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

EIGHT-HOUR OZONE REDESIGNATION REQUEST AND MAINTENANCE PLAN
FOR THE
BEAUMONT-PORT ARTHUR OZONE NONATTAINMENT AREA

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
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EXECUTIVE SUMMARY

On April 15, 2004, the United States Environmental Protection Agency (EPA) designated the Beaumont-Port Arthur (BPA) area (Hardin, Jefferson, and Orange Counties) as a marginal nonattainment area under the 1997 eight-hour ozone National Ambient Air Quality Standard (NAAQS). Under the marginal nonattainment designation, the BPA area was given until June 15, 2007, to attain the standard or face reclassification to moderate nonattainment of the NAAQS. The BPA area did not monitor attainment of the 1997 eight-hour ozone NAAQS by the June 15, 2007, deadline (based on data from the three years prior, 2004, 2005, and 2006). As a result, the EPA reclassified the area to moderate nonattainment for eight-hour ozone, effective April 17, 2008.

Though the area was reclassified, eight-hour ozone data for 2005, 2006, and 2007 indicate that BPA is monitoring attainment of the NAAQS with a design value (DV) of 83 parts per billion (ppb). Therefore, the Texas Commission on Environmental Quality (TCEQ) is seeking redesignation of the BPA area under Section 107(d)(3)(E) of the Federal Clean Air Act (FCAA), which states that the EPA can redesignate an area to attainment if all of the following conditions are met.

- The EPA has determined that the NAAQS have been attained.
- The applicable implementation plan has been fully approved by the EPA under the FCAA, Section 110(k).
- The EPA has determined that the improvement in air quality is due to permanent and enforceable reductions in emissions.
- The state has met all applicable requirements for the area under the FCAA, Section 110 and Part D.
- The EPA has fully approved a maintenance plan, including a contingency plan, for the area under Section 175A of the FCAA.

The EPA guidance recommends that states seeking redesignation of a nonattainment area consider the following provisions in their maintenance plan:[1]

- attainment inventory;
- maintenance demonstration;
- verification of continued attainment;
- monitoring network; and
- contingency plan.

With this SIP revision, the TCEQ is submitting a request that the BPA area be redesignated to attainment for the eight-hour ozone standard and that the EPA approve the maintenance plan that will ensure the BPA area remains in attainment of the 1997 eight-hour ozone NAAQS through 2021.

[1] USEPA: "Proceedures for Processing Requests to Redesignate Areas to Attainment" Memorandum from John Calcagni, Director, Air Quality Management Division, September 4, 1992.

SECTION V: LEGAL AUTHORITY

A. General

The TCEQ has the legal authority to implement, maintain, and enforce the National Ambient Air Quality Standards (NAAQS).

The first air pollution control act, known as the Clean Air Act of Texas, was passed by the Texas Legislature in 1965. In 1967, the Clean Air Act of Texas was superseded by a more comprehensive statute, the Texas Clean Air Act (TCAA), found in Article 4477-5, Vernon's Texas Civil Statutes. The Legislature amended the TCAA in 1969, 1971, 1973, 1979, 1985, 1987, 1989, 1991, 1993, 1995, 1997, 1999, 2001, 2003, 2005, and 2007. In 1989, the TCAA was codified as Chapter 382 of the Texas Health & Safety Code.

Originally, the TCAA stated that the Texas Air Control Board (TACB) is the state air pollution control agency and is the principal authority in the state on matters relating to the quality of air resources. In 1991, the legislature abolished the TACB effective September 1, 1993, and its powers, duties, responsibilities, and functions were transferred to the Texas Natural Resource Conservation Commission (TNRCC). With the creation of the TNRCC, the authority over air quality is found in both the Texas Water Code and the TCAA. Specifically, the authority of the TNRCC is found in Chapters 5 and 7. Chapter 5, Subchapters A - F, H - J, and L, include the general provisions, organization, and general powers and duties of the TNRCC, and the responsibilities and authority of the executive director. This chapter also authorizes the TNRCC to implement action when emergency conditions arise and to conduct hearings. Chapter 7 gives the TNRCC enforcement authority. In 2001, the 77th Texas Legislature continued the existence of the TNRCC until September 1, 2013, and changed the name of the TNRCC to the Texas Commission on Environmental Quality (TCEQ).

The TCAA specifically authorizes the TCEQ to establish the level of quality to be maintained in the state's air and to control the quality of the state's air by preparing and developing a general, comprehensive plan. The TCAA, Subchapters A - D, also authorize the TCEQ to collect information to enable the commission to develop an inventory of emissions; conduct research and investigations; enter property and examine records; prescribe monitoring requirements; institute enforcement proceedings; enter into contracts and execute instruments; formulate rules; issue orders taking into consideration factors bearing upon health, welfare, social and economic factors, and practicability and reasonableness; conduct hearings; establish air quality control regions; encourage cooperation with citizens' groups and other agencies and political subdivisions of the state as well as with industries and the federal government; and establish and operate a system of permits for construction or modification of facilities.

Local government authority is found in Subchapter E of the TCAA. Local governments have the same power as the TCEQ to enter property and make inspections. They also may make recommendations to the commission concerning any action of the TCEQ that affects their territorial jurisdiction, may bring enforcement actions, and may execute cooperative agreements with the TCEQ or other local governments. In addition, a city or town may enact and enforce ordinances for the control and abatement of air pollution not inconsistent with the provisions of the TCAA or the rules or orders of the commission.

Subchapters G and H of the TCAA authorize the TCEQ to establish vehicle inspection and maintenance programs in certain areas of the state, consistent with the requirements of the federal Clean Air Act; coordinate with federal, state and local transportation planning agencies to develop and implement transportation programs and measures necessary to attain and maintain the NAAQS; establish gasoline volatility and low emission diesel standards; and fund and authorize participating counties to implement vehicle repair assistance, retrofit and accelerated vehicle retirement programs.

B. Applicable Law

The following statutes and rules provide necessary authority to adopt and implement the SIP. The rules listed below have previously been submitted as part of the SIP.

Statutes

TEXAS HEALTH & SAFETY CODE, Chapter 382	September 1, 2007
TEXAS WATER CODE	September 1, 2007

All sections of each subchapter are included, unless otherwise noted.

Chapter 5: Texas Natural Resource Conservation Commission
Subchapter A: General Provisions
Subchapter B: Organization of the Texas Natural Resource Conservation Commission
Subchapter C: Texas Natural Resource Conservation Commission
Subchapter D: General Powers and Duties of the Commission
Subchapter E: Administrative Provisions for Commission
Subchapter F: Executive Director (except §§ 5.225, 5.226, 5.227, 5.2275, 5.231, 5.232, and 5.236)
Subchapter H: Delegation of Hearings
Subchapter I: Judicial Review
Subchapter J: Consolidated Permit Processing
Subchapter L: Emergency and Temporary Orders (§§ 5.514, 5.5145 and 5.515 only)

Chapter 7: Enforcement
Subchapter A: General Provisions (§§ 7.001, 7.002, 7.00251, 7.0025, 7.004, 7.005 only)
Subchapter B: Corrective Action and Injunctive Relief (§ 7.032 only)
Subchapter C: Administrative Penalties
Subchapter D: Civil Penalties (except § 7.109)
Subchapter E Criminal Offenses and Penalties: §§ 7.177, 7.179-7.183

Rules

All of the following rules are found in Title 30 Texas Administrative Code, as of the following effective dates:

Chapter 7, Memoranda of Understanding, §§ 7.110 and 7.119	May 2, 2002
Chapter 19, Electronic Reporting	March 1, 2007
Chapter 35, Subchapters A-C, K: Emergency and Temporary Orders and Permits; Temporary Suspension or Amendment of Permit Conditions	July 20, 2006

Chapter 39, Public Notice, §§ 39.201; 39.401; 39.403(a) and (b)(8)-(10); 39.405(f)(1) and (g);39.409; 39.411 (a), (b)(1)-(6) and (8)-(10) and (c)(1)-(6) and (d); 39.413(9), (11), (12) and (14); 39.418(a) and (b)(3) and (4); 39.419(a), (b),(d) and (e); 39.420(a), (b) and (c)(3) and (4); 39.423 (a) and (b); 39.601; 39.602; 39.603; 39.604; and 39.605	March 29, 2006
Chapter 101: General Air Quality Rules	August 16, 2007
Chapter 106: Permits by Rule, Subchapter A	June 30, 2004
Chapter 111: Control of Air Pollution from Visible Emissions and Particulate Matter	July 19, 2006
Chapter 112: Control of Air Pollution from Sulfur Compounds	July 16, 1997
Chapter 113: Standards of Performance for Hazardous Air Pollutants and for Designated Facilities and Pollutants	December 27, 2007
Chapter 114: Control of Air Pollution from Motor Vehicles	January 6, 2008
Chapter 115: Control of Air Pollution from Volatile Organic Compounds	July 19, 2007
Chapter 116: Permits for New Construction or Modification	January 10, 2008
Chapter 117: Control of Air Pollution from Nitrogen Compounds	June 14, 2007
Chapter 118: Control of Air Pollution Episodes	March 5, 2000
Chapter 122, § 122.122: Potential to Emit	December 11, 2002
Chapter 122, § 122.215: Minor Permit Revisions	June 3, 2001
Chapter 122, § 122.216: Applications for Minor Permit Revisions	June 3, 2001
Chapter 122, § 122.217: Procedures for Minor Permit Revisions	December 11, 2002
Chapter 122, § 122.218: Minor Permit Revision Procedures for Permit Revisions Involving the Use of Economic Incentives, Marketable Permits, and Emissions Trading	June 3, 2001

LIST OF ACRONYMS

ACT -- Alternative Control Techniques
AF -- Air-to-Fuel
APU -- Auxiliary Power Units
ARPDB -- Acid Rain Program Data Base
ATCM – Airborne Toxic Control Measure
auto-GC -- Automated Gas Chromatograph
BACT -- Best Available Control Technology
BCCA-AG -- Business Coalition for Clean Air-Appeal Group
BMP -- Best Management Practices
BPA -- Beaumont-Port Arthur
Btu/hr -- British Thermal Units per Hour
Btu/scf -- British Thermal Units per Square Cubic Feet
CAE -- Cetane Additive Enhanced Diesel Fuel
CAIR -- Clean Air Interstate Rule
CAMS – Continuous Air Monitoring Station
CAMx -- Comprehensive Air Model with Extensions
CARB -- California Air Resources Board
CBD -- Houston's Central Business District
CFFP – Clean Fuel Fleet Program
CFV – Clean Fuel Vehicle
CFR -- Code of Federal Regulations
CMAQ -- Congestion Mitigation and Air Quality
CO -- Carbon Monoxide
CTG -- Control Technique Guidelines
DECS -- Diesel Emission Control Strategy
DERC -- Discrete Emission Reduction Credits
DFW -- Dallas-Fort Worth
DMA – Marine Distillate fuel A
DMX – Marine Distillate fuel X
DPM -- Diesel Particulate Matter
DRRP -- Diesel Risk Reduction Program
DV -- Design Value
DVc -- Current Design Value
DVf -- Future Design Value
EAC -- Early Action Compact
EDMS -- Emissions and Dispersion Modeling System
E-GRID-2007 -- Emissions and Generation Resource Integrated Database
EE/RE -- Energy Efficiency/Renewable Energy
EGAS -- Economic Growth Analysis System
EGF -- Electric Generating Facilities
EGU -- Electric Generating Units
EI -- Emissions Inventory
EPA -- United States Environmental Protection Agency
EPS3 -- Emissions Processing System, version 3
ERC -- Emission Reduction Credits
ERCOT -- Electric Reliability Council of Texas
ESAD -- Emission Specification for Attainment Demonstration
ESL -- Energy Systems Laboratory, the Texas A&M University System
F -- Fahrenheit
FAA -- Federal Aviation Administration
FCAA -- Federal Clean Air Act

FCV -- Fuel Cell Vehicle
FGR -- Flue Gas Recirculation
FHWA -- Federal Highway Administration
FR -- Federal Register
FT -- Fischer-Tropsch Diesel Fuel
GIS -- Geographic Information System
GloBEIS -- Global Biosphere Emissions and Interactions System
gpm -- Gallons per Minute
GTM -- Gross Ton Mile
HAP -- Hazardous Air Pollutant
HARC -- Houston Advanced Research Center
HDT -- Heavy-Duty Truck
HECT -- Highly-Reactive Volatile Organic Compound Emissions Cap and Trade Program
HGB -- Houston-Galveston-Brazoria
H-GAC -- Houston-Galveston Area Council
HOV -- High Occupancy Vehicle
hp -- Horsepower
HPMS -- Highway Performance Monitoring System
HRVOC -- Highly-Reactive Volatile Organic Compound
HSC -- Houston Ship Channel
IC -- Internal Combustion
ICI -- Industrial, Commercial, and Institutional
IECC -- International Energy Conservation Code
I/M -- Inspection and Maintenance
km -- Kilometer
K_{VS} -- Vertical Exchange Coefficient
LAER -- Lowest Achievable Emission Rate
lb/MMBtu -- Pound per Million British Thermal Units
LDAR -- Leak Detection and Repair
LDIR -- Light Detection and Ranging
LDEQ -- Louisiana Department of Environmental Quality
LDGV -- Light-Duty Gasoline Vehicle
LDT -- Light-Duty Truck
LDV -- Light-Duty Vehicle
LED -- Low Emission Diesel
LEV -- Low Emission Vehicle
LEV II -- California's Low Emission Vehicle II Program
LIRAP -- Low Income Repair and Assistance Program
LNB -- Low Nitrogen Oxides (NO_X) Burners
LNC -- Low Nitrogen Oxides (NO_X) Combustors
LNG -- Liquefied Natural Gas
LTO -- Landing and Take-Off
MACT -- Maximum Achievable Control Technology
Mcf -- Thousand Cubic Feet
MCR -- Mid-Course Review
MDPV -- Medium-Duty Passenger Vehicle
MECT -- Mass Emissions Cap and Trade Program
MGO – Marine Gas Oil
MM5 -- Fifth Generation Meteorological Model
MMBtu/hr -- Million British Thermal Units per Hour
MMcf -- Million Cubic Feet
MMS -- Minerals Management Service
MOA -- Memorandum of Agreement

MON -- Miscellaneous Organic National Emission Standards for Hazardous Air Pollutants (NESHAP)
mph -- miles per hour
MVEB -- Motor Vehicle Emissions Budget
MW -- Megawatts
MY -- Model Year
NAAQS -- National Ambient Air Quality Standard
NEGF -- Non-Electric Generating Facility
NEI -- National Emissions Inventory
NESHAP -- National Emission Standards for Hazardous Air Pollutants
ng/J -- Nanogram per Joule
NMIM -- National Mobile Inventory Model
NOAA -- National Oceanic and Atmospheric Administration
NO_X -- Nitrogen Oxides
NO_y -- Nitrogen Species
NSCR -- Non-Selective Catalytic Reduction
NTRD -- New Technology Research and Development Program
O_3 -- Ozone
OGV -- Ocean-Going Vessel
PAYD -- Pay As You Drive
PBL -- Planetary Boundary Layer
PEI -- Periodic Emissions Inventory
PERP -- Portable Engine Registration Program
PiG -- Plume-in-Grid
PM -- Particulate Matter
$PM_{2.5}$ -- Particulate Matter less than 2.5 microns
ppb -- Parts Per Billion
ppbC -- Parts Per Billion Carbon
ppbv -- Parts Per Billion by Volume
ppm -- Parts Per Million
PSCF -- Potential Source Contribution Factors
PSDB -- Point Source Database
psia -- Pounds per Square Inch Absolute
PUC -- Public Utility Commission
RACT -- Reasonably Available Control Technology
RACM -- Reasonably Available Control Measure
RFP -- Reasonable Further Progress
RMSE -- Root Mean Square Error
ROP -- Rate-of-Progress
RRF -- Relative Reduction Factor
SB -- Senate Bill
SCAQMD -- South Coast Air Quality Management District
scfm -- Square Cubic Feet per Minute
SCR -- Selective Catalytic Reduction
SEP -- Supplemental Environmental Programs
SETPMTC -- Southeast Texas Photochemical Modeling Technical Committee
SIC -- Standard Industrial Classification
SIP -- State Implementation Plan
SNCR -- Selective Non-Catalytic Reduction
SOV -- Single Occupancy Vehicle
STP -- Surface Transportation Program
SWCV -- Solid Waste Collection Vehicle
TAC -- Texas Administrative Code

TACB -- Texas Air Control Board
TCAA -- Texas Clean Air Act
TCEQ -- Texas Commission on Environmental Quality (commission)
TCM -- Transportation Control Measure
TDM -- Travel Demand Model
TERP -- Texas Emission Reduction Plan
TexAQS 2000 -- Texas Air Quality Study 2000
TexAQS II -- Texas Air Quality Study 2006
TKE -- Turbulent Kinetic Energy
TNMHC -- Total Nonmethane Hydrocarbon
TNRCC -- Texas Natural Resource Conservation Commission
tpd -- tons per day
tpy -- tons per year
TSE -- Truck Stop Electrification
TTI -- Texas Transportation Institute
TUC -- Texas Utility Code
TxDOT -- Texas Department of Transportation
TxLED -- Texas Low Emission Diesel
USC -- United States Code
VMEP -- Voluntary Mobile Source Emissions Reduction Program
VMT -- Vehicle Miles Traveled
VOC -- Volatile Organic Compound
VRU -- Vapor Recovery Unit
ZEB -- Zero Emission Bus
ZEV -- Zero Emissions Vehicle

BEAUMONT-PORT ARTHUR EIGHT-HOUR OZONE REDESIGNATION REQUEST AND MAINTENANCE PLAN

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CHAPTER 1: GENERAL

1.1 BACKGROUND AND INTRODUCTION

1.1.1 Purpose of Plan

The Texas Commission on Environmental Quality (TCEQ) is seeking redesignation of the Beaumont-Port Arthur (BPA) area to attainment for the eight-hour ozone standard under Section 107(d)(3)(E) of the Federal Clean Air Act (FCAA), which states that the United States Environmental Protection Agency (EPA) can redesignate an area to attainment if all of the following conditions are met.

- The EPA has determined that the NAAQS have been attained.
- The applicable implementation plan has been fully approved by the EPA under Section 110(k) of the FCAA.
- The EPA has determined that the improvement in air quality is due to permanent and enforceable reductions in emissions.
- The state has met all applicable requirements for the area under Section 110 and Part D of the FCAA.
- The EPA has fully approved a maintenance plan, including a contingency plan, for the area under Section 175A of the FCAA.

The purpose of this state implementation plan (SIP) revision is to address all of the above requirements, including submittal of an eight-hour ozone maintenance plan that will fulfill the requirements under Section 107(d)(3)(E) of the FCAA and ensure the BPA area continues to attain the 1997 eight-hour ozone standard through the horizon year 2021. This revision includes a commitment to submit a second ten-year maintenance plan in eight years as required by the EPA, i.e., two years before the end of the first ten-year maintenance plan period.

This revision will also address two outstanding one-hour ozone requirements not met through the 1997 Eight-Hour Ozone Attainment Demonstration for the Beaumont-Port Arthur Ozone Nonattainment Area adopted by the commission on September 28, 2005. The outstanding requirements are described below.

(1) Clean-Fuel Vehicle Programs under Section 182(c)(4) of the FCAA

The 2005 BPA Eight-Hour Ozone Attainment Demonstration SIP revision, Section 5.3.2: *Clean-Fuel Vehicle Programs* states that emissions reduced by the federal Tier 2 standards for all light-duty vehicles with model years of 2004 or later and federal heavy duty diesel engine (HDDE) standards far surpass the emissions reductions that would be expected from implementation of federal Clean-Fuel Vehicle Programs in the BPA area. Therefore, the emission reductions from these federal rules are sufficient to cover any shortfall from the repeal of the Texas Clean Fleet program, the EPA approved version of the Clean-Fuel Vehicle Program. The EPA has since indicated that emission reductions from a federal rule cannot replace those from the Clean-Fuel Vehicle Program, and that the TCEQ must find an alternative state rule to replace the FCAA Section 182(c)(4) requirements.

(2) Contingency Measures for Not Attaining the Standard by November 15, 1996

On March 20, 2004, when the EPA reclassified the BPA one-hour ozone nonattainment area from moderate to serious, the EPA also required that a contingency plan be submitted to backfill the contingency measures that should have been triggered as a result of the BPA area not attaining the standard by November 15, 1996.[2] The BPA Eight-Hour Ozone Attainment Demonstration SIP revision adopted by the commission on October 27, 2004, identified a marine vessel loading rule as the contingency measure, which was required to be equivalent to 3 percent of the 1996 target value. However, the supplemental BPA Eight-Hour Ozone Attainment Demonstration SIP revision adopted by the commission on September 28, 2005, removed this contingency measure and identified measures to replace the reductions that would have occurred had the marine vessel loading contingency measure been implemented. The substitute measures adopted in the 2005 SIP revision were nitrogen oxides (NO_X) reductions from two sources: 1) voluntary reductions from three companies in the BPA area, through Agreed Orders which were adopted by the commission on December 15, 2004, and made federally enforceable by submittal and approval by the EPA, and 2) reductions from the Texas Emissions Reduction Plan (TERP).

The TCEQ projected that the TERP projects would result in NO_X reductions of 3.0 tons per day (tpd). TERP reductions were later projected to be 2.4 tpd, 0.6 tpd short of this commitment.[3]

Please see Section 2.2.2.1: *One-Hour Nonattainment Area Requirements* for information about how the TCEQ plans to address these outstanding obligations.

1.1.2 One-Hour Ozone History in the BPA Area

The BPA one-hour ozone nonattainment area consists of Hardin, Jefferson, and Orange Counties. Following the 1990 FCAA Amendments, the BPA area was classified as moderate and, therefore, was required to attain the one-hour ozone standard of 0.12 parts per million by November 15, 1996. The BPA area did not attain the standard by that date and also did not attain the standard by November 15, 1999, the attainment date for serious areas.

On April 16, 1999, the EPA proposed in the *Federal Register* to extend the BPA attainment date to November 15, 2007, based on its ozone transport policy in effect at the time. The EPA's transport policy provided that in determining the appropriate attainment date for an area, the EPA may consider the effect of transport of ozone or its precursors from an upwind area which interferes with the downwind area's ability to attain.

The BPA SIP revision that was adopted by the commission on October 27, 1999, and submitted to the EPA by November 15, 1999, contained modeling for both transport and non-transport episodes, two volatile organic compound (VOC) reasonably available control technology (RACT) rules, and a NO_X rule for lean-burn engines (Phase I).

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[2] USEPA, Determination of Nonattainment as of November 15, 1996 and Reclassification of the Beaumont/Port Arthur Ozone Nonattainment Area; State of Texas; Final Rule, 69 Fed Reg 16483, 16494 (2004).

[3] TCEQ: "Texas Emission Reduction Plan Biennial Report to the Texas Legislature" TCEQ Publication SFR-079/06, December 2006.

On April 19, 2000, the commission adopted an attainment demonstration SIP revision for the BPA area, which included Phase II of the NO_X reductions. The SIP revision included the following elements.

- A modeling demonstration showing attainment of the one-hour ozone standard and transport of ozone and its precursors from Houston; and a request that BPA's attainment date be extended to that of the Houston area (November 15, 2007) based on the EPA's ozone transport policy.
- A commitment to submit a mid-course review (MCR) to the EPA by May 1, 2004.
- Rules implementing the control strategy. Since the majority of NO_X emissions in BPA come from large industrial point sources, the attainment demonstration SIP relies primarily on point source NO_X reductions.

The EPA approved the BPA SIP revision on May 14, 2001, with an attainment date of November 15, 2007. Environmental groups subsequently challenged the EPA's extension of attainment dates based on transport; BPA was one of three areas in the nation for which suits were filed. On December 11, 2002, the Fifth Circuit Court of Appeals ruled that the EPA is not authorized by the FCAA to extend the area's attainment date based on transport. On June 19, 2003, the EPA proposed in the *Federal Register* to reclassify BPA to either serious or severe, with a November 15, 2005, attainment date for either classification. Negotiations were held between the environmental litigants, BPA industries, the EPA, and the TCEQ to obtain commitments from BPA industries in providing voluntary reductions and other environmental benefits. The EPA published final action in the *Federal Register* on March 30, 2004, reclassifying the BPA area to serious with an attainment date of November 15, 2005. The EPA's final rule also withdrew the following for the BPA area:

- Motor Vehicle Emissions Budget (MVEB);
- mid-course review commitment; and
- finding that BPA has implemented all Reasonable Available Control Measures (RACM).

In addition, the state was required to submit a new attainment demonstration, showing attainment by 2005, within one year of the effective date of the action.

The requirements for the new attainment demonstration were set forth in the EPA's March 30, 2004, *Federal Register* notice, as follows:

- revise the MVEB for 2005 using MOBILE6, the EPA's mobile source emission factors model;
- perform post-1996 Rate of Progress (ROP) analyses for 1999, 2002, and 2005;
- perform a new RACM demonstration;
- activate contingency measures previously adopted under 15 percent ROP requirements; and
- provide additional contingency measures as part of the SIP to meet post-1996 through 2005 ROP requirements.

1.1.3 Eight-Hour Ozone in the BPA Area

Effective June 15, 2004, the EPA designated the BPA area as a marginal nonattainment area under the 1997 eight-hour ozone standard and promulgated the first phase of the eight-hour implementation rules. This marginal classification required that the BPA area attain the eight-hour ozone standard by June 15, 2007. On October 27, 2004, the commission adopted an attainment demonstration for both the one-hour and eight-hour ozone standards for the BPA area. The attainment demonstration contained results of photochemical modeling and technical analyses in support of the demonstration of attainment of the one-hour and eight-hour ozone standards.

On September 28, 2005, the commission adopted revisions to the BPA SIP, addressing each of the remaining requirements needed for an EPA-approvable SIP. These requirements include: reasonably available control technology (RACT), RACM, an FCAA Clean-Fuel Vehicle Program demonstration, a 3 percent contingency requirement, and a new MVEB.

The BPA area did not monitor attainment of the 1997 eight-hour ozone NAAQS by the June 15, 2007, deadline (based on data from the three years prior, 2004, 2005, and 2006). As a result, the EPA reclassified the area to moderate nonattainment for the 1997 eight-hour ozone NAAQS, effective April 17, 2008. The new attainment date for the BPA area is June 15, 2010.

1.2 PUBLIC HEARING INFORMATION

The commission held public hearings and accepted oral and written comments at the following times and location:

DATE	TIME	LOCATION
August 14, 2008	7:00 p.m.	South East Texas Regional Planning Commission 2210 Eastex Freeway, Beaumont, TX
August 15, 2008	10:00 a.m.	South East Texas Regional Planning Commission 2210 Eastex Freeway, Beaumont, TX

Question and answer sessions were held 30 minutes prior to the hearings. The public comment period opened on July 11, 2008, and closed on August 18, 2008. Written comments were accepted via mail, fax, and through the e-comment system. There were 18 total comments and 13 total commenters. Summaries of public comments and TCEQ responses are included as part of this SIP revision.

1.3 SOCIAL AND ECONOMIC CONSIDERATIONS

Because rulemaking is not a part of this SIP revision, there are no changes that would require an analysis of social and economic considerations.

1.4 FISCAL AND MANPOWER RESOURCES

The state has determined that its fiscal and manpower resources are adequate and will not be adversely affected through implementation of this plan.

CHAPTER 2: REDESIGNATION REQIREMENTS

Section 107(d)(3)(E) of the Federal Clean Air Act (FCAA) states that an area can be redesignated to attainment if all of the following conditions are met.

- The EPA has determined that the NAAQS have been attained.
- The applicable implementation plan has been fully approved by the EPA under Section 110(k) of the FCAA.
- The EPA has determined that the improvement in air quality is due to permanent and enforceable reductions in emissions.
- The state has met all applicable requirements for the area under Section 110 and Part D of the FCAA.
- The EPA has fully approved a maintenance plan, including a contingency plan, for the area under Section 175A of the FCAA.

2.1 ATTAINMENT OF THE 1997 EIGHT-HOUR OZONE NAAQS

2.1.1 Ozone Data

The Beaumont-Port Arthur (BPA) ozone monitoring network consists of nine ambient air monitors. Data from these monitors is used to determine the BPA area's compliance with the 1997 eight-hour ozone National Ambient Air Quality Standard (NAAQS). Further information regarding the BPA ambient air monitors can be found in Chapter 5: *Monitoring Network*. Compliance with the 1997 eight-hour ozone NAAQS is determined by the area's Design Value (DV) (any consecutive three-year average of each annual fourth-highest daily maximum eight-hour ozone average). Ozone monitoring data indicate that for the three latest complete years (2005, 2006, and 2007) the BPA area's eight-hour ozone DV is 83 parts per billion (ppb), below the EPA's nonattainment threshold of 84 ppb.

2.1.2 Ozone Trend Analysis

Ozone trends in the BPA area have been decreasing over the past seventeen years. Table 2-1: *Eight-Hour and One-Hour Ozone Design Values in the BPA Area (1991-2007)* shows that the eight-hour ozone design value (DV) in 2007 for the BPA area is 83 ppb, which meets the 1997 eight-hour ozone NAAQS. The one-hour ozone DV in 2007 for the BPA area was 107 ppb which meets the former one-hour ozone NAAQS.

Table 2-1: Eight-Hour and One-Hour Ozone Design Values in the BPA Area (1991-2007)

Year	Eight-Hour Ozone Design Value	One-Hour Ozone Design Value
1991	101	150
1992	100	140
1993	97	130
1994	93	124
1995	94	139
1996	91	139
1997	93	139
1998	91	133
1999	88	130
2000	87	152
2001	89	127
2002	90	144
2003	91	129
2004	92	130
2005	88	128
2006	85	127
2007	83	107

Figure 2-1: *Eight-Hour and One-Hour Ozone Design Value Trends for the BPA Area from 1991 to 2007* shows decreases in both the eight-hour and one-hour ozone DVs. The eight-hour ozone DV has decreased by 17.8 percent over the past seventeen years and the one-hour ozone DV has decreased by 28.7 percent over the past seventeen years. The decreases in ozone have occurred despite increases in population in the BPA area as shown in Figure 2-2: *Ozone Design Values and Estimated Population for the BPA Area from 1991 to 2007.*

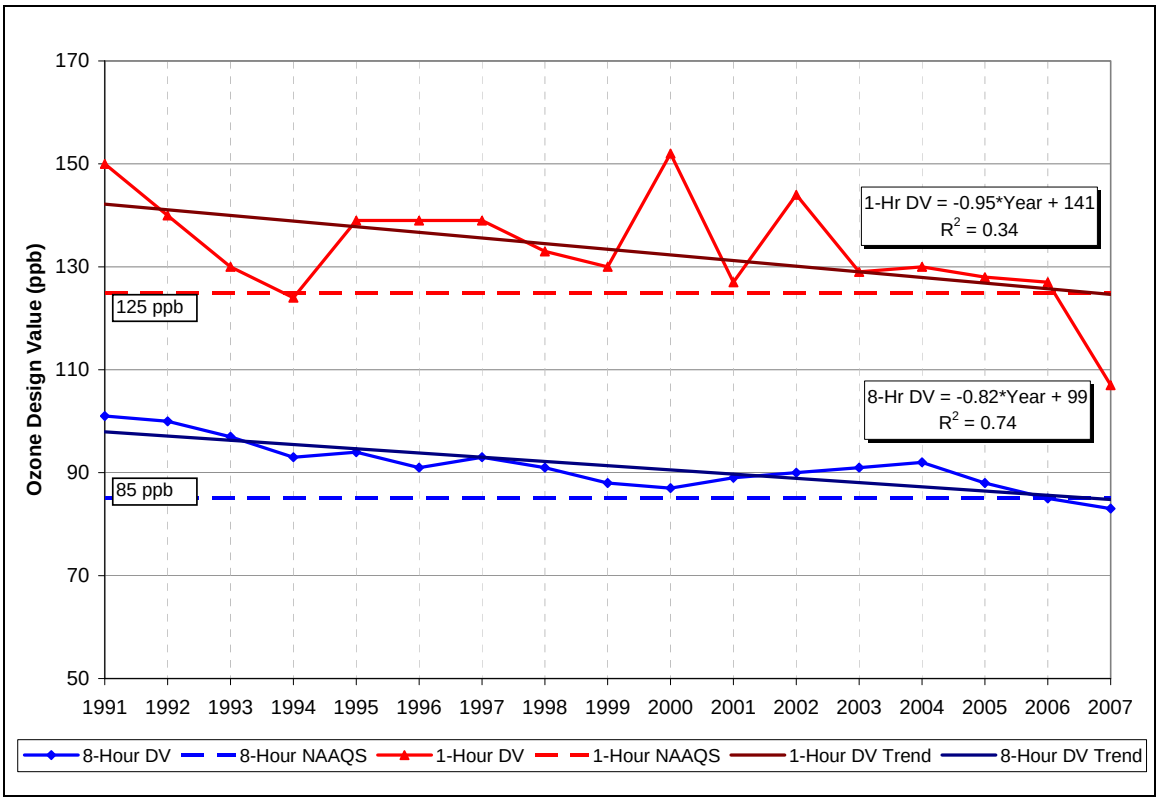

Figure 2-1: Eight-Hour and One-Hour Ozone Design Value Trends for the BPA Area from 1991 to 2007

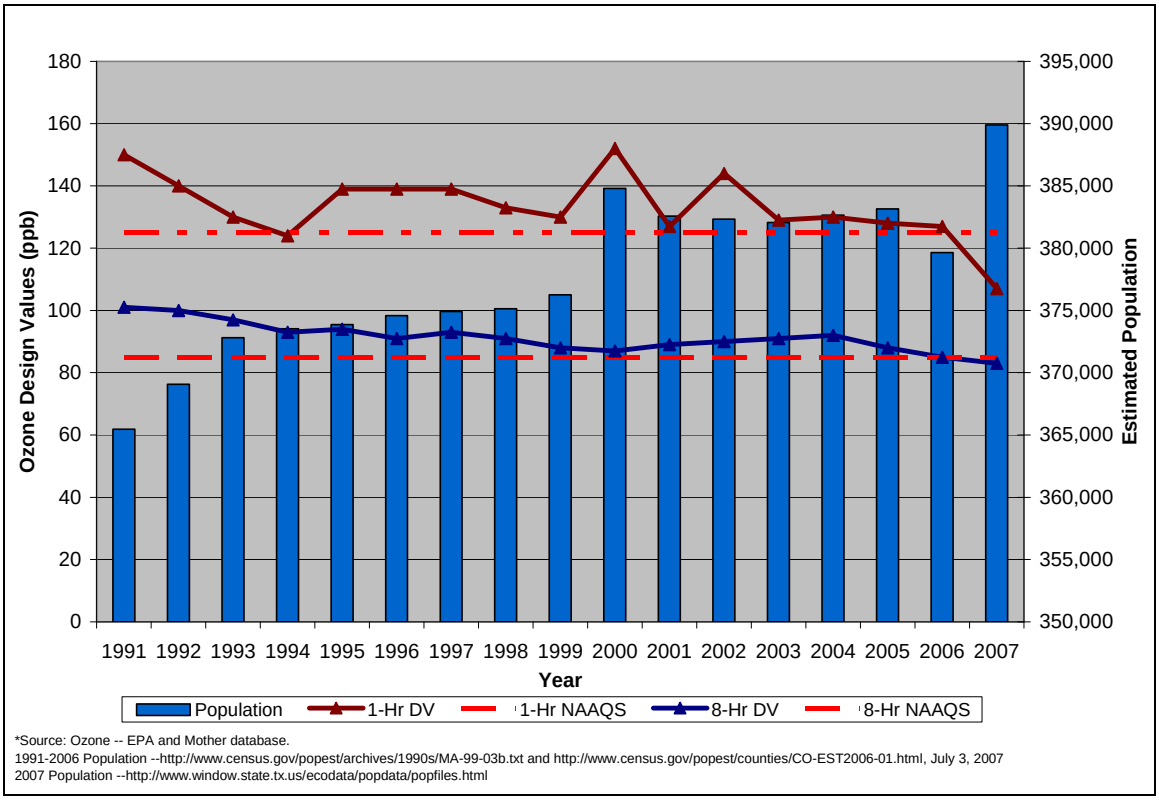

Figure 2-2: Ozone Design Values and Estimated Population for the BPA Area from 1991 to 2007

Figure 2-3: *Eight-Hour and One-Hour Ozone Exceedance Days and the Number of Monitors in the BPA Area from 1991 to 2007* shows that the number of both one-hour and eight-hour ozone exceedance days have decreased in the BPA area despite an increase in the number of monitors. In 2006 and 2007, there were no one-hour ozone exceedance days and there was only one one-hour ozone exceedance day in 2005. There were only three eight-hour ozone exceedance days in the BPA area in 2007. Because the exceedance day count is dependent on the number of monitors in the area, the number of eight-hour ozone exceedance days is shown in Figure 2-4: *Eight-Hour Ozone Exceedance Days by Monitor in the BPA Area from 1991-2007*. The eight-hour ozone exceedance days by monitors show decreases in the exceedance day count over the past seventeen years.

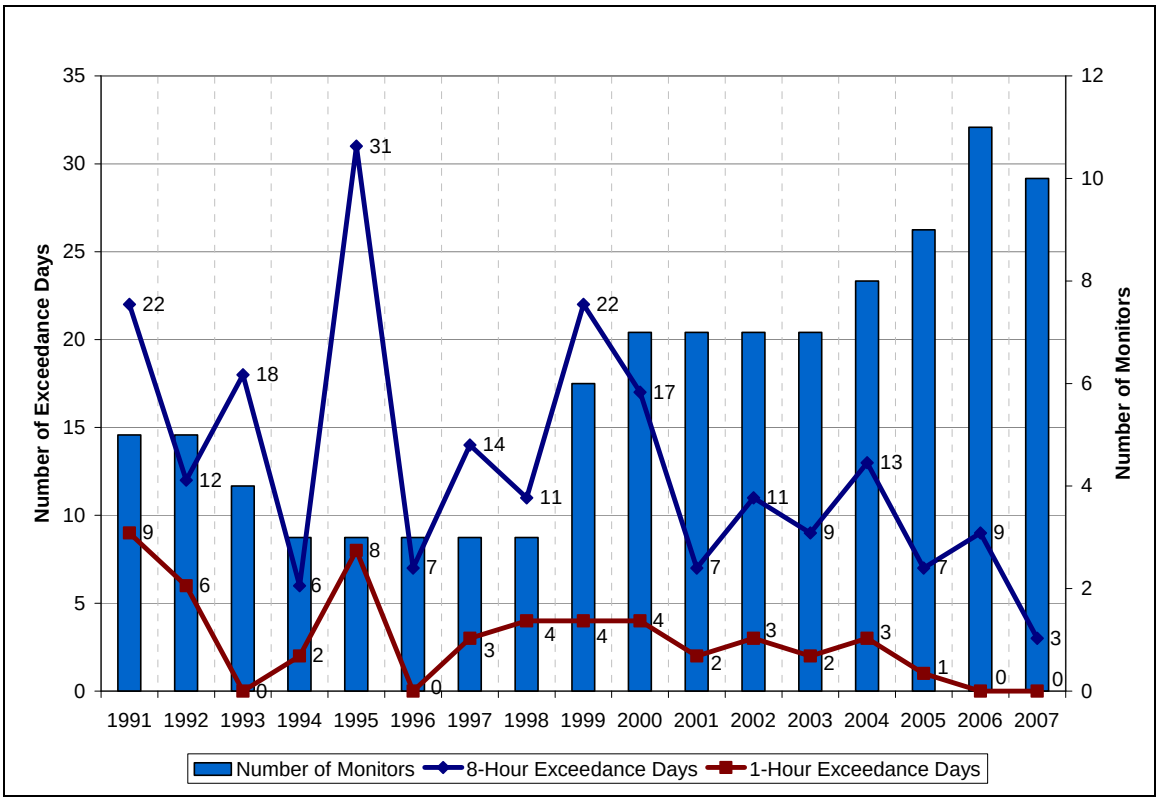

Figure 2-3: Eight-Hour and One-Hour Ozone Exceedance Days and the Number of Monitors in the BPA Area from 1991 to 2007

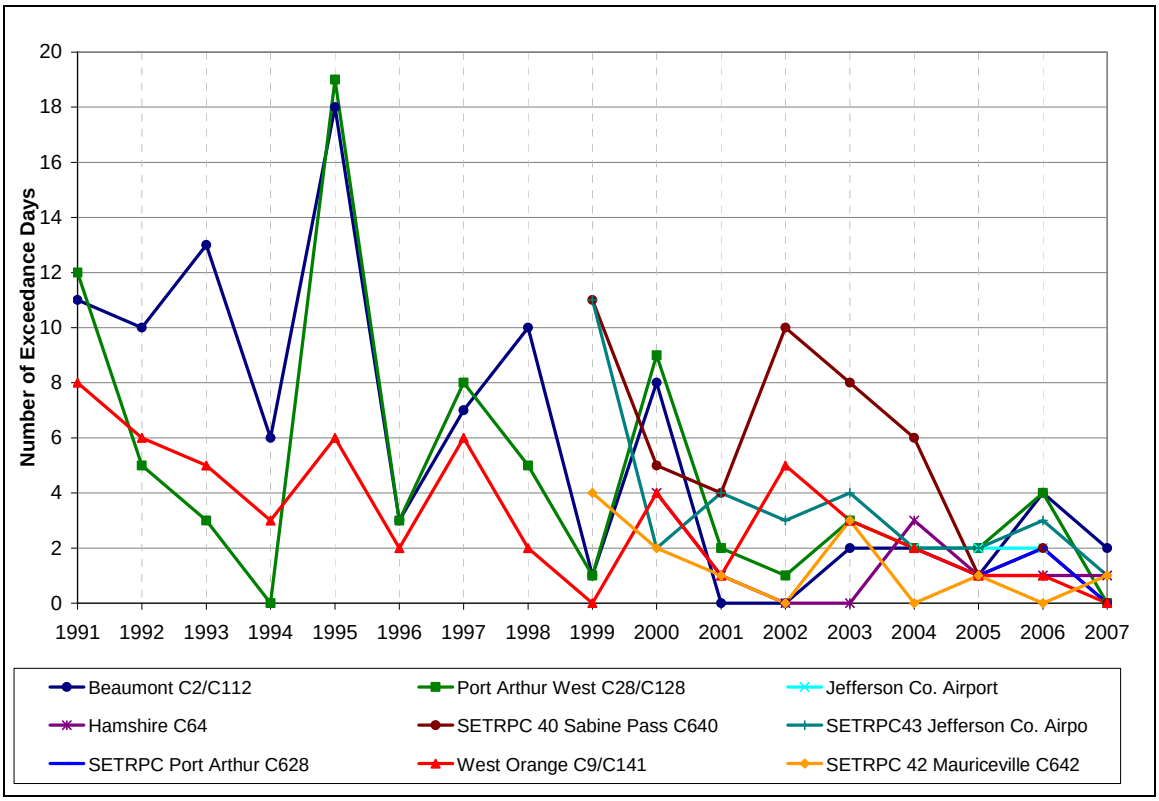

Figure 2-4: Eight-Hour Ozone Exceedance Days by Monitor for the BPA Area from 1991 to 2007

2.2 SIP APPROVABILITY UNDER SECTION 110(k) OF THE FCAA

The SIP revision for the BPA area must be fully approved under Section 110(k). This section of the FCAA contains the requirements for SIP completeness, deadlines, full, partial and conditional approval, and disapproval. Approval action on SIP elements and the redesignation request may occur simultaneously.[4] An area cannot be redesignated if a required element of its plan is the subject of a disapproval, a finding of failure to submit, or to implement the SIP; or partial, conditional, or limited approval. This does not mean that earlier issues with regard to the SIP will be reopened. SIPs must be fully approved only with respect to applicable requirements.

2.2.1 Section 110 General SIP Requirements

On October 2, 2007, the EPA requested that states certify that existing SIPs contain infrastructure provisions that address the requirements of the eight-hour ozone NAAQS under Section 110(a)(1) and (2) of the FCAA. The TCEQ submitted supporting documentation in an April 4, 2008, letter addressed to the EPA Region 6 Administrator, Richard E. Greene, to fulfill Texas' infrastructure SIP obligations for ozone.

2.2.2 Part D Requirements

In order for the BPA area to be redesignated, Texas must meet all requirements of Section 110 of the FCAA and Part D that were applicable prior to submittal of the redesignation request.

[4] USEPA: "Procedures for Processing Requests to Redesignate Areas to Attainment" Memorandum from John Calcagni, Director, Air Quality Management Division, September 4, 1992.

2.2.2.1 One-Hour Nonattainment Area Requirements

Although the one-hour ozone standard was revoked on June 15, 2005, under the EPA's anti-backsliding rules, areas designated nonattainment for the one-hour standard at the time of the eight-hour designations remained subject to certain control measures that applied by virtue of the one-hour classification. At the time of the 1997 eight-hour ozone NAAQS designation to nonattainment, the BPA area was classified as serious under the one-hour ozone standard. 40 Code of Federal Regulations (CFR) 51.905(a)(1) provides that the applicable one-hour requirements in 51.900(f) continue to apply after revocation. For the BPA area, these are:

- Reasonably Available Control Technology (RACT) under Section 172(b) of the FCAA;
- major source applicability cut-offs for purposes of RACT under Section 182(c) of the FCAA;
- Rate of Progress (ROP) reductions under Section 182(b)(1)(A) of the FCAA;
- Stage II vapor recovery under Section 182(b)(3) of the FCAA;
- clean fuel fleet program under Section 182(c)(4) of the FCAA;
- enhanced (ambient) monitoring under Section 182(c)(1) of the FCAA; and
- NO_X requirements under Section 182(f) of the FCAA.

The following requirements have been met through previous SIP revisions submitted to the EPA.

Reasonably Available Control Technology (RACT)

The EPA approved VOC RACT SIP revisions on May 15, 2001 (66 FR 26914) and February 28, 2008, (73 FR 10383).

Major Source Applicability Cut-Offs for Purposes of RACT

On September 28, 2005, the commission adopted VOC rules in 30 Texas Administrative Code (TAC) Chapter 115 for batch processing and ship building and repair in the BPA area to lower the exemption level to 50 tons per year to reflect the reclassification of the area from moderate to serious under the one-hour ozone NAAQS. This revision brings the BPA area into compliance with all appropriate RACT requirements.

Rate of Progress (ROP) Reductions

On October 27, 2004, the commission adopted a Post-1996 ROP SIP revision for the BPA area based on the serious classification, to address ROP analysis of two additional milestone years, 2002, and 2005. The pre-1996 15 percent ROP SIP revision for reductions achieved between 1990 and 1996 has also been met. Fulfillment of the contingency measures triggered under the 15 percent ROP SIP revision is discussed in the three paragraphs below.

Stage II Vapor Recovery

The commission has adopted Stage II rules and amendments for the BPA area. The EPA approved these as SIP revisions on April 15, 1994, (59 FR 17940) and March 29, 2005, (70 FR 15769).

Enhanced Monitoring

The three-county BPA area currently has nine monitors. The monitoring network described in Chapter 5: *MONITORING NETWORK* meets the federal requirements in 40 CFR Part 58 and Section 182(c)(1) for enhanced monitoring.

NO_X Reductions under Section 182(f)

Revisions to 30 TAC Chapter 117 implemented NO_X reductions in order to meet NO_X RACT requirements. These rules were conditionally approved as a revision to the SIP by the EPA on October 28, 1999, (64 FR 58011) and received final approval on March 3, 2000, (65 FR 11468).

Remaining Outstanding Obligations under the One-Hour Standard
Neither the 2004 nor the 2005 BPA SIP revisions have been approved by the EPA. As noted in the EPA guidance, the Administrator may approve outstanding SIP elements at the time of redesignation. In discussions with the TCEQ, the EPA has indicated that two outstanding one-hour obligations still need to be addressed before these SIP revisions can be approved by the Administrator. These obligations and the TCEQ's plan for meeting them are described in the remainder of this subsection.

Clean-Fuel Vehicle Programs Under Section 182(c)(4) of the FCAA
The 2005 BPA Eight-Hour Ozone Attainment Demonstration SIP revision, Section 5.3.2: *Clean-Fuel Vehicle Programs* states that emissions reduced by the federal Tier 2 standards for all light-duty vehicles with model years of 2004 or later and federal heavy duty diesel engine standards far surpass the emissions reductions that would be expected from implementation of federal Clean-Fuel Vehicle Programs in the BPA area. Therefore, the emission reductions from these federal rules are sufficient to cover any shortfall from the repeal of the Texas Clean Fleet program, the EPA approved version of the federal Clean Fuel Fleet Program (CFFP), a Clean-Fuel Vehicle Program. The EPA has since indicated that emission reductions from a federal rule cannot replace those from the Clean-Fuel Vehicle Program, and that the TCEQ must find an alternative state rule to replace the Section 182(c)(4) requirements of the FCAA.

The BPA area was reclassified from moderate to serious nonattainment for the one-hour ozone standard in March 2004, thus necessitating participation in the CFFP as required by Section 246 of the FCAA. Implementation of the CFFP in the BPA area could not have begun until the 2007 model year because a minimum of twenty-four months is required for the TCEQ to draft new rules, go through the proposal process, receive comment, finalize the regulations, and provide sufficient lead time for affected parties to comply. Twenty-four months from March 2004 was March 2006, which is more than half of the way through the 2006 model year.

In its August 1998 CFFP Implementation Guidance, the EPA defines model year for the purpose of fleet purchase requirements as September 1 through August 31. If a CFFP had been implemented in BPA starting with the 2007 model year on September 1, 2006, no reductions in on-road emissions would have occurred because the most recent federal standards for both light-duty and heavy-duty vehicles are more stringent than the clean fuel vehicle (CFV) standards referenced in Sections 243 and 245 of the FCAA.

In this instance, the TCEQ is not proposing to substitute federal measures to meet CFFP requirements. Such an approach would have been unacceptable during the 1990s when CFV standards were more stringent than the federal Tier 1 standards that began with the 1994 model year. Instead, the TCEQ is emphasizing that the most recent federal standards for both light-duty and heavy-duty vehicles have eclipsed the CFV standards because subsequent to September 1, 2006, any new vehicle purchase ranging from 0-26,000 pounds gross vehicle weight rating (GVWR) would have either equaled or, in most cases, exceeded CFV standards.

Under the scenario of a 2006 model year start, fleet purchases beginning on September 1, 2005, would have had to come under CFFP requirements. This would be impractical because it would have allowed less than eighteen months for the TCEQ to propose, seek public comment, and finalize such a rule. Nonetheless, even with a 2006 model year start for CFFP, the net benefits would still be zero due to the eclipsing of CFV standards referenced above. In a July 21, 2005, letter to manufacturers, EPA stated that "subsequent to publishing its CFV regulations, EPA has promulgated new emission standards that are generally more stringent than or equivalent to the CFV emission standards for light-duty vehicles, light-duty trucks, and heavy-duty engines." This letter is coded by EPA as CCD-05-12 and is included as Appendix A: *July 21, 2005, EPA Letter to Vehicle and Engine Manufacturers*. Since this letter is dated as July 21, 2005, it certainly

would apply to fleet purchases that began with the beginning of the 2006 model year on September 1, 2005.

In addition, EPA's Clean Fuel Fleets website (http://www.epa.gov/otaq/cff.htm) contains a listing of vehicles under a category labeled as "Certified Alternative Fuel and/or Clean-Fuel Fleet Vehicles." However, the latest available list is for the 2002 model year and was last posted to the Web site on May 23, 2001. This further leads to the conclusion that any vehicle purchases for 2006-or-later model year vehicles would either already meet or exceed CFV standards. Beginning with either the 2006 or 2007 model years, this analysis shows that the federal standards for new vehicles have eclipsed the current CFV standards and that no benefit would be derived from a CFFP; therefore, no substitute reductions are required from Texas.

The Appendix A letter further elaborates that the Tier 2 light-duty standards that began with the 2004 model year are either "equivalent to or more stringent than the CFV LEV emission standards" for the following vehicle categories and Tier 2 bins, as shown below in Table 2-2: *Summary of Tier 2 Certification Bins More Stringent Than CFV Standards*.

Table 2-2: Summary of Tier 2 Certification Bins More Stringent Than CFV Standards

Vehicle Category	Tier 2 Bin of Equal or Greater Stringency Than CFV Standards
Light-Duty Vehicle (LDV)	Bins 1-7 and Bin 9
Light-Duty Truck 1 (LDT1)	Bins 1-7 and Bin 9
Light-Duty Truck 2 (LDT2)	Bins 1-9
Light-Duty Truck 3 (LDT3)	Bins 1-10
Light-Duty Truck 4 (LDT4)	Bins 1-10
Medium Duty Passenger Vehicle (MDPV)	Bins 1-11

The only Tier 2 certification Bin that is absent from this list is Bin 8 for the LDV and LDT1 categories. However, the Tier 2 Bin distribution assigned by the most recent MOBILE6.2 emissions model assumes that both the LDV and LDT1 categories are comprised of only Bins 2-5 vehicles for the 2007 model year. Provided in Table 2-3: *MOBILE6.2 Tier 2 Bin Distribution Summary for the 2007 Model Year* is a summary of the Tier 2 Bin distribution for the 2007 model year referenced in the "T2EXH.D" file included with the most recent version of MOBILE6.2, which can be downloaded at http://www.epa.gov/otaq/m6.htm. As shown, Bin 8 of Tier 2 is comprised only of vehicles from LDT3 and LDT4, which are classes where Tier 2 is already more stringent than CFV.

Table 2-3: MOBILE6.2 Tier 2 Bin Distribution Summary for the 2007 Model Year

Tier 2 Bin	Vehicle Class for 2007 Model Year				
	LDV	LDT1	LDT2	LDT3	LDT4
1	0%	0%	0%	0%	0%
2	10%	10%	0%	0%	0%
3	30%	30%	0%	0%	0%
4	20%	20%	0%	0%	0%
5	40%	40%	40%	0%	0%
6	0%	0%	30%	0%	0%
7	0%	0%	30%	0%	0%
8	0%	0%	0%	100%	100%
9	0%	0%	0%	0%	0%
10	0%	0%	0%	0%	0%
11	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%

Table 2-4: *MOBILE6.2 Tier 2 Bin Distribution Summary for 2009-and-Later Model Years* shows the Tier 2 Bin distribution assumed by the MOBILE6.2 model for 2009-and-later model years, demonstrating that Bin 8 continues to be composed strictly of the LDT3 and LDT4 vehicle classes.

Table 2-4: MOBILE6.2 Tier 2 Bin Distribution Summary for 2009-and-Later Model Years

Tier 2 Bin	Vehicle Class for 2009-and-Later Model Years				
	LDV	LDT1	LDT2	LDT3	LDT4
1	0%	0%	0%	0%	0%
2	25%	25%	0%	0%	0%
3	55%	55%	0%	0%	0%
4	10%	10%	20%	0%	0%
5	10%	10%	20%	74%	0%
6	0%	0%	30%	0%	0%
7	0%	0%	30%	0%	0%
8	0%	0%	0%	26%	100%
9	0%	0%	0%	0%	0%
10	0%	0%	0%	0%	0%
11	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%

The letter addresses 2005-and-later model year heavy-duty vehicles and engines by stating:

- "8,501-10,000 GVWR Otto-cycle heavy-duty vehicle chassis standards are more stringent than the CFV Otto-cycle heavy-duty engine LEV emission standard."

- "10,001-14,000 GVWR Otto-cycle heavy-duty vehicle chassis standards are more stringent than the CFV Otto-cycle heavy-duty engine LEV emission standard."

- "Current emission standards for heavy-duty engine Otto-cycle engines and diesel engines are more stringent than CFV LEV heavy-duty Otto-cycle engines, or heavy-duty diesel engine emission standards."

Contingency Measures for Not Attaining the Standard by November 15, 1996
On March 20, 2004, when the EPA reclassified the BPA one-hour ozone nonattainment area from moderate to serious, it also required that a contingency plan be submitted to backfill the contingency measures that should have been triggered as a result of the BPA area not attaining the standard by November 15, 1996.[5] The BPA Eight-Hour Ozone Attainment Demonstration SIP revision adopted by the commission on October 27, 2004, identified a marine vessel loading rule as the contingency measure, which was required to be equivalent to 3 percent of the 1996 target value. However, the supplemental BPA Eight-Hour Ozone Attainment Demonstration SIP revision adopted by the commission on September 28, 2005, removed this contingency measure and identified measures to replace the reductions that would have occurred had the marine vessel loading contingency measure been implemented. The substitute measures adopted in the 2005 SIP revision were NO_X reductions from two sources: 1) voluntary reductions from three companies in the BPA area, through Agreed Orders which were adopted by the commission on December 15, 2004, and made federally enforceable by submittal and approval by the EPA, and 2) reductions from the Texas Emissions Reduction Plan (TERP).

The TCEQ projected that the TERP projects would result in NO_X reductions of 3.0 tons per day (tpd). TERP reductions were later projected to be 2.4 tpd, 0.6 tpd short of this commitment.[6]

NO_X reductions from the Agreed Orders included in the 2005 Attainment Demonstration SIP equal 6.46 tpd. Adding these NO_X reductions to the 2.4 tpd from the TERP projects equals 8.86 tpd, or 2.86 percent of the 1996 NO_X target value. No credit was taken, however, for the 0.55 tpd VOC reductions from the Agreed Orders, which equals 0.2 percent of the 1996 VOC target value. Including these VOC reductions, the total percent reduction from the 1996 target values was 3.06 percent, meeting the 3 percent requirement.

By meeting these outstanding obligations, the TCEQ anticipates that the EPA will find all requirements under Section 110(k) and Part D of the FCAA are fulfilled.

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[5] USEPA, Determination of Nonattainment as of November 15, 1996 and Reclassification of the Beaumont/Port Arthur Ozone Nonattainment Area; State of Texas; Final Rule, 69 Fed Reg 16483, 16494 (2004)
[6] TCEQ: "Texas Emission Reduction Plan Biennial Report to the Texas Legislature" TCEQ Publication SFR-079/06, December 2006.

2.2.2.2 Eight-Hour Requirements

2004 Eight-Hour Attainment Demonstration

On October 27, 2004, the commission adopted an attainment demonstration for the eight-hour standard for BPA as a marginal nonattainment area. This demonstration contained results of photochemical modeling and technical analyses in support of the demonstration. There were additional requirements for the attainment demonstration set forth in the EPA's April 30, 2004, *Federal Register* notice (69 FR 23951), which are not specifically addressed in the eight-hour ozone implementation rule that discusses the transition from the one-hour to the eight-hour standard. These additional requirements were:

- revise the MVEB for 2005 using MOBILE6, the EPA's mobile source emission factors model;
- perform a new Reasonably Available Control Measures (RACM) demonstration for 2007;
- activate contingency measures previously adopted under 15 percent ROP requirements; and
- provide additional contingency measures as part of the SIP to meet post-1996 through 2005 ROP requirements.

2005 Eight-Hour Attainment Demonstration for the BPA Ozone Nonattainment Area

On September 28, 2005, the commission adopted a SIP revision, which included an updated modeling demonstration, an updated MVEB, and addressed the four outstanding one-hour obligations below:

- major source applicability cut-offs for purposes of RACT;
- Clean-Fuel Vehicle Programs under Section 182(c)(4) of the FCAA;
- RACM Analysis; and
- contingency measure for marine vessel loading previously adopted under 15 percent ROP requirements.

2.2.2.3 Transport Emissions Revision

The commission adopted a SIP revision on April 16, 2008, concerning ozone and fine particulate matter transport emissions. This revision will also help meet the requirements under Part D of the FCAA.

2.3 PERMANENT AND ENFORCEABLE EMISSION REDUCTIONS

2.3.1 Control Strategies

The BPA area has experienced improved air quality over the past seventeen years, as evidenced by decreases in both one-hour and eight-hour ozone DVs. These reduced DVs are attributed to permanent and enforceable reductions in VOC and NO_X emissions through control strategies implemented in the area. Permanent and enforceable control strategies implemented in the BPA area include the following.

2.3.1.1 Point Source NO_X

The ozone control strategy for the BPA area has focused primarily on NO_X emission reductions from stationary point sources due to the significance of this sector in the emissions inventory. Over the last decade, the commission adopted progressively more stringent regulations in 30 TAC Chapter 117 for the control of NO_X. The following description summarizes the 30 TAC Chapter 117 rulemaking history to date for the BPA area.

In response to requirements of the FCAA, the commission adopted NO_X RACT rules effective June 9, 1993, in 30 TAC Chapter 117, "Control of Air Pollution from Nitrogen Compounds." These requirements applied to electric utility boilers, industrial boilers and process heaters, gas

turbines, rich-burn stationary gas-fired internal combustion engines, nitric acid plants, and adipic acid plants in the BPA area and had a compliance date of November 15, 1999.

On October 27, 1999, the commission adopted Phase I of the state's NO_X rulemaking activities for the BPA attainment demonstration. As part of that SIP revision, the commission adopted VOC rules for batch process and industrial wastewater sources and NO_X rules for lean-burn engines. Compliance with the Phase I rules was required by November 15, 2001.

Phase II of the state's NO_X rulemaking activities for the BPA attainment demonstration was adopted by the commission on April 19, 2000. These rules required further NO_X reductions from electric utility power boilers (approximately 50 percent reduction) and from industrial boilers and process heaters (approximately 20 percent reduction). The schedule set forth in the rules for the Phase II reductions requires two-thirds of the reductions by May 1, 2003, and the remaining one-third by May 1, 2005.

2.3.1.2 National Volatile Organic Compound Emission Standards for Consumer Products
Federal rules regulating the VOC content of consumer products are codified in 40 CFR 59 Subpart C. These rules were promulgated in 1998. Since that time, rules requiring stricter VOC limits have been adopted in California and in the Ozone Transport Commission (OTC) states.[7] The EPA is working to amend the federal rules based on the OTC model rule with compliance scheduled for January 2009. VOC emissions from consumer products are estimated to decrease by 14 percent from baseline levels.[8]

2.3.1.3 National Organic Compound Emission Standards for Architectural Coatings
Federal rules regulating the VOC content of architectural and industrial maintenance (AIM) coatings are codified in 40 CFR 59 Subpart D. These rules were promulgated in 1998. Since that time, rules requiring stricter VOC limits have been adopted in California and in the OTC states. The EPA is working to amend the federal rules based on the OTC model rule, with compliance scheduled for January 2009. VOC emissions from AIM coatings are estimated to decrease by 30 percent from baseline levels.[9]

2.3.1.4 National Low Emission Vehicle (NLEV) Program/Tier 2 Engine and Fuel Standards
Automobile manufacturers made a commitment through the NLEV program to introduce cleaner cars. This commitment along with improvements in gasoline quality, combined with advanced vehicle technologies, will assist areas in achieving their overall air quality goals by reducing NO_X emissions. The federal Tier 2 car and truck standards that have even more stringent emission standards than NLEVs, were phased in for all on-road and non-road vehicles and equipment beginning with the 2004 model year.

2.3.1.5 Stage I Vapor Recovery
The Stage I vapor recovery rules regulate the filling of gasoline storage tanks at gasoline stations by tank trucks. To comply with Stage I requirements, a vapor balance system is typically used to capture the vapors from the gasoline storage tanks that would otherwise be displaced to the atmosphere as these tanks are filled with gasoline. The captured vapors are routed back to the tanker truck and processed by a vapor control system when the tanker truck is subsequently refilled at a gasoline terminal or gasoline bulk plant. The effectiveness of Stage I vapor recovery rules depends on the captured vapors being: 1) effectively contained within the gasoline tanker

[7] Connecticut, Delaware, the District of Columbia, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, and Virginia
[8] Based on H54, a Houston Advanced Research Center (HARC) study performed by Principle Component Analysis (PCA)
[9] Based on H54, a HARC study performed by PCA

truck during transit; and 2) controlled when the transport vessel is refilled at a gasoline terminal or gasoline bulk plant.

2.3.1.5 Stage II Vapor Recovery

The Stage II vapor recovery program involves use of technology that prevents gasoline vapors from escaping during refueling of on-road motor vehicles. The EPA mandates that Stage II refueling requirements apply to all public and private refueling facilities dispensing 10,000 gallons or more of gasoline per month. The federal throughput constitutes a minimum threshold, but a state may be more stringent in adopting a throughput standard. The TCEQ applies a more stringent throughput standard in the applicable ozone nonattainment counties by requiring all facilities constructed after November 15, 1992, to install Stage II vapor recovery regardless of throughput.

2.3.1.6 Texas Low Emission Diesel (TxLED)

This rule reduces emissions of NO_X and other pollutants from diesel-powered motor vehicles and non-road equipment operating within 110 counties in the eastern half of Texas including the BPA area. The rule was originally adopted by the commission in December 2000, and was most recently revised in May 2007. The TxLED rules require that diesel fuel produced for delivery and ultimate sale to the consumer must contain less than 10 percent by volume aromatic hydrocarbons and must have a cetane number of 48 or greater. Some compliance options are allowed. The TxLED implementation dates were October 31, 2005, for producers and importers; December 15, 2005, for bulk distribution facilities; and January 31, 2006, for retail fuel dispensing outlets, wholesale bulk purchasers, consumer facilities, and all other affected persons. The TxLED rules were revised in May 2007 to include marine distillate fuels commonly known as Marine Distillate fuel X (DMX), Marine Distillate fuel A (DMA), and Marine Gas Oil (MGO), into the definition of diesel fuels for compliance with the TxLED requirements in the Houston-Galveston-Brazoria ozone nonattainment area counties. The requirements affecting marine diesel were phased-in from October 1, 2007, to January 1, 2008.

2.3.1.7 Texas Emission Reduction Plan (TERP)

In 2001, the 77th Texas Legislature passed Senate Bill 5, establishing the TERP, which includes incentive grants programs to reduce NO_X emissions from internal combustion engines on mobile sources. Eligible grant projects include fleet expansions with cleaner engines, replacement of old vehicles and equipment, repower of old engines, and on-vehicle and on-site infrastructure for idle reduction, electrification, and delivery of alternative fuels.

As of September 2007, the program has awarded over $19 million for 58 projects in the BPA area, which are estimated to reduce NO_X emissions by more than 2.7 tons per day by 2009, at an average cost per ton of NO_X reduced of $4,311. In the BPA area, the projects funded thus far have resulted in 4,483.24 total tons of NO_X reductions.

For information on recent TERP activities, please visit the TERP Web site: www.tceq.state.tx.us/implementation/air/terp/.

2.3.1.8 Locomotives and Marine Compression-Ignition Engines

On March 14, 2008, the EPA adopted new emission standards for locomotives and marine diesel engines that will reduce PM emissions by about 90 percent and NO_X emissions by about 80 percent from engines meeting these new standards when compared to engines meeting the current standards. The new federal standards comprise a three-part program to tighten emission standards for existing locomotives and large marine engines when they are remanufactured, effective immediately; establish stringent Tier III standards for new locomotives and marine diesel engines that will be phased in beginning 2009; and establish more stringent Tier IV standards for new locomotives and marine diesel engines that will be phased in beginning 2014. In addition, these

new federal standards include idle reduction requirements for newly built and remanufactured locomotives and provisions that encourage the production of cleaner new generation switch locomotives.

2.3.2 2002 Periodic Emissions Inventory (PEI)

In accordance with the EPA's Consolidated Emissions Reporting Rule (CERR), the TCEQ submitted a 2002 PEI for NO_X and VOC in the BPA area, as well as the other Texas ozone nonattainment areas. This PEI does not include emissions from upstream oil and gas production, which were under-estimated, particularly with regard to flash emissions from oil and condensate storage tanks at wellhead and gathering site tank batteries. The TCEQ revised the emissions in the 2005 area source inventory using the more accurate emission factors determined from HARC 51C. This revision to the area source inventory is further discussed in Section 4.2.1.1: *Flash Emissions from Upstream Oil and Gas Production*. The 2002 PEI was submitted as part of the 2005 Dallas-Fort Worth Five Percent Increment of Progress SIP revision. However, the 2002 PEI has not been open to public comment in the BPA area or submitted to the EPA as part of a SIP revision for the BPA area. The TCEQ is submitting the 2002 PEI as part of this SIP revision. For the entire inventory, please see Appendix B: *Texas 2002 Periodic Emissions Inventory Area, Nonroad Mobile, and Biogenic Sources*.

As shown in Table 2-5: *VOC Emissions for 2002 PEI and 2005 Base EI* and Table 2-6: *NO_X Emissions for 2002 PEI and 2005 Base EI*, both VOC and NO_X emissions from anthropogenic sources in the BPA area decreased from 2002 to 2005. For the purpose of comparing like values, area source VOC emissions for 2005 in Table 2-5 do not include flash emissions from upstream oil and gas production.

Table 2-5: VOC Emissions for 2002 PEI and 2005 Base EI

Source Category	VOC (tons per average ozone season day)	
	2002 PEI	2005 base
On-Road	13.32	11.63
Point	43.81	42.68
Area	50.11	42.59*
Non-Road	13.85	4.96
TOTAL	121.09	101.86

* This figure represents the 2005 base inventory for area sources used in the maintenance plan not including flash emissions from upstream oil and gas production.

Table 2-6: NO_X Emissions for 2002 PEI and 2005 Base EI

Source Category	NO_X (tons per average ozone season day)	
	2002 PEI	2005 base
On-Road	45.84	45.60
Point	109.23	68.49
Area	7.54	9.06
Non-Road	48.99	25.99
TOTAL	211.60	149.14

2.3.3 Trend Analysis

2.3.3.1 NO_X Trends

Overall, NO_X trends in the BPA area are decreasing. Figure 2-5: *Average and 95th Percentile NOX Concentrations for the BPA Area from 1991 to 2007* shows the NO_X trends at two monitors in the BPA area, Beaumont (CAMS 2) and West Orange (CAMS 9). The 95th percentile of NO_X

concentrations has decreased at both monitors over the past 17 years. The average NO_X concentration has remained relatively flat at Beaumont (CAMS 2) but has decreased at West Orange (CAMS 9).

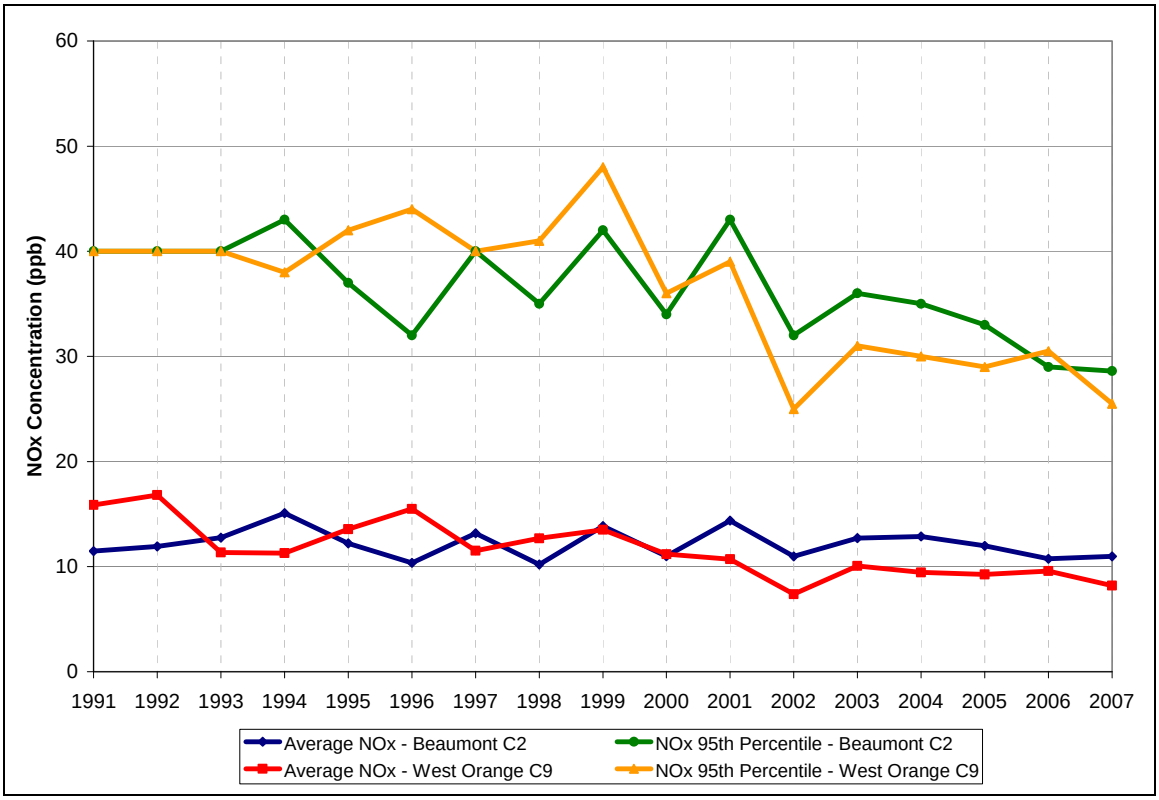

Figure 2-5: Average and 95th Percentile NO_X Concentrations for the BPA Area from 1991 to 2007

2.3.3.2 VOC Trends

The ambient VOC data in the BPA area is limited. There was one automated gas-chromatograph (AGC) monitor, the Jefferson County Airport monitor, with valid data in the BPA area from 2003 to 2004. There were no AGC monitors with valid data in 2005 in the BPA area. The AGC monitor at Hamshire (CAMS 64) had valid data from July 18, 2006, to August 28, 2006, which is a little over one month of valid data. Currently there are two AGC monitors operating in the BPA area, Lamar, Beaumont (CAMS 2) and Nederland High School, Beaumont (CAMS 1035). The two monitors currently operating have valid data from August 28, 2006, and August 29, 2006, respectively, which would give a little more than one year of continuous data at the time of this writing in the BPA area.

Despite the lack in long term continuous VOC trends, VOC canister data have been available in the BPA area since 1990. These data were provided to the TCEQ by the Southeast Texas Regional Planning Commission (SETRPC). The VOC canisters samples are 24-hour averages and are sampled every 12 days. Figure 2-6: *SETRPC Average Ethylene Trends in the BPA Area from 1993 to 2007* and Figure 2-7: *SETRPC Average Propylene Trends in the BPA Area from 1990 to 2007* show that the ethylene and propylene, two of the most reactive VOC, levels have been decreasing at seven canister sites in the BPA area over the past fifteen and eighteen years respectively. While the ethylene concentrations are higher than the propylene concentrations, the average ethylene concentration has decreased at the five canister sites that have been operating over the past fifteen years, ranging from a nine percent decrease at Beaumont to an 84 percent decrease at Airport. Similarly, the average propylene concentrations have decreased at the five

sites that have been operating over the past sixteen years, ranging from a 75 percent decrease at Port Neches to an 87 percent decrease at Airport.

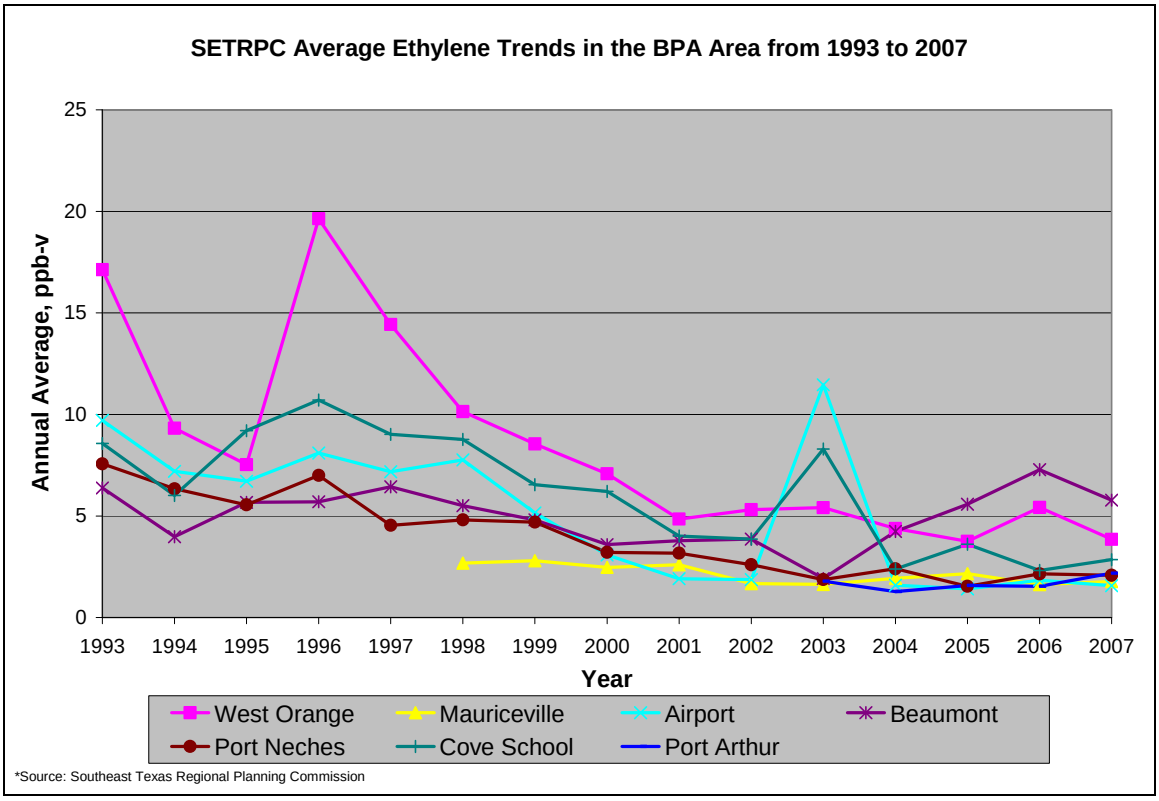

Figure 2-6: SETRPC Average Ethylene Trends in the BPA Area from 1993 to 2007

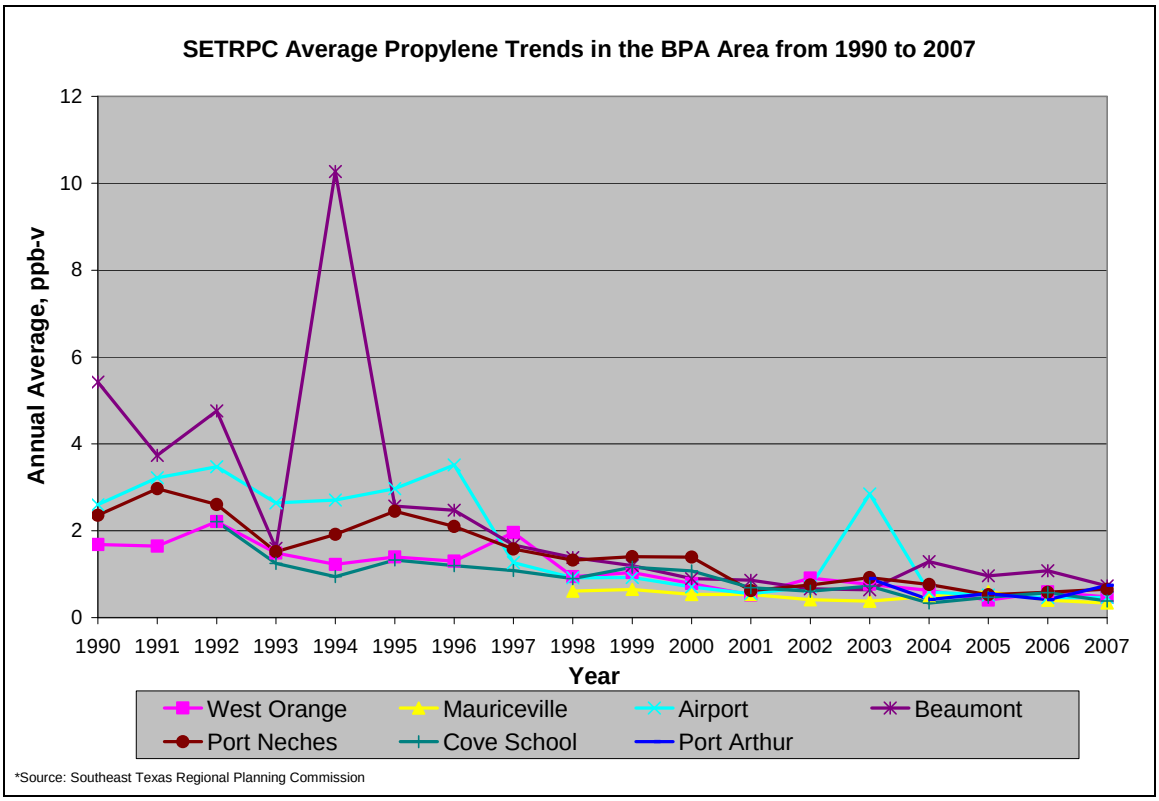

Figure 2-7: SETRPC Average Propylene Trends in the BPA Area from 1990 to 2007

2.4 SECTION 175A REQUIREMENTS FOR MAINTENANCE PLANS

The remainder of this SIP revision is intended to fulfill the maintenance requirements in Section 175A of the FCAA and contains the following elements:

- attainment inventory;
- maintenance demonstration;
- verification of continued attainment;
- monitoring network; and
- contingency plan.

CHAPTER 3: ATTAINMENT EMISSIONS INVENTORY

3.1 OVERVIEW

The attainment inventory for the Beaumont-Port Arthur (BPA) is based on the volatile organic compounds (VOC) and nitrogen oxides (NO_X) emissions of an actual typical summer day. The attainment emission inventory base year is 2005. The 1990 Federal Clean Air Act (FCAA) Amendments require that emissions inventories (EI) be prepared for ozone nonattainment areas. Because ozone is photochemically produced in the atmosphere when VOC mixes with NO_X in the presence of sunlight, the Texas Commission on Environmental Quality (TCEQ) must compile information on the sources of these precursor pollutants. The EI must identify the source types present in an area, the amount of each pollutant emitted, and the types of processes and control devices employed at stationary sources or other source categories. The EI provides data for a variety of air quality planning tasks, including establishing baseline emission levels, calculating reduction targets, control strategy development for achieving the required emission reductions, emission inputs into air quality simulation models, and tracking actual emission reductions against the established emissions growth and control budgets. The total VOC and NO_X emissions inventory for an area is summarized from the estimates developed for four general categories of emissions sources, which are each explained in Sections 4.2.1 through 4.2.4. Summaries of the 2005 VOC and NO_X emissions by source type are provided in Table 3-1: *Summary of VOC Emissions in BPA by Source Type (2005)* and Table 3-2: *Summary of NO_X Emissions in BPA by Source Type (2005).*

Table 3-1: Summary of VOC Emissions in BPA by Source Type (2005)

Source Category	VOC (tons per average ozone season day)
On-Road Mobile	11.63
Point	42.68
Area	151.57
Non-Road Mobile	4.96
TOTAL	210.84

Table 3-2: Summary of NO_X Emissions in BPA by Source Type (2005)

Source Category	NO_X (tons per average ozone season day)
On-Road Mobile	45.60
Point	68.49
Area	9.06
Non-Road Mobile	25.99
TOTAL	149.14

CHAPTER 4: MAINTENANCE DEMONSTRATION

4.1 GENERAL

The maintenance plan must demonstrate that the Beaumont-Port Arthur (BPA) area will remain in attainment of the 1997 eight-hour ozone standard for the ten-year period following the date of redesignation to attainment. Because redesignation of the area to attainment is contingent upon the United States Environmental Protection Agency's (EPA) approval of this maintenance plan, the Texas Commission on Environmental Quality (TCEQ) has set a horizon year of 2021. Setting the horizon date at 12 years from the time that the maintenance plan must be submitted to the EPA allows adequate time for review and approval of the plan and redesignation of the BPA area to attainment. The maintenance demonstration is satisfied if the state demonstrates that future volatile organic compounds (VOC) and nitrogen oxides (NO_X) emission levels are not expected to result in exceedances of the 1997 eight-hour ozone National Ambient Air Quality Standard (NAAQS).

4.2 FUTURE EMISSIONS AND VERIFICATION OF CONTINUED ATTAINMENT

To track the progress of the maintenance plan, the TCEQ will continue to periodically update the Emissions Inventory (EI). In addition to the EI for 2005, the emission inventory base year, and the horizon year of 2021, interim years of 2011, 2014, and 2017 were selected to show a trend analysis for maintenance of the 1997 eight-hour ozone NAAQS. Tables 4-1: *Summary of VOC Emissions in BPA by Source Type (2005, 2011, 2014, 2017, and 2021)* and 4-2: *Summary of NO_X Emissions in BPA by Source Type (2005, 2011, 2014, 2017, and 2021)* depict the 2005 base EI and the EIs that will be used to compare against 2005, to ensure compliance with the 1997 eight-hour ozone NAAQS. Table 4-3: *Summary of Total VOC and NO_X Emissions in BPA (2005, 2011, 2014, 2017, and 2021)* depicts combined total VOC and NO_X base and projection values.

Table 4-1: Summary of VOC Emissions in BPA by Source Type (2005, 2011, 2014, 2017, and 2021)

Source Category	VOC (tons per average ozone season day)					
	2005	2011	2014	2017	2021	Net Change
On-Road	11.63	7.92	6.51	5.58	4.77	**-6.86**
Point	42.68	48.26	49.83	51.54	53.95	**11.27**
Area	151.57	155.68	156.84	158.40	160.54	**8.97**
Non-Road	4.96	4.36	4.23	4.20	4.30	**-0.66**
TOTAL	210.84	216.22	217.41	219.72	223.56	**12.72**

Table 4-2: Summary of NO_X Emissions in BPA by Source Type (2005, 2011, 2014, 2017, and 2021)

Source Category	NO_X (tons per average ozone season day)					
	2005	2011	2014	2017	2021	Net Change
On-Road	45.60	17.91	12.38	8.66	6.24	**-39.36**
Point	68.49	79.17	81.14	83.04	85.44	**16.95**
Area	9.06	9.95	10.40	10.86	11.47	**2.41**
Non-Road	25.99	27.08	27.88	28.87	30.63	**4.64**
TOTAL	149.14	134.11	131.80	131.43	133.78	**-15.36**

Table 4-3: Summary of Total VOC and NO_X Emissions in BPA (2005, 2011, 2014, 2017, and 2021)

Pollutant (tons per average ozone season day)	2005	2011	2014	2017	2021	Net Change
Total VOC	210.84	216.22	217.41	219.72	223.56	**12.72**
Total NO_X	149.14	134.11	131.80	131.43	133.78	**-15.36**
Total Combined	359.98	350.33	349.21	351.15	357.34	**-2.64**

Photochemical modeling analyses for the BPA area show that reducing NO_X emissions is more effective in reducing the eight-hour ozone Design Value (DV) in the BPA area than reducing VOC emissions. To estimate the relative efficacy of reductions of VOC compared to reductions of NO_X, three model analyses were conducted using two episodes from the September 28, 2005, BPA Ozone Attainment Demonstration State Implementation Plan (SIP) revision, August 12 and 13, 2000, and August 29 through September 6, 2000, both of which were part of Texas Air Quality Study (TexAQS) 2000. The first analysis was the final control strategy used in the attainment demonstration, called Future Case fy07o.cs08 (future year 2007, version o, with Control Strategy 08). An additional model analysis (fy07m.cs08_ bpa100n095v_nf) reduced anthropogenic emissions of VOC by 5 percent from each source category, and another analysis (fy07m.cs08_bpa095n100v_nf) reduced anthropogenic emissions of NO_X by 5 percent from each source category. Table 4-4: *Calculated Future (2007) Ozone Design Values for the BPA Area* shows 2007 DVs that were calculated for each of the three analyses, along with the overall ozone reductions associated with each. For all three analyses, emissions from wildfires, which occurred during the episode were not included in the modeling. Compared to the unreduced future case, these latter two runs reduced emissions of NO_X and VOC by 7.80 and 5.53 tpd, respectively.

Table 4-4: Calculated Future (2007) Ozone Design Values for the BPA Area

Model Analysis	NO_X Emission Reduction (tpd)	VOC Emission Reduction (tpd)	Calculated Future Ozone Design Value (ppb)	Reduction to Future Ozone Design Value (ppb)
Future Case fy07o.cs08	0.0	0.0	82.081	N/A
fy07m.cs08_bpa100n095v_nf	0.0	5.53	82.027	0.054
fy07m.cs08_bpa095n100v_nf	7.80	0.0	81.794	0.287

Reducing VOC emissions by 5.53 tpd results in an estimated ozone DV reduction of 0.054 ppb. To reduce the ozone DV by one ppb, 102.4 tpd of VOC would need to be reduced. Similarly, reducing NO_X emissions by 7.80 tpd reduces the future ozone DV by 0.287 ppb, which means that a reduction of 27.2 tpd of NO_X emissions would be required to reduce one ppb in the ozone DV. Thus, NO_X emission reductions are expected to be 3.76 (102.4/27.2) times as effective in reducing the ozone DV as VOC emission reductions.

In the above analysis, both VOC and NO_X reductions were extrapolated linearly to a convenient value (the amount needed to reduce the ozone DV by one ppb). In reality, the chemistry (particularly the NO_X chemistry) is non-linear. NO_X reductions become increasingly effective in reducing the ozone DV as reductions increase. Conversely, VOC reductions behave relatively linearly and do not increase significantly in effectiveness as reductions increase. For large emission reductions, therefore, NO_X should become even more effective relative to VOC, and the equivalence value will increase beyond 3.76. NO_X emission reductions on a scale of a few tpd can be assumed to be about 3.76 times as effective as VOC emission reductions.

The trend analysis shows an overall decrease of 2.64 tons per average ozone season day in combined NO_X and VOC emissions for the BPA area. This is the net change including a projected 12.72 tpd increase in VOC and a 15.36 tpd decrease in NO_X. Also, photochemical modeling analysis for the BPA area shows that reducing NO_X emissions is expected to be more than three times as effective in reducing the ozone design value as VOC reductions. Therefore, the projected 15.36 tpd decrease of NO_X will more than offset the projected 12.72 tpd increase of VOC. Based on future trends and additional photochemical analysis, the BPA area is projected to show continued attainment through the end of the ten-year period following redesignation under the 1997 eight-hour ozone standard.

4.2.1 Area Sources

An area source is a group of minor point sources that emit air contaminants into the air and are not required to submit a point source emissions inventory to the TCEQ. Although these individual minor point sources may emit a small amount of contaminants into the air, collectively, they may be a significant source of VOC, NO_X, carbon monoxide (CO), particulate matter (PM_{10} and $PM_{2.5}$), and/or sulfur dioxide (SO_2). Area sources are divided into two groups characterized by the emission mechanism: hydrocarbon evaporative emissions or fuel combustion emissions. Examples of hydrocarbon evaporative emission sources include printing operations, industrial coatings, degreasing solvents, house paints, leaking underground storage tanks, and gasoline service station underground tank filling and vehicle refueling operations. Fuel combustion emission sources include stationary source fossil fuel combustion at residences and businesses, vehicle or equipment operations, outdoor burning, structural fires, and wildfires.

Area source emission calculations are estimated as county-wide totals rather than as individual source emissions. These emissions, with some exceptions, may be calculated by multiplication of an established, EPA approved emission factor (emissions per unit of activity) by the appropriate activity or activity surrogate responsible for generating emissions. Actual activity data is used when available. Examples include gallons of gasoline sold in a county, amount of printer ink used, number of wildfire acres burned, and amount of oil and natural gas produced. When actual activity data is unavailable, surrogates are used. These surrogates include total county population and employment data by industry type. Often actual activity data is available only at the state or national level and must be adapted to the county level using an appropriate surrogate.

The 2005 Periodic Emissions Inventory (PEI) was the starting point for the area source 2005 EI for the BPA area (Hardin, Jefferson, and Orange counties). PEI categories and emissions were reviewed and subsequently updated with current methodologies and local activity data when it was available. Major efforts are made to locate appropriate activity data. Specific categories were updated using information and data that represent 2005 activities. For other categories, emissions were grown from the 2002 EI to 2005 using the EPA's Economic Growth Analysis System (EGAS) 5.0 growth factors. Use of these various methodologies resulted in the 2005 area source EI being compiled from several sources of data, including work from various contracts, TCEQ research, and the EPA's National Emissions Inventory.

For those area source categories affected by TCEQ rules, rule effectiveness factors are applied to the baseline or uncontrolled emissions. These factors address the efficiency of the controls and the percentage of the category's population affected by the rule. The area source EIs for future years 2011, 2014, 2017, and 2021 are compiled using the EGAS growth factors. The EGAS contains individual growth factors for each category and for each forecasting year. This projection method is the EPA standard and accepted method for developing future year EIs.

Quality assurance of area source emissions involves ensuring that the activity data used for each separate category is current and valid. Data such as current population figures, fuel usage, and material usage were updated and the EPA guidance on emission factors was used. Other routine

efforts such as checking calculations for errors and conducting reasonableness and completeness checks were implemented.

4.2.1.1 Flash Emissions from Upstream Oil and Gas Production

VOC emissions from oil and gas production operations are higher than have been historically reported because the amount of emissions from flash losses from crude oil and condensate storage tanks at production tank batteries have been previously underestimated. Methods described in the EPA publication AP-42, *Compilation of Air Pollutant Emission Factors*, for estimating emissions from storage tanks do not account for flash emissions. A study sponsored by the TCEQ and the Houston Area Research Center (HARC) in 2006, known as project H51C, determined average emission factors from upstream oil and gas production tank batteries based on the quantity of crude oil and condensate produced. To present a more accurate inventory, the TCEQ has used these emission factors, which are higher than factors previously used, to estimate VOC emissions from the BPA area. These emissions are not expected to increase in future years and projections are expected to remain flat through the 2021 target year. Although oil and gas production varies from year to year due to supply and demand, the overall trend in the BPA area since 1993 has been downward. Moreover, newer technology has made recovery of these flash emissions easier and more economical, especially with the higher cost of natural gas and natural gas liquids. The TCEQ has sponsored a series of oil and gas pollution prevention workshops to inform industry of the new technologies and the potential cost savings from recovering these emissions. As companies become aware of the magnitude of the flash emissions, they are further motivated to reduce their emissions by improving their maintenance activities and/or installing control devices such as vapor recovery units.

4.2.2 On-Road Mobile Sources

On-road inventory estimates were developed under contract by the Texas Transportation Institute (TTI). Consistent with requirements from a September 4, 1992, EPA memorandum entitled "Procedures for Processing Requests to Redesignate Areas to Attainment," the on-road inventories for each of these calendar years are based on vehicle miles traveled (VMT) estimates for a typical summer weekday. The roadway link-level VMT estimates were obtained from travel demand modeling for the three-county BPA area. MOBILE6.2.03, which is the latest available version of the EPA's MOBILE model, was used to estimate the summer weekday emission rates in units of grams per mile (gpm) for NO_X and VOC. Table 4-5: *VMT, NO_X, and VOC On-Road Summary From 2005-2021 for BPA* summarizes the 2005, 2011, 2014, 2017, and 2021 summer weekday on-road emissions in tpd for the three-county BPA area.

Table 4-5: VMT, NO_X, and VOC On-Road Summary From 2005-2021 for BPA

Calendar Year	Weekday VMT	Summer Weekday On-Road Emissions (tpd)	
		NO_X	VOC
2005	12,620,598	45.60	11.63
2011	13,418,267	17.91	7.92
2014	13,951,735	12.38	6.51
2017	14,353,868	8.66	5.58
2021	14,803,438	6.24	4.77

Table 4-6: *Low RVP Gasoline On-Road Benefits for Three-County BPA Area* summarizes the on-road benefits of the Low Reid Vapor Pressure (RVP) gasoline program, which are included within the emission inventory figures presented in Table 4-5: *VMT, NO_X, and VOC On-Road Summary From 2005-2021 for BPA.*

Table 4-6: Low RVP Gasoline On-Road Benefits for Three-County BPA Area

Calendar Year	Low RVP Gasoline Benefits (tpd)	
	NO_X	VOC
2005	0.10	0.80
2011	0.07	0.50
2014	0.06	0.37
2017	0.05	0.30
2021	0.04	0.23

Table 4-7: *TxLED Fuel On-Road Benefits for Three-County BPA Area* summarizes the on-road benefits of the Texas Low Emission Diesel (TxLED) fuel program, which are included within the emission inventory figures presented in Table 4-5: *VMT, NO_X, and VOC On-Road Summary From 2005-2021 for BPA.* The TxLED requirements did not take effect until the fall of 2005, so the 2005 summer weekday on-road inventories exclude such benefits.

Table 4-7: TxLED Fuel On-Road Benefits for Three-County BPA Area

Calendar Year	TxLED Benefits (tpd)	
	NO_X	VOC
2005	--	--
2011	0.61	0.00
2014	0.37	0.00
2017	0.22	0.00
2021	0.12	0.00

The September 4, 1992, EPA memorandum referenced above requires that "the state should estimate the percent reduction (from the year that was used to determine the DV for designation and classification) achieved from Federal measures such as the Federal Motor Vehicle Control Program (FMVCP) and fuel volatility rules as well as control measures that have been adopted and implemented by the state." Table 4-8: *Summary of On-Road Emissions Excluding Low RVP Gasoline & TxLED Fuel* provides an on-road emissions summary that removes both the Low RVP gasoline and TxLED fuel benefits referenced in Tables 4-6: *Low RVP Gasoline On-Road Benefits for Three-County BPA Area* and 4-7: *TxLED Fuel On-Road Benefits for Three-County BPA Area*, respectively, so that the FMVCP benefits can be presented.

Table 4-8: Summary of On-Road Emissions Excluding Low RVP Gasoline & TxLED Fuel

Calendar Year	Weekday VMT	Summer Weekday FMVCP Emissions (tpd)	
		NO_X	VOC
2005	12,620,598	45.70	12.42
2011	13,418,267	18.59	8.41
2014	13,951,735	12.81	6.88
2017	14,353,868	8.93	5.88
2021	14,803,438	6.41	5.01

Using the 2005 emission totals from Table 4-8: *Summary of On-Road Emissions Excluding Low RVP Gasoline & TxLED Fuel* as a baseline for designation and classification purposes, Table 4-9: *Estimated FMVCP Relative Reductions from 2005 Baseline* summarizes the relative reductions in NO_X and VOC that the FMVCP is expected to provide from 2011 through 2021. The reductions presented account for the expected ongoing increases in VMT to 2021.

Table 4-9: Estimated FMVCP Relative Reductions from 2005 Baseline

Calendar Year	VMT Change	FMVCP Emissions Change	
		NO_X	VOC
2005	--	--	--
2011	6.3%	-59.3%	-32.3%
2014	10.5%	-72.0%	-44.6%
2017	13.7%	-80.5%	-52.7%
2021	17.3%	-86.0%	-59.7%

Table 4-10: *Estimated Reductions from 2005 Baseline of FMVCP, Low RVP, & TxLED* presents the expected relative reductions if the 2005 FMVCP emissions from Table 4-8: *Summary of On-Road Emissions Excluding Low RVP Gasoline & TxLED Fuel* are held constant, but the 2011-2021 on-road emissions from Table 4-5: *VMT, NO_X, and VOC On-Road Summary From 2005-2021 for BPA* are used that include the benefits of both Low RVP and TxLED. As Tables 4-6: *Low RVP Gasoline On-Road Benefits for Three-County BPA Area* and 4-7: *TxLED Fuel On-Road Benefits for Three-County BPA Area* demonstrate, the bulk of the non-FMVCP NO_X benefits are from TxLED, while all of the non-FMVCP benefits for VOC are from Low RVP gasoline.

Table 4-10: Estimated Reductions from 2005 Baseline of FMVCP, Low RVP, & TxLED

Calendar Year	VMT Change	Change From FMVCP, Low RVP, & TxLED	
		NO_X	VOC
2005	--	--	--
2011	6.3%	-60.8%	-36.3%
2014	10.5%	-72.9%	-47.6%
2017	13.7%	-81.0%	-55.1%
2021	17.3%	-86.3%	-61.6%

Greater detail covering the development of these on-road inventories with respect to vehicle type, county, etc. can be found in Appendix C: *2005/2006 On-Road Mobile Source Ozone Episode Modeling Emissions Inventories for the BPA Eight-Hour Nonattainment Area, TTI Report, July 2007* and Appendix D: *2011, 2014, 2017, and 2021 On-Road Mobile Source Emission Inventories for the BPA Eight-Hour Nonattainment Area, TTI Report, April 2008*.

The following FTP sites for each calendar year contain electronic MOBILE6.2.03 input files along with tab-delimited inventory summary tables for ease of loading into spreadsheet software:

- ftp://ftp.tceq.state.tx.us/pub/OEPAA/TAD/Modeling/Mobile_EI/BPA/m62/2005/
- ftp://ftp.tceq.state.tx.us/pub/OEPAA/TAD/Modeling/Mobile_EI/BPA/m62/2011/
- ftp://ftp.tceq.state.tx.us/pub/OEPAA/TAD/Modeling/Mobile_EI/BPA/m62/2014/
- ftp://ftp.tceq.state.tx.us/pub/OEPAA/TAD/Modeling/Mobile_EI/BPA/m62/2017/
- ftp://ftp.tceq.state.tx.us/pub/OEPAA/TAD/Modeling/Mobile_EI/BPA/m62/2021/

4.2.2.1 Motor Vehicles Emissions Budget (MVEB)

The NO_X and VOC on-road inventory totals for 2021, the final year of this Maintenance Plan, establish the basis of the MVEB prior to addition of any safety margin allocation from other source categories. The MVEB is presented below in Table 4-11: *2021 Horizon Year MVEB for the BPA Area*.

Table 4-11: 2021 Horizon Year MVEB for the BPA Area

Calendar Year	MVEB (tpd)	
	NO_X	VOC
2021	6.24	4.77

4.2.2.2 Safety Margin

A safety margin is the amount by which the total projected emissions from all sources of a given pollutant are less than the total emissions that would satisfy the applicable requirement for attainment, 40 CFR 93.101. Also 40 CFR 93.124 (a) allows the safety margin to be allocated to the transportation sector for conformity purposes. As shown in the emissions inventories earlier in this plan, the 2021 total emissions inventories for NO_X are below the level necessary to demonstrate continued maintenance. The state may allocate some or all of the safety margin to the MVEB for transportation conformity purposes, according to the federal transportation conformity rule.

The 2021 inventory in the BPA area represents a 15.36 tpd decrease in NO_X emissions compared with 2005, while VOC emissions increase by 12.72 tpd. However, because NO_X and VOC are not equally efficient ozone producers, simply adding the VOC emissions increase to the NO_X emissions decrease does not provide a meaningful measure relative to peak ozone concentrations. As shown previously in this chapter, NO_X emission reductions are estimated to be 3.76 times as efficient in reducing peak eight-hour ozone concentrations as VOC reductions. This same relationship will hold true for emission increases as long as they are relatively small (on the order of a few tpd).

Therefore, it is reasonable to convert the VOC emissions into its NO_X equivalent by dividing it by 3.76. Doing so yields a NO_X-equivalent value of 3.38 tpd increase, which can then be added to the projected 15.36 tpd decrease in NO_X emissions to yield a 11.98 tpd reduction of NO_X-equivalent emissions. As shown in Table 4-12: *2021 Horizon Year MVEB and Safety Margin for the BPA Area*, the TCEQ is allocating one tpd of the 11.98 tpd NO_X emission reduction as a safety margin, which increases the MVEB for NO_X emissions from 6.24 tpd to 7.24 tpd.

Table 4-12: 2021 Horizon Year MVEB and Safety Margin for the BPA Area

MVEB	On-Road Emissions (tpd)	
	NO_X	VOC
2021 Summer Weekday	6.24	4.77
Safety Margin	1.00	0.00
MVEB with Safety Margin	7.24	4.77

4.2.3 Non-Road Mobile Sources

Non-road mobile categories include, but are not limited to, aircraft, railroad locomotives, commercial marine vessels, and a broad range of equipment from 600-horsepower engines in the construction equipment class to one-horsepower string trimmers in the lawn and garden class. For all non-road mobile categories except aircraft, locomotives, and commercial marine vessels, the emissions were calculated using the TCEQ developed Texas specific NONROAD (TexN) model that utilizes the EPA's latest NONROAD MODEL 2005. Although operating the EPA's

model with all of the default surrogates is acceptable, the EPA encourages states to update the model with local, county-level data based on surveys and other relevant information. The TexN model is a software tool for developing emissions estimates for non-road mobile sources in Texas using county specific activity data. The model allows the TCEQ to replace the EPA's default data with local data. Local, county-level data is incorporated into the TexN model as it becomes available to the TCEQ.

The TexN model generates emissions for every county in the state for over 200 individual types of equipment, for the following classes:

- agricultural;
- commercial;
- construction;
- industrial/oilfield;
- lawn and garden;
- logging;
- railway maintenance;
- recreational; and
- recreational marine.

The emissions for the 2005 base year and 2011 were estimated using the TexN model. The model uses variables such as equipment populations, activity data (e.g., hours of operation, load factors, etc.), emission factors, and growth factors, to estimate emissions from nonroad mobile sources. The current TexN model can only provide projections to 2013. In order to estimate emissions beyond 2013, projection ratios were developed using the latest version of the EPA's National Mobile Inventory Model (NMIM). The NMIM was run with default activity data for the years 2005, 2011, 2014, 2017, and 2021 to establish projection ratios. The projection ratios were then applied to the TexN numbers to develop the 2014, 2017, and 2021 emission numbers.

The equation below explains how emissions were projected for the years beyond 2013:

$$\mathbf{E_{2014Projected} = E_{2011TexN} * (E_{2014NMIM} / E_{2011NMIM})}$$

The emissions summary for non-road mobile sources that are in the NONROAD MODEL categories is presented in Table 4-13: *Summary of NONROAD Emissions in the BPA Area*.

Table 4-13: Summary of NONROAD Emissions in BPA Area

Calendar Year	VOC	NO_X
	tons per average ozone season day	
2005	3.88	6.11
2011	3.17	4.58
2014	2.98	3.94
2017	2.89	3.39
2021	2.89	2.95

Quality assurance procedures for non-road mobile source emissions rely primarily upon the quality of data used for each separate category. Data such as local equipment population figures and fuel usage routinely change annually. Sources of this information were contacted during the inventory development for updates. Using the current TexN model ensures that updates to equipment types, horsepower ranges, and results from applicable rules are applied to the emissions. Other routine efforts such as checking calculations for errors and conducting reasonableness and completeness checks were also implemented.

4.2.3.1 Airports

Emissions from airport activities were estimated for VOC and NO_X for the following airports: Beaumont municipal airport, Jefferson County, Hawthorne Field, and Orange County. The categories considered were Ground Support Equipment (GSE), General Aviation (GA), and commercial aircraft.

Emissions numbers were projected using the growth factors obtained from "Terminal Area Forecast Summary for Fiscal Years 2005-2025, U.S. Department of Transportation Federal Aviation Administration, FAA-APO-06-1 March 2006, page 17." Commercial aircraft, GSE, GA, and total area airport emissions are displayed in Table 4-14: *Summary of Emissions for BPA Area Airports*.

Table 4-14: Summary of Emissions for BPA Area Airports

Calendar Year	2005		2011		2014		2017		2021	
Pollutant (tons per average ozone season day)	VOC	NO_X	VOC	NO_X	VOC	NO_X	VOC	NO_X	VOC	NO_X
Commercial Aircraft Emissions	0.42	0.38	0.45	0.41	0.46	0.42	0.48	0.44	0.50	0.45
GSE Emission	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
GA Emissions	0.01	0.05	0.10	0.05	0.11	0.05	0.11	0.06	0.12	0.06
Total Area Airport Emissions	0.53	0.44	0.56	0.47	0.58	0.49	0.60	0.50	0.63	0.52
Landing and Take Off (LTO)*	2275		2433		2513		2597		2712	
Growth percent**	1.16		6.96		10.44		14.14		19.22	

Note: Airports in Beaumont-Port Arthur considered in this report: Beaumont municipal airport, Jefferson County, Hawthorne Field, and Orange County. 2011, 2014, 2017 and 2021 emissions and LTOs were calculated from 2005 using the estimated Operations at Towered Airport national compounded growth rate of 1.16 percent from 2004 - 2015 and 1.27 percent from 2015 - 2025 for Non Hub Towers. See "Terminal Area Forecast Summary for Fiscal Year 2005 -2025, U.S. Department of Transportation Federal Aviation Administration, FAA-APO-06-1 March 2006, page 17."

* Source: U.S. Department of Transportation Bureau of Transportation Statistics Office of Airline Information; Airport Activity Statistics of Certificated Air Carriers Summary Tables, Table 7, twelve months ending December 31, 2005.
** The growth percent for 2011, 2014, 2017 and 2021 was calculated from the base year, 2005. Emissions for 2005 were extrapolated from the 2007 emissions number obtained from the 2005 SIP, Revisions to the BPA Eight-Hour Ozone Attainment Demonstration SIP, September 28, 2005, Table 3-36 2007 Non-road Category BPA 3-County, totals for a Weekday Non-road before SIP controls Page 3--55.

4.2.3.2 Locomotives and Marine Vessels

The on-road mobile source emissions primarily attributed to railway/locomotive and marine/boating activities in the BPA area were developed using the 2005 TexAER data. The factors used to determine projected emissions took into consideration shipping activities in area ports and cargo transport. Additionally, federal controls and activities were also considered when developing the non-road mobile source emissions projections derived from locomotive and marine activities. Base year and projected emissions for these sources are displayed in Table 4-15: *VOC and NO_X Emissions Analysis for BPA Area Railway/Locomotive Activity* and Table 4-16: *VOC and NO_X Emissions Analysis for BPA Area Marine/Boating Activity*.

Table 4-15: Summary of Emissions for BPA Area Railway-Locomotive Activity

Calendar Year	VOC	NO_X
	tons per average ozone season day	
2005	0.11	2.04
2011	0.14	2.43
2014	0.15	2.66
2017	0.16	2.91
2021	0.18	3.27

Note: The 2005 base year emissions were obtained from the 2005 TexAER data. The growth factor of 3 percent per year was used to determine estimated emissions for calendar years 2011, 2014, 2017, and 2021 was determined by the growth factor extrapolated from data in the Tier-Specific Locomotive Engine Update, August 31, 2007, conducted for the TCEQ by Eastern Research Group, Inc. The study was developed to ascertain emissions activity in the Dallas-Fort Worth Area, the Houston-Galveston-Brazoria Area, and the state of Texas. The growth rate was developed using reports from railway companies, regulatory controls data, and Texas Emissions Reduction Plan (TERP) data.

Table 4-16: Summary of Emissions for BPA Area Marine-Boating Activity

Calendar Year	VOC	NO_X
	tons per average ozone season day	
2005	0.44	17.40
2011	0.49	19.60
2014	0.52	20.79
2017	0.55	22.07
2021	0.60	23.89

Note: The 2005 base year emissions for area Marine-Boating Activity were obtained from the 2005 TexAER that consisted of data collected for TCEQ by Starcrest. The growth factor of 2 percent per year was used to determine estimated emissions for calendar years 2008, 2011, 2014, 2017, and 2021 and was ascertained from data and analysis of the Houston/Galveston Routine Vessel Identification and Traffic Study, February 2, 2007, and the Harbor Vessel Marine Emissions Inventory of the Houston/Galveston /Brazoria Area: Phase 1 Data Collection Final Report, August 31, 2007. Both studies were conducted for the TCEQ by Eastern Research Group, Inc. Ports in Jefferson, Orange, and Hardin counties were profiled under "Beaumont, TX" and included data related to cargo tons and ship containers handled through the ports.

4.2.4 Stationary Point Sources

4.2.4.1 Emissions Inventory Compilation

Stationary point source emissions data are collected annually from sites that meet the reporting requirements of 30 Texas Administrative Code (TAC) § 101.10. To collect the data, the TCEQ mails emissions inventory questionnaires (EIQ) to all sites identified as meeting the reporting requirements. Companies are required to report emissions data and to provide sample calculations used to estimate the emissions. Information characterizing the process equipment, the abatement units, and the emission points is also required.

All data submitted in the EIQ are reviewed for quality assurance purposes and then stored in the State of Texas Air Reporting System (STARS) database. The following TCEQ web page contains EIQ guidance documents and other historical point source emissions of major pollutants: http://www.tceq.state.tx.us/implementation/air/industei/psei/psei.html. Additional information is available upon request from the TCEQ's Air Quality Division.

4.2.4.2 Updated 2005 Base Year Inventory

The TCEQ extracted the 2005 base year inventory data from STARS on February 15, 2008. The extracted data were reported ozone season daily emissions of NO_X and VOC from each site in the BPA area that submitted an EIQ for 2005 and reflect revisions made on or before that date.

4.2.4.3 Updated Uncontrolled Milestone Year Inventories

In developing the milestone year inventories, the TCEQ projected the 2005 inventory using the following approaches: normalizing the 2005 emissions for refineries that are expanding operations; applying projection factors for the remaining sources; and adding unused emissions credits.

Three refineries are increasing daily production levels, in accord with recent permit actions. Motiva Enterprises, LLC is doubling the capacity at its Port Arthur refinery from 300,000 to 600,000 barrels per day, the Premcor Refining Group (Valero) is expanding its capacity to 420,000 from 300,000 barrels per day, and Total Petrochemicals USA Incorporated is increasing the capacity of its Port Arthur refinery by 50,000 barrels per day. Because of these expansions, the TCEQ projected emissions for each site by multiplying the 2005 emissions by the ratio of the future site annual allowable emissions to the 2005 annual allowable emissions. Please refer to Appendix E: *Point Source Inventory Projection Methodology* for more details and discussion. None of the projections employed show a decline in emissions from these sources from 2005 to 2021.

For non-electric generation units other than the above mentioned refineries, the TCEQ estimated future emissions by applying projection factors (refer to the paragraph below for discussion of projection factors). Projection factors were compared to emissions changes from 2002 to 2005 for each contaminant and for each industrial category at the county level. For industries with emissions increases, the dataset with the projection factor closest to the actual change was used to project the 2005 base inventory. For sectors with decreases in emissions from 2002 to 2005, the TCEQ did not apply a growth factor to the 2005 emissions; future year emissions were projected at the 2005 levels. None of the projections employed showed a decline in emissions from these sources from 2005 to 2021.

Using EGAS 5.0, the TCEQ derived projection factors from both the Regional Economic Modeling, Inc. (REMI) 5.5 factor set and the Moody's Economy, Inc. factor set at the countywide level for Texas. The above two sets were employed because the economic information was available at the county rather than at the state level. The projection factors, available only to 2020, were projected to 2021 by applying a linear regression on the 2017 to 2020 factors.

For electric generating units (EGUs), the TCEQ used the REMI growth factors to project emissions for future milestone years. This method was used even though the sector showed a decrease in emissions from 2002 to 2005. A different projection method is warranted because EGUs differ from non-EGUs in that, in the absence of new controls, EGU emissions are related to population growth and economic growth.

Initially, EGU emissions were determined using Clean Air Interstate Rule (CAIR) allocations. However, on July 28, 2008, the United States Court of Appeals for the District of Columbia Circuit issued an opinion that vacated CAIR. Because of continuing legal issues, the EPA strongly urged the TCEQ to revise this redesignation request and maintenance plan to be as independent of CAIR as possible.

The growth in NO_X and VOC emissions in the BPA area was adjusted to account for emissions credits. Emissions credits are emissions reductions that may return to the air shed in the future. To account for the possible use of these banked NO_X and VOC emissions, the TCEQ applied emissions credits extracted from the TCEQ Emissions Banking and Trading database on March 17, 2008. There are two kinds of credits: emissions reductions credits (ERC) and discrete emissions reductions credits (DERC). The TCEQ applied an environmental offset of 1.1 to the credits. The TCEQ calculated DERC use by averaging 2003 to 2005 DERC use, and projected that DERC will be generated at the same rate as use.

Table 4-17: *BPA Three-County Stationary Point Source VOC and NO_X Emissions* contains the results for NO_X and VOC emissions projections from stationary point sources.

Table 4-17: BPA Three-County Stationary Point Source VOC and NO_X Emissions

Calendar Year	VOC	NO_X
	tons per average ozone season day	
2005	42.68	68.49
2011	48.26	79.17
2014	49.83	81.14
2017	51.54	83.04
2021	53.95	85.44

4.2.5 Biogenic Sources

Biogenic sources include pine and oak forests, crops, and lawn grass that produce VOC emissions such as isoprene, monoterpene, and alpha-pinene. In addition, nitric oxide emissions are produced by soils. The EPA, using the latest Biogenic Emissions Inventory System (BEIS) model, provided the biogenic EI to the states. Data used in the model includes vegetation types and land use from satellite imaging, field biomass surveys, and emission factors for plant species.

The EPA guidance excludes biogenic emissions from the baseline and future inventories, and thus this submittal does not consider biogenic sources. However, biogenic emissions are necessary to determine the overall emissions profile of an area and therefore are required for air quality modeling.

4.3 CONTROL STRATEGIES

To address the significant air quality concerns under the one-hour and eight-hour ozone NAAQS, the TCEQ and the EPA have developed strategies to reduce NO_X and VOC emissions. These strategies reduced ozone levels and will assist the area in maintaining the standard in the BPA area. The following are descriptions of the strategies, which are also discussed in Section 2.3.1: *Control Strategies* of Chapter 2: *Redesignation Requirements.*

4.3.1 Point Source NO_X Control Strategy

The ozone control strategy for the BPA area has focused primarily on NO_X emission reductions from stationary point sources due to the relatively large contributions from this sector in the emissions inventory. Over the last decade, the commission has adopted progressively more stringent regulations in 30 TAC Chapter 117 for the control of NO_X emissions. The following description summarizes the 30 TAC Chapter 117 rulemaking history to date for the BPA area.

To meet the requirements of the FCAA, the commission adopted NO_X RACT rules effective June 9, 1993, in 30 TAC Chapter 117, "Control of Air Pollution from Nitrogen Compounds." These requirements applied to electric utility boilers, industrial boilers and process heaters, gas turbines, rich-burn stationary gas-fired internal combustion engines, nitric acid plants, and adipic acid plants in the BPA area and had a compliance date of November 15, 1999.

On October 27, 1999, the commission adopted Phase I of the state's NO_X rulemaking activities for the BPA attainment demonstration. As part of that SIP revision, the commission adopted VOC rules for batch process and industrial wastewater sources and NO_X rules for lean-burn engines. Compliance with the Phase I rules was required by November 15, 2001.

Phase II of the state's NO_X rulemaking activities for the BPA attainment demonstration was adopted by the commission on April 19, 2000. These rules required further NO_X reductions from electric utility power boilers (approximately 50 percent reduction) and from industrial boilers and process heaters (approximately 20 percent reduction). The schedule set forth in the rules for the

Phase II reductions requires two-thirds of the reductions by May 1, 2003, and the remaining one-third by May 1, 2005.

4.3.2 National Volatile Organic Compound Emission Standards for Consumer Products

Federal rules regulating the VOC content of consumer products are codified in 40 CFR 59 Subpart C. These rules were promulgated in 1998. Since that time, rules requiring stricter VOC limits have been adopted in California and in the OTC states. The EPA is working to amend the federal rules based on the OTC model rule, with compliance scheduled for January 2009. VOC emissions from consumer products are estimated to decrease by 14 percent from baseline levels.[10]

4.3.3 National Organic Compound Emission Standards for Architectural Coatings

Federal rules regulating the VOC content of AIM coatings are codified in 40 CFR 59 Subpart D. These rules were promulgated in 1998. Since that time, rules requiring stricter VOC limits have been adopted in California and in the OTC states. The EPA is working to amend the federal rules based on the OTC model rule, with compliance scheduled for January 2009. VOC emissions from AIM coatings are estimated to decrease by 30 percent from baseline levels.[11]

4.3.4 National Low Emission Vehicle (NLEV) Program/Tier 2 Engine and Fuel Standards

Automobile manufacturers made a commitment through the NLEV program to introduce cleaner cars. This commitment along with improvements in gasoline quality, combined with the advanced vehicle technology, will assist areas in achieving their overall air quality goals by reducing NO_X emissions. The federal Tier 2 car and truck standards that have even more stringent emission standards than NLEVs, were phased in for all on-road and non-road vehicles and equipment beginning with the 2004 model year.

4.3.5 Stage I Vapor Recovery

The Stage I vapor recovery rules regulate the filling of gasoline storage tanks at gasoline stations by tank trucks. To comply with Stage I requirements, a vapor balance system is typically used to capture the vapors from the gasoline storage tanks that would otherwise be displaced to the atmosphere as these tanks are filled with gasoline. The captured vapors are routed back to the tanker truck and processed by a vapor control system when the tanker truck is subsequently refilled at a gasoline terminal or gasoline bulk plant. The effectiveness of Stage I vapor recovery rules depends on the captured vapors being: 1) effectively contained within the gasoline tanker truck during transit; and 2) controlled when the transport vessel is refilled at a gasoline terminal or gasoline bulk plant.

4.3.6 Stage II Vapor Recovery

The Stage II vapor recovery program involves use of technology that prevents gasoline vapors from escaping during refueling of on-road motor vehicles. The EPA mandates that Stage II refueling requirements apply to all public and private refueling facilities dispensing 10,000 gallons or more of gasoline per month. The federal throughput constitutes a minimum threshold, but a state may be more stringent in adopting a throughput standard. The TCEQ applies a more stringent throughput standard in the applicable ozone nonattainment counties by requiring all facilities constructed after November 15, 1992, to install Stage II vapor recovery regardless of throughput.

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[10] Based on H54, a HARC study performed by PCA

[11] Based on H54, a HARC study performed by PCA

4.3.7 Texas Low Emission Diesel (TxLED)

This rule reduces emissions of NO_X and other pollutants from diesel-powered motor vehicles and non-road equipment operating within 110 counties in the eastern half of Texas including the BPA area. The rule was originally adopted by the commission in December 2000, and was most recently revised in May 2007. The TxLED rules require that diesel fuel produced for delivery and ultimate sale to the consumer must contain less than 10 percent by volume aromatic hydrocarbons and must have a cetane number of 48 or greater. Some compliance options are allowed. The TxLED implementation dates were October 31, 2005, for producers and importers; December 15, 2005, for bulk distribution facilities; and January 31, 2006, for retail fuel dispensing outlets, wholesale bulk purchasers, consumer facilities, and all other affected persons. The TxLED rules were revised in May 2007 to include marine distillate fuels commonly known as Marine Distillate fuel X (DMX), Marine Distillate fuel A (DMA), and Marine Gas Oil (MGO), into the definition of diesel fuels for compliance with the TxLED requirements in the Houston-Galveston-Brazoria ozone nonattainment area counties. The requirements affecting marine diesel were phased-in from October 1, 2007, to January 1, 2008.

4.3.8 Texas Emission Reduction Plan (TERP)

In 2001, the 77th Texas Legislature passed Senate Bill 5, establishing the TERP, which includes incentive grants programs to reduce NO_X emissions from internal combustion engines on mobile sources. Eligible grant projects include fleet expansions with cleaner engines, replacement of old vehicles and equipment, repower of old engines, and on-vehicle and on-site infrastructure for idle reduction, electrification, and delivery of alternative fuels.

As of September 2007, the program has awarded over $19 million for 58 projects in the BPA area, which are estimated to reduce NO_X emissions by more than 2.7 tons per day by 2009, at an average cost per ton of NO_X reduced of $4,311. In the BPA area, the projects funded thus far have resulted in NO_X reductions of 4,483.24 total tons.

For information on recent TERP activities, please visit the TERP web site: www.tceq.state.tx.us/implementation/air/terp/.

4.3.9 Locomotives and Marine Compression-Ignition Engines

On March 14, 2008, the EPA adopted new emission standards for locomotives and marine diesel engines that will reduce PM emissions by about 90 percent and NO_X emissions by about 80 percent from engines meeting these new standards when compared to engines meeting the current standards. The new federal standards comprise a three-part program to tighten emission standards for existing locomotives and large marine engines when they are remanufactured, effective immediately; establish stringent Tier III standards for new locomotives and marine diesel engines that will be phased in beginning 2009; and establish more stringent Tier IV standards for new locomotives and marine diesel engines that will be phased in beginning 2014. In addition, these new federal standards include idle reduction requirements for newly built and remanufactured locomotives and provisions that encourage the production of cleaner new generation switch locomotives.

4.4 EMISSIONS SUMMARY

The 2005 base year and the 2011, 2014, 2017, and 2021 future year EI summaries by source categories for the BPA area are shown in Figures 4-1: *BPA VOC Emissions by Source Category* and 4-2: *BPA NO_X Emissions by Source Category*. These figures illustrate that the largest man-made contribution of VOC is from area sources. For NO_X, the largest man-made contribution is from point sources. Contributions from biogenic emissions are not included in the summary because the maintenance measures are limited to the reduction of man-made emissions.

The percentages of emissions by source category for 2002, 2004, 2010, and 2014 are reflected in Table 4-18: *Percentages of VOC Emissions in BPA by Source Category* and Table 4-19: *Percentages of* NO_X *Emissions in BPA by Source Category*.

Table 4-18: Percentages of VOC Emissions in BPA by Source Category

Source Category	VOC Emissions by Evaluation Year				
	2005	2011	2014	2017	2021
On-Road	5.52%	3.66%	2.99%	2.54%	2.13%
Point	20.24%	22.32%	22.92%	23.46%	24.13%
Area	71.89%	72.00%	72.14%	72.09%	71.81%
Non-Road	2.35%	2.02%	1.95%	1.91%	1.92%

Table 4-19: Percentages of NO_X Emissions in BPA by Source Category

Source Category	NO_X Emissions by Evaluation Year				
	2005	2011	2014	2017	2021
On-Road	30.58%	13.35%	9.39%	6.59%	4.66%
Point	45.92%	59.03%	61.56%	63.18%	63.87%
Area	6.07%	7.42%	7.89%	8.26%	8.57%
Non-Road	17.43%	20.19%	21.15%	21.97%	22.90%

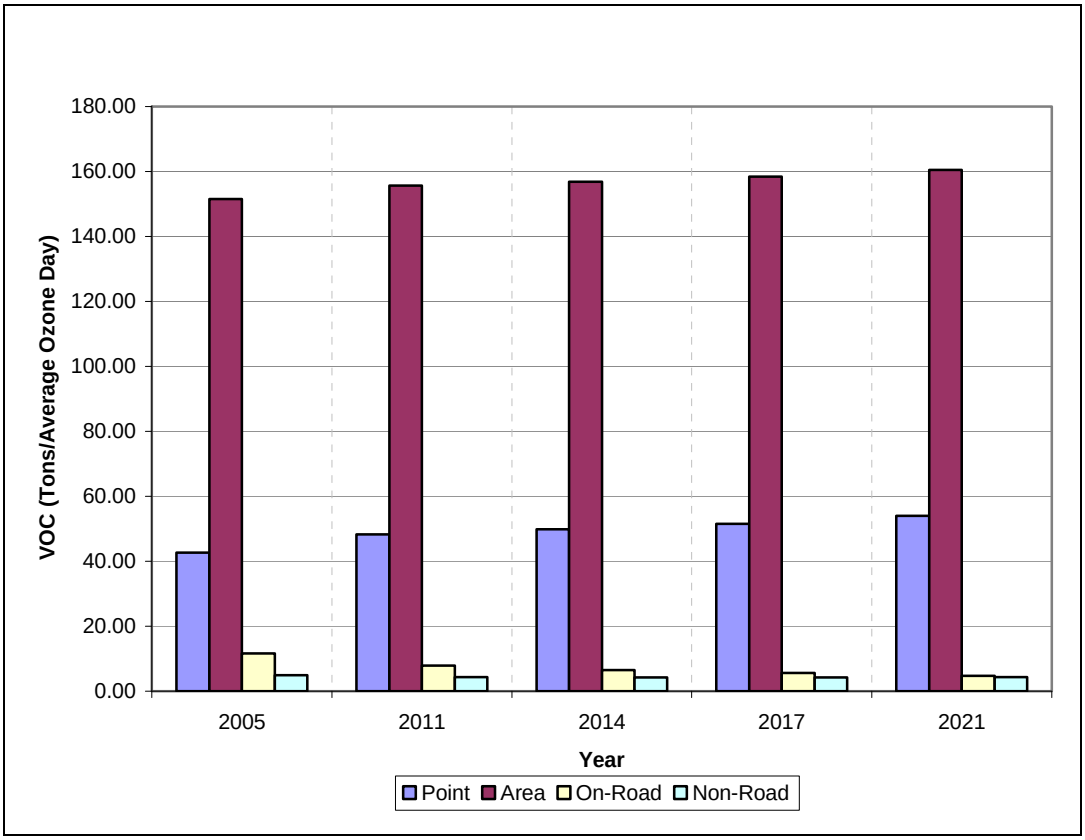

Figure 4-1: BPA VOC Emissions by Source Category

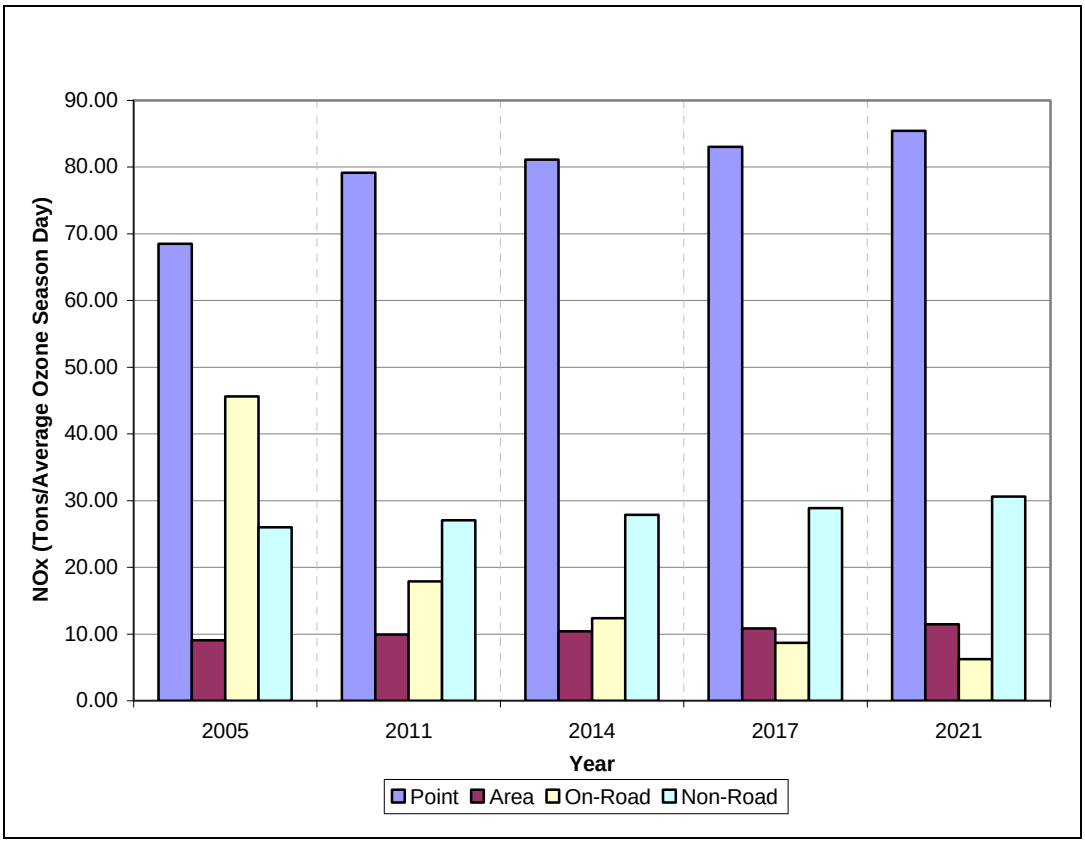

Figure 4-2: BPA NO_X Emissions by Source Category

CHAPTER 5: MONITORING NETWORK

5.1 GENERAL

The method chosen to verify continued attainment is the ambient air quality monitoring network. The ambient air monitoring sites will remain active at their present locations during the entire length of the maintenance plan period (2021). The relocation or removal of any monitors will be done with the United States Environmental Protection Agency's (EPA) concurrence. Data retrieved from the BPA area's monitors will be quality controlled and submitted to the EPA's Air Quality System (AQS) on a monthly basis.

The Beaumont-Port Arthur (BPA) area monitoring network consists of nine ambient air monitors located in Jefferson and Orange Counties, Texas. The South East Texas Regional Planning Commission (SETRPC) funds and operates four of the monitors: Port Arthur (Continuous Air Monitoring Station (CAMS) 628), Sabine Pass (CAMS 640), Mauriceville (CAMS 642), and Jefferson County Airport (CAMS 643). The remaining five, Beaumont-Lamar (CAMS 2), Hamshire (CAMS 64), Nederland High School (CAMS 1035), Port Arthur West (CAMS 28), and West Orange (CAMS 9), are funded and operated by the TCEQ. The Jefferson County Airport monitor (CAMS 643) is the monitor driving the area's Design Value (DV) (2005-2007). The monitors are managed in accordance with 40 CFR Part 58, to verify the attainment status of the area. The Texas Commission on Environmental Quality (TCEQ) commits to keep CAMS 2, 9, 28, 64, and 1035 in place until the end of the maintenance period (2021) and continue to report data from these monitors to the EPA on the schedule required by 40 Code of Federal Regulations (CFR) Part 58. The TCEQ will also continue to provide data from the SETRPC monitors on the commission's website as long as the SETRPC participates in the network. The monitors will be used to detect if and when appropriate levels have been exceeded for contingency measure triggering purposes.

CHAPTER 6: CONTINGENCY PLAN

6.1 BACKGROUND

The Federal Clean Air Act (FCAA) requires that maintenance plans include contingency provisions to promptly correct any violation of the National Ambient Air Quality Standard (NAAQS) [see Section 175A(d) of the FCAA]. The contingency plan ensures that the contingency measures are adopted expeditiously if they are triggered. In accordance with United States Environmental Protection Agency (EPA) guidance[12], a trigger has been established in order to effectuate appropriate and timely responses to indications of a possible future violation of the NAAQS. Thus, actions may be taken that can avoid a violation and potential redesignation to nonattainment.

6.2 CONTINGENCY MEASURES AND TRIGGER LEVEL

Since the implementation of potential contingency measures would not be expected to take place until well in the future, the identification of specific detailed measures is not practical. The most appropriate contingency measures may be significantly different from the measures mentioned below due to technological, societal, economic, and political factors that are impossible to predict.

If air quality monitoring data indicate that the area has violated the 1997 eight-hour ozone NAAQS (any consecutive three-year average of each annual fourth-highest daily maximum eight-hour ozone average at or above 85 parts per billion (ppb)) the Texas Commission on Environmental Quality (TCEQ) will implement specific contingency measures. Those to be considered include but are not limited to the following control measures:

- Revision to 30 Texas Administrative Code (TAC) Chapter 117, Subchapter B, Division 1 or Subchapter E, Division 4, to control rich-burn, gas-fired, reciprocating internal combustion engines located in the Beaumont-Port Arthur (BPA) area to meet nitrogen oxides (NO_X) emission specifications and other requirements to reduce NO_X emissions and ozone air pollution.

- Inclusion of one or more counties in the BPA area in 30 TAC Chapter 115 volatile organic compounds (VOC) rules for the control of crude and condensate storage tanks at upstream oil and gas exploration and production sites or midstream pipeline breakout stations with uncontrolled flash emissions greater than 25 tons per year.

- Inclusion of one or more counties in the BPA area in 30 TAC Chapter 115 VOC rules for more stringent controls for tank fittings on floating roof tanks, such as slotted guidepoles and other openings in internal and external floating roofs.

- Inclusion of one or more counties in the BPA area in 30 TAC Chapter 115 VOC rules limiting emissions from landings of floating roofs in floating roof tanks.

[12] USEPA: "Proceedures for Processing Requests to Redesignate Areas to Attainment" Memorandum from John Calcagni, Director, Air Quality Management Division, September 4, 1992.

- Inclusion of one or more counties in the BPA area in 30 TAC Chapter 115 VOC rules for control of VOC emissions from degassing operations for storage tanks with a nominal capacity of 75,000 gallons or more storing materials with a true vapor pressure greater than 2.6 pounds per square inch absolute (psia), or with a nominal capacity of 250,000 gallons or more storing materials with a true vapor pressure of 0.5 psia or greater. Degassing vapors from storage vessels, transport vessels, and marine vessels would be required to vent to a control device until the VOC concentration of the vapors is reduced to less than 34,000 parts per million by volume as methane.

- Inclusion of one or more counties in the BPA area in 30 TAC Chapter 114 rule for Texas Low Emission Diesel (TxLED) compliant marine diesel.

Texas has the authority to promulgate rules according to Texas Health and Safety Code § 382.017 and Texas Water Code § 5.103. State administrative procedures require that proposed rules are adopted no more than six months after notice of the proposal is published in the *Texas Register* (see Texas Gov. Code § 2001.027). These measures or other strategies that would reduce the ozone precursor levels to the extent necessary to comply with the 1997 eight-hour ozone NAAQS will be adopted (subject to commission approval and opportunity for public comment), submitted, and implemented no longer than 18 months following a monitored and quality assured violation of the NAAQS.

The BPA area may also be expected to voluntarily implement some additional local control measures.

Appendices Available Upon Request

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