

**PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION  
REASONABLY AVAILABLE CONTROL TECHNOLOGY (RACT)  
STATE IMPLEMENTATION PLAN (SIP) REVISION  
UNDER THE 8-HOUR OZONE NATIONAL AMBIENT AIR QUALITY  
STANDARD (NAAQS)  
September 2006**

**1. INTRODUCTION**

**Background and Requirements**

The federal Clean Air Act (CAA) gives the states primary responsibility for achieving the National Ambient Air Quality Standards (NAAQS). The NAAQS are established by the U.S. Environmental Protection Agency (EPA) as the maximum concentrations in the atmosphere for specific air contaminants to protect public health and welfare. The principal mechanism at the state level for complying with the CAA is the State Implementation Plan (SIP). A SIP includes the regulatory programs, actions, and commitments a state will carry out to implement its responsibilities under the CAA. Once approved by the EPA, a SIP is legally enforceable under both federal and state law.

This document is a SIP revision for meeting the Reasonably Available Control Technology (RACT) requirements mandated under the CAA and regulations adopted thereunder relating to the 8-hour ozone NAAQS. The CAA requires that states achieve the NAAQS by specified dates, based on the severity of an area's air quality problem. Maintaining concentrations of ground-level ozone below the health-based standard is important because ozone is a serious human health threat, and also can cause damage to important food crops, forests, and wildlife. Repeated exposure to ozone pollution may cause a variety of adverse health effects for both healthy people and those with existing conditions including difficulty in breathing, chest pains, coughing, nausea, throat irritation, and congestion. It can worsen bronchitis, heart disease, emphysema, and asthma, and reduce lung capacity. Asthma is a significant and growing threat to children and adults.

Stationary source control measures are techniques and equipment for reducing ozone precursor emissions, i.e., volatile organic compounds (VOC) and nitrogen oxides (NO<sub>x</sub>) from stationary sources in the state. For the purposes of regulating stationary sources, the entire Commonwealth of Pennsylvania is considered a "moderate" ozone nonattainment area for the federal 8-hour ozone NAAQS because it is in the Ozone Transport Region established by operation of law under Section 184 of the CAA. See, 42 U.S.C. § 7511c. Strategies are being developed to meet this new federal clean air mandate. Sections 172(c)(1) and 182(b)(2) and (f) of the federal CAA require owners and operators of sources in ozone nonattainment areas to implement RACT requirements for sources that are subject to Control Techniques Guidelines (CTG) issued by EPA and for "major sources" of VOC and NO<sub>x</sub>, which are ozone precursors. See, 42 U.S.C. § 7502(c)(1) and § 7511a (b) and (f). RACT is defined as the lowest emissions limitation that a particular

source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility (44 FR 53762; September 17, 1979). RACT requirements are specified in the CAA to assure that significant source categories at major sources of ozone precursor emissions are controlled to a “reasonable” extent, but not necessarily to the more stringent Best Available Control Technology (BACT) or Maximum Achievable Control Technology (MACT) levels.

According to the EPA’s Final Rule to Implement the 8-Hour Ozone NAAQS (70 FR 71612, November 29, 2005), areas classified as “moderate” nonattainment or higher must submit a demonstration, as a revision to the SIP, that their current rules fulfill 8-hour ozone RACT requirements for all CTG categories and all major, non-CTG sources. Such demonstrations can be made with either a new RACT determination or a certification that previously-required RACT controls represent RACT for the 8-hour ozone NAAQS. The certification should be accompanied by appropriate supporting information, such as consideration of information received during the public comment period. The RACT SIP revision submittal is in addition to the 8-hour ozone attainment demonstration plan for the area, which will also be a revision to Pennsylvania’s SIP. The RACT SIP revision must be submitted to EPA by September 15, 2006. This proposed RACT SIP revision demonstrates the following: 1) all required RACT controls have been implemented on all relevant stationary sources of VOC and NO<sub>x</sub> emissions; 2) all RACT controls have been approved by EPA under the 1-hour ozone NAAQS; and 3) all RACT controls have been certified, based on EPA’s guidance and standards, to represent RACT control levels under the new 8-hour ozone NAAQS.

The Pennsylvania Department of Environmental Protection (Department) is also developing attainment demonstrations for all areas that are not monitoring attainment of the eight-hour ozone standard. These demonstrations are due to EPA by June 15, 2007 and will also be subject to public hearing and comment prior to submission. It is very likely that in order to attain and maintain the 8-hour ozone NAAQS, Pennsylvania’s Environmental Quality Board (EQB) will need to adopt new regulations that are more stringent than the basic RACT requirements that represent the minimum level of acceptable control. The Department is currently working with the member states of the Ozone Transport Commission to determine what additional control requirements will be necessary to demonstrate attainment of the eight-hour NAAQS in Pennsylvania. More information on controls under consideration is available at <http://www.otcair.org/>.

## **Summary**

The Department is certifying through this SIP revision that its existing federally-approved SIP meets the RACT requirements for the 50 ton per year (tpy) non-CTG major VOC sources and for 100 tpy NO<sub>x</sub> sources, and that all CTG-covered source categories are addressed at the emission thresholds set forth in the CTG. This certification is based on a combination of the following: 1) certification that previously-adopted RACT controls approved by EPA as revisions to Pennsylvania’s SIP under the 1-hour ozone NAAQS are based on the currently available technically and economically feasible controls, and that they represent RACT for 8-hour implementation purposes; and 2) the

adoption of more recent regulations that represent RACT or beyond RACT control levels. Based on the foregoing, the Department finds that all of its existing rules that apply to ozone precursor emissions fulfill RACT requirements for the 8-hour ozone NAAQS. Moreover, the Department finds that all CTG sources and major, non-CTG sources under its jurisdiction are controlled to RACT or more stringent standards.

## **2. CERTIFICATION OF VOC AND NOX RACT REQUIREMENTS**

### **Discussion**

The certification process began with Department's staff reviewing the federal and state requirements, including CTGs, Available Control Technology (ACT) documents, federal Standards of Performance for New Stationary Sources (NSPS), National Emission Standards for Hazardous Air Pollutants (NESHAPS), and Maximum Achievable Control Technology (MACT) for the applicable source categories. Each regulation adopted by the Pennsylvania EQB has been evaluated against applicable CTGs and ACTs, and found to fulfill RACT for the applicable source category. The SIP-approved Nonattainment New Source Review (NSR) regulation specifies requirements for new or modified major stationary sources in Pennsylvania. The NSR regulation requires that owners and operators of such new or modified sources comply with the Lowest Achievable Emissions Rate (LAER).

The sources would also be subject to the Best Available Control Technology (BACT) requirements mandated for the SIP-approved Prevention of Significant Deterioration program if they may emit increased amounts of VOC or NO<sub>x</sub> above certain significance levels. BACT is an emission limitation based on the maximum degree of emission reduction (considering energy, environmental, and economic impacts) achievable through application of production processes and available methods, systems, and techniques. BACT does not allow emissions in excess of those allowed under any applicable federal CAA provision. A review of the emission levels for sources permitted under LAER/BACT after the implementation of RACT for the 1-hour NAAQS shows LAER control measures to be as stringent or more restrictive than emission levels required by RACT. This conclusion is further reflected in the Department's regulation that specifies presumptive RACT emission limitation requirements for sources that perform a LAER or BACT-approved NO<sub>x</sub> analysis in accordance with 25 Pa. Code, Section 129.93(c)(6) and (7).

The Best Available Technology (BAT) determinations authorized under Section 6.6 (c) of the Pennsylvania Air Pollution Control Act requires applicants for new sources to show that emissions from new sources will be the minimum attainable using BAT, See 35 P.S. Section 4006.6 (c) and 25 Pa. Code sections 127.1 and 127.12. BAT determinations conducted by the Department after 1995 for new stationary sources under the Department's jurisdiction are more restrictive than the RACT requirements. In addition to the BACT/LAER requirements for new or modified major sources subject to NSR, the Department requires that new sources which do not qualify for review under

major source NSR instead implement BAT. Therefore, all sources, even those determined to be minor, are subject to the BAT requirements.

### Certification of VOC RACT Requirements

Table 1 in this document lists each Department VOC RACT control regulation, the RACT basis for the regulation (CTG, ACT, etc.), the citation of EPA’s approval of the SIP revision, the RACT Rule applicability and requirements, and certification that the current Rule represents RACT under the 8-hour ozone NAAQS. Where the Department has certified that a current SIP-approved regulation represents RACT under the 8-hour ozone NAAQS, the Department states that it is not aware of any significant changes in control technology that affect the original RACT determination. The Department previously used a range of \$3,000-\$5,000/ton of VOC as a benchmark value when determining cost-effective control technology for VOC sources subject to the RACT requirements adopted for the 1-hour ozone standard. Due to increased energy costs, those previously determined cost-effective controls continue to represent RACT for the 8-hour ozone NAAQS because VOC control technology has not substantially changed since the mid-1990s. As shown below as an example, the cost analysis the Department performed in 2006 to evaluate the control of VOC emissions from a regenerative thermal oxidizer shows the costs to still be beyond RACT, and therefore the RACT determinations made for the 1-hour ozone standard are representative of RACT for the 8-hour standard.

<b>FACILITY DATA -</b>		<b>REFERENCE -</b>
<b>Flow Rate (cfm)</b>	70,000.00	Phone conversation on September 6, 2006 with Steve
<b>Hours/year</b>	8,760.00	White of Anguil Environmental Systems in Milwaukee, WI
<b>Uncontrolled VOC (tpy)</b>	145.00	
<b>TOTAL CAPITAL INVESTMENT (TCI) -</b>		
Purchased Equipment Cost (PEC)	\$1,000,000.00	
Freight	\$60,000.00	6% of PEC
<b>Total PEC:</b>	<b>\$1,060,000.00</b>	
<b>Direct Installation Costs</b>		
Foundation and Suport	\$84,800.00	8% of Total PEC
Handling & Erection	\$148,400.00	12% of Total PEC
Electrical	\$42,400.00	4% of Total PEC
Piping	\$21,200.00	2% of Total PEC
Insulation for Duct work	\$10,600.00	1% of Total PEC
Painting	\$10,600.00	1% of Total PEC

<b>Total Direct Installation Costs:</b>	<b>\$318,000.00</b>	
<b>Indirect Installation Costs</b>		
Engineering	\$106,000.00	10% of Total PEC
Construction and field expenses	\$53,000.00	5% of Total PEC
Contractor Fees	\$106,000.00	10% of Total PEC
Start-up	\$21,200.00	2% of Total PEC
Performance test	\$3,000.00	
Contingencies	\$31,800.00	3% of Total PEC
<b>Total Indirect Installation Costs:</b>	<b>\$321,000.00</b>	
<b>Total Capital Investment Cost:</b>	<b>\$1,699,000.00</b>	
<b>ANNUAL OPERATING COSTS -</b>		
<b>Direct Annual Costs</b>		
Electricity Cost	\$527,092.00	\$0.07/kwh, 8760 hrs/yr
Operator	\$16,425.00	0.5hr/shift, 3 shift/day, \$30/hr
Supervisor	\$2,463.75	15% of Operator
Maintenance	\$19,162.50	0.5hr/shift, 3 shift/day, \$35/hr
Material	\$19,162.50	100% of Maintenance
Fuel Cost	\$488,808.00	
<b>Total Direct Annual Costs:</b>	<b>\$546,021.75</b>	
<b>Indirect Annual Costs</b>		
Overhead	\$34,328.25	60% of Maintenance (OAQPS)
Administrative Charge	\$33,980.00	2% of TCI (OAQPS)
Property taxes	\$16,990.00	1% of TCI (OAQPS)
Insurance	\$16,990.00	1% of TCI (OAQPS)
Capital Recovery	\$275,238.00	(10 yrs @ 10% - OAQPS)
<b>Total Indirect Annual Costs:</b>	<b>\$377,526.25</b>	
<b>Total Annual Operating Costs:</b>	<b>\$923,548.00</b>	
<b>VOC Emissions Reduction (TPY)</b>	<b>142.10</b>	
<b>Cost Effectiveness \$/Ton of VOC Removed</b>	<b>\$6,499.28</b>	

**Table 1 - VOC RACT List and Certification Under the 8-Hour Ozone NAAQS**

PA Regulation Title 25. Environmental Protection, Chapter 129	RACT Basis Document	SIP Revision Approved by EPA (Date and Citation)	RACT Rule Applicability and Requirements	Requirements at least as stringent as the 8-hour ozone RACT?
SOURCES OF VOC Section 129.51. - General	This section lists the general implementing provisions of SOURCES OF VOC, and not RACT controls.	<b>6/25/01, 66 Federal Register 33645</b>		
SOURCES OF VOC Section 129.52. - Surface coating processes	<p>CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume II: Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks, EPA-450/2-77-008, May 1977</p> <p>CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume III: Surface Coating of Metal Furniture, EPA-450/2-77-032, December 1977</p> <p>CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume IV: Surface Coating for Insulation of Magnet Wire, EPA-450/2-77-033, December 1977</p> <p>CTG: Control of Volatile Organic Emissions from</p>	<b>7/20/01, 66 Federal Register 37908</b>	<p>This section applies to coating operations at automobile and light-duty truck assembly plants, and to any can, coil, paper, fabric, or vinyl coating unit and establishes maximum allowable VOC emissions per unit of coating solids.</p> <p>This section applies to the coating of metal furniture, and establishes max allowable VOC emissions per unit of coating solids.</p> <p>This section applies to the coating of magnetic wire and establishes max allowable VOC emissions per unit of coating solids.</p> <p>This section</p>	<p>Yes.</p> <p>This section fully implements the CTG-specified controls, and represents current RACT control levels over the affected sources under the 8-hour ozone NAAQS.</p>

PA Regulation Title 25. Environmental Protection, Chapter 129	RACT Basis Document	SIP Revision Approved by EPA (Date and Citation)	RACT Rule Applicability and Requirements	Requirements at least as stringent as the 8-hour ozone RACT?
	<p>Existing Stationary Sources, Volume V: Surface Coating of Large Appliances, EPA-450/2-77-034, December 1977</p> <p>CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume VI: Surface Coating of Miscellaneous Metal Parts and Products, EPA-450/2-78-015, June 1978</p>		<p>applies to the coating of large appliances and establishes max allowable VOC emissions per unit of coating solids.</p> <p>This section applies to any miscellaneous metal parts coating line, and establishes max allowable VOC emissions per unit of coating solids.</p>	
SOURCES OF VOC Section 129.55. - Petroleum refineries—specific sources	CTG: Control of Refinery Vacuum Producing Systems, Wastewater Separators, and Process Unit Turnarounds, EPA-450/2-77-025, October 1977	<b>01/19/83, 48 Federal Register 2319</b>	<p>This section applies to vacuum-producing systems, wastewater separators and process unit turnaround at petroleum refineries.</p> <p>Requirements include (1) no uncompressed VOC emission from vacuum producing systems, (2) covers, lids or seals for wastewater separators, and (3) depressurization of process unit or vessel to reduce its internal</p>	<p>Yes.</p> <p>This section fully implements the CTG-specified control and represents current RACT control level over the affected sources under the 8-hour ozone NAAQS.</p>

PA Regulation Title 25. Environmental Protection, Chapter 129	RACT Basis Document	SIP Revision Approved by EPA (Date and Citation)	RACT Rule Applicability and Requirements	Requirements at least as stringent as the 8-hour ozone RACT?
			pressure to 136 kPa or less and then venting to vapor recovery system, flare or firebox.	
SOURCES OF VOC Section 129.56.- Storage tanks greater than 40,000 gallons capacity containing VOCs	CTG: Control of Volatile Organic Emissions from Petroleum Liquid Storage in External Floating Roof Tanks, EPA-450/2-78-047, December 1978  CTG: Control of Volatile Organic Emissions from Storage of Petroleum Liquids in Fixed Roof Tanks, EPA-450/2-77-036, December 1977	<b>07/26/00, 65 Federal Register 45920</b>	This section applies to petroleum liquid storage tanks with external floating or fixed roofs and with a capacity of greater than 40,000 gal.  The rule establishes sealing standards for storage tanks, including a vapor collection and recovery system.	Yes.  This section fully implements the CTG-specified control and represents current RACT control level over the affected sources under the 8-hour ozone NAAQS.
SOURCES OF VOC Section 129.57.- Storage tanks less than or equal to 40,000 gallons capacity containing VOCs	CTG: Control of Volatile Organic Emissions from Storage of Petroleum Liquids in Fixed Roof Tanks, EPA-450/2-77-036, December 1977  CTG: Control of Volatile Organic Emissions from Petroleum Liquid Storage in External Floating Roof Tanks, EPA-450/2-78-047, December 1978	<b>01/19/83, 48 Federal Register 2319</b>	This section applies to petroleum liquid storage tanks with external floating or fixed roofs and with a capacity of 40,000 gal or less.  The rule establishes sealing standards for storage tanks, including a vapor collection and recovery system.	Yes.  This section fully implements the CTG-specified control and represents current RACT control level over the affected sources under the 8-hour ozone NAAQS.
SOURCES OF VOC	CTG: Control of Volatile Organic	<b>07/27/84, 49 Federal</b>	This section applies to	Yes.

PA Regulation Title 25. Environmental Protection, Chapter 129	RACT Basis Document	SIP Revision Approved by EPA (Date and Citation)	RACT Rule Applicability and Requirements	Requirements at least as stringent as the 8-hour ozone RACT?
Section 129.58.- Petroleum refineries— fugitive sources	Compound Leaks from Petroleum Refinery Equipment, EPA- 450/2-78-036, June 1978	<b>Register 30183</b>	equipment in VOC service in any process unit at petroleum refineries.  The rule establishes standards for proper valve operations under various scenarios to prevent VOC leak emissions.	This section fully implements the CTG- specified control and represents current RACT control level over the affected sources under the 8-hour ozone NAAQS.
SOURCES OF VOC Section 129.59.- Bulk gasoline terminals	CTG: Control of Hydrocarbons from Tank Truck Gasoline Loading Terminals, EPA- 450/2-77-026, December 1977	<b>08/11/92, 57 Federal Register 35777</b>	This section applies to the total of all the loading racks at any bulk gasoline terminal that delivers liquid product into gasoline tank trucks.  Requirements include control using a vapor collection and control system designed to collect and destroy the organic compound liquids or vapors displaced from gasoline tank trucks during product loading; and various other equipment and operational requirements.	Yes.  This section fully implements the CTG- specified control and represents current RACT control level over the affected sources under the 8-hour ozone NAAQS.
SOURCES OF VOC Section 129.60.-	CTG: Control of Volatile Organic Emissions from	<b>08/11/92, 57 Federal Register</b>	This section applies to all unloading,	Yes.  This section

PA Regulation Title 25. Environmental Protection, Chapter 129	RACT Basis Document	SIP Revision Approved by EPA (Date and Citation)	RACT Rule Applicability and Requirements	Requirements at least as stringent as the 8-hour ozone RACT?
Bulk gasoline plants	Bulk Gasoline Plants, EPA-450/2-77- 035, December 1977	<b>35777</b>	loading, and storage operations at bulk gasoline plants and to any gasoline tank truck delivering or receiving gasoline at a bulk gasoline plant.  Requirements include the use of vapor balance, and various equipment and work practice standards.	fully implements the CTG-specified control and represents current RACT control level over the affected sources under the 8-hour ozone NAAQS.
SOURCES OF VOC Section 129.61.- Small gasoline storage tank control (Stage I control).	CTG: Design Criteria for Stage I Vapor Control Systems - Gasoline Service Stations, November 1975	<b>08/11/92, 57 Federal Register 35777</b>	This section applies to stationary gasoline storage tanks at gasoline dispensing facilities.  The requirements include (1) loading with submerged fill method, and (2) installing vapor recovery system that returns the displaced vapors to the delivery vessels and then to the bulk plant or terminal.	Yes.  This section fully implements the CTG-specified control and represents current RACT control level over the affected sources under the 8-hour ozone NAAQS.
SOURCES OF VOC Section 129.62.- General standards for bulk gasoline terminals, bulk gasoline plants and small	CTG: Control of Hydrocarbons from Tank Truck Gasoline Loading Terminals, EPA-450/2-77-026, December 1977  CTG: Control of	<b>12/22/94, 59 Federal Register 65971</b>	This section applies to gasoline tank trucks equipped for gasoline vapor collection.  The rule requires that the affected	Yes.  This section fully implements the CTG-specified control and represents

PA Regulation Title 25. Environmental Protection, Chapter 129	RACT Basis Document	SIP Revision Approved by EPA (Date and Citation)	RACT Rule Applicability and Requirements	Requirements at least as stringent as the 8-hour ozone RACT?
gasoline storage tanks	Volatile Organic Compound Leaks from Gasoline Tank Trucks and Vapor Collection Systems, EPA-450/2-78-051, December 1978		gasoline tank trucks must be vapor-tight.	current RACT control level over the affected sources under the 8-hour ozone NAAQS.
SOURCES OF VOC Section 129.63.- Degreasing operations	CTG: Control of Volatile Organic Emissions from Solvent Metal Cleaning, EPA-450/2-77-022, November 1977  ACT Document – Halogenated Solvent Cleaners, EPA-450/3-89-030, August 1989.	<b>01/16/03, 68 Federal Register 2208</b>	This section applies to solvent cleaning machine that contains solvent in which VOC is more than 5% by weight.  This rule establishes standards for (1) batch cold cleaning machines, (2) batch vapor cleaning machines, (3) inline cleaning machines, (4) and cleaning machines without a solvent-air interface. It also specifies an alternative standard for (2) and (3) above.	Yes.  This section is more stringent than the current CTG/ACT control level, and represents RACT control level under the 8-hour ozone NAAQS.
SOURCES OF VOC Section 129.64.- Cutback asphalt paving	CTG: Control of Volatile Organic Compounds from Use of Cutback Asphalt, EPA-450/2-77-037, December 1977	<b>07/27/84, 49 Federal Register 30183</b>	This section establishes requirements related to the use of cutback asphalt and establishes VOC content limits for emulsified asphalt.	Yes.  This section fully implements the CTG-specified control and represents current RACT control level over the

PA Regulation Title 25. Environmental Protection, Chapter 129	RACT Basis Document	SIP Revision Approved by EPA (Date and Citation)	RACT Rule Applicability and Requirements	Requirements at least as stringent as the 8-hour ozone RACT?
				affected sources under the 8-hour ozone NAAQS.
SOURCES OF VOC Section 129.65.- Ethylene production plants		<b>11/14/02, 67 Federal Register 68935</b>	This section establishes control requirements for waste gas streams from ethylene production plants.	Yes.  This section represents current RACT control level over the affected sources under the 8-hour ozone NAAQS.
SOURCES OF VOC Section 129.67.- Graphic arts systems	CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume VIII: Graphic Arts - Rotogravure and Flexography, EPA- 450/2-78-033, December 1978	<b>07/26/00, 65 Federal Register 45920</b>	This section applies to any rotogravure or flexographic printing process at a facility with potential uncontrolled VOC emission greater than 100 tons per year.  The rule establishes the limits of VOC contents in coatings and inks used in the covered facilities, and specifies standards for control devices for various printing processes.	Yes.  This section fully implements the CTG- specified control and represents current RACT control level over the affected sources under the 8-hour ozone NAAQS.
SOURCES OF VOC Section 129.68.- Manufacture of synthesized	CTG: Control of Volatile Organic Emissions from Manufacture of Synthesized Pharmaceutical	<b>08/11/92, 57 Federal Register 35777</b>	This section applies to VOC sources at synthesized pharmaceutical manufacturing	Yes.  This section fully implements the CTG-

PA Regulation Title 25. Environmental Protection, Chapter 129	RACT Basis Document	SIP Revision Approved by EPA (Date and Citation)	RACT Rule Applicability and Requirements	Requirements at least as stringent as the 8-hour ozone RACT?
pharmaceutical products	Products, 450/2-78-029, December 1978		facilities, including reactors, distillation operations, crystallizers, centrifuges, and vacuum dryers.  The rule establishes standards for controlling and reducing VOC emissions from all covered sources.	specified control and represents current RACT control level over the affected sources under the 8-hour ozone NAAQS.
SOURCES OF VOC Section 129.69.- Manufacture of pneumatic rubber tires	CTG: Control of Volatile Organic Emissions from Manufacture of Pneumatic Rubber Tires, EPA-450/2-78-030, December 1978	<b>12/22/94, 59 Federal Register 65971</b>	This section establishes VOC emission limits for pneumatic rubber tire manufacturing operations.	Yes.  This section fully implements the CTG-specified control and represents current RACT control level over the affected sources under the 8-hour ozone NAAQS.
SOURCES OF VOC Section 129.71.- Synthetic organic chemical and polymer manufacturing— fugitive sources	CTG: Control of Volatile Organic Compound Emissions from Manufacture of High-Density Polyethylene, Polypropylene, and Polystyrene Resins, EPA-450/3-83-008, November 1983  CTG: Control of Volatile Organic Compound	<b>12/22/94, 59 Federal Register 65971</b>	This section establishes provisions for minimizing leaks, and establishes a leak detection and repair program for process equipment.	Yes.  This section fully implements the CTG-specified control and represents current RACT control level over the affected sources under the 8-hour ozone

PA Regulation Title 25. Environmental Protection, Chapter 129	RACT Basis Document	SIP Revision Approved by EPA (Date and Citation)	RACT Rule Applicability and Requirements	Requirements at least as stringent as the 8-hour ozone RACT?
	Fugitive Emissions from Synthetic Organic Chemical Polymer and Resin Manufacturing Equipment, EPA-450/3-83-006, March 1984			NAAQS.
SOURCES OF VOC Section 129.72.- Manufacture of surface active agents	Non-CTG RACT: An industry-specific RACT determination.	<b>12/22/94, 59 Federal Register 65971</b>	This section establishes VOC control requirements for process operations involved in surface active agents manufacturing.	Yes.  This section represents current RACT control level over the affected sources under the 8-hour ozone NAAQS.
SOURCES OF VOC Section 129.73.- Aerospace manufacturing and rework	CTG: Aerospace (CTG & MACT) (see 59 FR 29216, June 6, 1994); CTG (Final), EPA-453/R-97-004, December 1997	<b>06/25/01, 66 Federal Register 33645</b>	This section applies to any aerospace manufacturing and rework facility.  In brief, the rule establishes vapor pressure limits, VOC content limits, emission limits and/or work practice standards for: (a) handwipe, spray gun, or flush cleaning operations, (b) primer, topcoat, self-priming topcoat, and specialty coating operations, (c) chemical milling maskant application, (d) depainting of	Yes.  This section fully implements the CTG-specified control and represents current RACT control level over the affected sources under the 8-hour ozone NAAQS.

PA Regulation Title 25. Environmental Protection, Chapter 129	RACT Basis Document	SIP Revision Approved by EPA (Date and Citation)	RACT Rule Applicability and Requirements	Requirements at least as stringent as the 8-hour ozone RACT?
			aerospace vehicles, and (e) handling and storing of VOC.	
SOURCES OF VOC Section 129.75.- Mobile equipment repair and refinishing	ACT: Automobile Body refinishing ACT (EPA 453/R- 94-031, April 1994)	<b>08/14/00,</b> <b>65 Federal</b> <b>Register</b> <b>49501</b>	This section applies to any person who applies coatings to mobile equipment.  The rule establishes: (a) Requirements for using improved transfer efficiency coating and application equipment; (b) requirements for enclosed spray gun cleaning techniques; and (c) minimum training standards in the proper use of equipment and materials. The VOC limits for mobile equipment repair and refinishing coatings are in effect nationally under the Federal requirements at 40 CFR Part 59, subpart B, National VOC Emission Standards for Automobile Refinish Coatings, which was adopted by EPA in 1998.	Yes.  This section is more stringent than the current ACT control level, and represents RACT control level under the 8-hour ozone NAAQS.
STATIONARY SOURCES OF NO <sub>x</sub>	Non-CTG RACT, CAA Section	<b>07/20/01,</b> <b>66 Federal</b>	This section establishes	Yes.

PA Regulation Title 25. Environmental Protection, Chapter 129	RACT Basis Document	SIP Revision Approved by EPA (Date and Citation)	RACT Rule Applicability and Requirements	Requirements at least as stringent as the 8-hour ozone RACT?
AND VOC Sections 129.91- 129.95 Control of major sources of NO <sub>x</sub> and VOCs	182(b)(2)(C)	<b>Register 37908</b>	provisions for case-by-case determinations of RACT for major non-CTG VOC sources.	This provision represents current NO <sub>x</sub> RACT control requirement under the 8- hour ozone NAAQS.
WOOD FURNITURE MANUFACTURING OPERATIONS Sections 129.101- 129.107	CTG: Wood Furniture (CTG- MACT) - draft MACT out 5-94; Final CTG, EPA- 453/R-96-007, April 1996; see also 61 FR 25223, and, 61 FR 50823, September 27, 1996	<b>07/20/01, 66 Federal Register 37908</b>	This section establishes VOC emission limitations and work practice standards for wood furniture manufacturing operations with the potential to emit 25 tpy or greater of VOC.	Yes.  This section fully implements the CTG specified control and represents current RACT control level over the affected sources under the 8-hour ozone NAAQS.

## Certification of NOx RACT Requirements

Table 2 of this document lists each Department NOx RACT control regulation, the RACT basis for the regulation, SIP revision approval by EPA citations, the RACT Rule applicability and requirements, and certification that the existing regulation represents RACT under the 8-hour ozone NAAQS. Where Pennsylvania has certified that a current SIP approved regulation represents RACT under the 8-hour ozone standard, DEP states that it is not aware of any significant changes in control technology that affect the original RACT determination. The Department previously used a cost of \$1,500/ton of NOx as a benchmark value when determining cost-effective control technology for NOx sources subject to the RACT requirements adopted for the 1-hour ozone NAAQS. These cost-effective controls continue to represent RACT for the 8-hour ozone NAAQS because NOx control technologies have not substantially changed since the mid-1990s. Although the capital costs for certain control technologies, such as SCR and low-NOx burners, have remained fairly constant, the annual operating costs have significantly increased due to price increases for urea, electricity, and operating labor. Generally, replacement low NOx burners are not available for older existing 100 MMBtu/hr boilers and smaller, but when they are available, they are not cost-effective as RACT. As shown in the example below, the cost analysis the Department performed in 2006 to evaluate the cost of low-NOx burner control technology for 100 MMBtu/hr boilers and smaller shows the costs to still be beyond RACT, and therefore the RACT determinations made for the 1-hour ozone standard are representative of RACT for the 8-hour NAAQS.

<b>DIRECT COSTS -</b>		<b>REFERENCE</b>
Equipment Cost (EC)	\$100,000.00	Phone conversation with Mr. Troy Probst of Faber Burner Company on July 24, 2006
Instrumentation and Monitoring	\$10,000.00	(Typically 10% of EC)
Freight	\$6,000.00	6% of EC (Estimated)
Tax	\$6,000.00	6% of EC (Estimated)
<b>Total Purchased Equipment Cost:</b>	<b>\$122,000.00</b>	
Direct Installation Cost	\$70,000.00	Phone conversation with Mr. Troy Probst of Faber Burner Company on July 24, 2006
<b>Total Direct Costs:</b>	<b>\$192,000.00</b>	
<b>INDIRECT COSTS -</b>		
Design, Engineer, Supervision & Start-up	\$50,000.00	Scaled from costs analysis for Low NOx Burner for another boiler
Performance Test	\$5,000.00	Typical costs for NOx emission test
Contingencies (20% of EC)	\$20,000.00	Typical
<b>TOTAL CAPITAL INVESTMENT (TCI) -</b>	<b>\$267,000.00</b>	
<b>ANNUAL OPERATING COSTS</b>		

<b>Direct Annual Costs</b>		
Electricity	\$52,560.00	75 kw @ \$0.08/kw-hr (Faber Burner Company's assumption for 100 MMBtu/hr boiler)
Material & Maintenance	\$13,350.00	5% of TCI (Most vendors)
<b>Total Direct Costs:</b>	<b>\$65,910.00</b>	
<b>Indirect Annual Costs</b>		
Overhead	\$8,010.00	60% of Maintenance (OAQPS)
PropertyTax+Ins.+Admn.	\$10,680.00	(4% of TCI - OAQPS)
Capital Recovery	\$43,254.00	(10 yrs @ 10% - OAQPS)
<b>Total Indirect Costs:</b>	<b>\$61,944.00</b>	
<b>TOTAL ANNUAL OPERATING COSTS -</b>	<b>\$127,854.00</b>	
Uncontrolled NOx Emissions (TPY)	142.00	
NOx Removed (TPY @ 45% Efficiency)	63.90	
<b>Cost-Effectiveness (\$/Ton NOx removed)</b>	<b>\$2,000.85</b>	

Although the Department has completed 1-hour ozone nonattainment RACT analyses and made RACT determinations for classes of sources including boilers, cement kilns and glass furnaces, the Department continues to evaluate the feasibility of additional NOx emissions reductions from these categories of sources that may be needed for attainment of the 8-hour ozone NAAQS. The Department is working with the Ozone Transport Commission to define “beyond-RACT” requirements for these classes of sources and will propose additional “beyond-RACT” measures for these classes of sources as necessary for attainment of the 8-hour ozone NAAQS.

Therefore, the case-by-case NOx RACT determinations for the 1-hour ozone NAAQS continue to represent NOx RACT for the 8-hour ozone NAAQS.

**Table 2 - NO<sub>x</sub> RACT List and Certification Under the 8-Hour Ozone NAAQS**

PA Regulation Title 25. Environmental Protection, Chapter 129 & Chapter 145	RACT Basis Document	SIP Revision Approved by EPA	RACT Rule Applicability and Requirements	Requirements at least as stringent as the 8-hour ozone RACT?
<p>STATIONARY SOURCES OF NO<sub>x</sub> AND VOC Sections 129.91-129.95 Control of major sources of NO<sub>x</sub> and VOCs</p>	<p>NO<sub>x</sub> RACT, CAA Section 182(b)(2) and Section 182(f)</p>	<p><b>07/20/01, 66 Federal Register 37908</b></p>	<p>This section establishes provisions for case-by-case determinations of RACT for major NO<sub>x</sub> sources.</p> <p>In addition, it establishes requirements for case-by-case RACT determinations for certain major NO<sub>x</sub> sources and establishes presumptive RACT limitations for certain classes of combustion units: coal-fired combustion units rated equal or greater than 100 mmBtu, combustion units rated equal or greater than 20 mmBtu and less than 50 mmBtu.</p>	<p>Yes.</p> <p>This provision represents current NO<sub>x</sub> RACT control requirement under the 8-hour ozone NAAQS.</p>
<p>INTERSTATE POLLUTION TRANSPORT REDUCTION Subchapter A. Sections 145.1-145.100 NO<sub>x</sub> Budget Trading Program</p>	<p>These sections ensure that sources subject to the cap-and-trade program achieve RACT-level reductions because they meet the NO<sub>x</sub> SIP Call requirements.</p> <p>EPA believes that the SIP provisions for those sources subject to the State's emission</p>	<p><b>08/21/01, 66 Federal Register 43795</b></p>	<p>This rule establishes a NO<sub>x</sub> budget and trading program for large sources of NO<sub>x</sub>.</p> <p>Applies to an affected trading source that is: 1) Fossil fuel-fired electric generating unit that serves a generator with a nameplate capacity greater than 25.0 MWe and sells any</p>	<p>Yes.</p> <p>This provision represents current NO<sub>x</sub> RACT control requirement under the 8-hour ozone NAAQS.</p>

PA Regulation Title 25. Environmental Protection, Chapter 129 & Chapter 145	RACT Basis Document	SIP Revision Approved by EPA	RACT Rule Applicability and Requirements	Requirements at least as stringent as the 8-hour ozone RACT?
	cap-and-trade program where the cap-and-trade program has been adopted by the State that meets the NOx SIP Call requirements meet the ozone NOx RACT requirement (70 FR 71652).		amount of electricity; 2) Nonelectric generating unit that has a maximum design heat input greater than 250 mmBtu/hr; and 3) Other source for which an opt-in application is submitted and approved by the Department.	
Subchapter B. Sections 145.111- 145.113 Emissions of NOx From Stationary Internal Combustion Engines	“RACT is considered met for cement kilns and stationary internal combustion engines that are subject to a SIP approved as meeting the NOx SIP Call obligation to install and operate controls that are expected to achieve at least a 30 percent and 82 percent reduction, respectively, from uncontrolled levels.” (70 FR 71653).	<b>07/14/06, 71 Federal Register 40048</b>	This section establishes presumptive RACT limitations and standard requirements for certain stationary internal combustion engines: stationary internal combustion engine rated equal or greater than 2,400 brake horsepower, diesel stationary internal combustion engine rated equal or greater than 3,000 brake horsepower, and dual-fuel stationary internal combustion engine rated equal or greater than 4,000 brake horsepower.	Yes.  This provision represents current NOx RACT control requirement under the 8-hour ozone NAAQS.
Subchapter C. Sections 145.141- 145.144 Emissions of NOx From Cement Manufacturing	“RACT is considered met for cement kilns and stationary internal combustion engines that are subject to a SIP approved as meeting the NOx	<b>07/14/06, 71 Federal Register 40048</b>	This section establishes presumptive RACT limitations and standard requirements for certain (Portland) cement kilns.	Yes.  This provision represents current NOx RACT control requirement under the 8-hour ozone NAAQS.

PA Regulation Title 25. Environmental Protection, Chapter 129 & Chapter 145	RACT Basis Document	SIP Revision Approved by EPA	RACT Rule Applicability and Requirements	Requirements at least as stringent as the 8-hour ozone RACT?
	SIP Call obligation to install and operate controls that are expected to achieve at least a 30 percent and 82 percent reduction, respectively, from uncontrolled levels.” (70 FR 71653).			
Clean Air Interstate Rule (CAIR)			This rule will require additional NOx reductions from EGU facilities.	

### **3. NEW AND REVISED REGULATIONS**

Small Source NO<sub>x</sub> Provisions: Chapter 129 (Sections 129.201-129.205) of Title 25 was amended to incorporate the “Additional NO<sub>x</sub> Requirements” regulation in order to establish ozone-season NO<sub>x</sub> emission limits for certain boilers, turbines and stationary internal combustion units that are small sources of NO<sub>x</sub> in the five-county Southeast Pennsylvania severe 1-hour ozone nonattainment area. The requirements constitute beyond-RACT control levels. The requirements were designed to achieve emission reductions that are integral to maintaining the EPA’s approval of the attainment demonstration contained in the SIP elements for the Philadelphia area.

### **4. NEGATIVE DECLARATION LIST**

The Department’s permit staff performed an inventory of existing and operating VOC sources and their applicable CTG categories, and found the following CTG VOC controls have not been adopted by the EQB because there are no emission sources that would require these CTG requirements:

Control of Volatile Organic Equipment Leaks from Natural Gas/Gasoline Processing Plants, EPA-450/2-83-007, December 1983.

Shipbuilding/Repair ACT (EPA 453/R-94-032, April 1994) and CTG, see 61 FR 44050, August 27, 1996.

Control of Volatile Organic Compound Emissions from Large Petroleum Dry Cleaners, EPA-450/3-82-009, September 1982.

Control of Volatile Organic Compound Emissions from Air Oxidation Processes in Synthetic Organic Chemical Manufacturing Industry, EPA-450/3-84-015, December 1984.

Control of Volatile Organic Compound Emissions from Reactor Processes and Distillation Operations Processes in the Synthetic Organic Chemical Manufacturing Industry, EPA-450/4-91-031, August 1993.

Control of Volatile Organic Emissions from Existing Stationary Sources, Volume VII: Factory Surface Coating of Flat Wood Paneling, EPA-450/2-78-032, June 1978.

Note: Eight sources previously coded in the Department’s stationary source inventory as flat wood paneling sources have been re-coded in the 2005 Air Information Management System (AIMS) to correctly reflect their operations, i.e. wood furniture and cabinet manufacturing.

### **5. DOCUMENTATION**

#### **A. CTG, ACT and CAA Document References:**

1. Control Technology Guidance (CTG) document: Control of Volatile Organic Compound Emissions from Coating Operations at Aerospace Manufacturing and Rework Operations, EPA-453/R-97-004, December 1997.

2. ACT: Automobile Refinishing, EPA-453/R-94-031, April 1994.
3. CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume II: Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks, EPA-450/2-77-008, May 1977 (Group I).
4. CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume III: Surface Coating of Metal Furniture, EPA-450/2-77-032, December 1977.
5. CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume V: Surface Coating of Large Appliances, EPA-450/2-77-034, December 1977 (Group I).
6. CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume IV: Surface Coating of Insulation of Magnet Wire, EPA-450/2-77-033, December 1977 (Group I).
7. CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume VI: Surface Coating of Miscellaneous Metal Parts and Products, EPA-450/2-78-015, June 1978 (Group II).
8. CTG: Control of Volatile Organic Emissions from Manufacture of Pneumatic Rubber Tires, EPA-450/2-78-030, December 1978 (Group II).
9. CTG: Control of Volatile Organic Emissions from Bulk Gasoline Plants, EPA-450/2-77-035, December, 1977 (Group I).
10. CTG: Design Criteria for Stage I Vapor Control Systems - Gasoline Service Stations, November 1975 (Group I).
11. CTG: Control of Hydrocarbons from Tank Truck Gasoline Loading Terminals, EPA-450/2-77-026, December 1977 (Group I).
12. CTG: Control of Volatile Organic Compound Leaks from Gasoline Tank Trucks and Vapor Collection Systems, EPA-450/2-78-051, December 1978 (Group II).
13. CTG: Control of Refinery Vacuum Producing Systems, Wastewater Separators, and Process Unit Turnarounds, EPA-450/2-77-025, October 1977 (Group I).
14. CTG: Control of Volatile Organic Compound Leaks from Petroleum Refinery Equipment, EPA-450/2-78-036, June 1978 (Group II).
15. CTG: Control of Volatile Organic Emissions from Petroleum Liquid Storage in External Floating Roof Tanks, EPA-450-2/78-047, December 1978 (Group II).
16. CTG: Control of Volatile Organic Emissions from Storage of Petroleum Liquids in Fixed Roof Tanks, EPA-450/2-77-036, December 1977 (Group I).
17. CTG: Control of Volatile Organic Emissions from Wood Furniture Manufacturing Operations, EPA-453/R-96-007, April 1996.
18. CTG: Control of Volatile Organic Emissions from Solvent Metal Cleaning, EPA-450/2-77-022 November 1977 (Group I).
19. ACT: Halogenated Solvent Cleaners, EPA-450/3-89-030, August 1989.
20. CTG: Control of Volatile Organic Compounds from Use of Cutback Asphalt, EPA-450/2-77 037, December 1977 (Group I).
21. CTG: Control of Volatile Organic Emissions from Manufacture of Synthesized Pharmaceutical Products, EPA-450/2-78-029, December 1978 (Group II).
22. CTG: Control of Volatile Organic Emissions from Existing Stationary Sources, Volume VIII: Graphic Arts-Rotogravure and Flexography, EPA-450/2-78-033, December 1978 (Group II).

23. CTG: Control of Volatile Organic Compound Fugitive Emissions from Synthetic Organic Chemical Polymer and Resin Manufacturing Equipment, EPA-450/3-83-006, March 1984 (Group III).
24. CTG: Control of Volatile Organic Compound Emissions from Manufacture of High-Density Polyethylene, Polypropylene, and Polystyrene Resins, EPA-450/3-83-008, November 1983 (Group III).
25. CAA Section 182(b)(2)(C).
26. CAA Section 182(b)(2).
27. CAA Section 182(f).
28. CAA Section 184.

**B. Pennsylvania VOC and NOx RACT Regulations:**

PA Code Title 25 Environmental Protection, Chapter 129. Standards For Sources  
PA Code Title 25 Environmental Protection, Chapter 145. Interstate Pollution Transport Reduction. These regulations are available electronically at the following web address:  
<http://www.dep.state.pa.us/dep/deputate/airwaste/aq/regs.htm>  
(Note: Hard copy of these regulations available upon request.)

**C. Other Supporting Documents:**

1. STAPPA/ALAPCO controlling emissions of Nitrogen Oxides from existing utility boilers under Title I of the Clean Air Act: Options and Recommendations, STAPPA/ALAPCO, 4/27/1992.
2. NESCAUM Stationary Source Committee Recommendation on NOx RACT for Utility Boilers, 8/12/1992.
3. NESCAUM Stationary Source Committee Recommendation on NOx RACT for Industrial Boilers, Internal Combustion Engines and Combustion Turbines, 9/18/1992.
4. The USEPA's OAQPS Control Cost Manual, January 1990.
5. Memorandum: Cost-Effective Nitrogen Oxides (NOx) Reasonably Available Control Technology, USEPA March 16, 1994.
6. Memorandum: Nitrogen Oxides (NOx) Reasonably Available Control Technology (RACT) for the Repowering of Utility Boilers, USEPA March 9, 1994
7. State Implementation Plans; Nitrogen Oxides Supplement to the General Preamble; Clean Air Act Amendments of 1990 Implementation of Title I; Proposed Rule, USEPA, 11/25/1992.
8. Memorandum: Cost-Effectiveness Nitrogen Oxides (NOx) Reasonable Available Control Technology (RACT), USEPA OAQPS 07/09/1993.
9. Memorandum: Fuel Switching to Meet the Reasonable Available Control Technology (RACT) Requirements for Nitrogen Oxides (NOx) USEPA July 30, 1993.
10. Alternative Control Techniques Document: NOx Emissions from Process Heaters (Revised), USEPA, September 1993.
11. Alternative Control Techniques Document: NOx Emissions from industrial/Commercial/Institutional (ICI) Boilers, USEPA, March 1994.
12. Alternative Control Techniques Document: NOx Emissions from Utility Boilers, USEPA, March 1994.

13. Alternative Control Techniques Document: NO<sub>x</sub> Emissions from Stationary Gas Turbines, USEPA, January 1993.
14. Alternative Control Techniques Document: NO<sub>x</sub> Emissions from Stationary Reciprocating Internal Combustion Engines, USEPA 1993
15. NO<sub>x</sub> Emissions from Stationary Internal Combustion Engines, USEPA, October 2003.
16. Stationary Reciprocating Internal Combustion Engines – Updated Information on NO<sub>x</sub> Emissions and Control Techniques – Revised Final Report, USEPA, 9/1/2000.
17. Alternative Control Techniques Document: NO<sub>x</sub> Emissions from Iron and Steel Mills, USEPA, September 1994.
18. Alternative Control Techniques Document: NO<sub>x</sub> Emissions from Glass Manufacturing, February 1993.
19. Evaluation and costing of NO<sub>x</sub> controls for existing utility boilers in the NESCAUM region, USEPA 453/R-92-010, December 1992.
20. Compilation of Air Pollutant Emission Factors Vol. I Stationary point and Area Sources fifth edition, USEPA, January 1995.
21. NESCAUM Stationary Source Committee Recommendation On NO<sub>x</sub> RACT for Utility Boilers, 3/25/1992.