

SECTION XIV

RULES

AND

REGULATIONS

TEXAS AIR CONTROL BOARD

GENERAL RULES

Rule 1. Definitions

In addition to the terms which are defined by Article 4477-5, V.T.C.S., the following terms shall have the meanings given herein:

- 1.01 Act. The Texas Clean Air Act, codified as Article 4477-5.
- 1.02 Ambient Air. That portion of the atmosphere, external to buildings, to which the general public has access.
- 1.03 Article. When followed by a number, "article" refers to provisions of the law as codified in Vernon's Revised Civil Statutes of Texas, 1925, as amended.
- 1.04 Background. Background concentration is defined as that level of air contaminants that cannot be reduced by controlling emissions from man-made sources. It is determined by measuring levels in non-urban areas.
- 1.05 Carbon Compounds. Compounds, excluding carbon dioxide, which contain carbon in combination with any other element or elements. Hydrocarbons, containing hydrogen and carbon, are one category of carbon compounds.
- 1.06 Combustion Unit. Any boiler plant, furnace, incinerator, flare, engine, or other device or system used to oxidize solid, liquid, or gaseous fuels, but excluding motors and engines used in propelling land, water, and air vehicles.
- 1.07 Commercial Incinerators. An incinerator used to dispose of waste material from retail and wholesale trade establishments.
- 1.08 Condensate. Liquids that result from the cooling and/or pressure changes of produced natural gas. Once these liquids are processed at gasoline plants, refineries, or in any other manner, they are no longer considered condensates.
- 1.09 Domestic Wastes. The garbage and rubbish normally resulting from the functions of life within a residence.
- 1.10 Downwind Level. The concentration of air contaminants from a source or sources on a property as measured at or beyond the property boundary.
- 1.11 Exhaust Emission. Air contaminants emitted to the atmosphere from an opening downstream from the exhaust ports of a motor vehicle engine.
- 1.12 Federal Motor Vehicle Regulation. The Motor Vehicle Air Pollution Standards, Title 45, Subtitle A, Part 85, Code of Federal Regulations.

- 1.13 Flue. Any duct, stack, chimney, or conduit used to conduct air contaminants into the open air.
- 1.14 Forage. Any vegetation which may be consumed by animals.
- 1.15 Garbage. Solid waste consisting of putrescible animal and vegetable waste materials resulting from the handling, preparation, cooking, and consumption of food, including waste materials from markets, storage facilities, handling and sale of produce and other food products.
- 1.16 Incinerator. An enclosed combustion apparatus and appurtenances thereto which is used in the process of burning wastes for the primary purpose of reducing its volume and weight by removing the combustibles of the waste, and which is equipped with a flue for conducting products of combustion to the atmosphere. An open trench type (with closed ends) combustion unit may be considered an incinerator when approved by the Executive Director.
- 1.17 Inorganic Fluoride Compounds. All inorganic chemicals having an atom or atoms of fluorine in their chemical structure.
- 1.18 Major Upset. An unscheduled occurrence or excursion of a process or operation that results in an emission of air contaminants that contravenes the Texas Air Control Board Regulations and/or the intent of the Texas Clean Air Act and is beyond immediate control, or a release that is initiated to protect life in the immediate or adjacent areas.
- 1.19 Motor Vehicle. A self-propelled vehicle designed for transporting persons or property on a street or highway.
- 1.20 Net Ground-Level Concentration. The upwind level subtracted from the downwind level.
- 1.21 New Source. Any stationary source, the construction or modification of which is commenced after the date of adoption of these Regulations.
- 1.22 Non-Methane Hydrocarbons. The total hydrocarbon content of the sample minus the methane content of the sample.
- 1.23 Opacity. The degree to which an emission of air contaminants obstructs the transmission of light expressed as the percentage to which the light is obstructed as measured by an optical instrument or trained observer.
- 1.24 Outdoor Burning. Any fire or smoke-producing process which is not conducted in a combustion unit.
- 1.25 Particulate Matter. Any material, except uncombined water, that exists as a solid or liquid in the atmosphere or in a gas stream at standard conditions

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- 1.26 Process or Processes. Any action, operation, or treatment embracing chemical, commercial, industrial, or manufacturing factors such as combustion units, kilns, stills, dryers, roasters, and equipment used in connection therewith, and all other methods or forms of manufacturing or processing that may emit smoke, particulate matter, gaseous matter, or visible emissions.
- 1.27 Process Weight Per Hour. "Process Weight" is the total weight of all materials introduced or recirculated into any specific process which process may cause any discharge into the atmosphere. Solid fuels charged into the process will be considered as part of the process weight, but liquid and gaseous fuels and combustion air will not. The "Process Weight Per Hour" will be derived by dividing the total process weight by the number of hours in one complete operation from the beginning of any given process to the completion thereof, excluding any time during which the equipment used to conduct the process is idle. For continuous operation, the "Process Weight Per Hour" will be derived by dividing the process weight for a 24-hour period by twenty-four.
- 1.28 Property. All land under common control or ownership on which any source or combination of sources is located, coupled with all improvements on such land, and all fixed or movable objects on such land, or any vessel on the waters of this State which may constitute a source.
- 1.29 Rubbish. Nonputrescible solid waste, consisting of both combustible and noncombustible waste materials; combustible rubbish includes paper, rags, cartons, wood, excelsior, furniture, rubber, plastics, yard trimmings, leaves, and similar materials; noncombustible rubbish includes glass, crockery, tin cans, aluminum cans, metal furniture, and like materials which will not burn at ordinary incinerator temperatures (1600°F to 1800°F).
- 1.30 Smoke. Small gas-borne particles resulting from incomplete combustion consisting predominantly of carbon and other combustible material and present in sufficient quantity to be visible.
- 1.31 Sour Gas. Any natural gas containing more than one and one-half (1 1/2) grains of hydrogen sulfide per one hundred (100) cubic feet, or more than thirty (30) grains of total sulfur per one hundred (100) cubic feet.
- 1.32 Sour Crude. A crude oil which will emit a sour gas when in equilibrium at atmospheric pressure.
- 1.33 Source. A point of origin of air contaminants, whether privately or publicly owned or operated. Upon request of a source owner the Executive Director shall determine whether multiple processes emitting air contaminants from a single point of emission will be treated as a single source or as multiple sources.

- 1.34 Standard Conditions. A condition at a temperature of 70°F and a pressure of 14.7 pounds per square inch absolute. Pollutant concentrations from an incinerator will be corrected to a condition of 50% excess air if the incinerator is operating at greater than 50% excess air.
- 1.35 Standard Metropolitan Statistical Area. An area consisting of a county or one or more contiguous counties which is officially so designated by the U. S. Bureau of the Budget.
- 1.36 Submerged Fill Pipe. Any fill pipe the discharge opening of which is entirely submerged when the liquid level is six inches above the bottom of the tank or is always submerged during filling operations; or when applied to a tank which is loaded from the side, shall mean any fill pipe the discharge opening of which is entirely submerged when the liquid level is two times the fill pipe diameter in inches above the bottom of the tank.
- 1.37 Sulfur Compounds. All inorganic or organic chemicals having an atom or atoms of sulfur in their chemical structure.
- 1.38 Sweet Crude Oil and Gas. Those crude petroleum hydrocarbons that are not "sour" as defined.
- 1.39 System or Device. Any article, chemical, machine, equipment, or other contrivance, the use of which may eliminate, reduce, or control the emissions of air contaminants to the atmosphere.
- 1.40 Upwind Level. The representative concentration of air contaminants flowing onto or across a property as measured at any point.
- 1.41 Visible Emissions. Particulate or gaseous matter which can be detected by the human eye. The radiant energy from an open flame shall not be considered a visible emission under this definition.
- 1.42 Volatile Carbon Compound. Any carbon compound or mixture of carbon compounds which has an aggregate vapor pressure of 1.5 pounds per square inch absolute or greater under actual conditions of storage or use.
- 1.43 Volatile Carbon Compound - Effluent Water Separation. Any tank, box, sump, or other container in which any volatile carbon compound, floating on or entrained or contained in water entering such tank, box, sump, or other container, is physically separated and removed from such water prior to outfall, drainage, or recovery of such water.

Rule 2. Other Definitions.

Unless specifically defined in the Act or in the Rules of the Board, the terms used by the Board have the meanings commonly ascribed to them in the field of air pollution control.

Rule 3. Multiple Air Contaminant Sources or Properties.

- 3.1 In an area where an additive effect occurs from the accumulation of air contaminants from two or more sources on a single property or from two or more properties, such that the level of air contaminants exceeds the ambient air quality standards established by the Texas Air Control Board, and each source or each property is emitting no more than the allowed limit for an air contaminant for a single source or from a single property, further reduction of emissions from each source or property shall be made as determined by the Board.
- 3.2 Two or more property holders in a county having a population of less than 50,000 as determined by the most recent federal census may petition the Board to have their properties designated a single property for purposes of controlling emissions therefrom, if the properties are contiguous except for intervening roads, railroads, rights-of-way, canals and watercourses, which are considered a part of the area for purposes of this provision. The petition shall describe generally the manner in which control of emissions from the combined properties will be administered and shall name the party or parties accepting responsibility thereof. The petition shall be accompanied by an executed copy of a written agreement between the property holders who consent to having their properties so designated and shall also be accompanied by a detailed map of the vicinity showing geographical features such as roads, watercourses, and well-known landmarks; the boundaries of the petitioner's properties; the area to be included in the single property designation; and present land uses in the areas surrounding the area to be included. The Board may place such conditions on the approval of the petition as it may deem appropriate.

Rule 4. Circumvention.

No person shall use any plan, activity, device or contrivance which the Executive Director determines will, without resulting in an actual reduction of air contaminants, conceal or appear to minimize the effects of an emission which would otherwise constitute a violation of the Act or Regulations. Air introduced for dilution purposes only is considered a circumvention of the Regulations.

Rule 5. Nuisance.

No person shall discharge from any source whatsoever one or more air contaminants or combinations thereof, in such concentration and of such duration as are or may tend to be injurious to or to adversely affect human health or welfare, animal life, vegetation or property, or as to interfere with the normal use and enjoyment of animal life, vegetation or property.

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Rule 6. Traffic Hazard.

No person shall discharge from any source whatsoever such quantities of air contaminants, uncombined water, or other materials which cause or have a tendency to cause a traffic hazard or an interference with normal road use.

Rule 7. Notification Requirements for Major Upset.

The Executive Director and the appropriate local air pollution control agency shall be notified as soon as possible of any major upset condition which causes or may cause an excessive emission that contravenes the intent of the Texas Clean Air Act and/or the Regulations of the Board. A list of persons to contact may be obtained from the Executive Director upon request.

Rule 8. Notification Requirements for Maintenance.

The Executive Director and the appropriate local air pollution control agency shall be notified in writing at least ten (10) days prior to any planned maintenance, start-up, or shut-down which will or may cause an excessive emission that contravenes the intent of the Texas Clean Air Act and/or the Regulations of the Board. If ten (10) days notice cannot be given due to an unplanned occurrence, notice shall be given as soon as practical prior to the shut-down.

Rule 9. Sampling

9.1 Any person owning or operating a source which emits air contaminants into the air of this State shall, upon request by the Board or the Executive Director, conduct sampling to determine the opacity, rate, composition, and/or concentration of such emissions. Sampling shall be conducted at a frequency and within a period of time which are reasonable as specified by the Board or Executive Director. The sampling method shall be specified by the Board or the Executive Director and, further, the sampling shall be conducted so as to reflect with reasonable accuracy the above listed characteristics of such emissions.

9.11 Any person affected by Rule 9.1 may request the Executive Director to approve alternate sampling techniques or other means to determine the opacity, rate, composition, and/or concentration of emissions. The Executive Director may approve such alternate methods or means if it can be demonstrated that such alternatives will be substantially equivalent to the sampling methods specified by the Executive Director or the Board.

9.2 If requested to obtain air contaminants emission data pursuant to Rule 9.1, the owner or operator shall attest to and report the results so obtained to the Executive Director within a reasonable time specified by and on forms furnished by the Executive Director.

9.3 Copies of all data, computations and results obtained under Rule 9.1 shall be retained by the owner or operator of a source for at least five years and shall be made available to the Board, or any members, employees or agents thereof, and to any local air pollution control agencies, during regular business hours.

Rule 10. Sampling Ports.

Any person, at the request of the Board shall provide in connection with each flue a power source near the point of testing in addition to such sampling and testing facilities and sampling ports, including safe and easy access thereto, exclusive of instruments and sensing devices, as may be necessary for the Board to determine the nature and quality of emissions which are or may be discharged as a result of source operations. Evidence and data based on these samples and calculations may be used to substantiate violations of the Act, Rules and Regulations. Agents of the Board shall be permitted to sample the stacks during operating hours.

Rule 11. Filing of Emissions Data.

Upon request by the Board or the Executive Director, any person affected by any Rule or Regulation of the Texas Air Control Board shall file emissions data with the Board on forms supplied by the Board.

Rule 12. Exemptions from Rules and Regulations.

12.1 Emissions occurring during major upsets may not be required to meet the allowable emission levels set by the Rules and Regulations upon proper notification as set forth in Rule 7 of these General Rules, if a determination is made by the Executive Director after consultation with appropriate local agencies and with appropriate officials of the subject source that the upset conditions were unavoidable and that a shut-down or other corrective actions were taken as soon as practicable.

12.2 Emissions occurring during start-up or shut-down of processes or during periods of maintenance may not be required to meet the allowable emission levels set by the Rules and Regulations if so determined by the Executive Director upon proper notification as set forth in Rule 8 of these General Rules. The Executive Director may specify the amount, time, and duration of emissions that will be allowed during start-up and shut-down and during periods of maintenance.

- 12.3 Smoke generators and other devices used for training inspectors in the evaluation of visible emissions at a training school approved by the Board are not required to meet the allowable emission levels set by the Rules and Regulations, but must be located and operated such that a nuisance is not created at any time.
- 12.4 Equipment, machines, devices, flues, contrivances built or installed to be used at a domestic residence for domestic use are not required to meet the allowable emission levels set by the Rules and Regulations unless specifically required by a particular Regulation.
- 12.5 Sources emitting air contaminants which cannot be controlled or reduced due to a lack of technological knowledge may be exempt from the applicable Rules and Regulations when so determined and ordered by the Texas Air Control Board. The Board may specify limitation and conditions as to the operation of such exempt sources.
- 12.6 No nuisance conditions shall be permitted to occur under these exemptions.

Rule 13. Board Seal.

The seal of the Board shall bear the words "Texas Air Control Board", the star, and the oak and olive branches common to other official State seals.

Rule 14. Use and Effect of Rules.

These rules may be used by the Board as guides in the exercise of discretion, where discretion is vested. They shall not be construed as a limitation or restriction on the exercise of discretion, where it exists, nor shall they be construed to deprive the Board of the exercise of any power, duties and jurisdiction conferred by law, or to limit or restrict the amount and character of data or information which may be required for the proper administration of the law.

Rule 15. Sampling Procedures and Terminology.

Where not otherwise specified in the Rules, Regulations, determinations and orders of the Board, the procedures used for sampling air and measuring air contaminants, and the methods of expressing the findings shall be those commonly accepted and used in the field of air pollution control.

Rule 16. Invoking Jurisdiction of the Board.

Any person may petition the Board through the Executive Director for such consideration and action related to air pollution control as he may desire. The Board will review and act on the petition in such manner as the Board may prescribe.

Rule 17. Petition for Variance.

Any person seeking a variance, amendment of a variance, or extension of a variance issued to that person shall file a petition on a form prepared by the Board. The form shall be furnished by the Board without charge upon request. In order to obtain a variance past the date by which compliance is to be achieved, a person must have demonstrated continuous and substantial progress toward compliance before the date of petition.

Rule 18. Effect of Acceptance of Variance or Permit.

Acceptance of a variance or a permit constitutes an acknowledgement and agreement that the holder thereof will comply with its terms and with the Rules, Regulations, and orders of the Board adopted pursuant to the Act.

Rule 19. Initiation of Review.

The Board may initiate proceedings to revoke or amend a variance or a permit on its own motion, on recommendation of the Executive Director, or upon request of an interested person who presents reasonable justifiable grounds therefor.

Rule 20. Transfers.

A variance or a permit is granted in personam, and does not attach to the realty to which it relates. A variance cannot be transferred without prior notification to the Board. If a transfer of ownership of a source covered by a variance is contemplated by the holder of the variance, and the source and characteristics of the emissions will remain unchanged, upon notification, the Executive Director shall issue an endorsement to the variance reflecting the name of the new owner. Continuation of emissions by the new owner without prior notification to the Board makes the variance subject to forfeiture.

Rule 21. Remedies Cumulative.

The administrative and judicial procedures available to the Board to prevent, correct or remedy air pollution conditions or violations are cumulative. Within the limits of the authority set forth in the Act and these Rules, the Board or the Executive Director may act under any one or more of these procedures, as applicable to the facts of a particular air pollution condition or claimed violation.

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Rule 22. Severability.

If any provision of any of the Regulations of the Board or the application of that provision to any person, situation or circumstance is for any reason adjudged invalid, the adjudication does not affect any other provision of the Regulations or the application of the adjudicated provision to any other person, situation, or circumstance. The Board declares that it would have adopted the valid portions and applications of the Regulations without the invalid part and to this end the provisions of the Regulations are declared to be severable.

Rule 23. It is the intention of the Texas Air Control Board to utilize and enforce the Ambient Air Quality Standards and emission limitations promulgated pursuant to the Federal Clean Air Act, 42 U.S.C., 1857 et seq., as amended.

Rule 24. The National Primary and Secondary Ambient Air Quality Standards as published in the Federal Register, 36 Fed. Reg. 818F (April 30, 1971), are to be applied throughout all parts of Texas. The Primary Standards are to be achieved no later than three (3) years after the Implementation Plan is approved by the Environmental Protection Agency, and the Secondary Standards are to be achieved within a reasonable time thereafter as so determined by the Texas Air Control Board.

Rule 25. The general rules contained herein shall be in force immediately and shall supersede all previous General Provisions and Procedural Rules of the Texas Air Control Board.

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Amendment of Rule 9

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Amendment of Rule 9

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TEXAS AIR CONTROL BOARD

REGULATION I

CONTROL OF AIR POLLUTION FROM  
SMOKE, VISIBLE EMISSIONS, AND PARTICULATE MATTER

Rule 101. Outdoor Burning

101.1 No person may cause, suffer, allow or permit any outdoor burning within the State of Texas, except as provided by Rule 101.2.

101.2 Outdoor burning is authorized in the following instances if no nuisance is or will be created:

101.21 Outdoor burning when conducted pursuant to a written grant of authority by the Texas Air Control Board or Executive Director.

101.22 Outdoor burning for the purpose of training fire-fighting personnel when requested by certified mail and when authorized in writing by the local air pollution control agency or local health unit. If notice of denial from the local air pollution control agency or local health unit is not received within ten (10) days of the request, the burning is authorized. Authorization to conduct outdoor burning under this provision may be revoked by the Texas Air Control Board if it is found that this provision is used to circumvent Rule 101.

101.23 Outdoor burning of domestic waste at and from a property designed for and used exclusively as a private residence, housing not more than three families when collection of the domestic waste is not provided by the local governmental entity having jurisdiction.

101.24 Outdoor burning consisting of campfires and fires used solely for recreational or ceremonial purposes, or in the non-commercial preparation of food.

101.25 Outdoor burning in a rural area of trees, brush, grass, and other dry vegetable matter from such area in land-clearing, right-of-way maintenance operations, forest management purposes, and range land management purposes, if all the following conditions are met:

- 101.251 The burning must be outside the corporate limits of a city or town except when it is necessary to eliminate a naturally occurring fire hazard.
- 101.252 The wind direction at the time of starting the burning must be away from any nearby city, town, residence, recreational, commercial, or industrial area.
- 101.253 The burning must be at least one thousand feet from any residence, recreational, commercial, or industrial area except those located on the property where the burning is to take place, except when it is necessary to eliminate a naturally occurring fire hazard.
- 101.254 Heavy oils, asphaltic materials, items containing natural or synthetic rubber or any material other than dry plant growth which may produce unreasonable amounts of smoke must not be burned.
- 101.255 If the burning will cause smoke to blow onto or across a highway, it is the responsibility of the person initiating the burning to post flagmen on affected roads in accordance with the requirements of the Department of Public Safety.
- 101.256 The initial burning for land clearing and right-of-way maintenance purposes may be commenced after 9:00 a.m. Material which will not be completely consumed before 5:00 p.m. shall not be added to the fire.
- 101.257 Burning within an area should be staggered so that total atmospheric loads of smoke are reduced.
- 101.258 Burning shall not be conducted when meteorological forecasts predict wind movement of less than three (3) miles per hour or greater than fifteen (15) miles per hour or when a significant shift in wind direction is predicted which could produce adverse effects to personnel, animals, or property during the burning period.
- 101.259 Burning shall not be conducted during periods of actual or predicted persistent (12 hours or more) low-level (below 1600 feet) atmospheric inversions or in areas covered by a current air stagnation advisory.

- 101.26 Outdoor burning of the garbage and rubbish generated by a city or town having a population of less than 5,000, as determined by the most recent federal census, or by any unincorporated area serving less than 5,000, as determined by the most recent federal census, may be conducted if the following conditions are met:
- 101.261 The city or unincorporated area and the location of the burning must be outside a defined Standard Metropolitan Statistical Area.
  - 101.262 Cities in newly designated Standard Metropolitan Statistical Areas shall have eighteen (18) months after the designation of the Standard Metropolitan Statistical Area to comply with Rule 101.
  - 101.263 The location of the burning must not be within a city or town; must be at least one mile from any residential, recreational, commercial or industrial area; and must be at least 300 yards from any public road.
  - 101.264 The initial burning may be commenced only between the hours of 9:00 a.m. and 1:00 p.m. Combustible material must not be added to the fire between 1:00 p.m. of one day and 9:00 a.m. of the following day.
  - 101.265 The exceptions provided by Rule 101.26 will not apply after December 31, 1973, to cities with a population over 3,000, as determined by the most recent federal census.
- 101.27 Outdoor burning of hydrocarbons from pipeline breaks and oil spills may be allowed upon proper notification as set forth in Rule 7 of the General Rules, if the Executive Director determines that the burning is necessary to protect the public welfare.
- 101.3 No disposal or deposit outdoors of any material capable of igniting spontaneously is allowed except where the disposal or deposit is made pursuant to a specific grant of authority by the Texas Air Control Board or the Executive Director.
- 101.4 The authority to conduct outdoor burning under this Regulation does not exempt or excuse the person responsible from the consequences, damages, or injuries resulting from the burning and does not exempt or excuse anyone from complying with all other applicable laws or ordinances, regulations and orders of governmental entities having jurisdiction even though the burning is otherwise conducted in compliance with the regulation.

Rule 102. Incineration

- 102.1 No person may cause, suffer, allow, or permit the burning of garbage or rubbish in a single-chamber residential or commercial incinerator unless the Executive Director approves an incinerator demonstrated to provide equivalent performance to multiple-chamber incinerators.
- 102.2 No person may cause, suffer or permit the burning of garbage or rubbish in a single-chamber incinerator constructed after April 1, 1972, unless the Executive Director approves an incinerator demonstrated to provide equivalent performance to multiple-chamber incinerators.

Rule 103. Visible Emissions.

- 103.1 No person may cause, suffer, allow, or permit visible emissions from any stationary flue to exceed an opacity of 30% averaged over a 5-minute period. No person may cause, suffer, allow, or permit visible emissions from any stationary flue beginning construction after January 31, 1972, to exceed an opacity of 20% averaged over a 5-minute period. Visible emissions during the cleaning of a firebox or the building of a new fire, sootblowing, equipment changes, ash removal and rapping of precipitators may exceed the limits set forth in Rule 103.1 for a period aggregating not more than five minutes in any sixty consecutive minutes, nor more than six hours in any ten-day period.
- 103.2 No person may cause, suffer, allow, or permit visible emissions from a waste gas flare for more than five minutes in any 2-hour period except as provided in Rule 12.1 of the General Rules.
- 103.3 No person may cause, suffer, allow, or permit excessive visible emissions from any building or enclosed facility.
- 103.4 No person may cause, suffer, allow, or permit excessive visible emissions from motor vehicles for more than ten consecutive seconds.
- 103.5 No person may cause, suffer, allow, or permit excessive visible emissions from any railroad locomotive, ship or any other vessel, except during reasonable periods of engine start-up.
- 103.6 No person may cause, suffer, allow, or permit visible emissions from any stationary flue having a total flow rate of 100,000 acfm or more to exceed an opacity of 15% averaged over a 5-minute period unless an optical instrument capable of measuring the opacity of emissions is installed in the flue. Records of all such measurements shall be retained as provided for in Rule 9 of the General Rules. The provision shall not apply to flues having gas streams containing moisture which interferes with proper instrument operation, if so determined by the Executive Director.

103.7 Contributions from uncombined water shall not be included in determining compliance with Rule 103. The burden of proof which establishes the applicability of Rule 103.7 shall be upon the person seeking to come within its provisions.

Rule 104. Particulate Matter from Materials Handling, Construction, and Roads.

104.1 Rule 104 shall apply only in Standard Metropolitan Statistical Areas where the federal air quality standards for particulate matter are exceeded.

104.2 No person may cause, suffer, allow, or permit any fine material to be handled, transported, or stored without taking at least the following precautions to prevent particulate matter from becoming airborne:

104.21 Application of water or suitable chemicals or some other covering on materials stockpiles, and other surfaces which can create airborne dusts under normal conditions;

104.22 Installation and use of hoods, fans and filters to enclose, collect, and clean the emissions of dusty materials;

104.23 Covering or wetting at all times when in motion, of open-bodied trucks, trailers, or railroad cars transporting materials in areas where the general public has access which can create airborne particulate matter.

104.3 No person may cause, suffer, allow or permit a building structure to be used, constructed, altered, repaired or demolished without taking at least the following precautions to prevent particulate matter from becoming airborne:

104.31 Use of water or chemicals where feasible for control of dust in the demolition of buildings or structures, in construction operations, or in the clearing of land;

104.32 Use of adequate methods to prevent airborne particulate matter during sandblasting of buildings or other similar operations.

104.4 No person may cause, suffer, allow, or permit a road to be used, constructed, altered, or repaired without taking at least the following precautions to prevent particulate matter from becoming airborne:

104.41 Application of asphalt, oil, water or suitable chemicals on heavily traveled dirt streets as necessary.

- 104.42 Paving of public or commercial parking surfaces having more than five parking spaces.
- 104.43 Removal as necessary from paved street and parking surfaces of earth or other material which have a tendency to become airborne.
- 104.5 Alternate means of control may be approved by the Executive Director of the Texas Air Control Board.

Rule 105. Particulate Matter

- 105.1 No person may cause, suffer, allow, or permit emissions of particulate matter from any source to exceed the allowable rates specified in Table 1 and/or Figure 1.
- 105.11 If a source has an effective stack height less than the standard effective stack height as determined from Table 2 and/or Figure 2, the allowable emission level must be reduced by multiplying it by:

$$\left( \frac{\text{Effective Stack Height}}{\text{Standard Effective Stack Height}} \right)^2$$

- 105.12 Effective stack height shall be calculated by the following equation:

$$h_e = h + 0.083 v_e D_e \left[ 1.5 + 0.82 \left( \frac{T_e - 550}{T_e} \right) D_e \right]$$

Where:

- $h_e$  = Effective stack height in feet (ft)  
 $h$  = Physical stack height above ground level in feet (ft)  
 $v_e$  = Stack exit velocity in feet per second (ft/sec)  
 $D_e$  = Stack exit inside diameter in feet (ft)  
 $T_e$  = Stack exit temperature in degrees Rankin (°R)

- 105.2 No person may cause, suffer, allow or permit emissions of particulate matter from a source or sources operated on a property or from multiple sources operated on contiguous properties to exceed any of the following net ground level concentrations.
- 105.21 One hundred (100) micrograms per cubic meter ( $\mu\text{g}/\text{M}^3$ ) of air sampled, averaged over any five (5) consecutive hours.
- 105.22 Two hundred (200) micrograms per cubic meter ( $\mu\text{g}/\text{M}^3$ ) of air sampled, averaged over any three (3) consecutive hours.
- 105.23 Four hundred (400) micrograms per cubic meter ( $\mu\text{g}/\text{M}^3$ ) of air sampled, averaged over any one (1) hour period.

105.3 Rules 105.1 and 105.2 shall not apply to any oil or gas fuel fired steam generator with a heat input greater than 2500 million BTU per hour or any solid fossil fuel fired steam generator.

105.31 No person may cause, suffer, allow, or permit emissions of particulate matter from any solid fossil fuel fired steam generator to exceed 0.3 lbs. per million BTU heat input maximum 2-hour average.

105.32 No person may cause, suffer, allow or permit emissions of particulate matter from any oil or gas fuel fired steam generator with a heat input greater than 2500 million BTU per hour to exceed 0.1 lb. per million BTU heat input maximum 2-hour average.

Rule 106. Transient Operations.

106.1 Rules 103 and 105 shall not apply to portable hot-mix asphaltic concrete plants, portable rock-crusher, and other transient operations engaged in public works projects which are not operated at the same premise for more than six months if all the following conditions are met:

106.11 The plant is located at least one mile outside the nearest corporate limits of any city or town.

106.12 The plant is located at least one mile from any occupied facility or recreational area other than that located on the same property as the plant.

106.13 The plant is equipped with cyclones, or wet scrubbers, or water sprays at the material transfer points open to the atmosphere, or other equipment or systems approved by the Executive Director, properly installed, in good working order and in operation.

106.2 The time requirement for Rule 106.1 may be extended by the Executive Director upon written request.

106.3 All emissions from sources operating under provisions of Rule 106 shall be controlled so as not to permit or create a nuisance.

106.4 Rule 106 shall not apply in Dallas or Harris Counties.

106.5 Rule 106 shall not apply to portable hot-mix asphaltic concrete plants after December 31, 1974.

Rule 107. Agricultural Process.

107.1 Rules 103, 104, 105 and 108 shall not apply to any person affected by Section 3.10 (e) of the Texas Clean Air Act.

- 107.2 No person affected by Section 3.10 (e) of the Texas Clean Air Act may cause, suffer, allow, or permit emissions of particulate matter from any or all sources associated with a specific process to exceed the allowable levels specified in Table 3 and/or Figure 3, except as provided by Rule 107.3.
- 107.3 Any person affected by Section 3.10 (e) of the Texas Clean Air Act who does not wish to be controlled by the process weight method, established by Rule 107.2, may select an alternate method of control which the Executive Director finds will provide emission control efficiency and measurement to achieve the same goal as Rule 107.2.
- 107.4 Any person affected by Section 3.10 (e) of the Texas Clean Air Act who does not select an alternate method and notify the Executive Director, in writing, prior to any plant investigation by the staff of the Texas Air Control Board shall be controlled by the process weight method established by Rule 107.2, unless the Executive Director, at his discretion, chooses to accept proposals for an alternate method at that time.
- 107.5 Nothing herein is intended to affect the limitations on burning set out in Rule 101.
- 107.6 Persons affected by Rule 107 shall be in compliance with the provisions set forth herein by February 15, 1973.
- Rule 108. Persons affected by this Regulation shall be in compliance with the provisions contained herein no later than December 31, 1973. Not later than six months after the effective date of this Regulation, any person affected by this Regulation shall submit to the Texas Air Control Board a written report on his compliance status, including but not limited to, the minimum time required to design, procure, install and test abatement equipment or procedures. Progress reports shall be submitted to the Board every four months commencing in July of 1972 until compliance is achieved.

All persons shall continue to be governed by the provisions of Regulation I, which became effective on March 16, 1967, and amended on January 23, 1968, September 12, 1969, and May 18, 1971, and Regulation II, which became effective February 22, 1968, and amended on September 12, 1969, until December 31, 1973, at which time this Regulation shall supersede the previous Regulation I and II.

Date Adopted: January 26, 1972  
 Date Filed with Secretary of State: February 4, 1972  
 Date Effective: March 5, 1972  
 Amendment of Rule 105.3  
 Date Adopted: December 19, 1973  
 Date Filed with Secretary of State: December 20, 1973  
 Date Effective: January 19, 1974

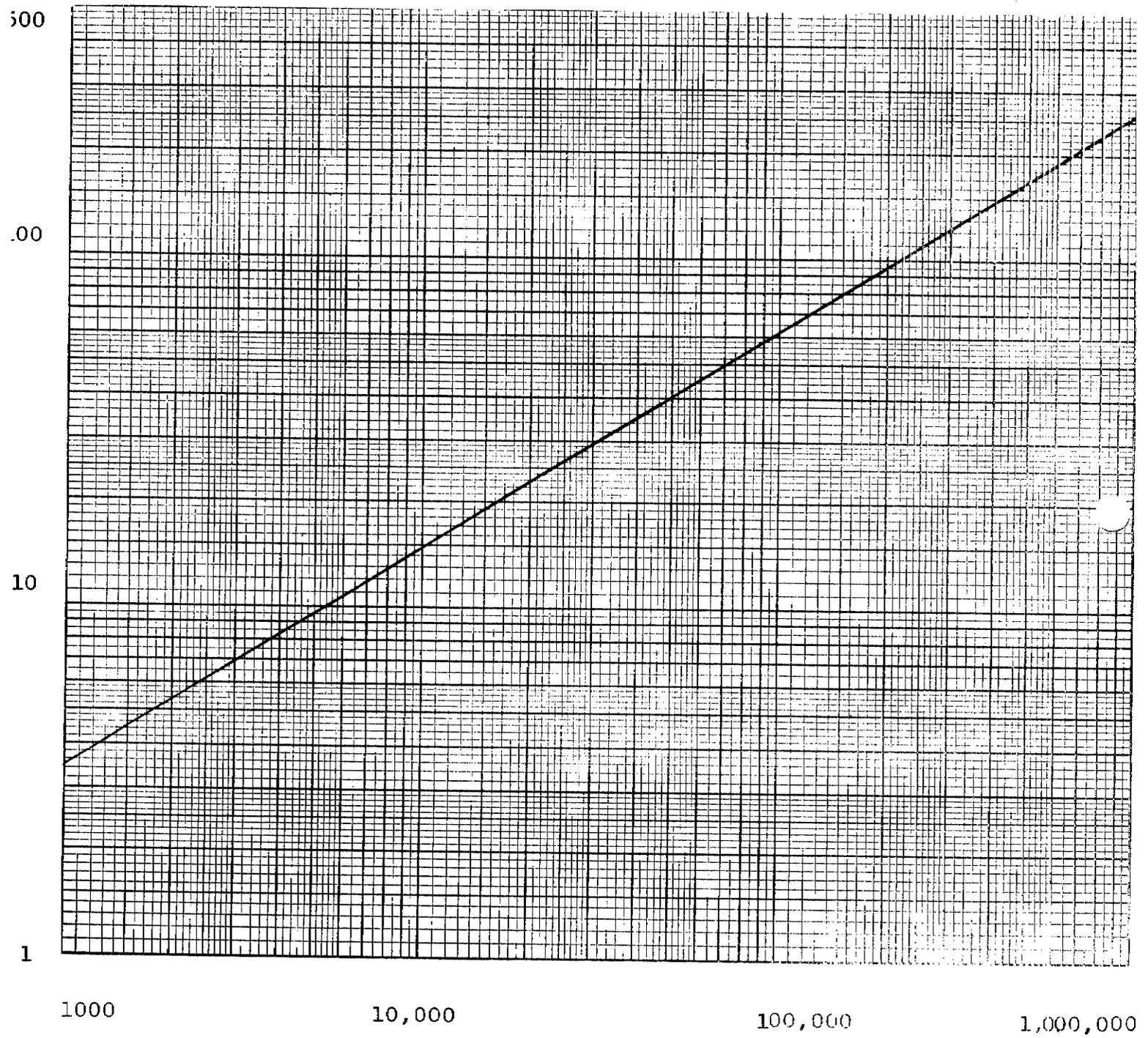
TABLE 1  
ALLOWABLE PARTICULATE EMISSION RATES  
FOR SPECIFIC FLOW RATES

| Effluent Flow Rate<br>acfm | Rate of Emission<br>lb/hr |
|----------------------------|---------------------------|
| 1,000                      | 3.5                       |
| 2,000                      | 5.3                       |
| 4,000                      | 8.2                       |
| 6,000                      | 10.6                      |
| 8,000                      | 12.6                      |
| 10,000                     | 14.5                      |
| 20,000                     | 22.3                      |
| 40,000                     | 34.2                      |
| 60,000                     | 44.0                      |
| 80,000                     | 52.6                      |
| 100,000                    | 60.4                      |
| 200,000                    | 92.9                      |
| 400,000                    | 143.0                     |
| 600,000                    | 184.0                     |
| 800,000                    | 219.4                     |
| 1,000,000                  | 252.0                     |

Interpolation and extrapolation of the data in this table shall be accomplished by the use of the equation  $E=0.048 q^{0.62}$  where E is the allowable emission rate in lb/hr and q is the stack effluent flow rate in acfm.

FIGURE 1

ALLOWABLE PARTICULATE EMISSION RATES  
FOR SPECIFIC FLOW RATES



STACK EFFLUENT FLOW RATE (acfm)

TABLE 2

STANDARD EFFECTIVE STACK HEIGHT  
 BASED ON SPECIFIC FLOW RATES

| Effluent Flow Rate<br>acfm | Standard Effective Stack Height<br>ft |
|----------------------------|---------------------------------------|
| 1,000                      | 12                                    |
| 2,000                      | 15                                    |
| 4,000                      | 19                                    |
| 6,000                      | 22                                    |
| 8,000                      | 24                                    |
| 10,000                     | 26                                    |
| 20,000                     | 34                                    |
| 40,000                     | 43                                    |
| 60,000                     | 49                                    |
| 80,000                     | 55                                    |
| 100,000                    | 59                                    |
| 200,000                    | 75                                    |
| 400,000                    | 96                                    |
| 600,000                    | 110                                   |
| 800,000                    | 122                                   |
| 1,000,000                  | 132                                   |

Interpolation and extrapolation of the data in this Table shall be accomplished by the use of the equation  $H_e = 1.05 q^{0.35}$  where  $H_e$  is the standard effective stack height in feet and  $q$  is the stack effluent flow rate in acfm.

FIGURE 2

STANDARD EFFECTIVE STACK HEIGHT  
BASED ON SPECIFIC FLOW RATES

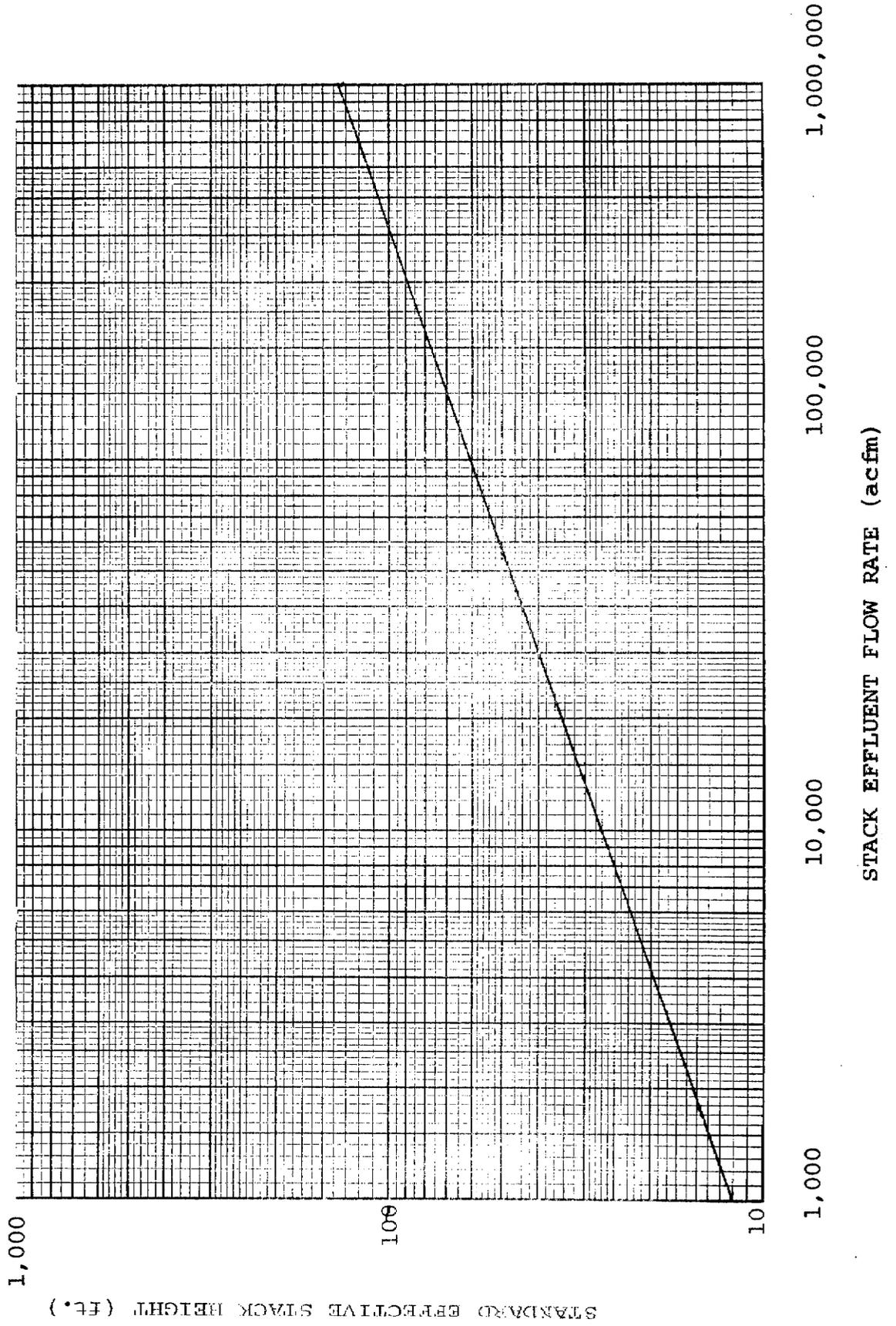


TABLE 3

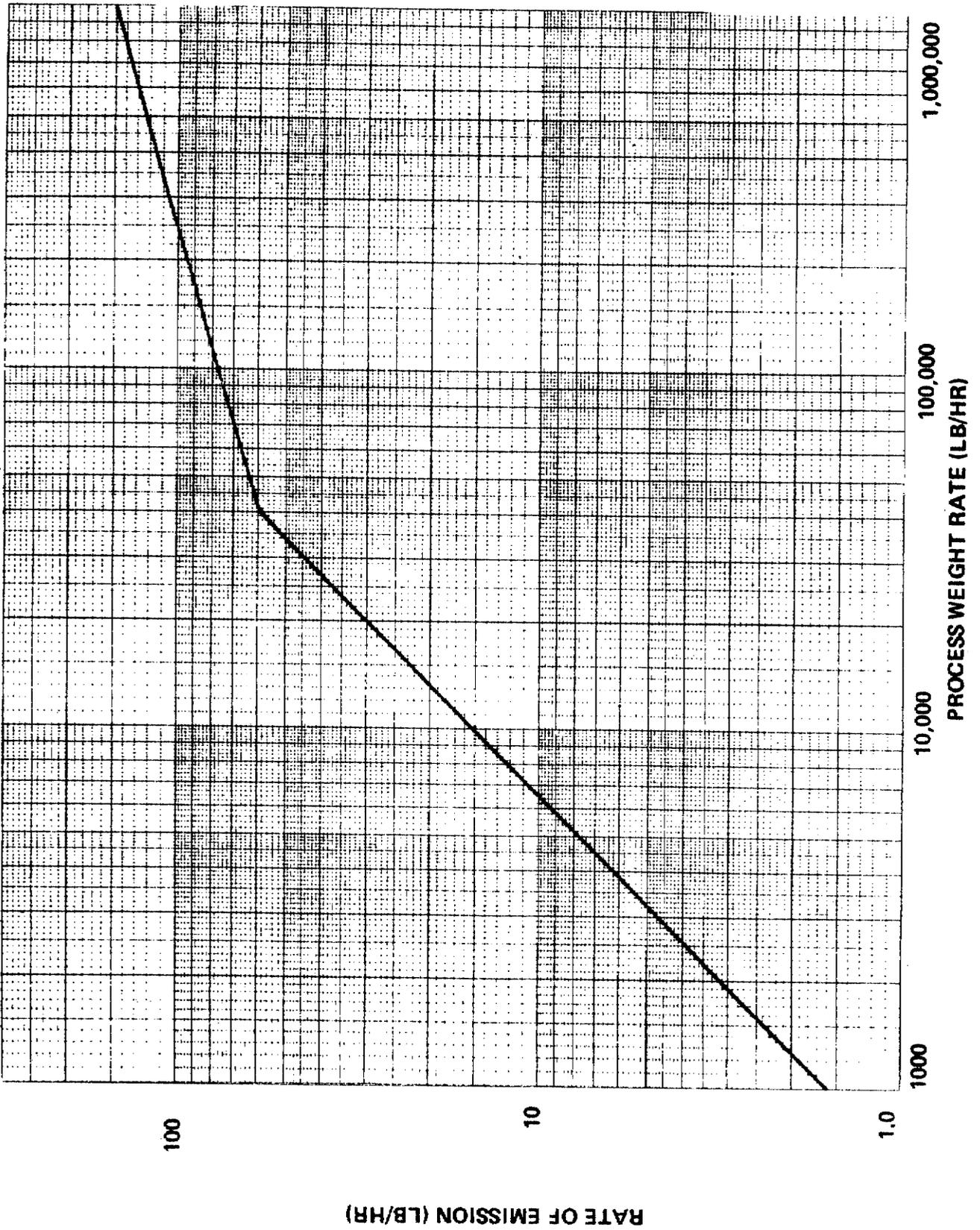
## ALLOWABLE RATE OF EMISSION BASED ON PROCESS WEIGHT RATE

| PROCESS WEIGHT<br>RATE | RATE OF<br>EMISSION | PROCESS WEIGHT<br>RATE | RATE OF<br>EMISSION |
|------------------------|---------------------|------------------------|---------------------|
| lb/hr                  | lb/hr               | lb/hr                  | lb/hr               |
| 1,000                  | 1.6                 | 16,000                 | 24.2                |
| 1,500                  | 2.4                 | 18,000                 | 27.2                |
| 2,000                  | 3.1                 | 20,000                 | 30.1                |
| 2,500                  | 3.9                 | 30,000                 | 44.9                |
| 3,000                  | 4.7                 | 40,000                 | 59.7                |
| 3,500                  | 5.4                 | 50,000                 | 64.0                |
| 4,000                  | 6.2                 | 60,000                 | 67.4                |
| 5,000                  | 7.7                 | 70,000                 | 70.5                |
| 6,000                  | 9.2                 | 80,000                 | 73.2                |
| 7,000                  | 10.7                | 90,000                 | 75.7                |
| 8,000                  | 12.2                | 100,000                | 78.1                |
| 9,000                  | 13.7                | 150,000                | 87.7                |
| 10,000                 | 15.2                | 200,000                | 95.2                |
| 12,000                 | 18.2                | 250,000                | 101.5               |
| 14,000                 | 21.2                | 500,000                | 123.9               |

Interpolation of the data in this table for process weights up to 40,000 lb/hr shall be accomplished by the use of the equation  $E = 3.12 (p^{0.985})$ , and interpolation and extrapolation of the data for process weight rates in excess of 40,000 lb/hr shall be accomplished by use of the equation  $E = 25.4(p^{0.287})$  where  $E$  = rate of emission in pounds per hour and  $p$  = process weight rate in tons per hour.

FIGURE 3

ALLOWABLE PARTICULATE EMISSION LEVELS BASED ON  
PROCESS WEIGHT RATE



TEXAS AIR CONTROL BOARD  
REGULATION II

CONTROL OF AIR POLLUTION FROM SULFUR COMPOUNDS

Rule 201. Control of Sulfur Dioxide.

201.01 No person may cause, suffer, allow or permit emissions of sulfur dioxide from any sulfuric acid plant burning elemental sulfur to exceed the allowable rates specified in Table 1 and/or Curve A of Figure 1.

201.011 If a source has an effective stack height less than the standard effective stack height as determined from Table 2 and/or Curve A of Figure 2, the allowable emission rates must be reduced by multiplying it by:

$$\left( \frac{\text{Effective Stack Height}}{\text{Standard Effective Stack Height}} \right)^2$$

201.012 Effective stack height shall be calculated by the following equation:

$$h_e = h + 0.083v_e D_e \left[ 1.5 + 0.82 \left( \frac{T_e - 550}{T_e} \right) D_e \right]$$

Where:

$h_e$  = Effective stack height in feet (ft)

$h$  = Physical stack height above ground level in feet (ft)

$v_e$  = Stack exit velocity in feet per second (ft/sec)

$D_e$  = Stack exit inside diameter in feet (ft)

$T_e$  = Stack exit temperature in degrees Rankine (°R)

201.02 No person may cause, suffer, allow or permit emissions of sulfur dioxide from any sulfuric acid plant to exceed the allowable rates specified in Table 3 and/or Curve B of Figure 1.

201.021 If a source has an effective stack height less than the standard effective stack height as determined from Table 4 and/or Curve B of Figure 2, the allowable emission rates must be reduced by multiplying it by:

$$\left( \frac{\text{Effective Stack Height}}{\text{Standard Effective Stack Height}} \right)^2$$

201.022 Effective stack height shall be calculated by the equation in Rule 201.012.

201.03 No person may cause, suffer, allow or permit emissions of sulfur dioxide from any sulfur recovery plant to exceed the allowable rates specified in Table 5 and/or Curve C of Figure 1.

201.031 If a source has an effective stack height less than the standard effective stack height as determined from Table 6 and/or Curve D of Figure 2, the allowable emission rates must be reduced by multiplying it by:

$$\left( \frac{\text{Effective Stack Height}}{\text{Standard Effective Stack Height}} \right)^2$$

201.032 Effective stack height shall be calculated by the equation in Rule 201.012.

201.04 No person may cause, suffer, allow or permit emissions of sulfur dioxide from nonferrous smelters to exceed 0.8% by volume of the total flue gas.

201.041 If a source has an effective stack height less than the standard effective stack height as determined from Table 7 and/or Curve C of Figure 2, the allowable emission rates must be reduced by multiplying it by:

$$\left( \frac{\text{Effective Stack Height}}{\text{Standard Effective Stack Height}} \right)^2$$

201.042 Effective stack height shall be calculated by the equation in Rule 201.012.

201.05 No person may cause, suffer, allow or permit emissions of sulfur dioxide from any solid fossil fuel fired steam generator to exceed 3.0 lb. per million B.T.U. heat input. New proven technology must be applied in removing sulfur dioxide from the emission from solid fossil fuel fired steam generators when it becomes available.

201.06 No person may cause, suffer, allow or permit emissions of sulfur dioxide from any liquid fuel fired steam generator, furnace or heater to exceed 440 ppm, by volume.

201.061 If a source has an effective stack height less than the standard effective stack height as determined from Table 8 and/or Figure 3, the allowable emission concentration must be reduced by multiplying it by:

$$\left( \frac{\text{Effective Stack Height}}{\text{Standard Effective Stack Height}} \right)^2$$

201.062 Effective stack height shall be calculated by the equation in Rule 201.012.

201.07 No person in Galveston or Harris Counties may cause, suffer, allow or permit emissions of sulfur dioxide from a source or sources operated on a property or multiple sources operated on contiguous properties to exceed a net ground level concentration of 0.28 ppm averaged over any 30-minute period.

201.08 No person in Jefferson or Orange Counties may cause, suffer, allow or permit emissions of sulfur dioxide from a source or sources operated on a property or multiple sources operated on contiguous properties to exceed a net ground level concentration of 0.32 ppm averaged over any 30-minute period.

201.09 No person may cause, suffer, allow or permit emissions of sulfur dioxide from a source or sources operated on a property or multiple sources operated on contiguous properties to exceed a net ground level concentration of 0.4 ppm averaged over any 30-minute period.

201.10 Emission rates of sulfur dioxide from sources not regulated by Rules 201.01, 201.02, 201.03, 201.04, 201.05 and 201.06 may be set by the Executive Director as necessary to attain ambient air quality standards.

201.11 If any person is unable to comply with Rules 201.06, 201.07, 201.08 or 201.09, solely because of the non-availability of low sulfur fuels, that person may file with the Texas Air Control Board a Temporary Fuel Shortage Control Plan, which shall include all of the following:

201.111 Evidence of the non-availability of low sulfur fuels. Such evidence shall include, but not be limited to statements from suppliers of fuel as to the availability of lower sulfur fuels, the price of such fuels and the expected duration of any periods of non-availability of particular fuels. Such evidence shall be updated semiannually as long as the Temporary Fuel Shortage Control Plan remains on file with the Texas Air Control Board or as long as it can reasonably be concluded that there may be a necessity to operate under the Temporary Fuel Shortage Control Plan.

- 201.112 A statement that all emission inventory data required by the Board are complete, accurate and on file with the Board.
- 201.113 Data for each source within the entire plant that utilizes the higher sulfur fuel. The data shall include the type, quantity and sulfur content of all the fuels to be burned, excess air to be used and the associated sulfur abatement procedure to be used, if any.
- 201.114 Any other information as specified by the Board or the Executive Director. The Executive Director may require more frequent and extensive monitoring for persons affected by Rule 201.11 than would normally be required for persons affected by Rules 201.06, 201.07, 201.08 and 201.09.
- 201.12 After a person has filed a Temporary Fuel Shortage Control Plan pursuant to Rule 201.11, the provisions of that plan will govern the operation of the source with regard to emissions of sulfur dioxide during the periods of low sulfur fuel shortages, and Rules 201.06, 201.07, 201.08 and 201.09 shall not apply during these periods, provided that the person has complied with the notification procedures of Rule 201.13 and provided that the cumulative emissions of sulfur dioxide from the entire plant will not cause or contribute to a condition in which the ambient air quality will exceed 0.5 ppm sulfur dioxide averaged over a three hour period more than once per year. An evaluation of the plan will be made by the Executive Director using appropriate diffusion modeling. If the plan cannot adequately demonstrate that the burning of higher sulfur fuels will not cause or contribute to a condition in which the ambient air quality will exceed 0.5 ppm sulfur dioxide averaged over a three hour period more than once per year, then the Executive Director will notify the applicant of the inadequacy of the plan. If a revised acceptable plan is not received within fourteen (14) days of notification, the Executive Director will refer the plan to the Texas Air Control Board for appropriate action.
- 201.13 Any person who finds it necessary to operate under a Temporary Fuel Shortage Control Plan filed pursuant to Rule 201.11 must comply with the following notification procedures:
- 201.131 The Executive Director and the appropriate local air pollution control agency shall be notified in writing as soon as practicable of a fuel shortage or impending fuel shortage which causes or may cause an excessive emission that contravenes Rules 201.06, 201.07, 201.08 or 201.09. Such notification shall include an estimate of the expected duration of the fuel shortage which will necessitate the person to operate under the Temporary Fuel Shortage Control Plan.

201.132 The Executive Director and the appropriate local air pollution control agency shall be notified in writing as soon as practicable of the termination of a fuel shortage which would allow the person to operate in compliance with Rules 201.06, 201.07, 201.08 and 201.09.

201.14 Any person who files a Temporary Fuel Shortage Control Plan under 201.11 and operates under that plan pursuant to 201.12 and 201.13 must submit to the Texas Air Control Board on a semiannual basis a written report detailing the following:

201.141 The types, quantity and sulfur content of fuels burned during the prior six months and the sources at which these fuels were burned.

201.142 The program the person has undertaken to achieve compliance with the applicable Rules 201.06, 201.07, 201.08 or 201.09 by December 31, 1976, including, if applicable, the minimum time required to design, procure, install and test abatement equipment and procedures.

201.15 Rules 201.11, 201.12, 201.13 and 201.14 shall be effective only until December 31, 1976, at which time all persons must comply with Rule 201.06 and either 201.07, 201.08 or 201.09. Persons affected by Rules 201.11 and 201.12 must demonstrate through the reports required by 201.132 how compliance will be achieved with the applicable Rules 201.06, 201.07, 201.08 or 201.09 as soon as practicable, but in no event later than December 31, 1976. The provisions of Rule 201.15 shall be reviewed periodically by the Board to determine if Rules 201.11, 201.12, 201.13 and 201.14 should be extended beyond December 31, 1976.

Rule 202. Persons affected by Rule 201 of this Regulation shall be in compliance with the provisions contained herein no later than December 31, 1973. No later than six months after the effective date of this Regulation, any person affected by this Regulation shall submit to the Texas Air Control Board a written report on his compliance status, including but not limited to, the minimum time required to design, procure, install and test abatement equipment or procedures. Progress reports shall be submitted to the Board every four months commencing in August of 1972 until compliance is achieved.

All persons shall continue to be governed by the provisions of Regulation III which became effective on February 22, 1968, until December 31, 1973, at which time Rule 201 shall supersede the previous Regulation III with regard to sulfur dioxide emissions.

Rule 203. Control of Hydrogen Sulfide.

203.1 No person may cause, suffer, allow or permit emissions of hydrogen sulfide from a source or sources operated on a property or multiple sources operated on contiguous properties to exceed a net ground level concentration of 0.08 ppm averaged over any 30-minute period if the downwind concentration of hydrogen sulfide affects a property used for residential, business or commercial purposes.

203.2 No person may cause, suffer, allow or permit emissions of hydrogen sulfide from a source or sources operated on a property or multiple sources operated on contiguous properties to exceed a net ground level concentration of 0.12 ppm averaged over any 30-minute period if the downwind concentration of hydrogen sulfide affects only property used for other than residential, recreational, business or commercial purposes, such as industrial property and vacant tracts and range lands not normally occupied by people.

Rule 204. Control of Sulfuric Acid.

204.1 No person may cause, suffer, allow, or permit emissions of sulfuric acid from a source or sources operated on a property or multiple sources operated on contiguous properties to exceed:

- (1) A net ground level concentration of 15  $\mu\text{g}$  per cubic meter of air averaged over any 24 hour period; or
- (2) A net ground level concentration of 50  $\mu\text{g}$  per cubic meter of air averaged over a one-hour period of time more than once during any consecutive 24-hour period; or
- (3) 100  $\mu\text{g}$  per cubic meter of air maximum at any time.

Rule 205. Calculation Methods

205.1 Determination of the net ground level concentration shall be performed in accordance with the procedures outlined in Appendix A for hydrogen sulfide and Appendix B for sulfuric acid.

Rule 206. Rules 203, 204 and 205 hereof shall be in force immediately and shall supersede the previous Regulation III of the Texas Air Control Board which became effective on February 22, 1968 with regard to hydrogen sulfide and sulfuric acid emissions.

Date Adopted: January 26, 1972  
Date Filed with Secretary of State: February 4, 1972  
Date Effective: March 5, 1972

Amendment of Rule 201 by adding Rules 201.11, 201.12, 201.13, 201.14 and 201.15; Amendment of Rule 202; and addition of Rules 203, 204, 205 and 206.

Date Adopted: December 19, 1973  
Date Filed with Secretary of State: December 20, 1973  
Date Effective: January 19, 1974

TABLE 1

SULFURIC ACID PLANTS BURNING ELEMENTAL SULFUR  
ALLOWABLE SULFUR DIOXIDE EMISSION RATES  
FOR SPECIFIC FLOW RATES

| EFFLUENT FLOW RATE | RATE OF EMISSION |
|--------------------|------------------|
| scfm               | lb/hr            |
| 1,000              | 19.8             |
| 2,000              | 39.6             |
| 4,000              | 79.2             |
| 6,000              | 119.0            |
| 8,000              | 158.0            |
| 10,000             | 198.0            |
| 20,000             | 396.0            |
| 40,000             | 792.0            |
| 60,000             | 1190.0           |
| 80,000             | 1580.0           |
| 100,000            | 1983.0           |

Interpolation and extrapolation of the data in this Table shall be accomplished by the use of the equation  $E = 0.0198 q$ , where E is the allowable emission rate in lb/hr and q is the stack effluent flow rate in scfm.

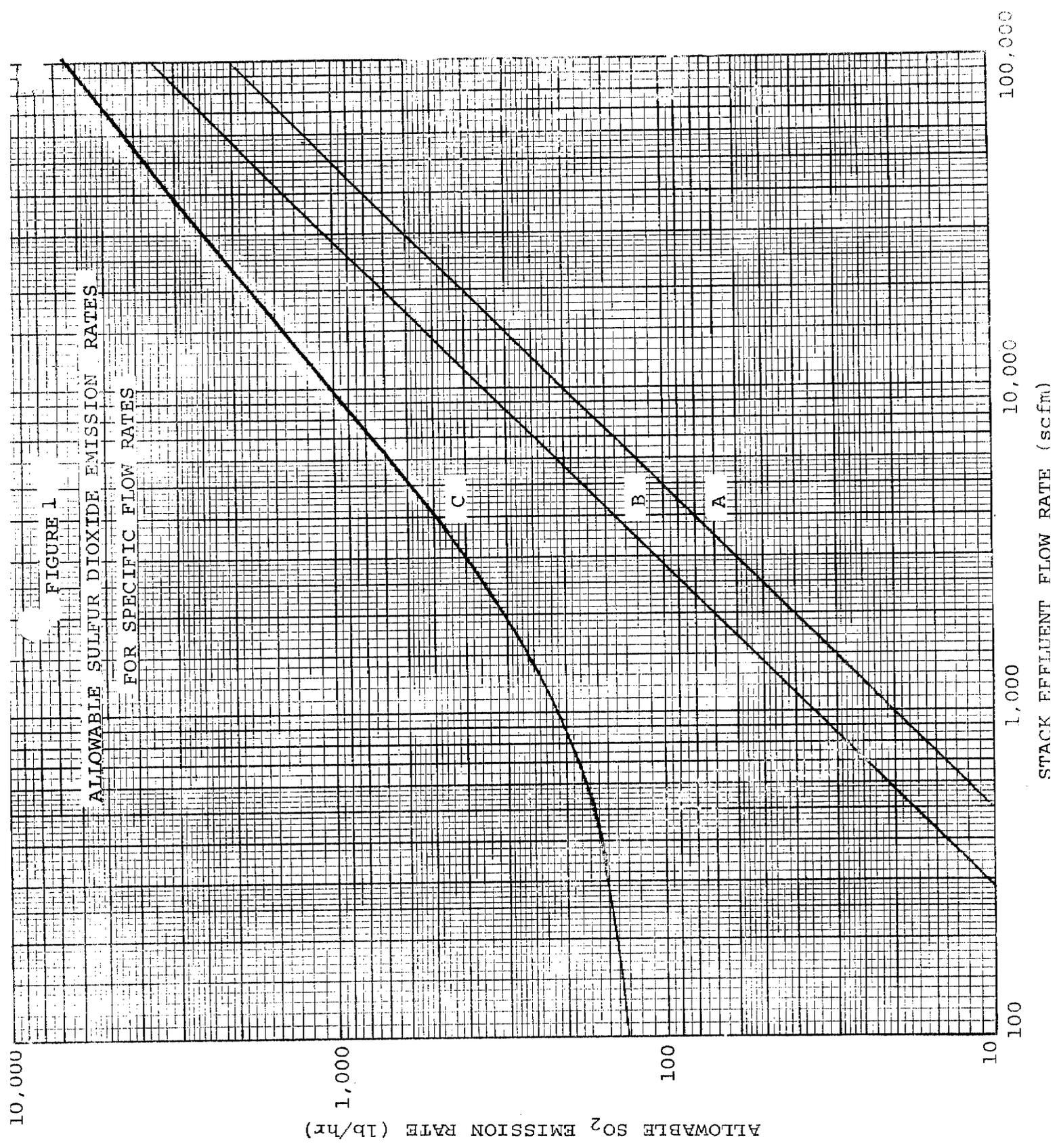


TABLE 2

SULFURIC ACID PLANTS BURNING ELEMENTAL SULFUR  
STANDARD EFFECTIVE STACK HEIGHT  
BASED ON SPECIFIC FLOW RATES

| EFFLUENT FLOW RATE | STANDARD EFFECTIVE STACK HEIGHT |
|--------------------|---------------------------------|
| scfm               | ft                              |
| 1,000              | 28                              |
| 2,000              | 40                              |
| 4,000              | 56                              |
| 6,000              | 69                              |
| 8,000              | 79                              |
| 10,000             | 89                              |
| 20,000             | 125                             |
| 40,000             | 177                             |
| 60,000             | 217                             |
| 80,000             | 250                             |
| 100,000            | 280                             |

Interpolation and extrapolation of the data in this Table shall be accomplished by the use of the equation  $H_e = 0.885 q^{0.5}$ , where  $H_e$  is the standard effective stack height in ft. and  $q$  is the effluent flow rate in scfm.

REV. 2.15.4

FIGURE 2

STANDARD EFFECTIVE STACK HEIGHT  
BASED ON SPECIFIC FLOW RATES

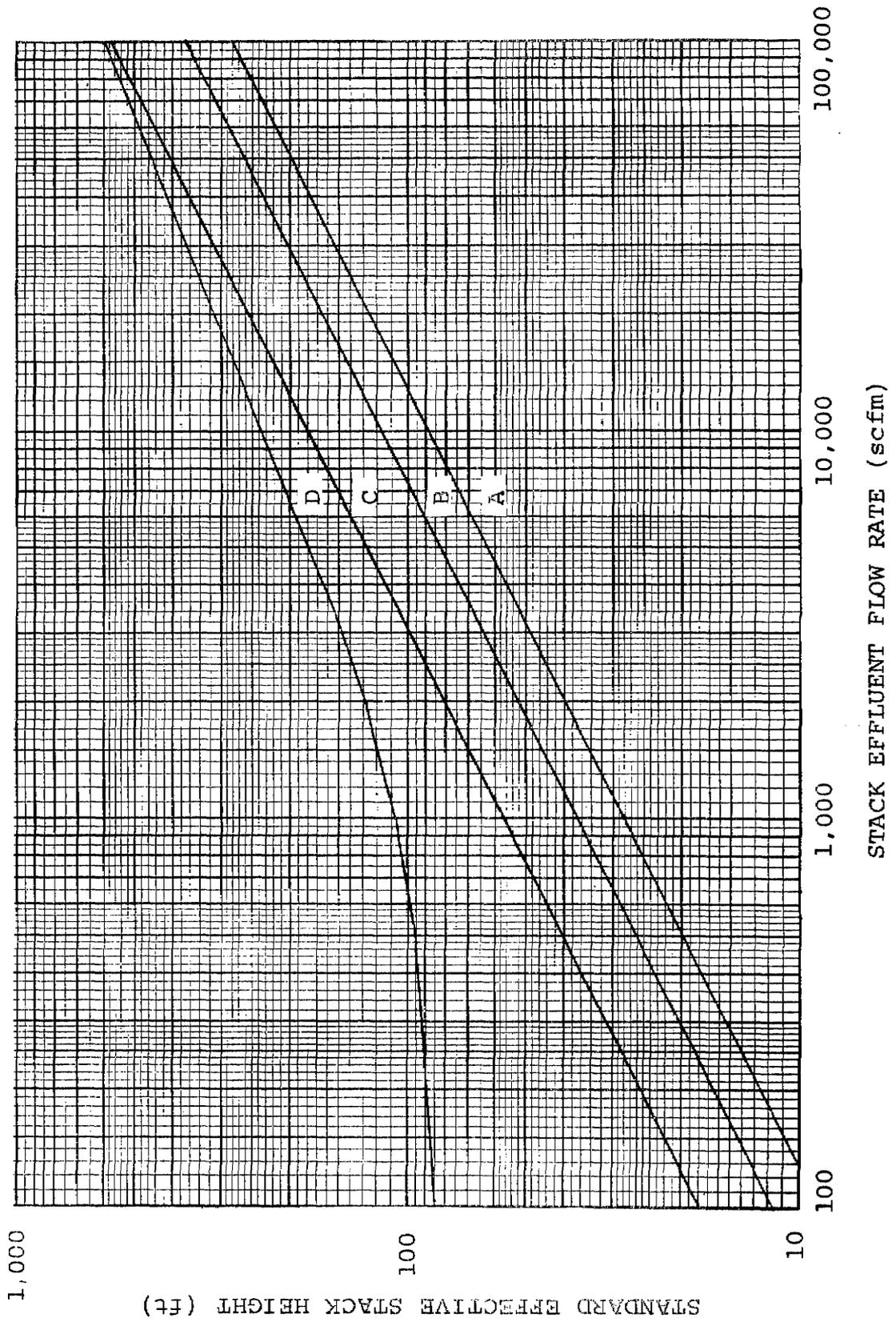


TABLE 3

## SULFURIC ACID PLANTS BURNING OTHER THAN ELEMENTAL SULFUR

ALLOWABLE SULFUR DIOXIDE EMISSION RATES  
FOR SPECIFIC FLOW RATES

| EFFLUENT FLOW RATE | RATE OF EMISSION |
|--------------------|------------------|
| scfm               | lb/hr            |
| 1,000              | 34.7             |
| 2,000              | 69.4             |
| 4,000              | 138.8            |
| 6,000              | 208.2            |
| 8,000              | 277.6            |
| 10,000             | 347.0            |
| 20,000             | 694.0            |
| 40,000             | 1388.0           |
| 60,000             | 2082.0           |
| 80,000             | 2776.0           |
| 100,000            | 3470.0           |

Interpolation and extrapolation of the data in this Table shall be accomplished by the use of the equation  $E = 0.0347 q$ , where E is the allowable emission rate in lb/hr and q is the stack effluent flow rate in scfm.

TABLE 4

## SULFURIC ACID PLANTS BURNING OTHER THAN ELEMENTAL SULFUR

STANDARD EFFECTIVE STACK HEIGHT  
BASED ON SPECIFIC FLOW RATES

| EFFLUENT FLOW RATE | STANDARD EFFECTIVE STACK HEIGHT |
|--------------------|---------------------------------|
| scfm               | ft.                             |
| 1,000              | 37                              |
| 2,000              | 52                              |
| 4,000              | 74                              |
| 6,000              | 91                              |
| 8,000              | 105                             |
| 10,000             | 117                             |
| 20,000             | 165                             |
| 40,000             | 234                             |
| 60,000             | 287                             |
| 80,000             | 331                             |
| 100,000            | 370                             |

Interpolation and extrapolation of the data in this Table shall be accomplished by the use of the equation  $H_e = 1.17 q^{0.5}$ , where  $H_e$  is the standard effective stack height in ft. and  $q$  is the stack effluent flow rate in scfm.

TABLE 5  
 SULFUR RECOVERY PLANTS  
 ALLOWABLE SULFUR DIOXIDE EMISSION BASED ON  
 SPECIFIC FLOW RATES

| EFFLUENT FLOW RATE | RATE OF EMISSION |
|--------------------|------------------|
| scfm               | lb/hr            |
| 1,000              | 214              |
| 2,000              | 305              |
| 3,000              | 396              |
| 4,000              | 487              |
| 5,000              | 579              |
| 6,000              | 670              |
| 7,000              | 759              |
| 8,000              | 845              |
| 9,000              | 929              |
| 10,000             | 1012             |
| 20,000             | 1766             |
| 30,000             | 2447             |
| 40,000             | 3084             |
| 50,000             | 3690             |

Interpolation and extrapolation of the data in this Table for stack effluent flow rates less than or equal to 4,000 scfm shall be accomplished by the use of the equation  $E = 123.4 + 0.091 q$ , where E is the allowable emission rate in lb/hr and q is the stack effluent flow rate in scfm. Interpolation and extrapolation of the data for stack effluent flow rates in excess of 4,000 scfm shall be accomplished by the use of the equation  $E = 0.614 q^{0.8042}$ .

TABLE 6  
SULFUR RECOVERY PLANTS  
STANDARD EFFECTIVE STACK HEIGHT  
BASED ON SPECIFIC FLOW RATES

| EFFLUENT FLOW RATE | STANDARD EFFECTIVE STACK HEIGHT |
|--------------------|---------------------------------|
| scfm               | ft                              |
| 100                | 85                              |
| 500                | 96                              |
| 1,000              | 109                             |
| 2,000              | 129                             |
| 3,000              | 148                             |
| 4,000              | 164                             |
| 5,000              | 178                             |
| 6,000              | 192                             |
| 7,000              | 204                             |
| 8,000              | 215                             |
| 9,000              | 226                             |
| 10,000             | 236                             |
| 20,000             | 311                             |
| 30,000             | 366                             |
| 40,000             | 411                             |
| 50,000             | 450                             |
| 60,000             | 484                             |
| 80,000             | 544                             |
| 100,000            | 595                             |

Interpolation and extrapolation of the data for stack effluent flow rates less than or equal to 4,000 scfm shall be accomplished by the use of the equation  $H_e = 7.4 [123.4 + 0.091 q]^{0.5}$ , where  $H_e$  is the standard effective stack height in feet and  $q$  is the stack effluent flow rate in scfm. Interpolation and extrapolation of the data for stack effluent in excess of 4,000 scfm shall be accomplished by the use of the equation  $H_e = 5.8 q^{0.402}$ .

TABLE 7  
 NON FERROUS SMELTERS  
 STANDARD EFFECTIVE STACK HEIGHT  
 BASED ON SPECIFIC FLOW RATES

| EFFLUENT FLOW RATE | STANDARD EFFECTIVE STACK HEIGHT |
|--------------------|---------------------------------|
| scfm               | ft                              |
| 1,000              | 57                              |
| 2,000              | 80                              |
| 3,000              | 99                              |
| 4,000              | 114                             |
| 5,000              | 127                             |
| 6,000              | 139                             |
| 7,000              | 151                             |
| 8,000              | 161                             |
| 9,000              | 171                             |
| 10,000             | 180                             |
| 20,000             | 255                             |
| 30,000             | 312                             |
| 40,000             | 360                             |
| 50,000             | 402                             |

Interpolation and extrapolation of the data in this Table shall be accomplished by the use of the equation  $H_e = 1.8 q^{0.5}$ , where  $H_e$  is the standard effective stack height in ft. and  $q$  is the stack effluent flow rate in scfm.

REV. 2.15,74

TABLE 8

## STEAM GENERATORS, BOILERS AND HEATERS BURNING LIQUID FUEL

STANDARD EFFECTIVE STACK HEIGHT  
BASED ON SPECIFIC FLOW RATE

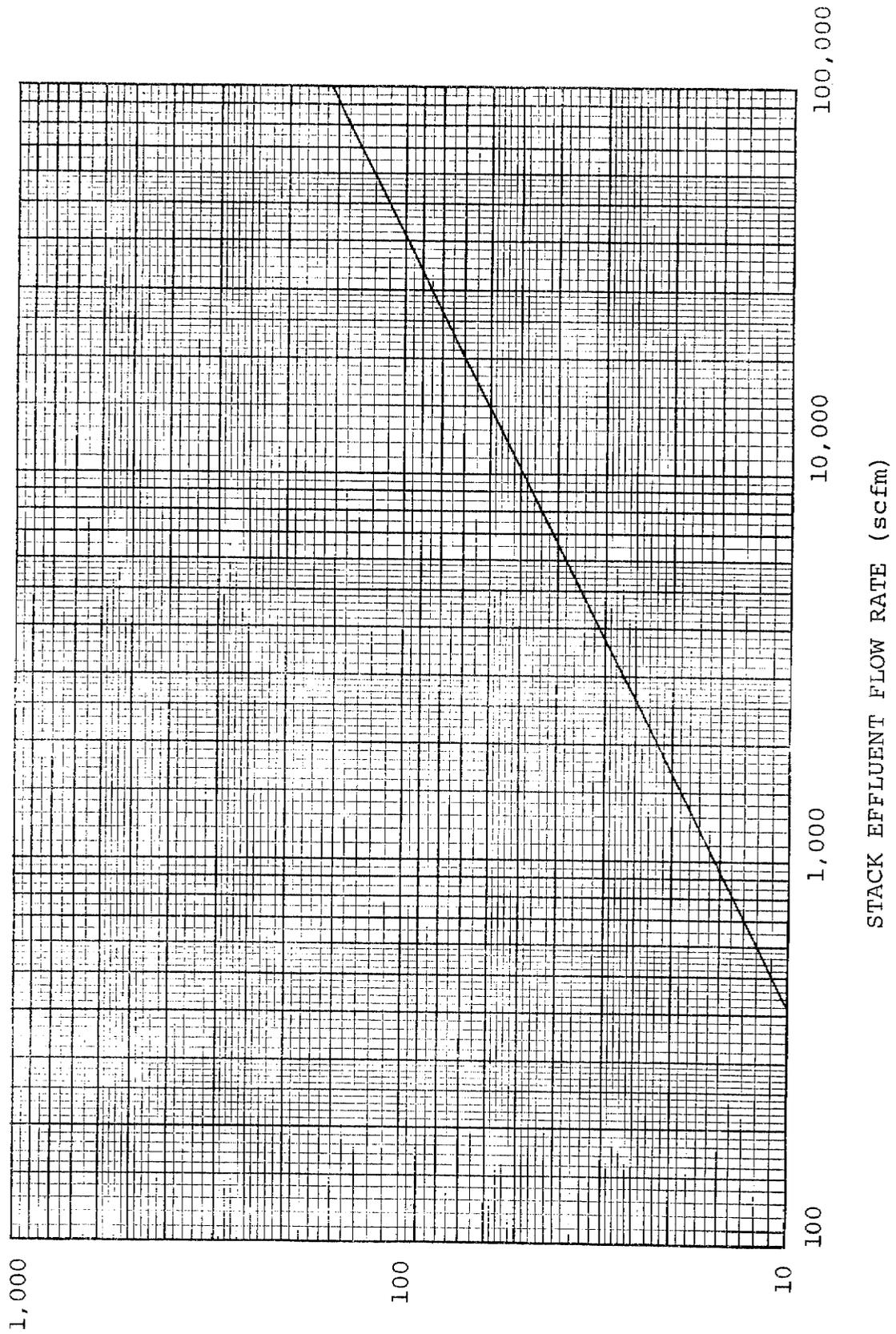
| EFFLUENT FLOW RATE | STANDARD EFFECTIVE STACK HEIGHT |
|--------------------|---------------------------------|
| scfm               | ft.                             |
| 1,000              | 15                              |
| 2,000              | 22                              |
| 4,000              | 31                              |
| 6,000              | 38                              |
| 8,000              | 44                              |
| 10,000             | 49                              |
| 20,000             | 69                              |
| 40,000             | 98                              |
| 60,000             | 120                             |
| 80,000             | 138                             |
| 100,000            | 155                             |

Interpolation and extrapolation of the data in this Table shall be accomplished by the use of the equation  $H_e = 0.49 q^{0.50}$ , where  $H_e$  is the standard effective stack height in feet and  $q$  is the stack effluent flow rate in scfm.

REV. 2.15,74

FIGURE 3

STANDARD EFFECTIVE STACK HEIGHT  
BASED ON SPECIFIC FLOW RATES



STANDARD EFFECTIVE STACK HEIGHT (ft)

APPENDIX A

I. Determination of compliance with emission limits.

In most cases downwind samples will suffice; however, if the sampled properties are suspected of being influenced by an upwind source of H<sub>2</sub>S, then both upwind and downwind samples will be taken. The concentration of H<sub>2</sub>S in the "downwind sample" less the concentration in the "upwind sample" shall be used in determining whether the emissions from the property comply with the requirements of Rule 203 of this Regulation. Calculated maximum allowable emission rates or ground level concentrations which are obtained by the Method in Section II below may be used in determining whether a property is in compliance with the emission limits specified.

II. Calculations of H<sub>2</sub>S Concentrations from Stack Samples and Measurements

The maximum allowable H<sub>2</sub>S emission rate which may be made from a stack on a property to comply with the emission limit set forth in Rule 203 of this Regulation may be calculated by Sutton's equation which has been modified to consider the critical wind speed and to correspond to a 30 minute air sample. Additional credit on stack emissions can be obtained if the distance from the stack to the property line is greater than thirty (30) stack heights. Those properties with greater than 30 stack heights to the property line should contact the Executive Director to obtain the proper correction factor.

A. For exit stack gas for temperatures of less than 125°F.

1. Rule 203.1. The H<sub>2</sub>S ambient air level is 0.08 ppm for 30 minutes.

$$Q_a = 8 \times 10^{-4} V_s d_s^2 \frac{1}{\left[ \frac{d_s}{h_s} \right]^{1.29}} \quad (1)$$

where:

$Q_a$  = emission rate, lbs/hr

$V_s$  = stack exit velocity, ft/sec.

$d_s$  = exit stack diameter, ft.

$h_s$  = physical stack height, ft.

To plot Graph II, assume a basic stack height of 100 ft. and plot  $\left[\frac{d_s}{100}\right]^{1.29}$  for various stack diameters versus stack velocity.

2. Rule 203.2. The  $H_2S$  ambient air level of 0.12 ppm for 30 minutes.

$$Q_a = 12 \times 10^{-4} V_s d_s^2 \frac{1}{\left[\frac{d_s}{h_s}\right]^{1.29}} \quad (2)$$

Symbols same as in equation (1) above.

B. For exit stack gas for temperatures greater than 125°F.

1. Rule 203.1. The  $H_2S$  ambient air level is 0.08 ppm for 30 minutes.

$$Q_a = 1.68 \times 10^{-3} V_s d_s \left[ 1.5 + 0.82 \left( \frac{\Delta T}{T_s} \right) d_s \right] h_s \quad (3)$$

where:

$Q_a$  = emission rate, lbs/hr

$V_s$  = stack exit velocity, ft/sec.

$d_s$  = exit stack diameter, ft.

$\Delta T$  = temperature difference between stack gas and the outdoor atmosphere in °Rankine. An outdoor temperature of 90°F (550°R) is assumed in preparing dispersion graphs.

$T_s$  = stack exit temperature in °Rankine.

To plot Graph III assume a basic stack height of 100 ft. and an exit velocity of 20 ft/sec. Let stack gas temperature vary with stack diameter.

2. Rule 203.2. The H<sub>2</sub>S ambient air level is 0.12 ppm for 30 minutes.

$$Q_a = 2.52 \times 10^{-3} V_s d_s \left[ 1.5 + 0.82 \left( \frac{\Delta T}{T_s} \right) d_s h_s \right] \quad (4)$$

Symbols same as used in equation (3).

Example 1 (Temperature of stack gas less than 125°F.)

How many lbs/hr of H<sub>2</sub>S can be discharged from a 200 ft. stack having a 4 ft exit diameter (ID) and a 30 ft/sec exit gas velocity? The stack gases temperature is 100°F and the distance to property line is 3000 ft. Emissions under Rule 203.1.

Solution

1. The ratio of stack diameter to 100 ft. is  $\frac{4}{100} = 0.04$
2. Enter ordinate of Graph II with 0.04; go horizontally to intersection of 30 ft/sec. velocity curve. At the intersection read on the abscissa 24 lbs/hr on (Rule 203.1) scale. This is the permitted value for a 100 ft. stack.
3. Correct emissions for a 200 ft. stack. Enter Graph I at 200 ft and obtain correction factor of 2.3. Thus the emissions become  $24 \times 2.3 = 55$  lbs/hr.

Note: Less than 30 stack heights to property line - no credit.

Example 2 (Temperature of stack gas greater than 125°F)

How many lbs/hr of H<sub>2</sub>S can be discharged from a 200 ft. stack having a 4 ft exit diameter (ID) and a 30 ft/sec exit gas velocity? The temperature of the exit gases is 400°F. Emissions under Rule 203.1.

Solution

1. Enter ordinate of Graph III with 400; go horizontally to intersection of 4 ft. diameter, read on the abscissa on Rule 203.1 scale 36 lbs/hr emission. This is permitted

value for 100 ft stack and exit velocity of 20 ft/sec.

2. Correct for stack height of 200 ft. This is direct ratio and becomes  $\frac{200'}{100'} = 2$ . The emission now becomes  $36 \times 2 = 72$  lbs/hr.
3. Correct for stack exit velocity of 30 ft/sec. This is a direct ratio and becomes  $\frac{30}{20} = 1.5$ . The allowed emission now becomes  $72 \times 1.5 = 108$  lbs/hr.

Note: Less than 30 stack heights to property line - no credit.

## APPENDIX B

- I. Determination of Compliance with Emission Limits. In most cases downwind samples will suffice; however, if the sampled properties are suspected of being influenced by an upwind source of  $H_2SO_4$ , then both upwind and downwind samples will be taken. The concentration of  $H_2SO_4$  in the "downwind sample" less the concentration in the "upwind sample" shall be used in determining whether the emissions from the property comply with the requirements of Rule 204 of this Regulation. Calculated maximum allowable emission rates or ground level concentrations which are obtained by the Method in Section II below may be used in determining whether a property is in compliance with the emission limits specified.
- II. Calculations of  $H_2SO_4$  Concentrations from Stack Samples and Measurement  
The maximum allowable  $H_2SO_4$  emission rate which may be made from a stack on a property to comply with the emission limit set forth in Rule 204 of this Regulation may be calculated by Sutton's equation which has been modified to consider the critical wind speed and to correspond to one hour sample. Additional credit on stack emissions can be obtained if the distance from the stack to the property line is greater than 30 stack heights. Those properties with greater than 30 stack heights to the property line should contact the Executive Director to obtain the proper correction factor.
  - A. For exit stack gas for temperatures of less than 125°F.
    1. Rule 204.1 - The  $H_2SO_4$  ambient air level of  $80 \mu g/M^3$  for one hour is used.

$$Q_a = 5.56 \times 10^{-4} V_s d_s^2 \left[ \frac{d_s}{h_s} \right]^{1.29} \quad (1)$$

where,

$Q_a$  = emission rate, lbs/hr

$V_s$  = stack exit velocity, ft/sec.

$d_s$  = exit stack diameter, ft.

$h_s$  = physical stack height, ft.

To plot Graph IV assume a basic stack height of 100 ft. and plot  $\left[ \frac{d_s}{100} \right]^{1.29}$  for various stack diameters versus stack velocity.

B. For exit stack gas for temperature greater than 125°F.

1. Rule 204.1 - The  $H_2SO_4$  ambient air level of 80  $\mu g/M^3$  for one hour is used.

$$Q_a = 12.32 \times 10^{-4} V_s d_s \left[ 1.5 + 0.82 \left( \frac{\Delta T}{T_s} \right) d_s \right] h_s \quad (2)$$

where,

$Q_a$  = emission rate, lbs/hr

$V_s$  = stack exit velocity, ft/sec

$d_s$  = exit stack diameter; ft.

$h_s$  = physical stack height, ft.

$\Delta T$  = temperature difference between stack gas and the outdoor atmosphere in °Rankine. An outdoor temperature of 90°F (550°R) is assumed in preparing dispersion graphs.

$T_s$  = stack exit temperature in °Rankine.

To plot Graph V, assume a basic stack height of 100 feet and an exit velocity of 20 ft/sec. Let stack gas temperature vary with stack diameter.

Example 1 (Temperature of stack gas less than 125°F)

How many lbs/hr of  $H_2SO_4$  can be discharged from a 200 ft stack having 4 ft exit diameter (ID) and a 30 ft/sec exit gas velocity? The temperature of the exit gases is 100°F.

### Solution

1. The ratio of stack diameter to 100 ft is  $\frac{4}{100} = 0.04$ .
2. Enter ordinate of Graph IV with 0.04; go horizontally to intersection of 30 ft/sec. velocity curve. At this intersection read on the abscissa 17 lbs/hr. This is the permitted value for a 100 ft. stack.
3. Correct emissions for a 200 ft. stack. Enter Graph I at 200 ft. and obtain correction factor of 2.3. Thus the emissions become  $17 \times 2.3 = 39$  lbs/hr.

### Example 2 (Temperature of stack gas greater than 125°F)

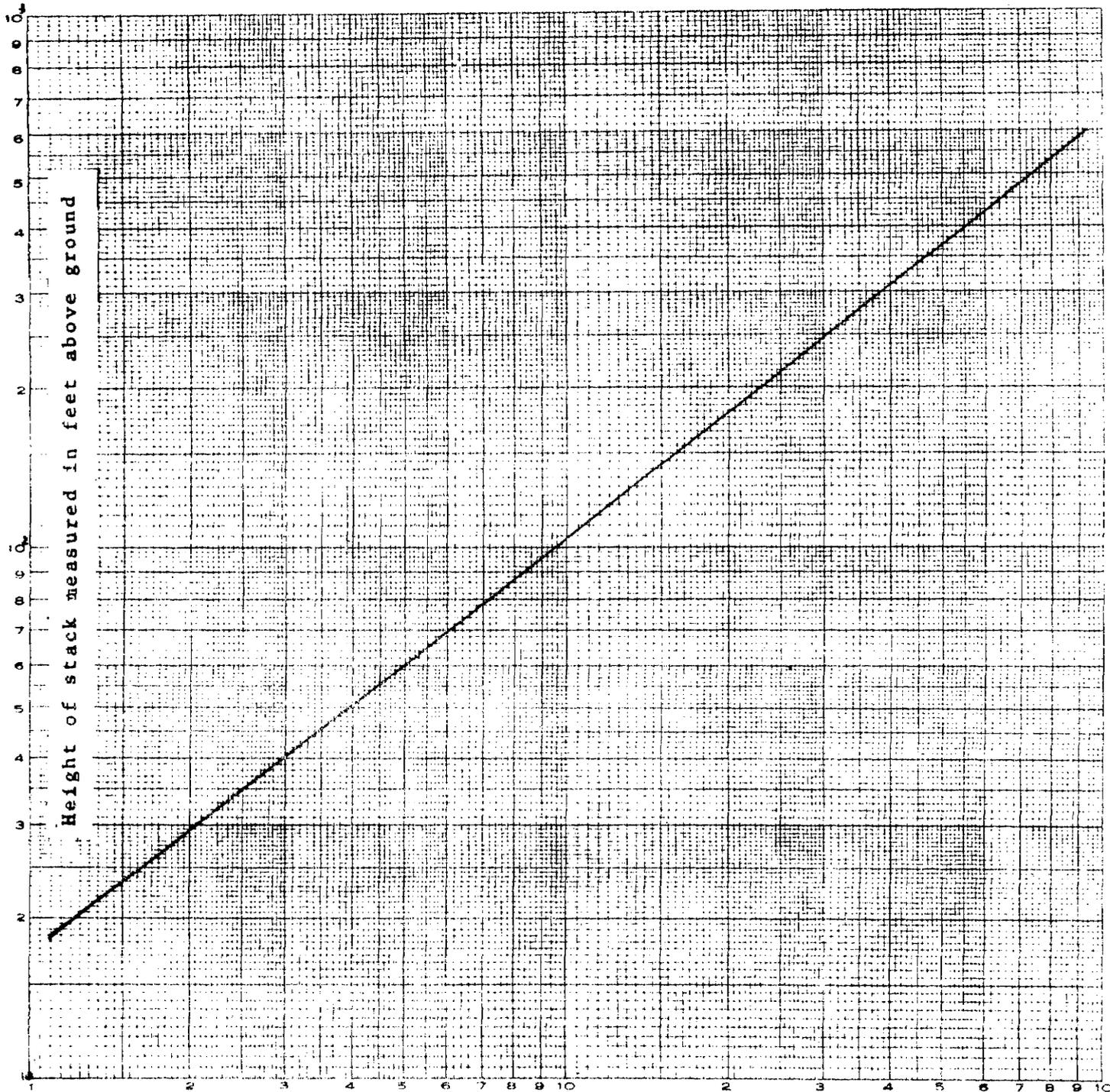
How many lbs/hr of  $H_2SO_4$  can be discharged from a 200 ft. stack having a 4 ft. exit diameter (ID) and a 30 ft/sec. exit gas velocity. The temperature of the exit gases is 400°F.

### Solution

1. Enter ordinate of Graph V with 400; go horizontally to intersection of 4 ft. diameter and read on abscissa 26 lbs/hr emission. This is permitted value for 100 ft. stack and exit velocity of 20 ft./sec.
2. Correct for stack height. Thus  $\frac{200}{100} = 2$ . We now have  $26 \times 2 = 52$  lbs/hr.
3. Correct for stack exit velocity of 30 ft/sec. This is a direct ratio and becomes  $\frac{30}{20} = 1.5$ . The emission now is  $52 \times 1.5 = 78$  lbs/hr.

# Correction Factors for Stack Height

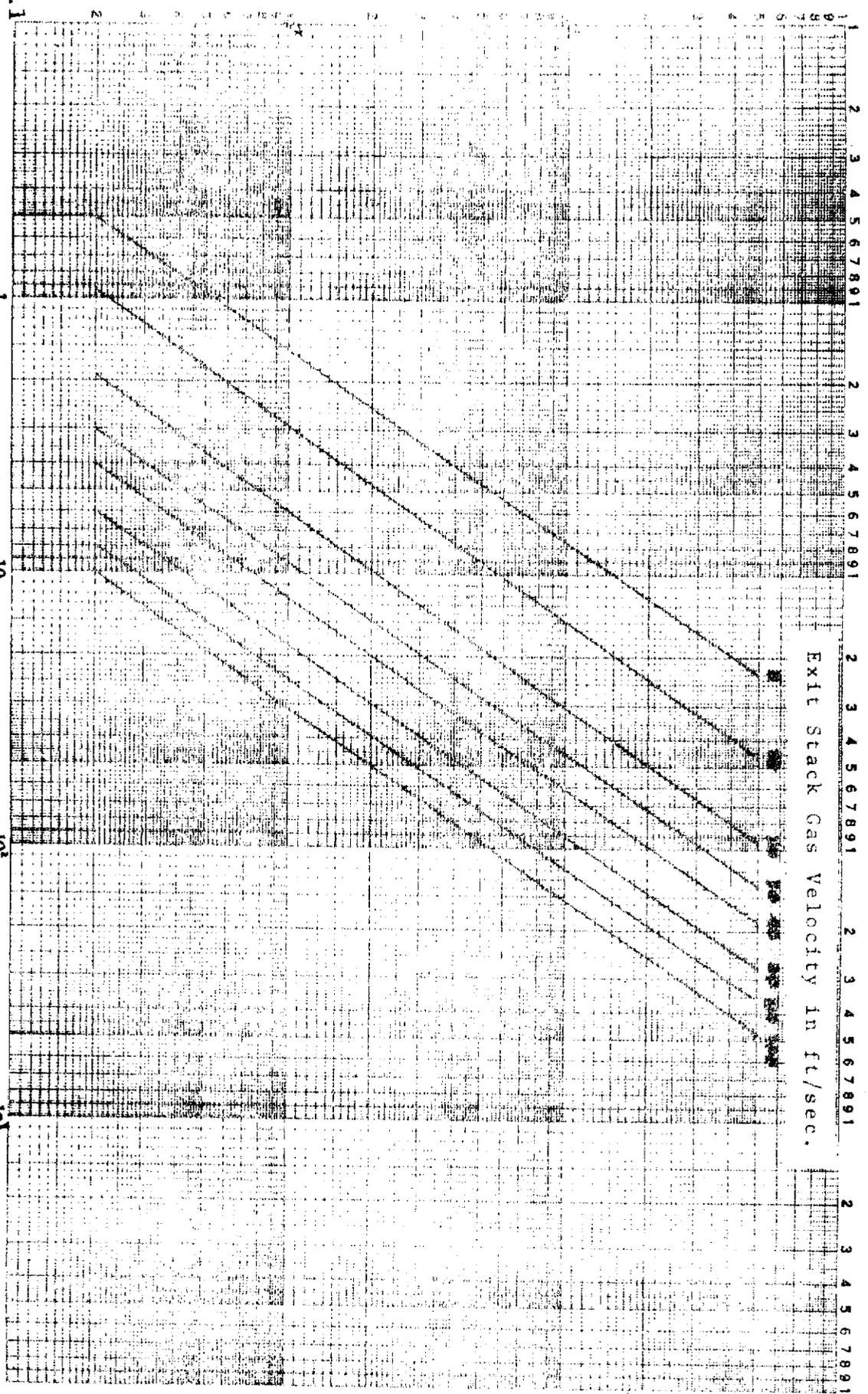
For use when stack gas temperature is equal or less than 125°F



CORRECTION FACTORS

GRAPH I

Stack diameter in feet  
100 ft. stack



Rule 203.2

Stack Emission Rate in lbs/hr.

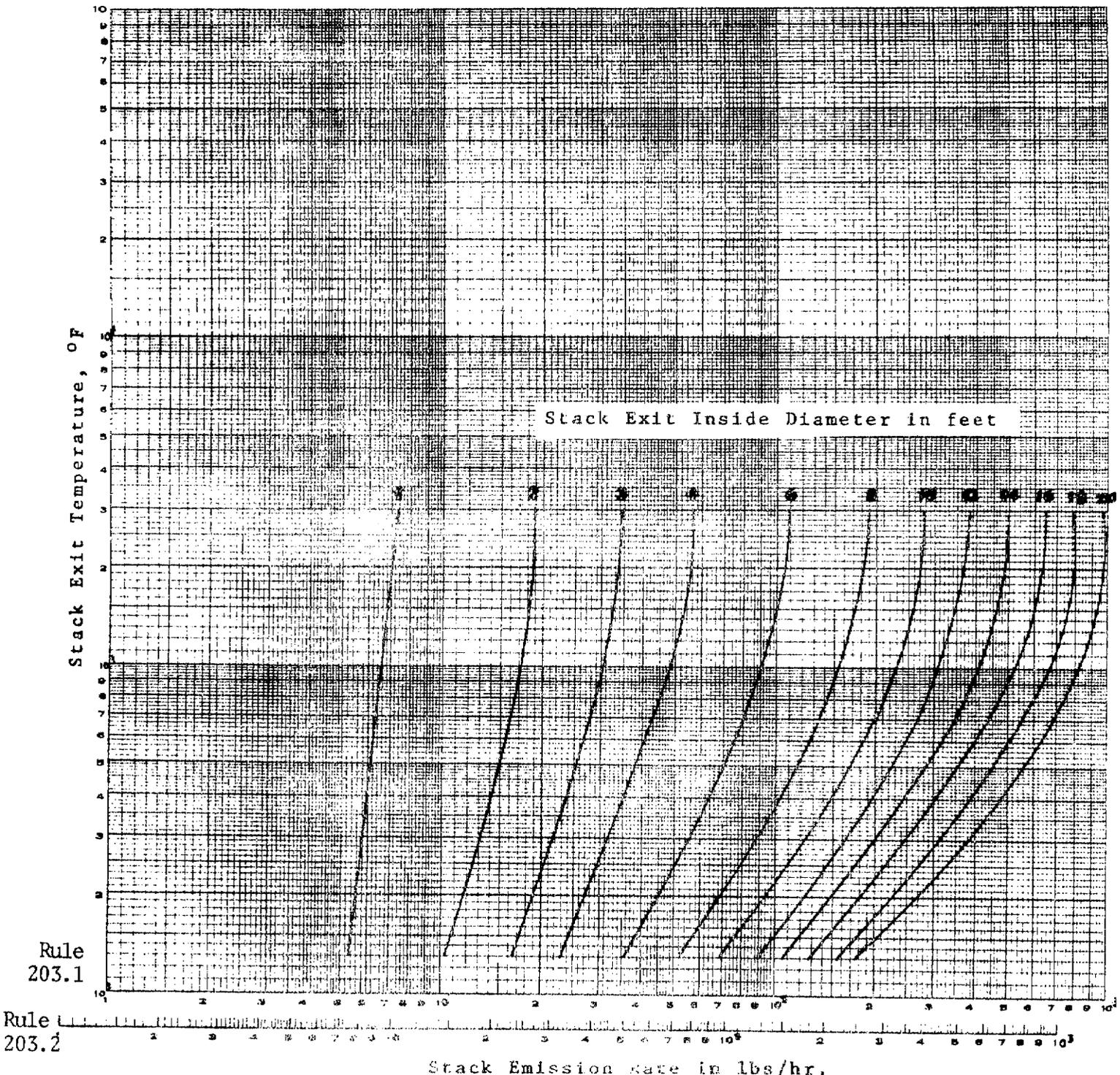
HYDROGEN SULFIDE

(Exit Stack Gas Temperature Less Than 1250F)

GRAPH II

TT DE

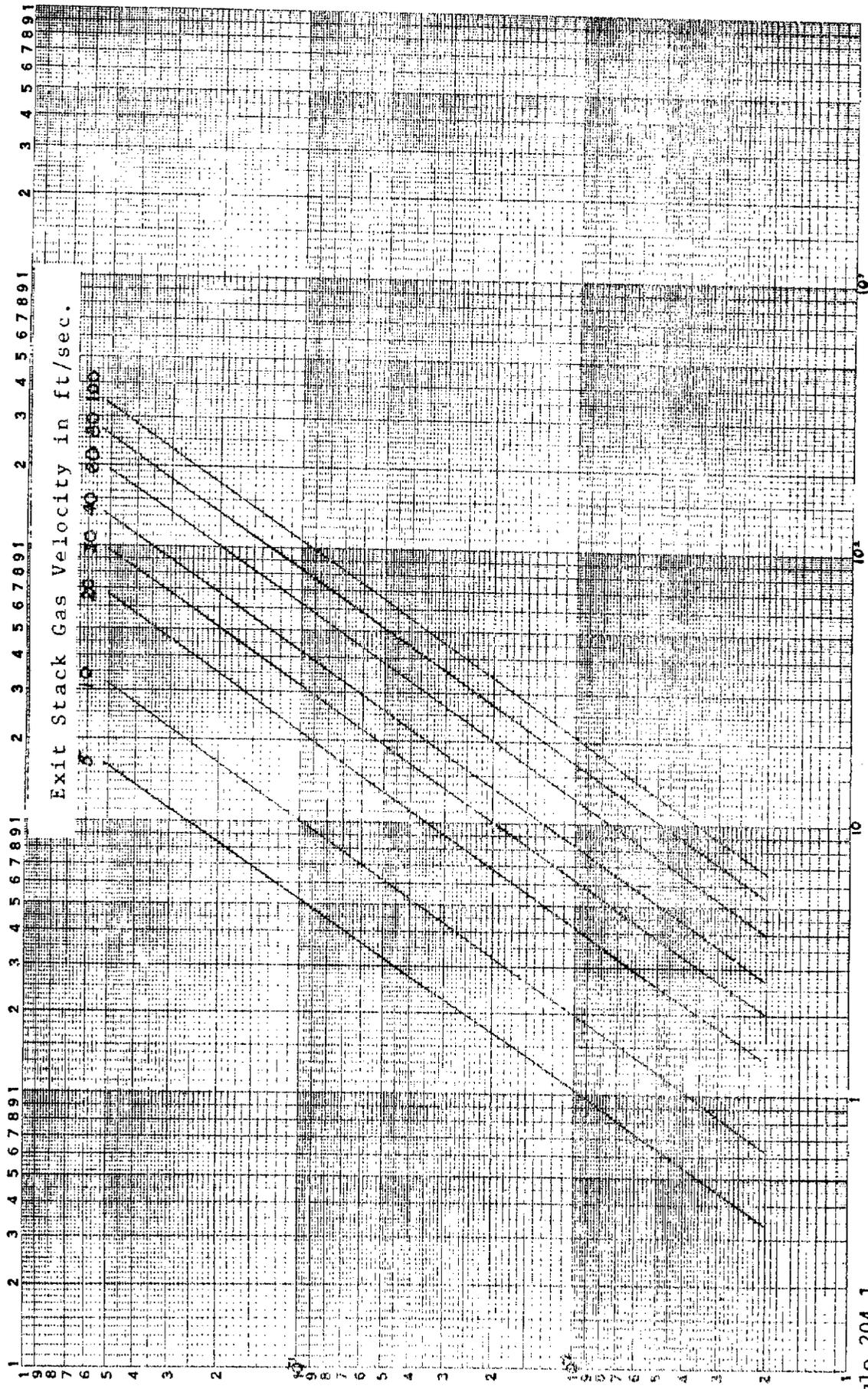
ADDITIONAL 0 1 2 3 4



HYDROGEN SULFIDE

GRAPH II

For Use When the Exit Temperature is greater than 125°F

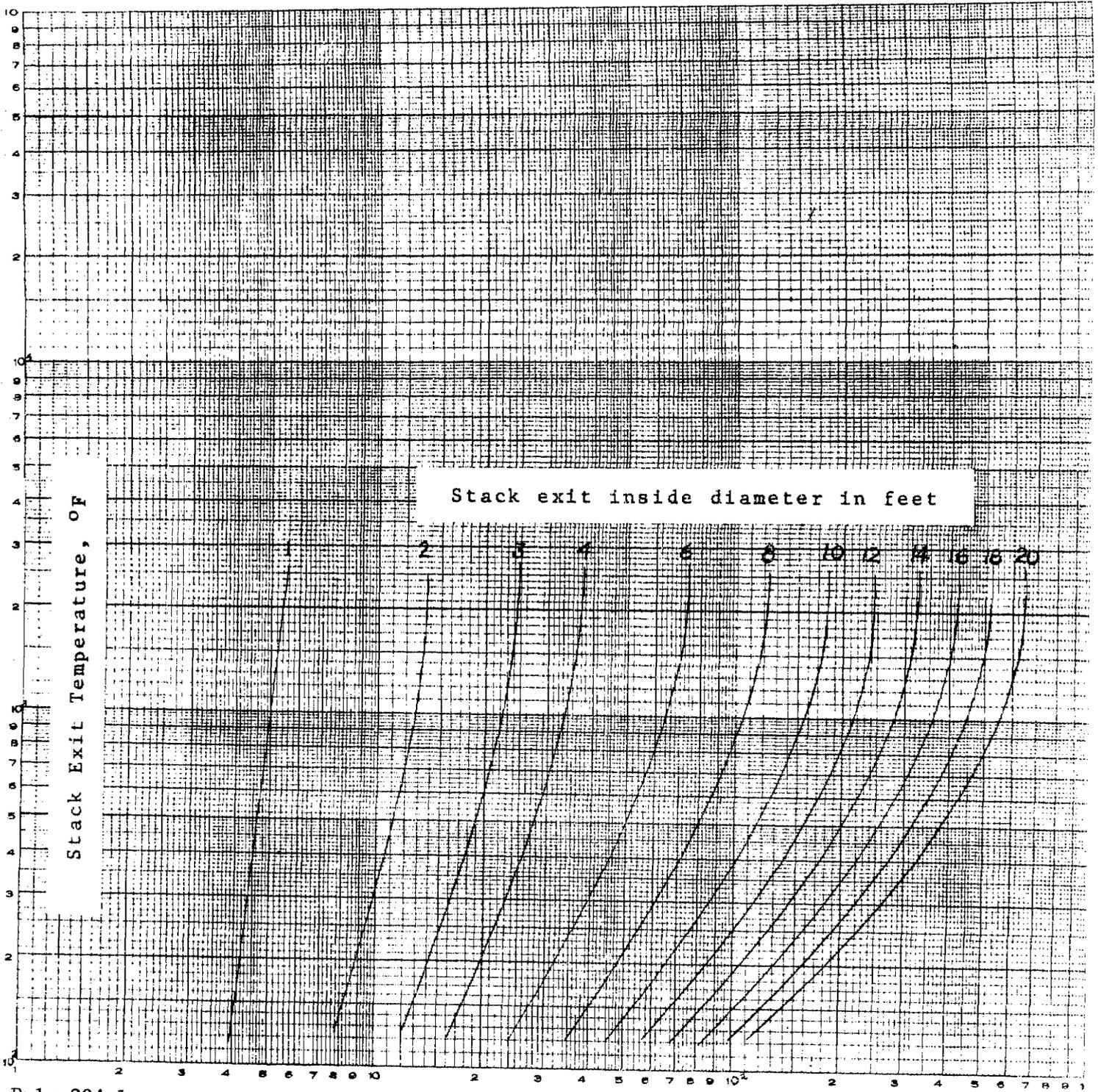


Rule 204.1

Stack Emission Rate in lbs/hr.

**SULFURIC ACID MIST**

(Exit Stack Gas Temperature Less Than 125°F)



Rule 204.1

SULFURIC ACID MIST

GRAPH V

Stack Emission Rate in lbs/hr.

For Use When The Exit Temperature is greater than 125°F