2) The applicant shall identify those operating conditions leading to the maximum emissions of sulfur dioxide and/or particulate matter. Specific operating schedules may be considered in order to determine a reasonable maximum controlled emission rate for each source affecting the study area (i.e., it is recognized that all sources may not operate at their maximum levels during the same time period).

e) Maximum grid point spacing used in the models shall be 1 kilometer for comparison with annual standards and 0.1 kilometer for short-term modeling.

f) The contribution to the point of maximum concentration shall be calculated for each source of sulfur dioxide (SO(2)) or total suspended particulate (TSP) within the study area. Sulfur dioxide or TSP ambient air quality monitoring data may be utilized to assist in establishing background concentrations. Such air quality data should have been collected for a minimum of 1 year and should be consistent with the ambient air quality monitoring portion of these procedures.

g) There are several meteorological situations which might cause sufficiently elevated ground-level concentrations to threaten the short-term ambient air quality standards. The following potentially adverse meteorological or physical conditions shall be considered as a minimum when performing the short-term modeling analyses:

1) Trapping conditions (for comparison with the 3-hour SO(2) standard and the 24-hour SO(2) and TSP standard).

A) Mixing height equal to the height of maximum plume rise for that source at the subject facility or

within the study area such that the maximum ground-level concentration is achieved.

B) Wind speed equal to 4.4 meters per second at a height of 10 meters above ground-level.

C) Atmospheric stability equal to B (unstable).

D) Wind direction equal to that direction which aligns the emission sources so as to maximize the ground-level concentrations.

E) Calculate the maximum 1-hour ground-level concentration using the dispersion model.

F) Calculate the minimum 3-hour ground-level SO(2) concentration by taking the 1-hour concentration in subsection (E) above times 0.80.

G) Calculate the maximum 24-hour concentration by taking 1/4 of the hourly concentration calculated in subsection (E) above.

2) Neutral stability with moderate to high winds (for comparison with the 3-hour SO(2) standard and the 24-hour SO(2) and TSP standard).

A) Mixing height equal to 1200 meters.
B) Stability class equal to D (neutral).

C) Determine the wind direction which aligns the emission sources such as to maximize the ground-level concentration of the actual source configuration.

D) Determine the critical wind speed (i.e., the wind speed which produces the maximum ground-level concentration).

E) Calculate the maximum 1-hour ground-level oncentration using the dispersion model including background).

F) Calculate the maximum 3-hour ground-level SO(2) concentration by taking the 1-hour concentration in subsection (E) above times 0.80.

G) Calculation of the 24-hour ground-level concentration requires an examination of actual meteorological conditions collected in the study area. One technique for calculating the 24-hour ground-level concentration from the 1-hour concentration is explained on page 38 of the Workbook of Atmospheric Dispersion Estimates. The method makes the assumption that the plume is uniformly distributed in

the crosswind direction within a downwind sector of 22.5 < and may be utilized when critical wind speed, persistent wind direction, and neutral stability occur for 16 hours or greater. The 24-hour concentration is obtained by multiplying the resulting sector concentration by t/24, where t is the number of hours within a 24-hour period during which the above meteorological conditions actually occur.

3) Inversion break-up fumigation (for comparison with the 3-hour SO(2) standard).

A) Assume that the mixing height is located at ground-level at the beginning of the 3-hour period for which the maximum ground-level concentration is being calculated. Allow the mixing height to rise at a rate of 4.88 meters per minute.

B) Assume an atmospheric stability class of E (stable) above the height of the inversion and B (unstable) below the inversion.

C) Assume a wind speed of 4.4 meters per second at a height of 10 meters above ground-level.

D) Determine the wind direction which aligns the emission sources such as to maximize the ground-level concentration for the actual source configuration.

E) Calculate the concentration profile downwind of the facility at 20 minute intervals. That is, calculate the height of the mixing layer at 20-minute intervals using the rate of rise given in subsection (A) above. Nine 20-minute average concentrations should be calculated to yield the 3-hour maximum ground-level concentration.

F) If the Agency's AQSTM is used to calculate the ground-level concentration under the fumigation situation, the maximum concentration will be that concentration computed at a distance of at least x = 4.4 t(subscript m) where x is equal to downwind distance in meters, and t(subscript m) is equal to the time in seconds required to eliminate the inversion from the physical stack height to the height of the plume rise.

4) Any other meteorological conditions experienced in the vicinity of the subject facility or physical characteristics of the facility or its surroundings which, in the opinion of the applicant might reasonably be expected to produce maximum ground-level concentrations in excess of those calculated using the considerations outlined in subsection (g)(1)-(3).

5) If meteorological information specific to the subject facility is available, then such data may be used to modify the procedures outlined in subsection (g)(1)(4), as appropriate. However, such meteorological information must have been collected:

A) At the site of the subject facility and should be sufficient to determine wind speed, wind direction, stability class and mixing height; and

B) During a field study having a minimum duration of one year. Such a meteorological field study should meet the requirements outlined in these procedures.

6) All dispersion models utilized for the annual and short-term analyses should be calibrated, if possible, with base year ambient air quality monitoring data.

h) The minimum requirement for model validation shall be the computation of a regression equaltion (linear, stepwise or non-linear, as appropriate) for observed concentrations vs. the concentrations calculated by the dispersion model (plus background).

1) Short-term concentrations should be grouped for like-meteorological conditions (considering the synoptic meteorological situation).

2) The regression equation should be applied to each calculated concentration (plus background) for the appropriate meteorological situations.

3) The listing of monitored concentrations should be submitted in support of the proposed emission limitation.

4) Practical displays of calculated vs. observed concentrations should be submitted in addition to correlation coefficients and standard errors of estimate.

5) As deemed necessary by the applicant, additional statistical tests may be used to evaluate the dispersion modeling results.

Section 291.207 Emission Projection and Allocation Techniques

a) Generally, the air quality impact analysis procedures use surrogate variables to project and allocate future point and area source emissions in the study area. It is assumed that the anticipated growth in emissions will be proportional to the growth in certain surrogate variables, and will, therefore, be spatially distributed in the study area according to the spatial distribution of the growth in such variables. The methodology for projecting and allocating point and area source emissions in

the study area is explained in detail in Volumes 7 and 13 of the USEPA's Guidelines for Air Quality Maintenance Planning and Analysis. The applicant is strongly urged to obtain and examine these documents throughly before undertaking an air quality impact analysis.

b) In undertaking an air quality impact assessment, the applicant should use growth and development projections which reflect control technology that is realistic for the projection period and type of source being considered. For example, with respect to point sources, the applicant should consider Best Available Control Technology (BACT) Regulations and Guidelines as defined by New Source Performance Standards (40 CFR 60) and as further defined by the USEPA in guidelines for Non Significant Deterioration (NSD)(40 CFR 52). Also the applicant should consider the application of Reasonably Available Control Technology (RACT) as defined by Federal guidelines in 40 CFR 51.

c) In undertaking air quality impact analyses, area source emissions projections at a subcounty spatial level will be necessary for use in dispersion models. The projections included in these analyses must be consistent with those projections being used by the Agency in its continuing air and water quality planning activities.

d) The Illinois Bureau of the Budget (IBOB) develops official state projections of population for each county in the state at 5-year increments to the year 2025. State agenices are constrained to use these figures, plus or minus 5%, for all planning activities. Variations in excess of 5% must be submitted to the IBOB with detailed supporting information before such figures will be acceptable to the Agency for inclusion in a planning analysis.

e) The Agency has township population projections (which are consistent with IBOB county control totals) for the entire state to the year 2010. Applicants may use these figures in lieu of any acceptable alternative figures either derived by the applicants or obtained from cognizant local and regional planning bodies in the area. Figures other than those obtained from the Agency should be substantiated by detailed information, including a description of data base, assumptions, and the methodology used in arriving at such alternative projections.

f) To obtain necessary, detailed subcounty information on housing units and structures, applicants should consult the 1970 Census reports series IIC(3) or PIIC(1). The publications include maps in which census tracts are overlaid with township boundaries. This base line data, coupled with the available township population projections, will provide sufficient information for the applicant to develop forecast year housing unit totals.

g) The IBOB prepares estimates of employment in approximately 200 key industry groups for 20 multicounty regions consitituting

the State of Illinois. Estimates are reported for base year and 5-year increments up to the year 2000. The "key industry" groupings roughly correspond to aggregates of 2-digit Standard Industrial Classification (SIC) categories. In order for an applicant to assess the air quality impact of his source and those of other major sources within the study area, information on the emissions levels of existing major sources is required in addition to a growth rate factor to be applied to such emissions for analysis of future years. Information on current emissions from existing major sources is available from the Agency. Growth factors for each of these major sources may be derived by determining the SIC code of any major facility in the study area, and assigning it the growth rate implicit in IBOB employment projections for the IBOB industry category in which this practicular SIC code is included. As with the population projections, the Agency will accept employment projections which deviate from current IBOB totals, only if such figures are accompanied by a detailed explanation of data base, assumptions, and methodology, and are concurred in by the IBOB.

h) Table 3 shows the various categories of emissions and corresponding orders of analysis possible in an air quality impact study. These categories of analysis are described in detail in Volume 13 of the USEPA's Guidelines for Air Quality Maintenance Planning and Analysis. Air quality impact analyses undertaken at the specified level should use the type and detail of data described in Table 4, unless concurrence from the Agency to do otherwise is obtained by the applicant. The orders of analyses range from that requiring the least detail (Order 1) to that requiring the greatest detail (Order 3). The status of any particular county with respect to the classification scheme in Table 4 may be obtained from the Division of Air Pollution Control.

1) Residential Fuel Combustion. Order 1 analyses use population by township, either obtained from the Agency or developed especially for the air quality impact study. Order 2 analyses use number of dwelling units by township (or equivalent sub-county spatial level) within the study area. When a reasonable factor of number-of-persons-per dwelling-unit is applied to the total number of dwelling units projected in the study area, the result must be consistent with IBOB population control totals. Order 3 analysis is refinement upon Order 2, such that the number of residential structures in the study area is classified according to the number of dwelling units per structure, similar to that classification outlined on page 35 of AQMA Guideline Document 13.

2) Commercial/Institutional Fuel Combustion. Order 1 anlayses are similar to that for Residential Fuel Combustion. Orders 2 and 3 use employment growth rates to project and allocate emissions in the study area, using the methodology described in Guideline Document 13 and the

information sources described in the preceding text.

3) Industrial Process. All orders of analysis use employment growth rates to project and allocate emissions in the study area, according to the methodology described in Guideline Document 13 and sources of information described in the proceding text.

4) Industrial Fuel Combustion. Requirements for Orders 1, 2, and 3 of this emissions category are similar to those for industrial process emissions.

5) Solid Waste. Estimation and allocation of emissions from the incineration of solid waste parallel the requirements for Residential, Commercial/Institutional, and Industrial Process Fuel Combustion for each order of analysis (i.e., the contribution of each emission source category to solid waste disposal emissions is determined by using the same indicator variables). For instance, in an Order 1, analysis of solid waste emissions, the relative contribution of commercial establishments to total solid waste emissions would be proportional to the growth in population. Base year figures on emissions in the applicant's study area due to solid waste disposal are available from the Agency.

SUBPART C: CONTENTS OF THE AIR QUALITY STUDY

Section 291.301 Contents of the Air Quality Study Submitted in Support of a Permit Application for an SO(2) or TSP Emission Source

The air quality study shall include the following:

a) A description of the nature and location of the sulfur dioxide or particulate emission sources at the subject facility, including but not limited to:

1) Diameter, height, exit gas temperature, and exit gas velocity for all stacks or vents through which the pollutant is emitted into the atmosphere,

2) Description of the fuels used to include type, sulfur content, ash content, heat content, and ultimate analysis,

3) Description of the type of fuel combustion equipment to include method of firing and maximum firing rate,

4) Specific description of the location of the emission sources (Universal Transverse Mercatur (UTM) coordinates or latitude/longitude) and a plot plan.

b) A summary of all ambient air quality data collected since January 1, 1973, at monitors located within a 50 mile radius of

the emission source and collected by the owner and/or operator of the emission source. The summary should include: annual averages; maximum and second highest short-term averages for each month; and the number of times the short-term AAQS were exceeded during each month.

c) A general description of the method by which the air quality study was conducted to include the method which was used to identify the maximum ground-level concentration of pollutant contributed to by the subject facility and the location of such maximum concentration.

d) A summary of all meteorological data collected by the owner or operator of the emission source since January 1, 1973, at monitors located within a 50-mile radius of the specified pollutant emission source provided that such data were used in the development of the emission limitation.

e) A description of the justification for all point source data, area source data and meteorological data which were input to the dispersion models.

f) An identification of and an estimate as to the frequency, characteristics, probable time of occurrence and duration of meteorological conditions associated with the maximum short-term ground-level concentration of the specified pollutant contributed to by the subject facility. A description of the techniques used in arriving at the above estimates should be included.

g) A detailed description and complete listing of all dispersion models and plume rise equations which were used to develop the emission limitation to include all model equations. This is not necessary if CDM and the AQSTM are exclusively utilized as received from the Agency, except that a statement that CDM and the AQSTM were used should be included.

h) A detailed description of the method that was used to determine total background pollutant concentrations in the vicinity of the subject facility for the annual model and for each of the meteorological conditions considered in performing the analysis is such background concentrations are different than those given in Section 291.103.

i) A detailed description of all dispersion model validation and calibration procedures to include the regression equations, correlation coefficients and other statistical data which indicate the reliability of the modeling results for the various situations modeled.

j) A detailed description of the technique used to allocate area source emissions from the county level to the sub-county level.

k) A detailed description of the technique used to project growth for the maintenance period.

l) A statement of the base year used for the analysis and the reasons for selection of the base period.

m) Detailed maps of the study area which include: topographic features, bodies of water, and locations of point and area sources.

n) Data tables which include but are not limited to:

1) Short-term and annual background concentrations which were determined for all meteorological conditions considered in the air quality study,

2) Calculated ground-level concentrations, calibrated and uncalibrated, from all short-term and annual dispersion modeling.

o) The type, number and location of meteorological monitoring devices from which data was obtained for use in performing the study including a discussion of the suitability of the location of such monitors.

p) The type, number and location of instruments for the continuous monitoring and recording of pollutant emissions which were used by the subject facility to determine emissions for use in the study.

q) A description of the system and procedures used for acquisition and storage of ambient air quality, meteorological and emissions data.

r) A description of the procedures utilized for validation of air quality, meteorological and emissions data for use in the study.

s) Identification of company personnel responsible for use performance of the air quality study so as to provide a point of contact.

t) An explicit statement of the emission limitation which is proposed for the source.

Section 291.APPENDIX A Rule into Section Table

Rule	Section
1.0	291.101
2.0	291.102
3.0	291.103
4.1	291.201
4.2	291.202
4.3	291.203
4.4	291.204
4.5	291.205

4.6	291.206
4.7	291.207
5.0	291.301