Table 5.1-1 HGB NO_x Reduction Estimates[1]

August 30, 2000	2000 Base Case (tpd)	Percent of 2000 Total	2007 Future Base	2007 Controlled (tpd)	Percent of 2007 Total
Onroad mobile sources	342	33%	218	175	33%
Area and nonroad mobile sources	184	18%	188	155	30%
Point sources[2]	492	47%	509	174	33%
Biogenic sources	21	2%	21	21	4%
TOTALS	**1039**	**100%**	**936**	**525**	**100%**

[1]Totals may not equal 100 percent due to round-off.
[2]Point source inventory subject to revision. See Chapter 3, Section 3.5.3 of the December 2000 SIP revision for explanation.

5.1 OVERVIEW

The current modeling for the HGB airshed indicates that additional HRVOC reductions will be the most effective measure in reducing ozone in the HGB area when combined with the 80 percent NO_x reductions in place. To achieve the necessary HRVOC reductions, the TCEQ is adopting a dual strategy: address variable short-term emissions through a not-to-exceed limit and address steady-state and routine emissions through an annual cap. The annual HRVOC cap would be reduced from the existing HRVOC cap in order to support the attainment demonstration modeling. The existing HRVOC rules for fugitives, cooling towers, flares, and process vent are also being revised as a part of this SIP revision.

The HGB SIP no longer relies primarily on NO_x based strategies. A combination of point source HRVOC controls and NO_x reductions provide the most effective means of reducing ozone in the HGB area and there is no longer a NO_x shortfall in the HGB SIP. The TCEQ has also reevaluated a number of the existing control strategies that were put in place in the December 2000 revision. The photochemical modeling shows that some of these strategies are no longer necessary to attain the 1-hour ozone standard. This revision repeals the Commercial Lawn/Garden Restriction and the Heavy-Duty Vehicle Idling Restriction. The TCEQ is also removing Chambers, Liberty, and Waller Counties from the Vehicle I/M Program. In addition, this revision includes changes to the environmental speed limit strategy. In September 2002, the commission revised the existing speed limit strategy to suspend the 55 mph speed limit until May 1, 2005 and to increase speeds to 5 mph below what was posted before May 1, 2002, where speeds were 65 mph or higher. In 2003, the 78th Texas Legislature removed authority to determine speed limits for environmental purposes. Therefore, this revision removes the reinstatement of the 55 mph speed limit on May 1, 2005. The currently posted speed limits remain 5 mph below the posted limit before May 1, 2002. As part of this revision, the restoration of adequate funding to TERP and the TERP projects funded to date are discussed. The TCEQ has also adopted a new statewide rule to control emissions from portable fuel containers. Historically, the commission has expressed a preference to implement technology-based strategies over behavior-altering strategies and these changes embody that philosophy.

Table 5.1-2: Summary of Control Strategies for the HGB Attainment Demonstration (December 2000-Present)

Type of Measure	Description
POINT SOURCE MEASURES	
Point Source NO_x	-Requires a variety of minor and major stationary sources in the 8-county HGB area to meet NO_x emission specifications -Requires an overall 80% reduction in NO_x -Estimated NO_x reductions 598 tpd **(No change from December 2002 revision)**
Emissions Banking and Trading Program	-Overall NO_x Mass Emission Cap and Trade Program for the HGB area -HRVOC Cap and Trade (HECT) Program for Harris County • Annual HRVOC cap was reduced from the HRVOC cap in the December 2002 SIP revision in order to support the attainment demonstration modeling • The respective caps were then reduced by 5% as a compliance margin to address uncertainty in geographical emission shifts under a cap and trade program • Exempts the seven counties surrounding Harris County while requiring each site with a potential to emit more than 10 tpy of HRVOC to establish enforceable limits on HRVOC emissions from vent gas streams, flares, and cooling tower heat exchangers subject to the control requirements • Allow sites to convert VOC emission reduction credits to a yearly allocation of HRVOC allowances, equivalent to no more than 5 percent of a site's initial HRVOC allocation, based on a ratio of maximum incremental reactivity(MIR) for the speciated VOCs reduced and the MIR for an HRVOC.
HRVOC Requirements	-Revises existing fugitive, cooling tower, and vent gas control and flare requirements -Establishes a short-term, 1200 lb/hour not-to-exceed limit for each site in Harris County
AREA/NON-ROAD MEASURES	
Federal area/non-road	-The difference of 2000 vs. 2007 area and non-road emissions, which consider the effect of federal controls and growth
TERP	-Provides grants for emission reduction technologies -Funding expected to achieve 38.9 tpd of emission reductions

Type of Measure	Description
Airport Reductions	-Agreements with Continental Airlines, Southwest Airlines, and the City of Houston to make local reductions of NO_x from sources at Houston area airports **(No change from December 2000 revision)**
California Spark-Ignition Engines	-Statewide rule requiring manufacturers to ensure that all affected large spark ignition engines are certified to California LSI standards -Exempts agriculture and construction equipment less than 175 hp, recreational equipment, stationary engines, marine vessels, and equipment on tracks **(No change from December 2000 revision)**
Gas-fired Water Heaters, Small Boilers, And Process Heaters	-Manufacture requirement for state-wide sales of water heaters, small boilers, and process heaters -Delay 10 ng/J compliance date for all Type 0 water heaters by 2 years
Stationary Diesel Engines	-Requires owners and operators of stationary diesel engines or dual-fuel engines in the 8-county HGB area to meet new emission specifications and operation restrictions **(No change from September 2001 revision)**
VOC RACT	-Implements RACT requirements for batch processes, bakeries, and offset lithographic printers in the 8-county HGB area **(No change from December 2000 revision)**
MOBILE SOURCE MEASURES	
Federal on-road	-The difference of 2000 vs. 2007 on-road emissions, which consider the effect of federal controls and growth
Inspection/ Maintenance	-Requires ASM II or equivalent testing as well as OBD testing -Began May 1, 2002 in Harris County -Began May 1, 2003 in Brazoria, Fort Bend, Galveston, and Montgomery Counties -Removes Chambers, Liberty, and Waller Counties
Speed Limit Reduction	-Maintains the speed limits at 5 mph below what was posted before May 1, 2002, where speeds were 65 mph or higher -Removes reinstatement of the 55 mph speed limit on May 1, 2005

Type of Measure	Description
Cleaner Diesel Fuel	-Beginning April 1, 2005 (October 1, 2005 *)diesel fuel used in the HGB, BPA, and DFW areas, and in an additional 95 East and Central Texas counties for both onroad and nonroad use does not exceed 500 ppm sulfur, contains less than 10.0% by volume of aromatic hydrocarbons, and has a minimum cetane number of 48. -Alternative diesel fuel formulations that achieve equivalent emission reductions may also be used. -Beginning June 1, 2006, the sulfur will be reduced to 15 ppm in both onroad and nonroad diesel fuel in the HGB, BPA, and DFW areas, and in an additional 95 East and Central Texas counties. **(No change from September 2001 revision)** (*It is anticipated the compliance date will be extended by six months to October 1, 2005. It is anticipated the rule will be revised by Spring 2005 as directed by the commission. See section 5.3.5.)
VMEP	-Numerous projects identified by the HGAC for inclusion in the SIP such as telecommuting, bus fare promotions, alternative fuel programs, and ozone action days -Revised credit taken for this program to 7 tpd
TCMs	-Numerous projects identified by HGAC for inclusion in the SIP, such as traffic signalization and bicycle/pedestrian projects -Updated to show that projects completed prior to the year 2000 have met their commitments and those not captured in the 2000 episode modeling have been incorporated in the appropriate milestone year emissions estimates.
OTHER	
Portable Fuel Containers Rule	-Establishes new design “no spill” criteria requirements for portable fuel containers sold, offered for sale, manufactured, and/or distributed in Texas beginning December 31, 2005

5.2 VOC RULES

5.2.1 Cooling Towers

The adopted amendments to the rules provide monitoring alternatives for special categories of cooling tower heat exchange systems that service jacketed reactors and systems with finite volume of HRVOC, such as refrigeration systems. Additionally, a new exemption is provided for cooling tower heat exchange systems with an intervening cooling fluid containing less than 100 part-per-million, by weight (ppmw) of HRVOC between the process and the cooling water. The amendments to the monitoring and testing requirements also provide for alternative monitoring locations for cooling tower heat exchange systems that service HRVOC and non-HRVOC units or that service multiple categories of heat exchange systems. Furthermore, alternative flow monitoring locations are allowed provided the selected location is representative of the total flow rate to the cooling tower.

Additionally, the adopted amendments to the Monitoring and Testing Requirements section clarify the calculation methodology to determine the percent measurement data availability. The adopted amendments also remove the 10 part-per-billion, by weight (ppbw) detection limit requirement for HRVOC monitoring and testing to provide flexibility to owner/operators in the selection of monitoring systems and analytical laboratories. A 25 ppb detection limit is specified for the total strippable VOC monitors required for cooling towers greater than 8000 gallons per minute to ensure enforceability of the 50 ppbw action level specified in the rule.

The amendments change the frequency of the multipoint calibration check procedure from monthly to quarterly in the alternative provisions specified for monitoring HRVOC continuously. In addition, the revised rule clarifies that the sampling system for the continuous HRVOC monitoring system must be demonstrated equivalent to the air stripping apparatus in the Appendix P procedure. Provisions to clarify data-handling procedures during out-of-order periods of the continuous HRVOC monitoring system have also been included in the adopted amendments. The adopted rule is also revised to allow collection of periodic samples from the continuous sampling system for the HRVOC monitoring system if only the analyzer is malfunctioning.

The adopted amendments to the Recordkeeping and Reporting Requirements section include revisions to the provisions for quality assurance plans (QAP) for monitoring requirements. The revised rule specifies that written QAPs must be developed, implemented, followed, and kept on-site, but the QAPs are not specifically required to be approved. QAPs are required to be submitted within 30 days of written request by the executive director. Modifications or alternatives to the testing and monitoring requirements still require executive director approval. The recordkeeping requirements are also revised to specify that one-half the detection limit may be used to calculate average HRVOC and total strippable VOC concentrations when the concentration results are below detectable levels. Furthermore, revisions to the recordkeeping requirements specify that if manufacturer's certified pump performance information is not available, then pump performance information from a qualified independent third-party organization may be used.

Finally, the adopted amendments revise the compliance schedule by which owners or operators must demonstrate compliance with the site-wide cap and the short-term, not-to-exceed limit. Owners or operators subject to the HRVOC emission cap and trade program must comply with the requirements of Chapter 101, Subchapter H, Division 6 by no later than January 1, 2007. Owners or operators exempt from the HRVOC Emission Cap and Trade (HECT) Program must comply with the ten ton per calendar year emission specification in §115.761(b) by no later than April 1, 2006. Owners or operators in the HGB ozone nonattainment area, excluding Harris County, must demonstrate that the enforceable limits on HRVOC emissions at sites within the seven surrounding counties are sufficient to preclude the need for an additional cap and trade system for those counties.

5.2.2 Vent Gas Control and Flares

The adopted rule adds a new definition of, "emergency flare" to differentiate flares that only receive emissions during upset events.

An adopted amendment to the Applicability and Definitions specifies that both controlled and uncontrolled HRVOC vent gas streams are covered by the rule.

The adopted amendments revise the Site-wide Cap and Control Requirements to reflect a the long-term

site-wide cap strategy on a calendar year basis instead of the existing 24-hour rolling average. In addition, the revision specifies that owners or operators of a site subject to the HRVOC vent gas rules shall comply with the HECT program in Chapter 101, Subchapter H, Division 6. A new short-term, not-to-exceed limit, in pounds of HRVOC per one-hour block is established, for all sites in Harris County.

The adopted amendments to the Monitoring and Testing Requirements Section add requirements for uncontrolled and controlled vents, monitoring parameters, and establishing operating limits. The process parameter monitoring requirements are necessary to help assure compliance with the site-wide caps. The revision requires testing for each vent gas not controlled by a flare. The revision also requires that HRVOC emissions during emissions events and scheduled startup, shutdown, and maintenance activities be determined using either testing or process knowledge and engineering calculations. This requirement is necessary due to the inclusion of emissions events and scheduled startup, shutdown, and maintenance activities in the site-wide caps and to better support the HGB attainment demonstration. The rule also includes a requirement that the owner or operator develop, implement, and follow written monitoring plans for the operational parameters. The rule is further revised to specify that additional testing may be performed to update emission data after the initial HRVOC emission test has been performed, and that test plans for additional testing must be submitted to the executive director at least 45 days prior to testing. The revision specifies that cylinder gas audits must be performed at a minimum quarterly, after the initial cylinder gas audit.

The adopted rule requires parameter monitoring for pressure relief valves. The owner or operator may use process knowledge to determine the HRVOC emission rates during events when the pressure relief valves open. Written monitoring plans for the pressure relief valve monitoring systems will also be required.

The adopted revision specifies that the owner or operator may install an online calorimeter to determine net heating value instead of monitoring for individual constituents to determine net heating value. The revision also specifies the calculation methodology for determining the percent measurement data availability. Samples collected during periods of monitor downtime shall be used to demonstrate "continuous compliance with the requirements of §115.722(a) - (d) of this title." Compliance with the minimum net heating value requirements is based on block one-hour average. Additionally, the revision specifies that HRVOC emission rates shall be calculated from data gathered according to paragraphs (1) - (6) and that compliance with the exit velocity requirements is based on a block one-hour average.

The adopted amendments require continuous monitoring systems for infrequent use flares, special categories of flares, or flares that combust high-purity product. The revision expands provisions for loading flares used solely for marine vessels loading operations or transport loading and unloading operations. The amendment also expands provisions for flares used solely for scheduled startup, shutdown, and maintenance activities to include permanent flares, not just portable flares. New alternative provisions for emergency flares, flares in temporary HRVOC service, and flares designed to receive and control liquid/dual phase streams are also included.

The adopted amendments specify requirements for flares used for marine vessel and transport loading and unloading to demonstrate compliance with heating values and exit velocity, and the site-wide cap. The amendments specify destruction efficiency (93 percent) to be used during each one-hour block period the flare does not meet the heating value and exit velocity requirements.

The adopted amendments permit the use of process knowledge to determine net heating value for flares receiving more than 95 percent of an individual HRVOC at all times.

The adopted amendments permit minor modifications to test and monitoring methods to be approved by the executive director.

Adopted amendments addressing flares in startup, shutdown and maintenance activities limit the total hours to 720 hours in 12 consecutive months for a single flare operated in HRVOC service at a site, and 1440 hours in 12 consecutive months for multiple HRVOC flares at a site. Also included are a 93 percent destruction efficiency during a one-hour block period to determine HRVOC emissions during a period of not meeting net heating value or exit velocity requirements.

The new rule specifies that QAPs and test plans be developed and kept on site. They are to be submitted within 30 days of written request by the executive director.

Adopted amendments address detailed recordkeeping and monitoring requirements specific to each type of flare and vent gas stream.

The adopted rule provides a new exemption to address circumstances where a flare is taken out of service prior to the compliance date for the site-wide cap. The revisions include alternative testing methods and alternatives for brine degassing of salt domes through process vent safety devices. A new definition "degassing safety device" and provisions allowing the use of process knowledge to determine HRVOC emissions are included in the proposal. The revision provides alternative provisions for the calibration of on-line analyzers for constituents needed to determine net heating value and molecular weight and provisions to allow the use of on-line calorimeters as an alternative.

Provisions to add continuous parameter monitoring of PRVs and for vent gas streams to provide more flexibility by allowing the owner/operator to establish the parameters are included. The definition of strippable VOC is revised to ensure replicable procedures.

The amendments to the Recordkeeping and Reporting Requirements section require affected pressure relief valves to include records of the parameters monitored, all process information, data, and calculations used to determine flow and emission data, and the required monitoring plans.

An additional revision specifies that the maximum potential HRVOC emissions for the sum of all vent gas streams claimed under this exemption must be less than 0.5 tpy. The amendments also include the addition of incinerators to list of the sources for which an exemption may be claimed. The rule specifies that for vent gas streams and pressure relief valves that become subject to the requirements of the division after December 31, 2005, testing and monitoring must be conducted as soon as practicable but no later than 60 days after being brought into HRVOC service.

5.2.3 HRVOC Fugitive Emissions

The revised rule specifies that all pressure relief valves in gaseous service must be monitored with a hydrocarbon gas analyzer for fugitive leaks. Section 115.781(b)(8) specifies that the body of the pressure relief valve must be monitored for fugitive leaks on a quarterly basis unless the relief valve is equipped with a rupture disk upstream. The amendment to §115.781(e) specifies that the vent from the pressure relief valve must be monitored within 24 hours following actuation to ensure that the relief mechanism has properly reseated.

The amendment adds requirements that are being deleted from the general fugitive rules in Subchapter D, Division 3. One of these requirements is to use dataloggers or electronic data collection devices during

monitoring. Another requirement adds provisions for calculating emissions from non-repairable leaking components and comparing them to emissions that would result from a shutdown to repair the leaking components. The adopted amendment changes the emission comparison from a cumulative basis to a daily basis and adds a 500-pound de minimis level.

The amendment to the audit provisions changes the requirement to conduct an audit of all process units every two years to a requirement to conduct an audit of the site at least once per calendar year. The amendment removes the requirement for the audit to include a list of components that should have been monitored but were not on the list be monitored. The rules require an independent third-party organization to perform a field survey to determine the representative percentage of leaking components at the site using a random sampling of the population of components of interest. The population of interest is all valves in HRVOC service at the site that are required to be monitored on a quarterly basis. The number of valves that must be included in the field survey is determined using a hypergeometric distribution rather than a binomial distribution. The field survey must be started after the usual monitoring service has completed its monitoring of the process unit and must be completed by the end of the next monitoring period (i.e. quarter). The revision also requires that the owner or operator submit a corrective action plan with the audit report if the results of the audit indicate deficiencies. The initial audit must be completed and the audit report submitted to the TCEQ by December 31, 2005.

5.2.4 HRVOC Emissions Cap and Trade (HECT) Program

Results from the TexAQS 2000 and recent photochemical modeling suggest that ozone formation in the HGB area stems from a combination of two different events: (1) the daily variable routine emissions of a large industrial base located in an urban core, and (2) sudden sharp increases in short-term emissions of highly reactive VOCs in the immediate presence of NO_x. A dual approach is required in order to address this problem effectively. The first part resembles strategies used by other metropolitan areas and includes vehicle I/M, cleaner fuels, cleaner technology for construction equipment, industrial-based controls for routine emissions of NOx and VOCs, and an annual cap on HRVOCs. The second part is a targeted strategy to address the short-term releases of HRVOCs through the establishment of a short-term cap. As a result, the TCEQ is adopting a dual strategy: address variable short-term emissions through a 1200 lb/hour not-to-exceed limit and address steady-state and routine emissions through an annual cap.

To reduce both the magnitude and frequency of short-term releases, the TCEQ has determined that a short-term limit of 1200 lbs over an hour will not result in an exceedance of the 1-hour ozone standard more than once a year. The annual HRVOC cap has been reduced from the existing HRVOC cap in order to support the attainment demonstration modeling. In addition, the cap was further reduced by 5 percent to account for daily variability in emissions and to address uncertainty in the geographic redistribution of emissions between the attainment demonstration model and how actual emissions may occur with trading in place. The commission also anticipates the reduction in other VOCs by allowing sites the opportunity to convert VOC emission reduction credits to a yearly allocation of HRVOC allowances based on a ratio of maximum incremental reactivity(MIR) for the speciated VOCs reduced and the MIR for an HRVOC. Each site subject to the HRVOC cap and trade may generate a quantity of HRVOC allowances from the conversion of VOCs ERCs equivalent to an amount not to exceed more than 5% of the site's initial allocation. In addition, sites may generate an HRVOC allocation from the conversion of VOC ERCs for HRVOC emissions increases from new or modified covered facilities not in operation prior to January 2, 2004 and that were authorized under a Chapter 116 permit that has been deemed administratively complete by the executive director within one year of the effective date of the HRVOC cap and trade rule.

The revision provides an exemption for the seven counties surrounding Harris County. Sites located in

those counties, otherwise subject to the HECT, must enforceably limit HRVOC emissions. Modeling studies have demonstrated that the proposed HRVOC limits on sites located in the seven counties surrounding Harris County are not necessary for the HGB area to attain the 1-hour ozone standard. Further, the magnitude of HRVOC emissions from the seven surrounding counties affecting peak ozone concentrations by one part per billion is significantly larger than 1,200 pounds per hour. Affected industries in the seven-county area have indicated to the commission that representations for HRVOC emissions within their respective air permits are well below the values likely to be put in place through the HRVOC annual cap. The commission is exempting sites in the seven surrounding counties based on the presumption that the enforceable limitations from these sites are less than the area cap for the seven surrounding counties. In order to ensure that this presumption is accurate, each site with a potential to emit more than 10 tpy of HRVOC must establish enforceable limits on HRVOC emissions from vent gas streams, flares, and cooling tower heat exchangers subject to the control requirements of Chapter 115, Subchapter H at levels represented in the most recent applications to the executive director for authorization under 30 TAC Chapter 116. Establishing enforceable limits on HRVOC emissions on an emission point basis can be accomplished through submittal of a PI-8 Form (Special Certification Form for Exemptions and Standard Permits) or any other form provided by the executive director to certify federally enforceable emission limits. In addition, enforceable limits on HRVOC emissions can be set by altering or amending authorizations under Chapter 116 to have an HRVOC emissions limit expressed in the maximum allowable emission rate table. The executive director will review the total amount of HRVOC emissions established through these enforceable limits for sites in the seven counties surrounding Harris County and present those findings to the commission for its determination on the appropriateness of the cap and trade program for those counties. If the evaluation reveals that the total amount of enforceable HRVOC emissions is at a level that is inconsistent with the attainment demonstration for the NAAQS for 1-hour ozone by the attainment date, the commission may revoke the exemption and require compliance with the HECT by January 1, 2007, or within 180 days after notification, whichever is later.

This approach will effectively address the 1-hour ozone standard because the strategies used to achieve the HRVOC caps are expected to result in additional VOC reductions. Furthermore, the TCEQ and the HRVOC regulated community have significantly expanded the real-time monitoring network of specific VOCs. A program to respond to these monitors rapidly in the event of an increase in emissions is under development. The combination of these factors increases the reliability of this control strategy.

5.2.5 General VOC Fugitive Rules

The revisions include removing certain requirements from the general fugitive rules and moving them to Subchapter H so they only apply to components in HRVOC service. Under the changes, the general VOC fugitive rules in Subchapter D do not require the use of dataloggers or electronic data collection devices during monitoring. In addition, the rules do not require facilities to maintain information that demonstrates cumulative emissions from all leaking components that cannot be repaired without a process unit shutdown are less than the emissions that a shutdown would generate. A shutdown for repair of leaking components is required only if emissions from a single leaking component would be greater than the emissions generated by a shutdown. Delay of repair up to six months is also allowed for pumps, compressors, or agitators if the repair involves upgrading existing seals or venting to a closed vent system and control device.

The amendments exempt flanges from weekly visual, audio, olfactory inspections if the flanges are monitored using EPA approved testing methods at least once per year. The revision also specifies that those flanges that cannot be inspected safely are not subject to the weekly inspection requirement, but

must be inspected as soon as possible during a time it is safe to inspect. An amendment to the recordkeeping requirements provides options for documenting exemptions. The rule revision also provides a de minimis vapor pressure cutoff of 0.002 pounds per square inch, absolute at 68 degrees Fahrenheit. Components with a VOC vapor pressure below this cutoff are exempt from the requirements in this division. New exemptions from monitoring have also been added for components in instrumentation systems and sampling connection systems and for insulated components.

5.2.6 Statewide Portable Fuel Container Rule

The portable fuel container rule establishes new requirements relating to the design criteria for portable fuel containers and portable fuel container spouts. The new rules will establish design criteria for "no-spill" portable fuel containers based in large part on the CARB standards. Effective December 31, 2005, these new rules will limit the type of portable fuel containers and portable fuel container spouts sold, offered for sale, manufactured, and/or distributed in the State of Texas. Fuel released into the environment leads to the contamination of both the state's air and water. These rules will ensure that portable fuel containers manufactured under these standards will release smaller amounts of fuel as the result of spillage and evaporation.

5.3 NO_x RULES

5.3.1 Point Source NO_x Rules (No change from December 2002 revision)

5.3.2 Emissions Banking and Trading Program (No change from September 2001 revision)

5.3.3 Vehicle Inspection/Maintenance Program

In the December 2000 Attainment Demonstration, the commission adopted an enhanced vehicle I/M program for the entire HGB area with a May 1, 2004 implementation date for Chambers, Liberty, and Waller Counties. On October 8, 2003, the commission delayed the implementation date of the program in the three counties until May 1, 2005. As part of this revision, the TCEQ evaluated this control strategy and the photochemical modeling shows that this strategy is no longer necessary to attain the 1-hour ozone standard. As a result, the commission adopted the removal of Chambers, Liberty, and Waller Counties from the Vehicle I/M Program on September 15, 2004.

5.3.4 Construction Equipment Operating Use Restriction-Removed and Replaced with TERP (No change from September 2001 Revision)

5.3.5 Cleaner Diesel Fuel (No change from September 2001 revision. However it is anticipated the rule will be revised in the Spring 2005.)

On October 13, 2004, the commission directed the TCEQ staff to initiate a rulemaking to extend the compliance date of the Texas Low Emission Diesel program by six months, to October 1, 2005. The extension would not affect the attainment demonstration nor the attainment demonstration motor vehicle emissions budgets. It is anticipated this rulemaking will be complete in the Spring 2005. The anticipated rule revision would also: address enforcement issues with alternative emission reduction plans; allow the use of new NO_x reduction calculation models developed by EPA to determine equivalency of alternative fuel formulations; allow for the use of additional test sequences that have been approved by EPA or CARB since the original rule was written; and strengthen registration requirements.

5.3.6 Small, Spark-Ignition Engine Operating Restriction

As part of this revision, the TCEQ evaluated this control strategy and the photochemical modeling shows

that this strategy is no longer necessary to attain the 1-hour ozone standard. As a result, the commission adopted the repeal of the Small, Spark-Ignition Engine Operating Restriction on October 27, 2004.

5.3.7 Voluntary Mobile Emission Reduction Program

For a revised program description, see the Houston/Galveston Area Council's (HGAC) Report Detailing the 2007 VMEP benefits for the 8-County HGB Area in Appendix O, Section O.7.

5.3.8 Accelerated Purchase of Tier 2/Tier 3 Non-Road Compressed-Ignition Equipment-Deleted and Replaced with TERP (No change from September 2001 revision)

5.3.9 Speed Limit Strategy

In September 2002, the commission revised the existing speed limit strategy to suspend the 55 mph speed limit until May 1, 2005 and to increase speeds to 5 mph below what was posted before May 1, 2002, where speeds were 65 mph or higher. In 2003, the 78th Texas Legislature removed authority to determine speed limits for environmental purposes. Therefore, this revision removes the reinstatement of the 55 mph speed limit on May 1, 2005. The currently posted speed limits remain at 5mph below the posted limit before May 1, 2002.

5.3.10 Airport Ground Support Equipment (No change from December 2000 revision)

5.3.11 California Spark-Ignition Engines (No change from December 2000 revision)

5.3.12 Vehicle Idling Restriction

As part of this revision, the TCEQ evaluated this control strategy and the photochemical modeling shows that this strategy is no longer necessary to attain the 1-hour ozone standard. As a result, this revision repeals the Vehicle Idling Restriction.

5.3.13 Gas Fired Water Heaters, Small Boilers, and Process Heaters (No change from December 2000 revision)

The Chapter 117 rules require new water heaters with a maximum rated capacity of no more than 75,000 British thermal units per hour, a Type 0 unit, that are sold, distributed, installed, or offered for sale after January 1, 2005, to comply with a 10 nanogram per joule (ng/J) emission specification. The commission is revising these rules to delay the 10 ng/J emission specification for all Type 0 water heaters by two years. The new compliance date will be January 1, 2007.

The statewide emission reductions reflected in the SIP models for the April 19, 2000, water heater rules is 1.0 tpd. Incorporating a two-year delay for all new conventional units and based on comments from AGA and GAMA, and using SCAQMD methodologies, the commission estimates that a 0.53 tpd reduction will be achieved by the end of calendar year 2007. Therefore, the shortfall is the difference between the modeled reductions and the reductions that will be realized by the two-year delay, which is 0.47 tpd.

5.3.14 Transportation Control Measures (TCMs)

The HGAC is revising the region's TCMs. Appendix F6 is a list of the revised measures, with reductions of .519 tpd of VOC and .847 tpd of NO_x in 2007.

Appendix I of the HGB December 2000 SIP revision, lists the TCMs in place (2.13 of VOC reductions and 1.06 tpd of NO_x) until EPA approves this revision. TCMs can be modified upon EPA approval of SIP revisions or through the TCM substitution process outlined in 30 TAC §114.270. EPA approval thru

the substitution process could expedite equivalent or better emission reduction measures in the region, as well as provide a public involvement process that focuses on these measures.

The list of revised measures in Appendix F6 is divided into two groups. The first group lists TCMs completed prior to 2000, as well as 25 projects that will not be completed by 2007 and are therefore removed. The second group lists TCMs in 2000 and later that are complete or to-be-completed. This group includes 19 projects replacing the removed projects.

The 25 removed projects, which include rail, bicycle and pedestrian, and park-and-ride lots, are deleted because they will not be completed by 2007, have been withdrawn by project sponsors, or have been incorporated into other programs such as VMEP. The cumulative emission reductions to be replaced are .044 tpd of VOC and .084 tpd of NO_x. Nineteen projects replace these, with reductions of .056 VOC and .100 NO_x. The completed projects are the commitments that have met and reporting requirements fulfilled. Full documentation of TCMs are found in the region's transportation conformity determination.

Emission reductions for TCM projects completed before 2000 are captured in the 2000 episode modeling. Emission reductions for projects to be completed in the year 2000 and after, are captured in the 2007 attainment year analysis and, therefore, reflected in the motor vehicle emissions budget. (See Chapter 3.)

5.3.15 Energy Efficiencies (No change from December 2002 revision)

5.3.16 Stationary Diesel Engines and Dual-Fuel Engines (No change from September 2001 revision)

5.3.17 Texas Emission Reduction Plan (TERP)

In 2001, the 77th Texas Legislature passed Senate Bill 5 which established the Texas Emission Reduction Plan (TERP). The bill provided funding mechanisms for the program and the state anticipated that about $130 million in new fees would be collected to fund the emission reductions contemplated. The major funding source, a fee on out-of-state vehicle registrations, was found to be in violation of the commerce clause of the Fourteenth Amendment of United States Constitution and Article I. Section 3 of the Texas Constitution. See *H.M. Dodd Motor Co. Inc. and Autoplex Automotive, LP. v. Texas Department of Public Safety, et al.*, Cause No GNID2585(200th Judicial District Court, Travis County, June 6, 2002). The 78th Texas Legislature enacted House Bill 1365 restoring funding to the TERP and providing a dedicated revenue mechanism for the TERP through an increase in the vehicle title fee and changes to existing surcharges on the sale, lease or use of onroad heavy-duty diesel vehicles and nonroad equipment. The TERP was also enhanced through the enactment of House Bill 1365 by the authorization of funding for projects that include stationary engines and equipment that use fuels other than diesel. Out of the $140 million per fiscal year in projected revenue through FY 2008, the Emissions Reduction Incentive Grants Program is allocated 87.5 percent of that total, or about $120.5 million per fiscal year. As a result, projected revenue for the program is expected to average about $140 million per fiscal year through FY 2008. This funding is sufficient to pay for at least 32.9 tpd in NO_x emission reductions in the HGB area and, based on an allocation approach established by the commission for future grant funding, should be enough to achieve over 38.8 tpd of reductions by 2007. The legislature also allocated funds to this program for other affected areas of the state.

The first emissions reduction incentive grant projects funded under the TERP were for fiscal years 2002 - 2003 (September 1, 2001 through August 31, 2003). The funds available for award under the grants program were substantially less than the $130 million originally expected due to the loss of funding from

the primary funding mechanism. Revenue generated for the TERP program was only $20.5 million per fiscal year, with approximately $14 million per fiscal year available for emission reduction incentive grants.

As a result, applications were only accepted for projects in the HGB and DFW nonattainment areas. There were 68 projects funded for onroad and offroad diesel vehicles and equipment. The projects included the purchase of heavy-duty diesel equipment that met engine emission standards earlier than required, repower of older vehicles and equipment, installation of retrofit devices, and use of qualifying fuels. The TCEQ awarded a total of $26.5 million, with an average projected cost per ton of NO_x reduced of $5,800.

During the first part of FY 2004, 43 projects in the eligible 41 counties were awarded funding totaling $15.9 million. The projected NO_x reductions are 3,083 tons, at an average cost per ton of $5,160.

In March 2004, 479 applications, requesting over $350 million, were received and reviewed. Projects have been selected for funding and, at the time of this report, 198 grant contracts have either been executed or are in the process of completion, for a total of $85,962,959. The final emission reduction projections and cost per ton estimates are pending acceptance of the grant contracts, but preliminary projections are that these projects will reduce over 14,000 tons of NO_x emissions, resulting in over 10 tpd of reductions, at an average cost per ton of about $6,100.

To date, the program has awarded over $128.3 million to grant projects, which are projected to result in reductions in NO_x emissions of over 21,616 tons, at an average cost per ton of NO_x reduced of approximately $5,900. Accounting for the projects already funded and, based on the approach established for allocating future TERP funds, the TERP funding will be sufficient to achieve over 32.9 tpd of reductions in the HGB area by 2007, and may be enough to achieve over 38.8 tpd.

For information on recent TERP activities, please visit the following web site:
http://www.terpgrants.org

For further information, contact the TERP help line at 1-800-919-TERP.

5.4 RACM ANALYSIS

The existing approved attainment demonstration is solely a NO_x based strategy and includes a 56 tpd shortfall. The December 2000 and September 2001 federally approved SIPs demonstrate attainment by modeling three of four days below 135 ppb and using a WoE analysis. The HGB SIP revision no longer relies solely on NO_x based strategies. This revision, in combination with the revisions to the SIP and rules in 30 Tex. Admin. Code Chapters 115 and 117 adopted by the commission in December 2002 and October 2003, addresses emissions of both NO_x and HRVOCs and demonstrates attainment without a shortfall. A combination of point source HRVOC controls and NO_x reductions appear to be the most effective means of reducing ozone in the HGB area and there is no longer a NO_x shortfall. In addition, the inclusion of Chambers, Liberty and Waller Counties in the I/M program, the heavy duty diesel vehicle idling, and the lawn and garden equipment use restriction rules do not significantly impact modeled peak ozone concentrations and are no longer necessary to attain the 1-hour ozone standard. The photochemical modeling of the August-September 2000 episode shows that, of the ten days in the episode, six days are clearly modeled below the 125 ppb NAAQS. Of the remaining four days, two days had maximum predicted concentrations of 125.1 - 125.2 ppb and one day had a predicted maximum concentration of 128.6 ppb. The final day, August 31, is discussed in detail in Section 3.9.

The TCEQ re-evaluated the existing RACM analysis performed as part of the September 2001 SIP revision. For NO_x controls, it has been determined that Tables 7.3-4 *EPA's List of Reasonably Available Control Measures- Area/Point Sources* and 7.3-5 *EPA's List of Reasonably Available Control Measures-Mobile Sources* remain unchanged from the September 2001 SIP revision with the exception of those discussed below.

With regard to the control measures which resulted in an overall decrease in NO_x emissions of 90 percent from point sources of NO_x emissions, the commission has determined that these are not reasonably available control measures for all source categories. In 2002, the commission revised the NO_x rules in Chapter 117 to require fewer reductions from certain NO_x point sources. If those rules were subsequently revised to reinstate the 90 percent reduction, the legal risks associated with any subsequent revision of these rules makes this measure not reasonably available. The costs of implementation of such requirements before the attainment date could be much greater than the costs projected at the time the rules were originally adopted in December 2000. In addition, the installation of these controls would not advance the attainment date. The NO_x reduction rules, together with the MECT, which are part of the federally approved 2001 SIP revision, required final reductions by April 1, 2007. The revised (2002) reduction schedule results in fewer reductions in the years 2004 and 2005, but achieves greater NO_x reductions in 2006. The final reductions are also required by the compliance date of April 1, 2007. Therefore, retaining the 90 percent rules alone does not advance the attainment date, and this control measure is no longer RACM.

The analysis of whether these strategies, which are no longer in place, are reasonably available must be considered in context of this revision as a whole. Because this strategy consists of the combination of NO_x and VOC, an analysis of whether 90 percent NO_x together with HRVOC controls will advance the attainment date is not appropriate.

In addition to a number of VOC controls used in the previous RACM analysis, the TCEQ has adopted a control strategy to address emissions of HRVOCs. The commission has determined that these HRVOC measures are reasonably available when considered together with the current reductions required by the NO_x rules.

In addition, the commission has adopted portable fuel container rules which establish new requirements relating to the design criteria for portable fuel containers and portable fuel container spouts. Effective December 31, 2005, these new rules will limit the type of portable fuel containers and portable fuel container spouts sold, offered for sale, manufactured, and/or distributed in the State of Texas. These rules will ensure that portable fuel containers manufactured under these standards will release fewer amounts of fuel as the result of spillage and evaporation of VOC emissions. The commission has determined that these rules are RACM.

For the remaining strategies for which the commission is repealing rules, the commission has determined that retaining these various strategies will not advance the attainment date. With regard to removing Chambers, Liberty, and Waller Counties from the Vehicle I/M program, the VMT for the three counties is 7,405,659 miles, which makes up 5.1 percent of the total VMT for the 8-county nonattainment area. The 82,809 registered vehicles in the three counties that are subject to the I/M testing make up only 3.0 percent of the total registered vehicles subject to I/M testing in the 8-county area. Additionally, the emission reduction estimates associated with the program in the three counties is 0.87 tpd of NO_x. The 1-hour ozone attainment demonstration for the 8-county HGB area includes 525 tpd of NO_x in 2007. Furthermore, preliminary estimates based on the number of registered vehicles subject to I/M testing, the emissions test fee, repair costs, and emission reduction estimates indicate the program would cost

approximately $19,556.3 per tpd of NO_x reduced. Given the low VMT, few registered vehicles subject to I/M testing, minimal emission reductions, low cost effectiveness, and the development of a more robust attainment demonstration, the commission maintains that the inclusion of the three counties in the I/M program is not a reasonable measure, nor does it advance the 1-hour ozone attainment date of the HGB area. Therefore, this measure is not RACM.

With regard to the repeal of the heavy duty diesel idling rules, by the year 2007, the idling limits would reduce NO_x emissions in the affected area by 0.48 tpd. The repeal of the idling restriction does not significantly impact modeled ozone concentrations. Given the minimal emission reductions, difficulty of enforcement, and the development of a more robust attainment demonstration, the commission maintains that the inclusion of the motor vehicle idling restriction rules is not a reasonable measure. These factors also indicate that this measure does not advance the 1-hour ozone attainment date of the HGB area and therefore is not RACM.

Historically, the commission has expressed a preference to implement technology-based strategies over behavior-altering strategies and these changes embody that philosophy. Changes to two behavior-altering control measures are included in this revision. Although the lawn and garden equipment use restriction rules achieve reductions in NO_x emissions, it is a behavior-altering strategy which is difficult to regulate and may prove unreliable. Given that effective implementation may not occur until long after the compliance date of April 1, 2005, inclusion of the this strategy does not advance the attainment date and therefore is not a RACM. This revision also includes changes to the environmental speed limit strategy. The previous speed limit strategy is no longer RACM because the commission is now limited by law to the strategies in place as of the effective change in the statute. Therefore, only the current speed limit is RACM.

CHAPTER 6: FUTURE ATTAINMENT PLANS

The TCEQ's ability to plan for future attainment demonstrations has proven to be difficult due to the level of uncertainty regarding the transition from the 1-hour ozone standard to the 8-hour ozone standard. On June 2, 2003, the Federal Register published EPA's 8-Hour Ozone Implementation Rule, which outlined options for implementing the 8-hour ozone standard and managing the existing 1-hour ozone standard. In April 2004, EPA finalized Phase I of the 8-Hour Ozone Implementation Rule. However, Phase II of the 8-Hour Ozone Implementation is expected sometime next year. Phase I of the rule provides flexibility in the transition from the 1-hour to the 8-hour ozone standard and this revision, as well as the technical work performed to date, will be invaluable through the transition period. Despite the uncertainty in future attainment plans, the TCEQ is fulfilling its 1-hour ozone obligations and beginning to analyze the HGB airshed in terms of the 8-hour ozone standard.

6.1 FUTURE INITIATIVES

Changes in the development of future plans occur as the TCEQ continues improving technological research and development, building the science for ozone modeling and analysis, and learning better quantification of HRVOC emissions. These initiatives will be beneficial to improving air quality planning and thus air quality in Texas.

6.1.1 New Technology Research and Development (NTRD) Program

The TCEQ's NTRD Program provides incentives to encourage and support research and to develop and commercialize technologies that reduce pollution in Texas. The program was formed when the TCEQ absorbed the functions of the Texas Council on Environmental Technology (TCET). The primary objective of the NTRD Program is to commercialize technologies that will support projects that are eligible for funding under the TERP Emissions Reduction Incentive Grants Program. The NTRD Program streamlines and expedites the process through which the TCEQ and the EPA recognize and provide SIP credit for new, innovative and creative technological advancement. This program will help spur the entrepreneurial and inventive spirit of Texans to help develop new technologies to assist in solving Texas' air quality challenges.

6.1.2 TexAQS II

The TexAQS 2000 is the most comprehensive and successful air quality study conducted to date in the U.S. With over 40 research organizations, and more than 250 scientists, TexAQS 2000 has provided, and will continue to provide, a large part of the scientific basis for reassessing ozone formation in the HGB area. The second phase of this study, TexAQS II, is scheduled for 2005 and 2006 and will cover the area of Texas east of and including the I-35/37 corridor. The pre-study work has already began and the meteorological, pollutant concentration, and transport data will be collected from May 2005 through October 2006 with the intensive field study period lasting from August through September 2006. The TCEQ will be heavily involved in this research in order to improve regulatory analysis and prediction tools used for developing SIPs. The study will assess formation and accumulation of ozone, year-round air pollution meteorology, and inventories of ozone. Research will also be conducted on ozone transport into, within, and out of Texas. For more information on the TexAQS II, please see the following web site:
http://www.utexas.edu/research/ceer/texaqs/

The commission has a long history of supporting enhancements to air quality models and associated applications and input data. These endeavors are critical to supporting SIP development for Texas areas and will continue to be a top priority. The commission is committed to working in cooperation with the

regulated community, academia, research consortiums, and others to ensure that the modeling used to develop effective control strategies will use the most current scientific methodologies and information to replicate ozone episodes in a given area.

Because the level of scientific knowledge is constantly evolving, a comprehensive description of ongoing or planned research projects is not provided at this time. However, the TCEQ maintains a catalog of projects relevant to Texas and is available at the following web site:
http://www.tnrcc.state.tx.us/air/aqp/airquality_science.html