

REVISIONS TO THE STATE IMPLEMENTATION PLAN (SIP)
FOR THE CONTROL OF OZONE AIR POLLUTION

POST-1996 RATE-OF-PROGRESS FOR
BEAUMONT/PORT ARTHUR AND HOUSTON/GALVESTON

TEXAS NATURAL RESOURCE CONSERVATION COMMISSION
P.O. BOX 13087
AUSTIN, TEXAS 78711-3087

NOVEMBER 9, 1994

LIST OF TABLES

TABLE NUMBER	TABLE NAME	PAGE NUMBER
1	Classification of Ozone Nonattainment Areas in Texas.....	19
2	Local Health Departments in Houston and Galveston.....	21
3	Regional Planning Organizations in Houston/Galveston and Beaumont/Port Arthur.....	22
4	COAST Task Schedule.....	23
5	Example: Final Base Year Inventory.....	30
6	Example: ROP Base Year Inventory.....	33
7	Example: Adjusted Base Year Inventory Relative to 1999.....	34
8	Example: RVP and Fleet Turnover Correction Term.....	35
9	Example: Calculation of Total Expected Reductions by 1999 (Excluding Growth).....	36
10	Example: Creditable Reductions to Date.....	39
11	1999 ROP Required VOC Emissions Target Calculations.....	40
12	1999 ROP Required VOC Emissions Target Calculations.....	41
13	Anthropogenic Emissions in the Beaumont/ Port Arthur Area.....	68
14	Estimated Reductions for 1994 ROP SIP: Beaumont/Port Arthur.....	70
15	Anthropogenic Emissions in the Houston/ Galveston Area.....	76
16	Estimated Reductions for 1994 ROP SIP: Houston/Galveston.....	78

TABLE NUMBER	TABLE NAME	PAGE NUMBER
17	Projected Growth of TNRCC Office of Air Quality Budget/Staffing from 1994 to 1998.....	86
18	Public Hearings for the 9% ROP SIP.....	87

APPENDICES

APPENDIX NUMBER	APPENDIX NAME	PAGE NUMBER
A	Alternate Methods of Control.....	A-1
B	Control Measure Catalog.....	B-1
C	Creditable Reductions for Beaumont/ Port Arthur & Houston/Galveston.....	C-1
D	Mobile5a Runs for Beaumont/Port Arthur & Houston/ Galveston.....	D-1
E	UAM Modeling Reports for Beaumont/Port Arthur and Houston/Galveston.....	E-1

A. INTRODUCTION

Requirements for State Implementation Plans (SIP) specified in 40 Code of Federal Regulations (CFR) Part 51.12 provide that "...in any region where existing (measured or estimated) ambient levels of pollutant exceed the levels specified by an applicable national standard, "the plan shall set forth a control strategy which shall provide for the emission reductions necessary for attainment and maintenance of such national standard. Ambient levels of sulfur dioxide and oxides of nitrogen (NO_x), as measured from 1975 through 1977, did not exceed the national standards set for these pollutants anywhere in Texas. Therefore, no control strategies for these pollutants were included in revisions to the Texas SIP submitted on April 13, 1979. Control strategies were submitted and approved for inclusion in the SIP for areas in which measured concentrations of ozone, total suspended particulate (TSP), or carbon monoxide (CO) exceeded a National Ambient Air Quality Standard (NAAQS) during the period from 1975 to 1977. On October 5, 1978, the Administrator of the U.S. Environmental Protection Agency (EPA) published a lead ambient air quality standard. The 1977 Amendments to the Federal Clean Air Act (FCAA) required that each state submit an implementation plan for the control of any new criteria pollutant. A SIP revision for lead was submitted in March of 1981.

The control strategies submitted in 1979 contained plans to reduce emissions required by EPA policy to demonstrate attainment of the primary NAAQS by December 31, 1982, except for ozone in the Harris County nonattainment area. For that area, an extension to December 31, 1987 was requested, as provided for in the 1977 FCAA Amendments.

Proposals to revise the Texas SIP to comply with the requirements of the 1977 Amendments to the FCAA were submitted to EPA on April 13, November 2, and November 21, 1979. On December 18, 1979 (44 FR 75830-74832), EPA approved the proposed revision to the Texas SIP relating to vehicle inspection and maintenance and extended the deadline for attainment of the NAAQS for ozone in Harris County until December 31, 1987. On March 25, 1980 (45 FR 19231-19245), EPA approved and incorporated into the Texas SIP many of the remaining provisions included in the proposals submitted by the state in April and November 1979. The March 25, 1980 Federal Register notice also included conditional approval of a number of the proposed SIP revisions submitted by the state.

Additional proposed SIP revisions were submitted to EPA by the state on July 25, 1980 and July 20, 1981 to comply with the requirements of the March 25, 1980 conditional approvals. By May 31, 1982, all of the proposed revisions to the Texas SIP submitted to EPA in April and November 1979, July 1980, and July 1981, with the exception of provisions relating to the definition

of major modification used in new source review (NSR) and certain portions of the control strategy for TSP in Harris County, had been fully approved or addressed in a Federal Register notice proposing final approval. The NSR provisions were approved on August 13, 1984.

The 1977 Amendments to the FCAA required SIPs to be revised by December 31, 1982 to provide additional emission reductions for those areas for which EPA approved extensions of the deadline for attainment of the NAAQS for ozone or CO. Paragraph B.5. of this section of the SIP contains the revision to the Texas SIP submitted to comply with the 1977 Amendments to the FCAA and EPA rules for 1982 SIP revisions.

The only area in Texas receiving an extension of the attainment deadline to December 31, 1987 was Harris County for ozone. Proposals to revise the Texas SIP for Harris County were submitted to EPA on December 9, 1982. On February 3, 1983, EPA proposed to approve all portions of the plan except for the Vehicle Parameter Inspection/Maintenance (I/M) Program. On April 30, 1983, the EPA Administrator proposed sanctions for failure to submit or implement an approvable I/M program in Harris County. Senate Bill 1205 was passed on May 25, 1983 by the Texas Legislature to provide the Texas Department of Public Safety (DPS) with the authority to implement enhanced vehicle inspection requirements and enforcement procedures. On August 3, 1984, EPA

proposed approval of the Texas SIP pending receipt of revisions incorporating these enhanced inspection procedures and measures ensuring enforceability of the program. These additional proposed SIP revisions were adopted by the state on November 9, 1984. Final approval by EPA was published on June 26, 1985.

Although the control strategies approved by EPA in the 1979 SIP revisions were implemented in accordance with the provisions of the plan, several areas in Texas did not attain the primary NAAQS by December 31, 1982. On February 23, 1983, EPA published a Federal Register notice identifying those areas and expressing the intent to impose economic and growth sanctions provided in the FCAA. However, EPA reversed that policy in the November 2, 1983 Federal Register, deciding instead to call for supplemental SIP revisions to include sufficient additional control requirements to demonstrate attainment by December 31, 1987.

On February 24, 1984, the EPA Region 6 Administrator notified the Governor of Texas that such supplemental SIP revisions would be required within one year for ozone in Dallas, Tarrant, and El Paso Counties and CO in El Paso County. The Texas Air Control Board (TACB) requested a six-month extension of the deadline (to August 31, 1985) on October 19, 1984. The EPA approved this request on November 16, 1984.

Proposals to revise the Texas SIP for Dallas, Tarrant, and El Paso Counties were submitted to EPA on September 30, 1985. However, the revisions for Dallas and Tarrant Counties did not provide sufficient reductions to demonstrate attainment of the ozone standard and on July 14, 1987, EPA published intent to invoke sanctions. Public officials in the two counties expressed a strong desire to provide additional control measures sufficient to satisfy requirements for an attainment demonstration.

A program of supplemental controls was taken to public hearings in late October 1987. As a result of testimony received at the hearings, a number of the controls were modified and several were deleted, but sufficient reductions were retained to demonstrate attainment by December 31, 1991. These controls were adopted by the TACB on December 18, 1987 and were submitted to EPA as proposed revisions to the SIP.

The FCAA Amendments of 1990 authorized EPA to designate areas failing to meet the NAAQS for ozone as nonattainment and to classify them according to severity. The four areas in Texas and their respective classifications included: Houston/Galveston (H/G)-severe, Beaumont/Port Arthur (B/PA)-serious, El Paso-~~(seri-~~ous), and Dallas/Fort Worth (D/FW)-moderate.

The FCAA Amendments required a SIP revision to be submitted for all ozone nonattainment areas classified as moderate and above by November 15, 1993 which described in part how an area intends to decrease volatile organic compounds (VOC) emissions by 15%, net-of-growth, by November 15, 1996. In addition to the 15% reduction, states must also prepare contingency rules that will result in an additional 3.0% reduction of either NO_x or VOC, of which up to 2.7% may be reductions in NO_x. Underlying this substitution provision is the recognition that NO_x controls may effectively reduce ozone in some areas and that the design of strategies is more efficient when the characteristic properties responsible for ozone formation and control are evaluated for each area. The primary condition to use NO_x controls as contingency measures is a demonstration, using the Urban Airshed Model (UAM), that these controls will be beneficial toward the reduction of ozone. These VOC and/or NO_x contingency measures would be implemented immediately should any area fall short of the 15% goal.

Texas submitted rules to meet the Rate-of-Progress (ROP) reduction in two phases. Phase I consisted of a core set of rules comprising a significant portion of the required reductions. This phase was submitted by the original deadline of November 15, 1993. A commitment listing the potential rules, from which the additional required reductions and contingency measures were to be selected, was submitted in conjunction with the Phase I SIP on November 15, 1993. That list of Phase II rules was intended to

rank options available to the state and to identify potential rules available to meet 100% of the ROP reductions and contingencies.

Phase II consisted of any remaining percentage toward the 15% net-of-growth reductions. Phase II was submitted by May 15, 1994. Complete contingency measures for the D/FW and El Paso nonattainment areas were included in the Phase II submittal. In light of revised EPA guidance, the complete list of contingency measures for the H/G and B/PA nonattainment areas is included in this SIP Revision. The appropriate compliance date for the 15% ROP rules was incorporated into each control measure to ensure that the required reductions will be achieved by the November 15, 1996 deadline. Only those portions of the Phase II rules needed to provide reasonable assurance of achieving the targeted reduction requirements were adopted by the Texas Natural Resource Conservation Commission (TNRCC) on May 4, 1994.

The D/FW and El Paso areas achieved sufficient reductions with the 15% ROP SIP to demonstrate attainment by 1996. Attainment Demonstration SIP Revisions for these two areas are being submitted separately.

The FCAA Amendments of 1990 require a Post-96 ROP SIP revision and accompanying rules to be submitted by November 15, 1994. This submittal must contain an Attainment Demonstration based on

UAM. Additionally, the revision must demonstrate how the H/G and B/PA nonattainment areas intend to achieve a 3% per year reduction of VOC and/or NO_x until the year 1999 for B/PA or 2007 for H/G, and additional reductions as needed to demonstrate modeled attainment. The plan must also carry an additional 3% of contingency measures to be implemented if the nonattainment area fails to meet a deadline. To use NO_x reductions for all or part of the Post-96 controls or the contingency measures requires a demonstration using UAM that NO_x controls would be beneficial in reducing ozone.

By the November 1994 deadline, the state is submitting a SIP revision designed to meet the 3% per year ROP requirements for the years 1997-1999. This "common sense" SIP revision details how the nonattainment areas intend to achieve the first three years' reductions of VOC (or 9% net-of-growth). Most of this amount has been achieved by quantifying additional reductions due to existing rules and reductions from federally-mandated rules. Rules to achieve the further reductions needed to meet the ROP SIP goal will be submitted to EPA by January 15, 1995.

The state is also submitting UAM modeling results conducted to date that show the relationship between emission levels of VOC and NO_x, and ozone concentration. This modeling will be submitted with the adopted rules by January 15, 1995. Based on the preliminary results of this modeling, which show a disbenefit

to NO_x reductions, the state is pursuing a temporary FCAA §182(f) exemption from NO_x reasonable available control technology (RACT) and transportation conformity requirements.

The final Attainment Demonstration SIP revision for the H/G and B/PA ozone nonattainment areas will be based on UAM using data primarily obtained from the Coastal Oxidant Assessment for Southeast Texas (COAST) study. This series of modeling runs will provide the state with an effective planning tool which will more clearly guide the formulation of cost effective ozone control strategies. This assessment should be completed by mid-1996, at which time the state will submit any further rules necessary to reach attainment as evidenced by the model. A detailed schedule will be developed for the submittal of the complete Attainment Demonstration, including UAM modeling of basecase episodes based primarily on the COAST data, and reductions in the amount necessary to achieve attainment by 1999 in B/PA and 2007 in H/G.

B. OZONE CONTROL STRATEGY

1. POLICY AND PURPOSE

a. Primary Purpose of Plan

The primary purpose of this plan is to accomplish the VOC emission reductions required by the 1977 FCAA and EPA and to comply with the 1990 Amendments to the FCAA. Such VOC emission reductions are required by EPA in areas which exceed the ozone NAAQS in the expectation that reductions in accordance with technical guidance will lower ozone concentrations sufficiently to achieve the standard.

b.-d. (No change.)

2. SUMMARY OF THE PRINCIPAL ELEMENTS ADDRESSED WITHIN THIS PLAN

a.-b. (No change.)

c. Establishing Baseline Air Quality

In order to determine the ozone air quality in relation to the NAAQS in each nonattainment area, EPA required that data from monitoring done in 1975, 1976, and 1977 be examined for the 1979

revisions. Data from 1978 was also considered when it became available. For the 1982 revisions, EPA required that monitoring data collected in 1978, 1979, and 1980 be examined. For Post-1982 revisions, EPA required that data collected in 1981, 1982, and 1983 be examined. Supplemental data collected in 1984 was also used to estimate the concentrations of certain air quality parameters.

The 1990 FCAA Amendments required each Governor to submit a list that designated nonattainment areas in each state. It required that data be collected for three complete years to determine the design values for each area (design values for Texas nonattainment areas are given in §VI.B.7.a.2)). For the initial nonattainment classification, data was used from 1987, 1988, and 1989.

Procedures for selecting or calculating baseline air quality to be used in plan preparation were promulgated by EPA and are discussed and used within this plan.

d. Required Emission Reductions

Emission reduction requirements for each nonattainment area are related to the degree by which baseline air quality exceeds the NAAQS for ozone. Reduction requirements are calculated by the use of algorithms or models that rely on measured data as

well as certain assumed values. These procedures and the various factors involved in each are discussed in detail in subsequent sections concerned with specific SIP revisions.

Previously, EPA required that emission reduction requirements were to be calculated only for urban nonattainment areas. The 1990 FCAA Amendments recognized that often suburban and rural (perimeter) counties can contribute to ozone nonattainment in an area. Therefore, in most cases, the concept of nonattainment was expanded to include entire Consolidated Metropolitan Statistical Areas (CMSA) or Metropolitan Statistical Areas (MSA).

The FCAA Amendments of 1990 require a Post-96 ROP SIP revision and accompanying rules to be submitted by November 15, 1994. This submittal must contain an Attainment Demonstration based on the UAM. Additionally, the revision must demonstrate how the H/G and B/PA nonattainment areas intend to achieve a 3% per year reduction of VOC and/or NO_x until the year 1999 for B/PA or 2007 for H/GA, and additional reductions if needed to demonstrate modeled attainment. The plan must also carry an additional 3% of contingency measures to be implemented if the nonattainment area fails to meet a deadline.

By the November 1994 deadline, the state is submitting a SIP revision designed to meet the 3% per year ROP requirements for the years 1997-1999. This "common sense" SIP

revision details how the nonattainment areas intend to achieve the first three years' reductions of VOC (or 9% net-of-growth). Most of this amount has been achieved by quantifying additional reductions due to existing rules and reductions from federally-mandated rules. Rules to achieve the further reductions needed to meet the ROP SIP goal will be submitted to EPA by January 15, 1995.

The state is also submitting UAM modeling results conducted to date that show the relationship between emission levels of VOC and NO_x, and ozone concentration. This modeling will be submitted with the adopted rules by January 15, 1995. Based on the preliminary results of this modeling, which show a disbenefit to NO_x reductions, the state is pursuing a temporary FCAA §182(f) exemption from NO_x RACT and transportation conformity requirements.

The final Attainment Demonstration SIP revision for the H/G and B/PA ozone nonattainment areas will be based on the UAM using data primarily obtained from the COAST study. This series of modeling runs will provide the state with an effective planning tool which will more clearly guide the formulation of cost effective ozone control strategies. This assessment should be completed by mid-1996, at which time the state will submit any further rules necessary to reach attainment as evidenced by the UAM. A detailed schedule will be developed for the submittal of

the complete Attainment Demonstration, including UAM modeling of basecase episodes based primarily on the COAST data, and reductions in the amount necessary to achieve attainment by 1999 in B/PA and 2007 in H/G.

e. Sources of Emission Reductions

Substantial quantities of VOC are emitted by business, industry, consumer products, and motor vehicles. The plan identifies the contributions from known sources and sets forth a program of control measures to meet the goal of a 9% reduction, net-of-growth, of VOC levels in the nonattainment areas for the years 1997-1999.

3. OZONE CONTROL PLAN FOR 1979 SIP REVISION (No Change.)
4. CONTROL STRATEGY FOR 1979 SIP REVISION (No Change.)
5. 1982 HARRIS COUNTY SIP REVISION (No Change.)
6. SIP REVISIONS FOR POST-1982 URBAN NONATTAINMENT AREAS
(No Change.)
7. SIP REVISIONS FOR 1993 RATE-OF-PROGRESS (No Change.)
8. SIP REVISIONS FOR MOBILE SOURCES (No Change.)

9. SIP REVISIONS FOR THE ATTAINMENT DEMONSTRATION (No Change.)

10. SIP REVISIONS FOR THE REDESIGNATION AND MAINTENANCE PLANS (No Change.)

11. SIP REVISIONS FOR POST-96 ROP (New.)

a. Ozone Control Plan

1) General

The FCAA Amendments of 1990 require a Post-96 ROP SIP revision and accompanying rules to be submitted by November 15, 1994. This submittal must contain an Attainment Demonstration based on UAM. Additionally, the revision must demonstrate how the H/G and B/PA nonattainment areas intend to achieve a 3% per year reduction of VOC and/or NO_x until the year 1999 for B/PA or 2007 for H/G, and additional reductions if needed to demonstrate modeled attainment. The plan must also carry an additional 3% of contingency measures to be implemented if the nonattainment area fails to meet a deadline.

By the November 1994 deadline, the state is submitting a SIP revision designed to meet the 3% per year ROP requirements for the years 1997-1999. This "common sense" SIP

revision details how the nonattainment areas intend to achieve the first three years' reductions of VOC (or 9% net-of-growth). Most of this amount has been achieved by quantifying additional reductions due to existing rules and reductions from federally-mandated rules. Rules to achieve the further reductions needed to meet the ROP SIP goal will be submitted to EPA by January 15, 1995.

The state is also submitting UAM modeling results conducted to date that show the relationship between emission levels of VOC and NO_x, and ozone concentration. This modeling will be submitted with the adopted rules by January 15, 1995. Based on the preliminary results of this modeling, which show a disbenefit to NO_x reductions, the state is pursuing a temporary FCAA §182(f) exemption from NO_x RACT and transportation conformity requirements.

The final Attainment Demonstration SIP revision for the H/G and B/PA ozone nonattainment areas will be based on UAM using data primarily obtained from the COAST study. This series of modeling runs will provide the state with an effective planning tool which will more clearly guide the formulation of cost effective ozone control strategies. This assessment should be completed by mid-1996, at which time the state will submit any further rules necessary to reach attainment as evidenced by the model. A detailed schedule will be developed for the submittal of the

complete Attainment Demonstration, including UAM modeling of basecase episodes based primarily on the COAST data, and reductions in the amount necessary to achieve attainment by 1999 in B/PA and 2007 in H/G.

The FCAA Amendments of 1990 require states to compile extensive air quality and emissions data. It specifies techniques and procedures to be used by states for establishing emissions levels, determining the amount of emission reductions required, and demonstrating attainment of the NAAQS.

a) Requirement For Reductions

This SIP revision will detail how Texas intends to achieve the ROP reduction of VOC from 1997 to 1999 (or 9% net-of-growth). Most of this amount will be achieved by quantifying additional reductions due to existing rules and reductions from federally-mandated rules. Rules to achieve the further reductions needed to meet the ROP goal will be submitted to EPA by January 15, 1995.

2) Ozone Nonattainment Area Designations in Texas

The EPA established the NAAQS for ozone. The ozone NAAQS is violated when the expected number of days per calendar year, with maximum hourly average concentrations greater than 0.12 parts

per million (ppm) is greater than one (1.0) when averaged over three consecutive years at any given monitor. Any area in which a monitor violates the NAAQS is designated as an ozone non-attainment area. Areas designated nonattainment are classified based on the severity of the problem as indicated by the "design value".

Each area designated nonattainment for ozone is classified as marginal, moderate, serious, severe. I or II, or extreme. The classification an area receives is based on the "design value" for the area which is calculated using ambient ozone concentrations measured at monitoring stations in the nonattainment area and applying a mathematical algorithm. Attainment dates are based primarily on the severity of the classification. The classifications of ozone nonattainment areas in Texas are presented in Table 1.

TABLE 1

Classification of Ozone Nonattainment Areas in Texas

CLASSIFICATION	ATTAINMENT DATE	DESIGN VALUE CLASSIFICATION	NONATTAINMENT AREA	ACTUAL DESIGN VALUE
Incomplete/ No Data	11/15/95	----	Victoria*	----
Marginal	11/15/93	.121-.137	None	
Moderate	11/15/96	.138-.159	Dallas/ Ft. Worth	.14
Serious	11/15/99	.160-.179	Beaumont/ Port Arthur El Paso	.16
	11/15/96			.17
Severe I	11/15/05	.180-.190	Houston/ Galveston	.22
Severe II	11/15/07	.190-.279		
Extreme	11/15/10	.280 & above	None	

* Victoria County was designated as an incomplete/no data nonattainment area for ozone. It has subsequently been redesignated to attainment.

The 1990 FCAA Amendments recognized that often suburban and rural (perimeter) counties can contribute to ozone nonattainment in an area. Therefore, it stated that any area violating the NAAQS would be designated as nonattainment and classified according to the severity of nonattainment. The counties affected in the H/G area are Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller. The B/PA area includes the counties of Jefferson, Hardin, and Orange. Rules affecting stationary sources will be uniformly applied throughout each nonattainment area. Mobile source rules may vary somewhat according to whether a county is urban or rural, because rural counties may require less extensive mobile source controls.

3) Local Consultation

The Texas Clean Air Act (TCAA) established the TACB as the official air pollution control agency for the State of Texas. Senate Bill 2, passed in 1991, merged the TACB with the Texas Water Commission (TWC) into the TNRCC effective September 1, 1993. Portions of the former TACB became the Office of Air Quality under the TNRCC.

The TCAA also grants authority to city and/or county governments to conduct air pollution control programs within their jurisdiction. There are two basic types of local programs, those operating through the local health departments and those operating through regional planning organizations.

a) Local Officials and Health Departments

The primary tasks of programs operating through the local health departments consist of air quality monitoring and compliance enforcement. Letters of agreement between the TNRCC and the local agency define the requirements of each local air pollution program. Other levels of local government, such as local politicians, judiciary, and city staff often play a role in advising the TNRCC and assisting in the public hearings process.

Table 2 lists the local health departments in H/G which operate air pollution programs in conjunction with the TNRCC.

TABLE 2

Local Health Departments in Houston and Galveston

LOCATION	DEPARTMENT	ADDRESS
Houston	Bureau of Air Quality Control (713) 640-4200	7411 Park Place Houston, TX 77087
Galveston	Galveston County Health District (409) 948-7221	P.O. Box 939 La Marque, TX 77568

b) Responsibilities and Planning Processes of the Councils of Governments and Metropolitan Planning Organizations

The regional planning agencies located within the Texas nonattainment areas assist the TNRCC with the development of the SIP to produce the most effective and affordable solutions to the regions' air pollution problems. Much of the responsibility for planning and implementing certain control programs, especially transportation control measures (TCM), has been delegated to the appropriate regional and metropolitan planning organizations. In the H/G nonattainment area, the regional and metropolitan planning organizations (MPOs) are responsible for compiling their own data and performing computer modeling to evaluate various

measures. In B/PA, the TNRCC performs the modeling function, but the regional organization plays a role in the planning and implementation process. The regional organizations in the nonattainment areas are listed in Table 3.

TABLE 3
Regional Planning Organizations in H/G
and B/PA

LOCATION	AGENCY	ADDRESS
Houston/ Galveston	Houston-Galveston Area Council (713) 627-3200	P.O. Box 22777 Houston, TX 77227-2777
Beaumont/ Port Arthur	South-East Texas Regional Planning Commission (409) 727-2384	3501 Turtle Creek Port Arthur, TX 77642

4) Identification of Emission Changes

a) Urban Airshed Modeling (UAM)

ROP SIP modeling is being developed for the H/G and B/PA nonattainment areas in two phases using the UAM. The first phase of ROP modeling is based on historical ozone episodes. This modeling is being subjected to hearing, and will be adopted by the TNRCC by January 15, 1995. The second phase of the ROP modeling will be conducted using data obtained primarily from the COAST project, an intensive 1993 field study. The COAST modeling and

associated SIP is projected to be completed by the summer of 1996. Control strategies developed in this second phase will be based on a more robust data base, providing a higher degree of confidence that the strategies will result in attainment of the ozone NAAQS. Table 4 consists of a schedule for the UAM modeling including the COAST data.

Table 4
COAST Task Schedule

ACTIVITY	DATE COMPLETED
Aerometric Data Available	10/31/94
Emissions Inventory Data Available	10/31/94
Initial UAM Evaluations	5/31/95
Attainment UAM Evaluations	8/31/95
Attainment Demonstration	12/31/95
Hearings Approval	2/7/96
Hearings	3/15/96
SIP Adoption	4/15/96
Submit to EPA	4/30/96

b) Emissions Inventory (EI)

The 1990 Amendments to the FCAA required that EIs be prepared for ozone nonattainment areas. Since ozone is photochemically produced in the atmosphere when VOCs are mixed with NO_x and CO in the presence of sunlight, it is important that the planning agency compile information on the important sources of these

precursor pollutants. It is the role of the EI to identify the source types present in an area, the amount of each pollutant emitted, and the types of processes and control devices employed at each plant or source category. The EI provides data for a variety of air quality planning tasks, including establishing baseline emission levels, calculating the 15% and Post-96 reduction targets, developing control strategies for achieving the required emissions reductions, inputting emissions into air quality simulation models, and tracking actual emissions reductions against the established emissions growth and control budget. The total inventory of emissions of VOC, NO_x, and CO for an area is summarized from the estimates developed for five general categories of emissions sources.

(1) Point Sources

Stationary point sources are defined for inventory purposes in the nonattainment areas as industrial, commercial, or institutional plants/operations responsible for generating annual VOC emissions of 10 tons per year (TPY) or greater, and/or 25 TPY NO_x, and/or or 100 TPY CO emissions. To collect emissions and industrial process operating data for these plants, the TNRCC sends out EI questionnaires (EIQ) to all sources identified as having the potential to generate emissions triggering EI reporting requirements. Companies are asked to report not only emissions data for all emissions generating units and emission

points, but also the type and amount of materials used in each process which may result in emissions, such as painting and degreasing materials, storage tank materials, or fuels burned. Information is also requested in the EIQ such as process equipment descriptions; emissions control devices currently in use; and emissions point parameters, including stack location, height, and exhaust gas, temperature, and flow rate. All data submitted via the EIQ is then subjected to rigorous quality assurance procedures by the engineering staff of the EI Section before entry into the TNRCC point source data base.

(2) Minor and Area Sources

To capture information about sources of emissions that fall below the point source reporting levels and are too numerous or too small to identify individually, calculations have been performed to estimate emissions from these sources on a source category or group basis. Minor and area sources are commercial, small-scale industrial, and residential categories of sources which use materials or operate processes which can generate emissions. Area sources can be divided into two groups characterized by the emission mechanism: evaporative emissions or fuel combustion emissions. Examples of evaporative losses include: printing, industrial coatings, degreasing solvents, house paints, leaking underground storage tanks, gasoline service station underground tank filling, and vehicle refueling operations. Fuel combustion

sources include stationary source fossil fuel combustion at residences and businesses, as well as outdoor burning, structural fires, and forest fires. These emissions, with some exceptions, may be calculated by multiplying an established emission factor (emissions per unit of activity) times the appropriate activity or activity surrogate responsible for generating emissions. Population is the activity surrogate most commonly used for many area source categories while other activity data include amount of gasoline sold in an area, employment by industry type, and acres of cropland harvested.

(3) On-Road Mobile Sources

On-road mobile sources consist of automobiles, trucks, motorcycles, and other internal combustion engine powered vehicles traveling on roadways in the nonattainment areas. Combustion related emissions are estimated for vehicle engine exhaust and evaporative emissions are estimated for the fuel tank and other evaporative mechanisms on the vehicle. Emission factors used to calculate the 1990 Base Year EI have been developed using the EPA MOBILE5a mobile emission factor model. The most current version of EPA's mobile emissions factor model, MOBILE5a, has been used to develop the 1999 projection EI. Various inputs are provided to the model to simulate the vehicle fleet driving in each particular nonattainment area. These inputs include such parameters as vehicle speeds by roadway type, vehicle registration by

vehicle type and age, percentage of vehicles in cold start mode, percentage of miles travelled by vehicle type, type of I/M program in place, and gasoline vapor pressure. All of these inputs have an impact on the emission factor calculated by the MOBILE program, and every effort is made to input parameters reflecting local conditions where possible. To complete the emissions estimate, the emission factors calculated by the MOBILE model must then be multiplied by the level of vehicle activity, i.e. vehicle miles travelled (VMT). The level of vehicle travel activity is developed from travel demand models (TDM) run by the Texas Department of Transportation (TxDOT) or the local MPO. The TDMs have been validated against actual ground counts of traffic passing over counters placed in various locations throughout each county. Estimates of VMT have been provided for some areas based on outputs of the federal Highway Performance Monitoring System (HPMS), which is a model built around vehicle count data from a number of specially located traffic counters. In areas where TDM VMT has been used as the EI activity basis, as required by the EPA, the resulting EIs have been adjusted for consistency with that area's HPMS VMT estimate.

(4) Non-Road Mobile Sources

This source category includes military, commercial and general aircraft, marine vessels, recreational boats, railroad locomotives, and a very broad category that includes everything

from the engines on construction equipment and tractors to lawn mowers and chainsaws. Calculation methods for emissions from non-road engine sources vary considerably because of the differences in usage patterns, but in general are based on manufacturer supplied information about engine horsepower, load factor, emission factors, usage, and equipment sales and distribution. Emissions estimates for all sources in the non-road category except aircraft, marine vessels, and locomotives were developed by a contractor to EPA's Office of Mobile Sources. Information regarding engine population and type was assembled by the contractor from national sales data, and patterns of equipment usage were derived by the contractor from several regional surveys. Aircraft emissions were estimated with landing and takeoff data for airports in each area multiplied by EPA developed emission factors for aircraft operations. Emissions from marine vessels were estimated based on fuel consumption by type of vessel. Emissions from locomotives were likewise derived from fuel consumption reported by individual railroads.

(5) Biogenics

Biogenic sources are essentially all types of plant life in the biosphere; forests, crops, lawn grass, and other vegetation. Plants are sources of VOC such as isoprene, monoterpene, and alpha-pinene. Tools for estimating emissions include satellite imaging for mapping of vegetative types and computer modeling of

emissions estimates based on emission factors by plant species. Emissions from biogenic sources are subtracted from the inventory prior to determining any required reductions for the 15% demonstration plan. However, the biogenic emissions are important in determining the overall emissions profile of an area and are included in the modeling of strategies for reaching attainment of the ozone air quality standard.

(6) Determination of Target Level

(a) Base Year Inventory

The Final 1990 Base Year Emissions Inventory is the most extensive, comprehensive inventory undertaken to date in terms of numbers of categories calculated, accounts reported, and inventory questionnaires evaluated. There were approximately 1,200 point source accounts reported and about 80 area source categories calculated. The categories that make up the final inventory are: point sources, area sources, biogenics, and mobile sources (on-road and non-road). The emissions numbers from these categories were collected, or calculated, for the counties in all four nonattainment areas. The process of developing adjustments to the emissions inventory and determining the emissions reductions are discussed in sections (b) through (1). These calculations are illustrated with a hypothetical

example in Tables 5 through 10. Table 5 is an example of a hypothetical Final Base Year Inventory.

TABLE 5

Example: Final Base Year Inventory

SOURCE CATEGORIES	EMISSIONS IN POUNDS PER DAY (lb/day)
Point Sources	1,000
Area Sources	2,500
Mobile Sources	3,000
Biogenic Sources	350
Total	6,850

(b) Rule Effectiveness and Rule Penetration Adjustments

Rule effectiveness (RE) and rule penetration are adjustments/reductions that occur to the raw emissions totals before they are ever compiled into the Final Base Year Inventory. RE is applied to all point source categories and may be applied (along with rule penetration) to applicable, regulated area source categories.

RE is an estimate of the ability of a rule to control the source to which it is applied. It is based on process type, process control reliability, and the ability of the regulating authority to measure and enforce the rule. The EPA requires that an

adjustment be made to the actual emissions measurements from each point and area source to account for RE. Without documentation to indicate determination of RE, EPA requires a default RE of 80%. The former TACB determined a different value for several major source categories based on research into the control technologies and methodologies applied in the particular industrial setting. An example of an emissions reduction calculation using RE is shown below:

Uncontrolled emissions	=	35 tons per day (TPD)
Estimated control efficiency	=	90%
RE	=	80%
Controlled emissions w/o RE	=	35 - 35(.90)
	=	3.5 tpod
Controlled emissions w/ RE	=	35 - 35[(.90) (.80)]
	=	9.8 tpod

Rule penetration (RP) is the extent to which a regulation may cover emissions from an area source category. If an area source rule has an exemption level, the RP is the percent of the total emissions in the category that are subject to the rule. RP must

be estimated for all area source rules. Rule penetration is estimated in the following manner:

$$\text{Rule Penetration} = \frac{\text{(Uncontrolled emissions covered by the regulation)}}{\text{(Total uncontrolled emissions)}} \times 100\%$$

An example of the calculation is:

Uncontrolled emissions	=	35 TPD
Control efficiency	=	90%
RP	=	75%
RE	=	80%
Controlled Emissions	=	35 - 35[(.90) (.75) (.80)]
	=	35 - 35[.54]
	=	16.1 tpod

(c) Rate-Of-Progress Base Year

Inventory

The ROP Base Year Inventory is derived from the Final 1990 Base Year EI by subtraction of the biogenics emissions numbers from the inventory totals. In addition, the ROP Base Year EI is confined to reporting on emissions strictly from the nonattainment counties. Table 6 continues the example.

TABLE 6

Example: ROP Base Year Inventory for 1990

SOURCE CATEGORIES	EMISSIONS IN LB/DAY
Point Sources	1,000
Area Sources	2,500
Mobile Sources	3,000
Total	6,500

(d) Adjusted Base Year Inventory

Adjustments are then made to the ROP Base Year EI reducing the mobile source emissions totals by those emissions reductions that would occur by 1999 as a result of the Federal Motor Vehicle Control Programs (FMVCP) promulgated prior to the FCAA Amendments. These are reductions that would occur as a consequence of fleet turnover between 1990 and 1999 regardless of the FCAA Amendments. Another adjustment made to the mobile and area source totals excludes emissions reductions that would occur between 1990 and 1999 as a result of Reid vapor pressure (RVP) regulations promulgated by November 15, 1990 or required under §211(h) of the FCAA Amendments. The resulting inventory, after these reductions, is called the Adjusted Base Year Inventory relative to 1999. An example Adjusted Base Year Inventory relative to 1999 is found in Table 7.

TABLE 7

Example: Adjusted Base Year Inventory Relative to 1999

SOURCE CATEGORIES	1996 EMISSIONS IN LB/DAY	1999 EMISSIONS IN LB/DAY
Point Sources	1,000	1,000
Area Sources (minus RVP cor- rection of 150 lb./day)	2,500	2,250
Mobile Sources (minus FMVCP & RVP of 750 lb/day)	2,500	2,250
Total	6000	5,600

(e) 9% Reduction Required by 1999

In order to calculate the total 9% reduction in emissions mandated by the FCAA Amendments between 1996 and 1999 (3% per year averaged over three years), the Adjusted Base Year Inventory relative to 1999 is multiplied by 9%.

Example: 5,600 lb/day x .09 = 504 lb/day

(f) RVP and Fleet Turnover Correction Term

For the Adjusted Base Year Inventories relative to 1996 and 1999 the RVP and Fleet Turnover Correction Term must be calculated. This term constitutes the reductions that would

occur between 1996 and 1999 resulting from FMVCP (reduces emissions through fleet turnover) and RVP regulations (reduces emissions through a lower maximum gasoline RVP limit) promulgated prior to the passage of the FCAA Amendments.

An example calculation of the RVP and Fleet Turnover Correction Term, determined by subtracting the Adjusted Base Year Inventory relative to 1999 from the Adjusted Base Year Inventory relative to 1996 (documented in the 15% ROP SIP revision), is found in Table 8.

TABLE 8

Example: RVP and Fleet Turnover Correction Term

Step	Inventories	Emissions in Lbs./Day
1.	Adjusted Base Year Relative to 1996	6,000
2.	Adjusted Base Year Relative to 1999	5,600
3.	RVP and Fleet Turnover Correction Term (Step 1 minus Step 2)	400

(g) Total Expected Reductions by 1999 (Excluding Growth)

The next step in the calculation process is to determine the Total of Expected Reductions by 1999, excluding growth. These reductions are the sum of the 9% reduction and the RVP and

Fleet Turnover Correction Term discussed in subsections (e) and (f) above.

TABLE 9

**Example: Calculation of Total Expected Reductions by 1999
(Excluding Growth)**

TYPE OF REDUCTION	REDUCTION AMOUNT IN LB/DAY
Required 9%	504
RVP and Fleet Turnover Correction Term	400
Total	904

(h) Setting the Target Level of Emissions for 1999

The emissions target level for 1999 is determined by subtracting the Total Expected Reductions shown above from the 1996 Target Level of Emissions (determined in the 15% ROP SIP revision after the 15% reduction has been achieved). This will be the emission level to be achieved in 1999 after the reductions to compensate for growth which must occur by the end of 1999. Continuing the example:

$$4,600 \text{ lb/day} - 904 \text{ lb/day} = 3,696 \text{ lb/day}$$

(i) Projecting the Inventory to

1999

The next step in this process is to project the emissions in 1999. The estimated emission total for 1999 is arrived at by applying growth factors to the total emissions in each category in the 1990 ROP Base Year Inventory. The growth factors applied to point source, area source, and most non-road categories are based on Bureau of Economic Analysis and Wharton Econometrics forecasts of growth over the period in product output, value added, earnings, and employment (among other indicators). The factors themselves are derived from software packages supplied by EPA called Bureau of Economic Analysis Projection Factor (BEAFAC) and Economic Growth Analysis System (E-GAS). However, the non-road engine category is projected based on growth in area population and on-road mobile source emissions are projected based on travel demand model VMT forecasts, in conjunction with emission factor forecasts, as modeled with MOBILE5a.

For this example, it will be assumed that the growth factor for all categories of emissions is 1.20 over the 1990 to 1999 period:

ROP Base Year Inventory = 6,500 lb/day

1999 Projection Inventory = 6,500 x 1.20 = 7,800 lb/day

(j) Determination of Required
Reductions (Including Emissions Growth)

The next step in the process is to determine the 1999 target level accounting for the required 9% reductions, and compensating for 100 percent of emissions due to growth. Total required reductions with growth are determined by subtracting the Target Level of Emissions for 1999 (h) from the 1999 Projection Inventory as determined in (i).

1999 Projection Inventory = 7,800 lb/day (i)
(with growth and pre-1990 controls)

Target 1999 Level = 3,696 lb/day (h)

Reduction Target = 7,800 - 3,696 = 4,104 lb/day

(k) Determination of Creditable
Reductions to Date

Next, the emission reductions estimates by 1999, obtainable by implementing the emission control programs detailed in the 15% ROP SIP revisions, applied to the grown 1999 EI are projected and summed across major source categories yielding the Creditable Reductions to Date. Table 10 is an example of Creditable Reductions to Date.

TABLE 10

Example: Creditable Reductions to Date

Source Categories	Reductions by 1999 Lbs./Day
Point/Stationary Sources	400
Area Sources	400
Mobile Sources	600
Total	1400

(1) Calculation of Shortfall in
Emission Reductions Needed to Meet 1999 Target Level

The last step in the process of arriving at the final reductions that will be needed to achieve the Target Level of Emissions for 1999 is to subtract the Creditable Reductions to Date as determined in (k) from the Required Reductions, including offsets for emissions growth, as determined in (j).

Required Reductions = 4,104 lb/day
(with growth and no post-1990 controls)

Creditable Reductions to Date = 1,400 lb/day
(effects of 15% ROP SIP controls by 1999)

Shortfall = 4,104 - 1,400 = 2,700 lb/day

(7) Inventory Summaries

The progression from the 1990 ROP Base Year Inventory to the emission reduction needed to meet the 1999 target level for each of the nonattainment areas is shown in Tables 11 and 12.

1999 ROP Required VOC Emissions Target Calculations
 Beaumont Ozone Nonattainment Area
 Ozone Season VOC Tons Per Day
 October 13, 1994

Step	Emissions Basis	Stationary		Mobile		Total
		Point	Area	On-road	Non-road	
1	1990 ROP Nonattainment Area Base Year EI	245.60	32.48	31.61	32.48	342.15
2	Adjusted Base Year EI Relative to 1996	245.60	32.48	20.14	32.46	330.68
3	Adjusted Base Year EI Relative to 1999	245.60	32.42	18.53	32.46	329.01
4	9% of Adjusted Base Year EI Relative to 1999					29.61
5	RVP and Fleet turnover correction [steps (2-3)]		0.06	1.61		1.67
6	1996 Target Level					276.80
7	1999 Target Level [steps(6-5-4)]					245.52
8	1999 Emissions Forecast (Growth)	253.12	33.27	21.49	32.41	340.29
9	Total Reductions Required by 1999 with growth [steps (8-7)]					94.77
10	Creditable Reductions to date					53.25
11	Shortfall					41.52

Notes for On-Road Mobile

1. Emissions forecast in step 8 includes projected 1999 enhanced I/M and FMVCP Tier 1 standards, but does not include stage II vapor recovery.
2. Base year on-road mobile emissions calculated with MOBILE5 for an ozone season weekday
3. Adjusted base year on road mobile emissions and 1999 forecast on-road mobile emissions calculated with MOBILE5A for an ozone season weekday

Table 11

1999 ROP Required VOC Emissions Target Calculations

Houston Ozone Nonattainment Area

Ozone Season VOC Tons Per Day

October 13, 1994

Step	Emissions Basis	Stationary		Mobile		Total
		Point	Area	On-road	Non-road	
1	1990 ROP Nonattainment Area Base Year EI	480.34	229.01	251.72	195.11	1156.18
2	Adjusted Base Year EI Relative to 1996	480.34	229.01	163.39	195.11	1067.85
3	Adjusted Base Year EI Relative to 1999	480.34	227.65	153.01	195.11	1056.11
4	9% of Adjusted Base Year EI Relative to 1999					95.05
5	RVP and Fleet turnover correction [steps (2-3)]		1.36	10.38		11.74
6	1996 Target Level					891.36
7	1999 Target Level [steps(6-5-4)]					784.57
8	1999 Emissions Forecast (Grown)	512.39	252.46	171.06	216.85	1152.78
9	Total Reductions Required by 1999 with growth [steps (8-7)]					368.21
10	Creditable Reductions to date	0.00	0.00	0.00	0.00	261.61
11	Shortfall					106.60

Notes for On-Road Mobile

1. Forecast in step 8 includes 1999 projected enhanced I/M, FMVCP Tier 1 standards, and reformulated gasoline, but does not include stage II vapor recovery.
2. Base year on-road mobile emissions calculated with MOBILE5 for an ozone season weekday
3. Adjusted base year on road mobile emissions and 1999 forecast on-road mobile emissions calculated with MOBILE5A for an ozone season weekday

Table 12

c) Factors Affecting Magnitude of VOC

Emissions

(1) Changes in Stationary and Area
Source Emissions Regulations

(a) Additional control techniques
guidelines (CTG), Federal Rules, and Other Federal and State
Programs

According to §108(b)(1) of the FCAA Amendments of 1990, the EPA Administrator shall issue to the states and appropriate air pollution control agencies information on air pollution control. Sections 182(b)(1)(C) and (D) of the FCAA specify in general terms which emissions reductions are creditable toward the ROP reduction requirements and which are not. Section 182(b)(1)(D) does not specifically limit the creditability of emissions reductions associated with the programs discussed in this section toward the ROP requirements; therefore, emissions reductions associated with the programs listed below are generally creditable. However, some additional limitations do exist to the extent that emissions reductions associated with the programs listed below must be quantifiable, real, enforceable, replicable, accountable, and occur between November 15, 1990 and November 15, 1999. The federal programs listed below are generally

creditable, provided they meet these limitations. Additionally, some state programs may be creditable provided they meet these limitations. The most important of these programs are discussed in greater detail later in this section.

- Control Technique Guidelines (CTGs)
- Benzene National Emissions Standards for Hazardous Air Pollutants (NESHAPS)
- Treatment, Storage, and Disposal Facilities (TSDFs)
- Hazardous Air Pollutant (HAP) Standards
- New Source Performance Standards (NSPS)
- Controls required for mobile sources

The 1990 FCAA Amendments significantly changed the permitting process for new sources or modifications of existing sources. The most important changes are with respect to the application of rules requiring emissions offsets in nonattainment areas. The definition of "major source" also changed for certain nonattainment areas. In Texas, the major source definition is 50 TPY in the B/PA areas and 25 TPY in the H/G. An additional impact of lowering the definition of major source in the nonattainment areas is the lower trigger for implementing the Lowest Achievable Emissions Rate (LAER) for new major sources or major modifications in accordance with the state construction permit rules in §116.150. Any reductions which do occur as a result of the 1990

FCAA Amendment's major source definition and offset requirements will be creditable towards the Post-96 "down-payment" reduction.

The offset requirement is managed by an "emissions banking" regulation. This allows industries to bank emissions they have made voluntarily (beyond those required by their TNRCC permit) if those reductions can be verified. New or expanding industries which would not otherwise have been permitted to operate can take advantage of these banked emissions. Nonattainment areas can, therefore, still attract new or expanding industry while obtaining subsequent emissions decreases through the required offsets.

Under the banking system, industries which are capable of demonstrating a verifiable voluntary reduction in emissions may sell these banked emissions to new or expanding industries. The purchasing industry must prove a greater than one-to-one offset ratio. These offset ratios vary between nonattainment areas. For B/PA, the offset ratio is 1.2 to 1, yielding a 20% net reduction. For H/G, it is 1.3 to 1, yielding a 30% reduction.

The 1990 FCAA Amendments required EPA to publish federal CTGs to control VOC emissions from several sources, including the following: volatile organic liquid storage, wood furniture, plastic parts, synthetic organic chemical manufacturing industry (SOCMI) batch processes, industrial clean-up solvents, aerospace coatings, marine coatings, offset lithography, SOCMI distillation and

reactor processes, industrial wastewater, and automobile refinishing. The EPA had only published final CTG documents for SOCMI reactor and distillation processes in time for them to be included in the 1993 ROP SIP revision, and has recently notified the states that they will not be providing CTGs for the other sources in the foreseeable future. Instead, EPA is to issue "Alternative Control Techniques" (ACTs) for these sources. The TNRCC has developed rules for several of these categories based on draft CTGs and ACTs, including offset lithography, SOCMI distillation and reactor processes, industrial wastewater, and automobile refinishing.

In general, in order to take ROP SIP credit, emission limits must be established by rule before the SIP submittal deadline. For some categories, TNRCC rule proposals have been drafted. State rulemaking is required for the source categories covered by ACTs, and EPA ACT drafts are available. The EPA has previously allowed states to claim ROP credit on a limited basis without preemptive rulemaking. The TNRCC is pursuing this approach for the Waste Treatment, Storage, and Disposal Facilities (MACT) categories and for the national engine rules. The 1990 FCAA Amendments precludes states from separate rulemaking for the engine categories. The following are federal programs for which the state has taken credit in either the 15% or the current SIP.

- Clean Fuel Fleet (FCAA Amendments)
- Aerospace Coatings (ACT)
- Cleanup Solvents (ACT)
- Plastic Parts (ACT)
- Shipbuilding Coatings/Repair (ACT)
- Aircraft Engines (FAA rule)
- Architectural Coatings
- Hazardous Organic National Emission Standards for Hazardous Air Pollutants (HON)
- Landfills subject to New Source Performance Standards
- Pulp and Paper Manufacture MACT
- Recreational Marine Vessels
- SOCMI - Batch Processes (ACT)
- Waste Treatment, Storage, and Disposal Facilities (MACT)

The TNRCC has received and considered the ACT for Control of Volatile Organic Compound Emissions from Batch Processes. The EPA requires that the TNRCC either develop a rule based on this ACT or show that other existing rules would cover this source category. Texas has an existing vent gas rule for all nonattainment counties which mandates at least a 90% control efficiency. TNRCC's interpretation of the new ACT is that the existing vent gas rule applies to the same source categories at a 90% control efficiency level. The TNRCC has further determined during analysis that 90% control efficiency represents RACT and

that further incremental reductions are not cost-effective enough to constitute RACT.

Nonattainment areas may also take credit for permanent shutdowns of stationary sources within their airshed. The credits may not be double-counted as part of NSR, banking, or any other offset program. The shutdowns must occur between 1990 and 1999. Within this framework, an area may take credit for the entire emissions from the closed facility or operations.

Certain rules adopted as part of the 15% ROP SIP continue to gain creditable emission reductions either through equipment turnover or phasing in of more stringent requirements between 1997 and 1999. These reductions are being quantified, and include categories such as the following:

- Small Utility Engines
- Automobile Inspection/Maintenance
- Federal Motor Vehicle Control Program
- Employee Trip Reduction
- Federal Reid Vapor Pressure Control
- Underground Storage Tank (UST) Remediation

(b) Extended Compliance Schedule

The Extended Compliance Schedule rule will provide stationary sources in the ozone nonattainment areas with additional flexibility for meeting compliance deadlines contained in other sections of Chapter 115 of this title (relating to Control of Air Pollution from VOCs). With the purchase and application of mobile source emission reduction credits, a stationary source can extend a compliance deadline for up to the life of the credit, but shall not exceed five years. The source choosing to apply for a deadline extension must purchase enough credits to cover 100% of the emissions from the affected emission point. This methodology provides a definite environmental benefit, minimizes the administrative costs for both the applicant and the TNRCC, and reduces processing time for the applicant and the TNRCC.

(c) Alternate Methods of Control

(AMOC)

On March 1, 1994, the TNRCC proposed rules regarding replicable procedures for AMOC which also provide an alternative to site-specific SIP revisions for designated ozone nonattainment areas. The intent of the TNRCC was to develop AMOC rules that incorporate replicable procedures that correspond with state regulations and protect the integrity of the SIP. The current federally approved SIP requires a site-specific SIP revision for alternate

compliance methods. The AMOC procedures streamline the process for case-by-case review of site-specific SIP revisions for designated ozone nonattainment areas while achieving additional emission reductions.

The AMOC rules were modified in response to comments from the EPA on Phase I VOC rules submitted on November 15, 1993, as part of the state's 15% ROP plan and comments from the public. The EIP guidance was utilized as a resource in the development of the TNRCC AMOC rules.

The TNRCC adopted the AMOC rules on July 13, 1994. The rules provide within a compressed time period the flexibility for achieving emission reductions and establish procedures for requesting the Executive Director's approval of an AMOC in lieu of compliance with control requirements in Chapter 115, relating to the Control of Air Pollution from Volatile Organic Compounds. The AMOC rules provide for alternative emission reductions greater than or equal to reductions specified in VOC rules, and have an offset ratio equal to the offset ratio for emissions banking. Further description of the AMOC rules may be found in Appendix A.

(d) Proposed New VOC Control

Measures

(i) New or Modified Point and

Area Source Controls

This section will discuss control measures to be implemented by January 15, 1995 to control VOC emissions from point and area sources. Later sections will discuss estimated reductions expected from these rules for each specific nonattainment area. Several of these rule revisions are clean-up in nature and will not result in additional reductions. The Control Measure Catalog (CMC), as discussed in Appendix B, ranks the various control measures based on a variety of criteria. This ranking will be especially useful in determining rules to be used as contingency measures.

(2) Changes in Mobile Source Emissions

(a) Federal Motor Vehicle Control

Program (FMVCP)

The FMVCP contains additional more stringent tail pipe emission standards for cars that will be effective in the future. The current tail pipe standards for cars are 0.41 gram per mile (gpm) total hydrocarbon (HC), 3.4 gpm CO, and 1.0 gpm NO_x. Lower

standards of 0.25 gpm nonmethane HC and 0.4 gpm NO_x, referred to as Tier I standards, will be phased in between 1994 and 1996 (the 3.4 gpm standard for CO does not change). By 1994, 40% of the cars manufactured will be subject to Tier I standards, 80% by 1995, and 100% by 1996. The EPA is required to study whether even tighter standards are needed, technologically feasible, and economical. If EPA determines by 1999 that lower standards are warranted, the standards (Tier II standards) will be cut in half beginning with 2004 model year vehicles. Tier I standards are creditable toward the 15% ROP requirement.

(b) Federal Gasoline Volatility
(Reid Vapor Pressure) Control Program

Before the 1990 FCAAA, EPA had established nationwide Reid Vapor Pressure (RVP) limits on gasoline of 9.0 pounds per square inch (psi) nationwide during the summer ozone season. Beginning in 1992, a more stringent RVP limit of 7.8 psi was instituted for the specified summer ozone season in ozone nonattainment areas. Phase I Reformulated Gasoline (RFG) has an RVP of 7.2, and Phase II RFG, which is scheduled to be implemented by 2000, will have an RVP of 7.0. For fuel blends containing gasoline and 10% ethanol, the psi limitation may be up to one psi higher, provided the gasoline portion of the mixture does not exceed the RVP limitations legal in the specific area.

(c) Transportation Planning

Much of the responsibility for the planning and implementation of TCMs has been delegated to the nonattainment areas' local governments and MPOs. TCMs are designed to either reduce the number of vehicles on the road, reduce the vehicle miles traveled, or improve the flow of traffic. There are a variety of TCMs being considered, and each nonattainment area will choose from among them. A new rule, 30 TAC §114.23, concerning Transportation Control Measures, has been adopted to provide enforceability to the TCM strategy selected for each area. The new rule contains TCM-specific definitions; designations of affected MPOs responsible for TCM development, funding, and implementation; requirements that MPOs submit specific information provided by agencies or entities responsible for implementation of TCMs and a quantification of the emission reduction benefits; requirements that MPOs maintain and provide specific information regarding TCM implementation status; requirements that the MPOs modify the transportation improvement plan (TIP) for the area, as necessary, to correct implementation deficiencies; and prescribed enforcement actions to be taken if deficiencies remain unresolved or if knowing violations of TCM commitments occur. The TCMs listed below are examples of those which may be adopted by November 15, 1994. Those not needed will be deleted, and others may be added as they become available or identified. TCMs under consideration include the following:

--Employer Trip Reduction (ETR). This program, which was mandated by the FCAA, requires employers in severe ozone nonattainment areas to implement programs to reduce work-related vehicle trips and miles travelled by employees. Employees who commute from attainment areas into nonattainment areas will also be affected. In the H/G area, this TCM is required, due to their "Severe II" ozone classification.

--High Occupancy Vehicle (HOV) Lanes. Restrict certain roads or lanes for passenger buses or high-occupancy vehicles, and programs for the provision of all forms of high-occupancy, shared-ride services.

--Trip-reduction ordinances.

--Traffic flow improvement programs that reduce emissions.

--Signal timing improvements and computer controlled signal coordination/progression permit vehicles traveling in the direction of the major traffic flow to receive a green light whenever possible, thereby reducing idling time. Intersections can also be modified to improve traffic flow and reduce emissions.

--Programs to limit or restrict vehicle use in the downtown area or other areas of high emission concentration, particularly during periods of peak use.

--Programs to limit portions of road surfaces or certain sections of the metropolitan area to bicycle or pedestrian use, and to construct new roads or paths for this purpose. Also programs for secure bicycle storage facilities and other facilities, including bicycle lanes, for the protection and convenience of bicyclists, in both public and private areas.

--Programs to reduce emissions due to extended idling of vehicles and extreme cold start conditions.

--Programs and ordinances to facilitate non-automobile travel, to facilitate provision and utilization of mass transit, and to generally reduce the need for single-occupant vehicle travel, as part of transportation planning and development efforts of a locality; including programs and ordinances applicable to new shopping centers, special events centers, and other centers of vehicle activity.

--Programs for improved public transit routes, service, frequency, and route modifications are also included. Other programs include reduced transit fare and municipal car pool/van pool programs.

--Programs to encourage the voluntary removal from use and the marketplace of pre-1980 model year light-duty vehicles and trucks.

--Programs and ordinances for parking incentives and disincentives to promote use of multi-occupancy vehicles or mass transit.

(d) Vehicle I/M Program

The 1990 FCAA Amendments mandate vehicle emissions I/M programs in areas that are classified as moderate and above for ozone or CO. For new and existing I/M programs, Congress also set minimum I/M design requirements such as computerized oversight, test-only inspections, and registration enforcement.

The EPA subsequently promulgated federal rules to specify performance standards for I/M programs. These rules, dated November 5, 1992, state what is expected by EPA. There are two types of performance standards. "Basic" programs are required for nonattainment areas with moderate ozone classifications and higher classified areas with a 1980 population of less than 200,000. "Enhanced" programs are required for those nonattainment areas with a 1980 population of 200,000 or more which are classified as having serious, severe, or extreme ozone pollution levels.

The H/G nonattainment area is required to have an enhanced I/M program. The B/PA nonattainment area is a serious nonattainment area, but its 1980 population of less than 200,000 qualifies it for a basic program.

In addition to basic and enhanced program designs for 1995 and after, the EPA formulated an "I/M correction" performance standard for programs in existence in 1990. This correction is explained below.

Certain Texas counties (Harris, Dallas, Tarrant, and El Paso) were required to have basic I/M programs for 1990. The EPA performance standards for this testing assumed that 100% of the affected vehicle population would be tested and that 20% of the vehicles would fail the test. Real-world I/M test designs and compliance and failure rates often vary from this standard. The TNRCC was required to evaluate whether its programs achieved equivalent emission reductions. Computer MOBILE5a modeling analyses show that the Harris County I/M program does not meet the EPA minimum reduction requirement.

There are several features to the new, revised I/M program: limited visual inspections, tailpipe emission testing, and evaporative emission checks. The visual emission control device inspection in all nonattainment areas will consist checking for two components: a test to verify presence of the catalytic convertor and the fuel inlet restrictor. The fuel inlet restrictor test is made to ensure that leaded gasoline is not being introduced in a vehicle requiring unleaded gasoline.

EPA proposes to approve I/M SIP submissions which are consistent with the following standards and approved methods of testing for vehicle emissions.

(i) Emission Standards

Emission standards are threshold limits for HC and CO emission levels. In high-technology transient testing (IM240), units of measure are expressed as gpm. For idle and steady state testing, units of measure are expressed as ppm or as a percentage. Emission standards will apply to all vehicles subject to the program. Failure of any applicable standard will necessitate appropriate automotive repairs. NO_x emission standards shall be applied to vehicles subject to a transient emission test. The TNRCC employs the federally required I/M standards for 1981 and newer light-duty gasoline vehicles; the TNRCC will set emission standards for other vehicle categories, based on overall failure rates and other performance criteria.

(ii) Evaporative System

Integrity test procedure

This test procedure measures an unacceptable drop in fuel delivery system pressure, which may indicate a fuel tank vapor leak or an improperly fitting gas cap. The fuel system is pressurized to 14 inches (water). Leakage of more than six inches of pressure over a specified time period will result in a failure for this

test. Any damage done to the evaporative emission control system during the test shall be repaired at the expense of the inspection facility.

(iii) Evaporative System

Purge Test Procedure

This procedure measures the fuel vapor flow (in standard liters) occurring in the vehicle's evaporative system during the transient emission test. Purge testing is only required for vehicles undergoing the IM240 test. Applicable vehicles must purge at least one liter of air over the course of the IM240 test in order to pass this test. The purge flow measurement system is connected to the purge portion of the evaporative system between the canister and the engine, preferably near the canister. The inspector is responsible for ensuring that all items disconnected during the conducting of the test are properly reconnected at the conclusion of the test procedure. Any damage to the evaporative emission control system during this test shall be repaired at the expense of the inspection facility.

(iv) Loaded-Mode, Two-Speed

Test

This test is conducted using "steady-state" equipment. Tail pipe emissions are sampled from the vehicle at a simulated speed of approximately 30 miles per hour, using a dynamometer, and at

idle. This test is further described in appendices to Subpart S of 40 CFR 51 (relating to I/M requirements). Most older-model year light-duty vehicles will be tested using the loaded-mode two-speed test.

(v) Preconditioned Two-Speed

Idle Test

This test is conducted using a steady-state analyzer without a dynamometer. First, the engine is "preconditioned" by raising the engine speed without sampling the emissions. The test sequence consists of a high engine speed mode at approximately 2,500 revolutions per minute (RPM) followed by an idle mode. Additional preconditioning followed by an identical second-chance test is performed only if the vehicle fails the first test cycle. This test is further described in appendices to Subpart S. Dedicated four-wheel drive and heavy-duty vehicles will be tested using this test type.

(vi) Transient Emission Test

Transient emission test equipment and procedures shall conform with EPA's final rules, guidance, and policy statements. Such documents are attached to the SIP revision for I/M programs. Test results are based on mass emission measurement units using a constant volume sampling system while the vehicle is driving

through a computer monitored driving cycle on a dynamometer, with inertial weight settings appropriate for the weight of the vehicle. The driving cycle includes acceleration, deceleration, and idle operating modes over 240 seconds as specified by EPA. The 240-second sequence may be ended earlier using fast pass or fast fail algorithms.

(e) Accelerated Vehicle Retirement

Rule

The purpose of the Accelerated Vehicle Retirement Program (AVRP or scrappage) is to reduce mobile source emissions of VOCs and NO_x, and provide additional flexibility for stationary sources in the following ozone nonattainment counties: Brazoria, Chambers, Collin, Dallas, Denton, El Paso, Fort Bend, Galveston, Hardin, Harris, Jefferson, Liberty, Montgomery, Orange, Tarrant, and Waller. A scrappage program reduces VOC, NO_x, and CO emissions from on-road mobile sources, by permanently removing high-emitting vehicles from the area-wide fleet. With this rule, stationary sources will have the opportunity to select the most cost-effective approach to comply with federal and state regulations for ozone reductions. The AVRP is a voluntary program for both the stationary source and the motorist.

The baseline tailpipe emissions for the scrappage vehicles are measured by an IM240 (high-tech) emission test. All

participating scrappage vehicles are required to submit a vehicle emission certificate (VEC), with emissions recorded in gpm, at the time the vehicle is purchased by the scrappage sponsor. The VEC should be obtained at a referee facility. Evaporative emissions by model year, as estimated by the most recent version of EPA's MOBILE Model, are added to the vehicles tailpipe emissions, if the vehicle fails the purge/pressure test.

Most owners of scrappage vehicles will replace their vehicle with a newer vehicle with much lower emissions. The emissions for the replacement vehicle must be accounted for in the credit calculation. The replacement vehicle is equal to the average fleet vehicle for that ozone nonattainment area as calculated from the most current auto registrations and the most recent version of the EPA MOBILE Model.

The final component in the mobile emissions reduction credit calculation is annual VMT. Annual VMT is determined by subtracting last year's odometer reading from the odometer reading at the time the vehicle is tested. Annual VMT is extrapolated if the difference does not represent a full 12 months.

The emission reduction in grams per year for each scrappage vehicle equals tailpipe emissions plus evaporative emissions minus estimated emissions for the replacement vehicle multiplied by VMT. The emission reduction (grams per mile) obtained by each

vehicle is converted to a mobile source emission reduction credit (MERC) expressed in tons per year. The MERC has a life of three years. It is discounted in year two and year three by 20% to account for vehicle attrition that would have occurred without the program.

The emission quantification methodology described above is replicated for each participating scrappage vehicle. The TNRCC Emissions Bank calculates the MERC value from the documentation provided by the scrappage dealer or sponsor. If the proper documentation is not provided, a vehicle could be disqualified by the bank and excluded from the MERC calculation. This would result in a lower MERC value than the actual emission reduction achieved. The modeled data inputs for the MERC calculation are updated annually by the TNRCC.

The staff of the Marketable Permits Section of the Air Policy Division will enforce the AVR. Scrappage Plans will be reviewed thoroughly so as to prevent a sponsor from mishandling vehicles, purchasing ineligible vehicles, or misinterpreting rule requirements. All documentation and MERC applications will be reviewed for completeness and accuracy. Each vehicle purchased must pass the eligibility criteria established by the rule, which will be determined by the documentation submitted with the MERC application. The TNRCC will randomly audit scrappage events to ensure compliance with the regulation. Scrapper certification

will also be determined and enforced by the Marketable Permits Section.

The Marketable Permits Section will also monitor, maintain records, and report on all scrappage activities through the TNRCC Emissions Bank. Copies of all the documentation required by the rule to verify residency, ownership, vehicle registration, emissions, the condition of the vehicle, and VMT will be on file at TNRCC. TNRCC will also keep records of any other documentation required to support the MERC calculation. The Marketable Permits staff will develop and maintain a data base of all scrappage vehicles and the credits generated. Annual reports of the AVRVP activity will be issued to the EPA.

The TNRCC has chosen to incorporate stricter requirements in the AVRVP program than necessary to account for any program uncertainty, to assure an environmental benefit when trading MERCs, and prevent any backsliding. The attrition rate has been set at 20%, as recommended by the EPA, rather than a lower rate which would be justified by the longer life of vehicles in the south. There are environmental benefits built in to all the uses of MERCs. The offset ratio for each nonattainment area is applied when MERCs are used as offsets. When MERCs are used to extend a compliance deadline of a new regulation for a specific emission point, the source must cover 100% of the emissions from that

emission point, not just the reduction that would have been achieved by the new regulation.

e) Emissions Tracking

(1) Annual Emission Statements from
Point Sources

Within three years after the date of the enactment of the FCAA Amendments of 1990, the state shall require that the owner or operator of each stationary source of NO_x emitting 25 TPY or greater, or VOC emitting 10 TPY or greater, provide the state with a statement of the actual emissions of NO_x or VOC from that source. Subsequent statements must be submitted to the state at least every year thereafter. These requirements have been incorporated into §101.10 of the General Rules.

(2) Periodic Emissions Inventories from
All Sources

No later than the end of each three-year period after the submission of the initial inventory, the state shall submit to the EPA Administrator a revised emissions inventory. This inventory shall be a comprehensive, accurate, and current inventory of actual emissions from all sources.

(3) Milestone

Six years after the date of the enactment of the FCAA Amendments of 1990 and at three-year intervals thereafter, the state must determine whether each serious or worse nonattainment area has achieved the required levels of emission reductions or milestones. Attainment of the milestones will be determined by means of a "compliance demonstration" required by §182(g)(2) of the FCAA Amendments of 1990. Compliance will be demonstrated by means of an area-wide inventory of actual emissions showing the required reduction. These demonstrations are due 90 days after each milestone.

If a state fails to meet a milestone compliance demonstration for any serious or severe area as required by §182(g)(2), the state must choose from three options: to be "bumped up" to the next highest classification, to implement additional control measures beyond those in the contingency plan which will already have been triggered and implemented in order to achieve the next milestone, or to adopt an economic incentive program.

f) Contingency Plan Requirements

The general requirements for nonattainment plans under §172(c)(9) of the FCAA Amendments of 1990 specify that each plan must contain additional measures that will take effect without further

rulemaking action by the state or EPA if an area either fails to meet any ROP requirements or to attain the NAAQS by the applicable date. States with moderate and above ozone nonattainment areas must include sufficient contingency measures in the November 1994 submittal which would, upon implementation, effect additional emissions reductions of up to 3.0% in the adjusted base year inventory within the following year.

After the TNRCC determines the rules required to meet at least a 9% net-of-growth requirement, contingency measures will be selected from the remaining set of rules proposed at the public hearings to obtain a minimum of 3.0% additional reduction. The contingency rules will be maintained in Chapter 115, except that a change in the rules concerning Counties and Compliance Schedule will reflect that the contingency rule will become effective whenever it is determined that a milestone has been missed and that the contingency measure is necessary to demonstrate the ROP target.

(1) Control Plans

All new rules will be proposed to be effective by November 15, 1999. The TNRCC will consider public testimony and refined emissions reduction estimates before determining which rules will be identified as contingency measures in each of the nonattainment

areas. If the contingency measures are needed, their compliance dates will then be changed to reflect this status.

(2) Contingency Trigger

The immediate (requiring no further rulemaking activity) implementation of contingency measures will be triggered by the failure to meet the ROP target or to attain the NAAQS by the applicable milestones.

If the TNRCC has an indication that one or more nonattainment areas has failed to make this or any milestone, it may choose to initiate implementation of all or a part of the 3.0% contingency measures prior to being notified by EPA. These rules will be derived from those controls identified in the control measure catalog, but not used in the 9% ROP reduction plan; or from other control measures identified by the TNRCC.

d. B/PA Ozone Control Strategy

1) General

a) Air Quality Analysis--Why These Reductions Are Needed

The 1990 Amendments to the FCAA classified the B/PA area as a Serious nonattainment area. The B/PA nonattainment area includes Hardin, Jefferson, and Orange Counties. The B/PA nonattainment area has an ozone design value of 0.16 ppm, which places the area in the serious classification. Currently, ozone air quality trends appear to be improving slowly. However, it is vital that further progress be made.

2) Estimated Emission Reductions

The Adjusted Base Year Emissions Inventory Relative to 1999 is 329.01 TPD. Table 13 summarizes the breakdown of emissions in the B/PA area by emission categories.

TABLE 13
Anthropogenic Emissions in the
Beaumont/Port Arthur Area

CATEGORY	AMOUNT IN TPD	PERCENTAGE
Point	245.60	74.65
Area	32.42	9.85
Non-Road Mobile	32.46	9.86
On-Road Mobile	18.53	5.63

a) Targeted Reductions

The 1990 FCAA Amendments specified several mandatory control measures for the B/PA nonattainment area. The first step was the

reduction of VOC by a minimum of 15% net-of-growth below the level calculated in the 1990 emissions inventory.

The following §§VI.B.7.a.2)b) and c) will detail the regulations and controls developed to enable B/PA to achieve the 9% reduction. Detailed information regarding each creditable control measure can be found in Appendix C.

b) Stationary and Area Source Controls
Toward 9% Reduction

Stationary or point sources in the B/PA nonattainment area account for 74.65% of the total anthropogenic emissions, the overwhelming majority of emissions. Area sources account for a further 9.85%. There are several federally mandated programs that will be creditable towards the 1994 ROP SIP, but additional measures may be needed in order for the B/PA area to meet its goal.

(3) New Control Measures to be
Implemented

Proposed rules will be included in the General Rules and Regulations IV and V (30 TAC Chapters 101, 114, and 115).

Table 14 identifies the estimated reductions toward the Post-96 ROP goal that are available for each control measure. This table is intended to identify options available to the state and is not intended to specify reduction targets for each category.

Table 14

ESTIMATED REDUCTIONS FOR 1994 ROP SIP: BEAUMONT/PORT ARTHUR			OCT 14, 1994	
EMISSIONS INVENTORY	1990	Percent	1999	Percent
Point Sources	245.6	74.66%	253.12	74.38%
Area Sources	32.36	9.84%	33.27	9.78%
On-Road Mobile Sources	18.53	5.63%	21.49	6.32%
Off-Road Mobile Sources	32.46	9.87%	32.41	9.52%
TOTAL	328.95		340.29	
ESTIMATED REDUCTIONS	1999 PROJ (TPOD)	CREDIT (TPOD)	% of REQUIRED	CUMULATIVE %
National Rules				
Architectural Coatings	1.13	0.28	0.68%	0.68%
HON	1.82	1.61	3.88%	4.56%
Aircraft Engines	0.02	0.01	0.02%	4.58%
Pulp and Paper MACT	2.30	2.07	4.98%	9.56%
Texas Alternative Fuel Fleet	21.49	0.03	0.06%	9.62%
Recreational Marine	11.67	0.02	0.05%	9.67%
Enhanced Monitoring	60.00	11.85	28.53%	38.19%
Existing Rules				
Util Engine Inv T/O 94-96	5.83	0.51	1.22%	39.42%
Utility Engine 97-99	11.15	2.16	5.19%	44.61%
UST Remediation	0.38	0.38	0.91%	45.52%
Stage I	2.92	0.85	2.04%	47.56%
Stage II	2.42	0.08	0.20%	47.76%
TCM'S	21.49	0.00	0.00%	47.76%
Tier I, I/M,	21.49	1.09	2.63%	50.38%
RE Floating Tanks	68.28	25.85	62.26%	112.64%
SUBTOTAL		46.77	112.64%	112.64%
Contingency Rules				
Clean Fuel Fleet (2000)	21.49	0.03	0.07%	112.71%
Recreational Marine (2000)	11.67	0.09	0.22%	112.93%
Utility Engines (2000)	11.15	0.21	0.51%	113.44%
Marine Vessel Loading	13.10	10.02	24.14%	137.58%
Industrial Wastewater	5.11	3.68	8.86%	146.44%
SUBTOTAL		14.04	33.81%	146.44%
TOTAL		60.80	146.44%	146.44%
TARGET		41.52		
IDENTIFIED REDUCTION		60.80		
EXCESS (SHORTFALL)		19.28		
TARGET + CONTINGENCY		51.39		
EXCESS (SHORTFALL)		9.41		

c) Mobile Source Controls

(1) Vehicle I/M Program

The B/PA nonattainment area subject to I/M is defined by Orange and Jefferson Counties. A test-only, managing contractor-operated, basic I/M program will be conducted.

All 1968 and newer model year light-duty vehicles and light-duty trucks will be subject to a two-speed (loaded-mode) and pressure test and a visual two-point antitampering check (catalytic converter and inlet restrictor). Exhaust gas testing for HC, CO, and CO₂ is required.

All heavy-duty trucks will be subject to a preconditioned two-speed idle and pressure test and a visual two-point antitampering check (if factory equipped with catalytic converter and inlet restrictor). Exhaust gas testing for HC, CO, and CO₂ is required.

Dedicated four-wheel drive vehicles, meaning any constant four-wheel drive vehicle which cannot be converted to two-wheel drive, except by removing one of the vehicle's drive shafts, shall be subject to a preconditioned two-speed idle test.

The TNRCC will monitor and evaluate the B/PA program by analysis of information provided regarding program activities performed and their final outcomes, including summary statistics and effectiveness evaluations of the enforcement mechanism, the quality assurance system, the quality control program, and the testing element.

(2) Reformulated Gasoline and Clean
Alternative Fuels

RFG is not being considered as a control measure for the general public in B/PA.

Provisions of the 1990 FCAA Amendments created the Federal Clean Fuel Fleet (FCFF) program. The program affects all private and public fleets in the serious, severe, and extreme nonattainment areas with 10 or more vehicles. The affected fleets are required to ensure that percentages of their purchases, starting in 1998, reach a minimum of the low-emission vehicle (LEV) standards, using clean fuels (natural gas, propane, methanol, ethanol, electricity, RFG, and low-sulfur diesel). The FCFF program gave states the option of opting-out to implement a substitute program, provided that it demonstrates equivalent reductions to those resulting from the federal program. Texas chose to opt-out of the federal program to implement the Texas Alternative Fuel

Fleet (TAFF) program, which was adopted by the TNRCC on July 6, 1994.

Under the final rule, fleets already covered by state alternative fuels legislation, Senate Bills 769, 740, and 7, will continue to comply with those requirements. However, beginning September 1, 1998, all vehicles purchased, leased, or otherwise acquired by these fleets must be certified to meet or exceed the LEV standards.

In addition, local government and private fleets, as well as school districts with 15 or more but less than 50 vehicles, can comply with the program either by satisfying the new purchase requirement, or by ensuring that certain percentages of their fleets meet the LEV standards, in accordance with the following schedule: 30 percent by September 1, 1998; 50 percent by September 1, 2000; and 90 percent by September 1, 2002. Alternatively fueled vehicles acquired before September 1, 1998, can be used toward compliance provided that the vehicles meet the federal Tier 1 emission standards and do not exceed 30 percent of the fleet on September 1, 1998.

All fleets, including those covered by state law (mass transit, state, and school districts of more than 50 buses), must comply with the above requirements using state approved alternative fuels. These fuels include natural gas, propane, methanol,

ethanol, and electricity. In addition, local government and private fleets, as well as school district fleets with 15 or more but less than 50 vehicles, can comply with the above requirements using RFG, provided that their vehicles are certified to use RFG and meet or exceed the required minimum standards. The TNRCC's intent behind this program is to provide these fleets with as much flexibility as possible in their efforts to comply, as well as to demonstrate equivalency with federal requirements.

3) Evidence of Attainment

The B/PA nonattainment area will be required to show evidence of attainment of the NAAQS on November 15, 1999. Evidence of attainment will be based on monitoring data from 1997, 1998, and 1999.

4) Contingency Plan

The B/PA nonattainment area will be required to develop a contingency plan. This plan would provide for the implementation of an additional 3.0% emission reduction of VOC should the area fail to make any of its milestone demonstrations. These contingency measures would have to be implemented without any further rule-making activity. For a discussion of contingency plans, see §VI.B.7.a.4)d)(2). For a general discussion of control measures, see §VI.B.7.a.4)b)(1)(c)(i), (ii), and (iii). The estimated

emissions reductions available for each potential contingency measure in the B/PA nonattainment area can be found in Table 13.

e. H/G Ozone Control Strategy

1) General

a) Air Quality Analysis--Why These Reductions Are Needed

The 1990 Amendments to the FCAA classified the H/G area as a Severe II nonattainment area. The H/G nonattainment area includes the counties of Brazoria, Fort Bend, Galveston, Harris, Liberty, Montgomery, Waller, and Chambers. The H/G nonattainment area has an ozone design value of 0.22 ppm, which places the area in the Severe II classification. Currently, ozone air quality remains substantially above the standard in the H/G nonattainment area. Therefore, it is vital that further progress be made.

2) Estimated Emission Reductions

The Adjusted Base Year Emissions Inventory Relative to 1999 for the H/G nonattainment area is 1,056.11 TPD. Table 15 summarizes the breakdown of emissions in the H/G area by emission categories.

TABLE 15

Anthropogenic Emissions in the
Houston/Galveston Area

CATEGORY	AMOUNT IN TPD	PERCENTAGE
Point	480.34	45.48%
Area	227.65	21.56%
Non-Road Mobile	195.11	18.47%
On-Road Mobile	153.01	14.49%

a) 9% Targeted Reductions

The 1990 FCAA Amendments specified several mandatory control measures for the H/G nonattainment area. The first step was the reduction of VOC by a minimum of 15% net-of-growth below the level calculated in the 1990 emissions inventory.

The following §§VI.B.7.b.2)b) and c) will detail the regulations and controls developed to enable H/G to achieve the 9% reduction. Detailed information regarding each creditable control strategy can be found in Appendix C.

b) Stationary and Area Source Controls

Toward 9% Reduction

Stationary or point sources in the H/G nonattainment area account for 45.48% of the total anthropogenic emissions. Area sources account for 21.56%. There are several federally mandated programs that will be creditable towards the Post-96 ROP SIP, but additional measures will be needed in order for the H/G area to meet its goal.

(3) New Control Measures to be Implemented

Proposed rules will be included in the General Rules and Regulations IV and V (30 TAC Chapters 101, 114, and 115).

Table 16 shows the estimated reductions toward the 1994 ROP goal that are available for each control measure.

Table 16

ESTIMATED REDUCTIONS FOR 1994 ROP SIP: HOUSTON/GALVESTON

OCT 14, 1994

EMISSIONS INVENTORY	1990	Percent	1999	Percent
Point Sources	480.34	45.48%	512.39	44.45%
Area Sources	227.65	21.56%	252.46	21.90%
On-Road Mobile Sources	153.01	14.49%	171.08	14.84%
Off-Road Mobile Sources	195.11	18.47%	216.85	18.81%
TOTAL	1056.11		1152.78	

ESTIMATED REDUCTIONS	1999 PROJ (TPOD)	CREDIT HGA (TPOD)	% of REQUIRED	CUMULATIVE %
National Rules				
Architectural Coatings	12.53	3.13	2.94%	2.94%
HON	0.53	0.47	0.44%	3.38%
Aircraft Engines	2.43	0.97	0.91%	4.29%
Pulp and Paper MACT	9.18	8.26	7.75%	12.04%
Texas Alternative Fuel Fleet	171.08	0.51	0.48%	12.52%
Recreational Marine	76.18	0.15	0.14%	12.66%
Enhanced Monitoring	215.51	46.77	43.87%	56.53%
Existing Rules				
Util Engine Inv T/O 94-96	52.20	4.54	4.26%	60.79%
Utility Engine 97-99	92.99	16.65	15.62%	76.40%
UST Remediation	2.05	2.05	1.92%	78.33%
Stage I	12.36	6.40	6.01%	84.33%
Stage II	21.02	0.72	0.68%	85.01%
TCM'S	171.08	0.00	0.00%	85.01%
Tier I, I/M,	171.08	14.19	13.31%	98.32%
RFG - Tanks	N/A	2.45	2.30%	100.62%
RFG - Loading Racks	N/A	3.76	3.53%	104.15%
RE Floating Tanks	70.96	26.86	25.20%	129.35%
SUBTOTAL		137.89	129.35%	
Contingency Rules				
Clean Fuel Fleet (2000)	171.08	0.60	0.56%	129.91%
Recreational Marine (2000)	68.21	0.61	0.57%	130.48%
Utility Engines (2000)	92.99	1.77	1.66%	132.14%
SUBTOTAL		2.97	2.79%	
TOTAL		140.86	132.14%	132.14%
TARGET		106.60		
IDENTIFIED REDUCTION		140.86		
EXCESS (SHORTFALL)		34.26		
TARGET + CONTINGENCY		138.28		
EXCESS (SHORTFALL)		2.58		

c) Mobile Source Controls

(1) Transportation Control Measures

(TCM)

A TCM program is mandated for the H/G nonattainment area. Several measures are being considered for implementation in the area. These measures include: land use densification, mixed land use development, pedestrian improvements, traffic signal timing improvements, college traffic management, K-12 school traffic management, employee transit pass subsidy, non-metro service area transit, fixed commuter rail, bicycle improvements, trip reduction ordinances, ridesharing, parking management, telecommuting, flexible work hours, compressed work week, gasoline tax/cost increase, emission pricing, roadway pricing, motorist information system, incident management, special events management, control of truck movements. Measures scheduled to be implemented include: high occupancy vehicle lanes, arterial traffic flow improvements, park-and-ride lots, transit service improvements, area-wide rideshare, and intelligent vehicle highway systems.

(2) Employer Trip Reduction (ETR)

An ETR program is proposed for the H/G nonattainment area. This mandatory program is designed to encourage ridership in

carpools, vanpools, and public transit, and increase vehicle ridership by 25% among employers of more than 100 employees.

(3) Vehicle Inspection/Maintenance

(I/M) Program

The program will begin full testing on January 1, 1995. The TNRCC may initiate testing with less stringent cutpoints in 1995 than will be required in 1998. All 1968 to 1983 model year light-duty vehicles and light-duty trucks will be subjected to a two-speed (loaded mode) and pressure test and a visual two-point antitampering check. Exhaust gas testing for HC, CO, and CO₂ is required.

All 1984 and newer model year light-duty vehicles and light-duty trucks will be subject to IM240, pressure and purge testing, and a visual two-point antitampering check. Exhaust gas testing for HC, CO, CO₂, and NO_x is required.

All heavy-duty trucks will be subject to a preconditioned two-speed idle and pressure test and a visual two-point antitampering check (if factory equipped with catalytic convertor and inlet restrictor). Exhaust gas testing for HC, CO, and CO₂ is required.

Dedicated four-wheel drive vehicles, meaning constant four-wheel drive vehicle which cannot be converted to two-wheel drive, except by removing one of the vehicle's drive shafts, shall be subject to a preconditioned two-speed idle test.

The pass/fail determination for the emissions test is made based on a comparison of the HC, CO, and NO_x readings to emission standards selected for that particular vehicle.

(4) RFG and Clean Alternative Fuels

Beginning on January 1, 1995, only RFG will be marketed in the H/G nonattainment area. This type of fuel has significant air quality benefits for both on-road and non-road gasoline engines.

Provisions of the 1990 Amendments of the FCAA created the FCFE program. The program affects all private and public fleets in the serious, severe, and extreme non-attainment areas with 10 or more vehicles. The affected fleets are required to ensure that percentages of their purchases, starting in 1998, reach a minimum of the LEV standards, using clean fuels (natural gas, propane, methanol, ethanol, electricity, RFG, and low-sulfur diesel). The FCFE program gave states the option of opting-out to implement a substitute program, provided that it demonstrates equivalent reductions to those resulting from the federal program. Texas

chose to opt-out of the federal program to implement the TAFF program, which was adopted by the TNRCC on July 6, 1994.

Under the final rule, fleets already covered by state alternative fuels legislation, Senate Bills 769, 740, and 7, will continue to comply with those requirements. However, beginning September 1, 1998, all vehicles purchased, leased, or otherwise acquired by these fleets must be certified to meet or exceed the LEV standards.

In addition, local government and private fleets, as well as school districts with 15 or more but less than 50 vehicles, can comply with the program either by satisfying the new purchase requirement, or by ensuring that certain percentages of their fleets meet the LEV standards, in accordance with the following schedule: 30 percent by September 1, 1998; 50 percent by September 1, 2000; and 90 percent by September 1, 2002. Alternatively fueled vehicles acquired before September 1, 1998, can be used toward compliance provided that the vehicles meet the federal Tier 1 emission standards and do not exceed 30 percent of the fleet on September 1, 1998.

All fleets, including those covered by state law (mass transit, state, and school districts of more than 50 buses), must comply with the above requirements using state approved alternative fuels. These fuels include natural gas, propane, methanol,

ethanol, and electricity. In addition, local government and private fleets, as well as school district fleets with 15 or more but less than 50 vehicles, can comply with the above requirements using RFG, provided that their vehicles are certified to use RFG and meet or exceed the required minimum standards. The TNRCC's intent behind this program is to provide these fleets with as much flexibility as possible in their efforts to comply, as well as to demonstrate equivalency with federal requirements.

3) Evidence of Attainment

The H/G nonattainment area will be required to show evidence of attainment of the NAAQS by November 15, 2007. Evidence of attainment will be based on monitoring data from 2005, 2006, and 2007.

4) Contingency Plan

The H/G nonattainment area will be required to develop a contingency plan. This plan would provide for the implementation of an additional 3.0% emission reduction of VOC, should the area fail to make any of its milestone demonstrations. These contingency measures would have to be implemented without any further rule-making activity. For a discussion of contingency plans, see §VI.B.7.a.4)d) (2). The estimated emissions reductions available

for each potential contingency measure in the H/G nonattainment area can be found in Table 17.

8. SOCIAL AND ECONOMIC CONSIDERATIONS OF THE PLAN

a.-g. (No change.)

h. Evaluation of the Post-96 ROP SIP Revisions (New.)

Extensive efforts were made to analyze the social and economic impacts of controls before they were proposed in this SIP revision. Cost per ton of VOC reduced is the most heavily weighted factor in the CMC ranking of control measures. In addition, the preambles published with each new rule revision to TNRCC Chapter 115 describe the economic impacts of the proposed controls, and each rule has been subjected to cost-benefit analysis by TNRCC's Budget and Finance Office.

9. FISCAL AND MANPOWER RESOURCES

Table 17 details the projected growth of the TNRCC's Office of Air Quality for budget and staffing requirements from 1994 to 2000.

Projected Growth of TNRCC Office of Air Quality Budget and Staffing: 1996-2000

Table 17

ORGANIZATIONAL PROGRAM	1996 STAFF	1996 DOLLARS	1998 STAFF	1998 DOLLARS	2000 STAFF	2000 DOLLARS
Air Policy	24	\$2,727,143	25	\$2,863,500	26	\$3,006,675
Permits	340	15,142,186	357	15,899,295	374	16,694,260
Air Quality Planning	132	6,344,777	139	6,662,016	146	6,995,117
Monitoring Operations	136	7,645,736	143	8,028,023	150	8,429,424
Enforcement	107	4,476,327	112	4,700,143	118	4,935,151
Mobile Sources	70	7,066,630	74	7,419,962	78	7,790,960
Legal & Regulatory Services	325	13,413,663	341	14,084,346	358	14,788,563
Environmental Training	14	583,185	14	612,344	15	642,961
Petroleum Storage Tank	6	249,204	6	261,664	6	274,747
Small Business Advocate	11	453,259	11	475,922	11	499,718
Small Business Tech. Assist.	13	547,808	13	575,198	14	603,958
Administration	120	18,353,816	125	19,271,507	130	20,235,082
TOTAL	1298	\$77,003,734	1360	\$80,853,921	1426	\$84,896,617
Estimated Employee Benefits		14,000,000		14,700,000		15,435,000
TOTAL (incl.empl.benfs.)	1298	\$91,003,734	1360	\$95,553,921	1426	\$100,331,617

(Estimated September, 1994)

87

10. HEARING REQUIREMENTS

a.-e. (No change.)

f. Public Hearings for Post-96 ROP SIP Revisions (New.)

Table 18 lists the public hearings that were conducted in each of the nonattainment areas regarding the Post-96 ROP SIP.

TABLE 18

Public Hearings for the 9% Rate-of-Progress SIP

NONATTAINMENT AREA	DATE	TIME	LOCATION
Houston/ Galveston	Sept 2, 1994	12:00pm	Houston-Galveston Area Council
Beaumont/ Port Arthur	Sept 1, 1994	7:00pm	John Grey Institute