

**TCEQ MASTER CONTROL STRATEGY LIST**  
**Point Sources**

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# TCEQ - MASTER CONTROL STRATEGY LIST

## Category

ID Control Strategy

## Point Sources

### Agricultural Operations

- 1 Emission reductions from livestock waste (VOC/NH<sub>3</sub>) WST-01  
*This control measure considers the ammonia and VOC emissions inventory associated with livestock waste and the development and assessment of feasible control approaches. Potential control options include, but are not limited to, removal of manure out-of-region or processing of manure at controlled composting facilities or at anaerobic digesters.*
- 2 Emission reductions from composting (VOC/NH<sub>3</sub>) WST-02  
*This control measure proposes to achieve VOC and NH<sub>3</sub> reductions from composting and related operations. A series of rules will be developed to 1) establish a registration program for composting and chipping and grinding facilities; 2) establish holding and/or processing time requirements for greenwaste; and, 3) set forth VOC and ammonia emission reduction requirements. Potential control options may include forced aeration, enclosures, process controls, and add-on controls (e.g. biofilters).*

### Airport Operations

- 3 Control emissions from airport terminals
- 4 Control emissions from facility energy conservation programs (airports)
- 5 Control emissions from aircraft maintenance

### Bakeries

- 6 Bakeries - VOC  
*Implement contingency measure to require reductions from bakery ovens at sites with total VOC 25> tpy but < 50 tpy. Extend requirements for control of bakery oven emissions to 5 new counties.*

### Boilers

- 7 Apply 90% SO<sub>2</sub> and 80% NO<sub>x</sub> reduction (similar to Best Available Retrofit Technology [BART]) to all medium and large industrial, commercial, and institutional (ICI) boilers
- 8 Apply likely controls (90% SO<sub>2</sub> and 80% NO<sub>x</sub> Reduction) to chemical plant boilers subject to the proposed Best Available Retrofit Technology (BART) requirements
- 9 Industrial, commercial and institutional (ICI) boilers - NO<sub>x</sub>  
*Expand existing 4 county DFW NO<sub>x</sub> controls to 5 new counties.- Apply HGB emission specifications to 9 counties.*
- 10 NO<sub>x</sub> reductions from refinery boilers, steam generators, and process heaters. - NO<sub>x</sub>  
*A 5 ppm NO<sub>x</sub> limit corrected to 3% O<sub>2</sub>, or 0.0062 lb/MMBtu standard for large refinery boilers and process heaters (larger than 110 MMBtu).*
- 11 Control emissions from boilers
- 12 Apply 40% SO<sub>2</sub> and 60% NO<sub>x</sub> reduction to all medium and large industrial, commercial, and institutional (ICI) boilers
- 13 Apply Likely Controls (90% SO<sub>2</sub> and 80% NO<sub>x</sub> Reduction) to industrial, commercial, and institutional (ICI) boilers subject to the proposed Best Available Retrofit Technology (BART) requirements
- 14 Institute fuel switching projects (point source) changing from coal fired boilers to gas fired boilers with fuel oil and propane backup

### Breweries

- 15 Breweries- VOC  
*Implement practices to minimize spillage in filling operations, keg cleaning and waste beer processing. Wastewater streams and components could be covered at all times and routed to a treatment system capable of a VOC reduction efficiency equivalent to that obtained from the use of properly operated biotreatment unit. Emissions from the fermentation tanks could be reduced by the use of a condenser. Coding of bottles, cans, cases, and kegs could incorporate the use of low VOC containing inks or an ink-free laser coding process.*

### Burners

- 16 Burner Modifications  
*Burner air and/or fuel modifications to improve air/fuel interaction.*
- 17 Low-NO<sub>x</sub> Burners  
*Burners designed to produce lower NO<sub>x</sub> emissions – “staged” combustion.*
- 18 Fuel Reburn  
*Inject portion of the fuel into the furnace downstream of burner zone. Usually requires overfire air (OFA) to complete combustion*

**Chemical Manufacturing**

- 19 Chemical manufacturing - VOC  
*Loading racks; Transportation & Marketing- Tank trucks/Cars loading; Petroleum storage tank-Loading racks: 30 TAC §§115.211 - 115.219 could be revised to require a 95% control efficiency rather than the 90% level of the current rule. The rule could also be extended to 5 counties in DFW at either 90% or 95 % control level.*

**Coal Properties and Processes**

- 20 Chemical Coal Cleaning  
*Uses chemical processes to remove pyrites (inorganic sulfur compounds) and organic sulfur in coal.*
- 21 Physical Coal Cleaning  
*Uses physical processes to remove pyrites (inorganic sulfur compounds) in coal.*
- 22 Switch to Low Sulfur Coal  
*Uses low-sulfur western or other coals.*

**Combustion**

- 23 Overfire Air  
*Form of "staged" combustion. Divert portion of the air from the windbox to OFA ports installed above the burners.*
- 24 Oxygen-enhanced combustion modification  
*Improve effectiveness of overfire air (OFA) operation by injecting oxygen into fuel-rich flames. Operate more fuel-rich without the problems. Emerging technology.*
- 25 Stationary external combustion - VOC  
*Optimized combustion practices. External combustion sources are typically fired with natural gas or fuel oil. VOC emissions are produced from unburned organics present in the fuel, and result from poor combustion conditions such as inefficient fuel-air mixing, low temperatures, and short residence time. Since these same conditions cause CO emissions to increase, continuous monitoring of CO may be used as a surrogate for VOC emissions. CO CEMS is already required for large boilers and process heaters under the NOx RACT rule. Combustion modifications for NOx control can result in CO and VOC increases.*
- 26 Engine test cells - NOx and VOC
- 27 Diesel and dual-fuel engines - NOx  
*Apply HGB specifications to 9 counties and East Texas (defined by SB7)- Apply HGB emission specifications to 9 counties and East Texas (defined by SB7) to major sources.*
- 28 Gas-fired stationary internal combustion engines - VOC  
*Assign VOC emission specification.*
- 29 Non-utility turbines - NOx  
*Apply HGB emission specifications to 9 counties.*
- 30 Backup diesel generators  
*Apply HGB emission specifications- Convert to natural gas- Convert to fuel cells.*
- 31 Gas-fired engines - NOx  
*Apply HGB emission specification to the 9 counties and remove the exemption for engines less than 300 hp.*

**Control Technology Rules**

- 32 Adopt emission caps based on "Retrofit Best Available Control Technology (BACT) Level" of 0.15 lbs/mmBtu for SO2 and 0.10 lbs/mmBtu for NOx
- 33 Apply likely controls (90% SO2 and 80% NOx Reduction) to sources subject to the proposed Best Available Retrofit Technology (BART) requirements
- 34 Adopt more stringent Reasonably Available Control Technology (RACT) regulations (90% from uncontrolled), lower applicability thresholds, and extend geographic coverage to all counties
- 35 Adopt emission caps based on "Best Available Control Technology (BACT) Level for New Plants" of 0.10 lbs/mmBtu for SO2 and 0.07 lbs/mmBtu for NOx
- 36 Apply likely controls (95% SO2 and 80% NOx reduction) to kilns subject to the proposed Best Available Retrofit Technology (BART) requirements
- 37 Apply likely controls (90% SO2 and 80% NOx Reduction) to sources subject to the proposed Best Available Retrofit Technology (BART) requirements

**Cooling Towers**

- 38 Cooling towers - VOC  
*Cooling water monitoring of cooling tower heat exchange systems for flow rate and VOC to detect leaks and quantify emissions (similar to HRVOC rules from HGB). VOC controls: Specific point source limit, repair requirements, or cap & trade approach.*

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# Point Sources

## Electric Generating Utilities

- 39 Seek additional cost effective alternatives beyond SB 7 requirements by focusing first on the largest and most frequently operated units
- 40 Texas Utility Reductions
- 41 Fogging at combustion turbines at TVA Allen steam plant
- 42 Electricity surcharge - NOx  
*Peak usage surcharge on energy use. This will encourage non-peak use, and will provide funding for local energy efficiency programs.*
- 43 Electric generating facilities - NOx  
*Apply HGB emission specifications to 9 counties- Apply HGB emission specifications to East Texas (defined by SB7). Expand existing 4 county DFW NOx controls to 5 new counties.*
- 44 DFW Electric Generating Utilities - % NOx Reductions - 4 Counties
- 45 Restrictions on peaking/peak shaving; Limit usage of emergency power generators
- 46 Wet injection at combustion turbines at TVA Allen steam plant
- 47 Use of solar energy to produce electrical power
- 48 Demand-side management for utilities
- 49 Alcoa/Eastman Agreed Orders (AS)
- 50 Remove grandfathering provisions for older sources and upgrade facilities with newer technology
- 51 TNRCC.14 rule for power plants in the nonattainment area
- 52 VOC reasonably available control technology (RACT) Batch Processing/Wastewater (GD)

## Emission Credits

- 53 Emission fees
- 54 Cap and trade with other units
- 55 Do not allow plants to trade credits with other plants in the same region
- 56 Regional Clean Air Incentives Market (RECLAIM)  
*Additional NOx Reductions for Regional Clean Air Incentives Market (RECLAIM). There are a variety of control strategies that can be implemented, including reducing ending allocations in 2003-2006, overlaying source-specific regulations, excluding smaller emitting facilities, and/or bifurcated market for powerplants and nonpowerplants.*
- 57 Discrete Emission Reduction Credit (DERC) and Emission Reduction Credit (ERC) Environmental Contribution - VOC and NOx  
*Increase the environmental contributions for ERCs and DERCs from 10% to 20%.*

## Emission Limits

- 58 Emission Charges of \$5,000 per Ton of VOC for Stationary Sources Emitting Over 1 Tons per Year (VOC) FSS-04  
*Emission Charges of \$5,000 per Ton of VOC for Stationary Sources Emitting Over 1 Tons per Year. If the federal ambient air standards are not met by the year 2010, the District shall impose an emissions fee, in addition to the federal penalty, of \$5,000 per ton of VOC, emitted by each major source in excess of 80 percent of the sources' baseline emissions. The fee rate will be adjusted annually to reflect increases in the consumer price index. The fee shall be paid for each calendar year after the year 2010 and until the area is redesignated as an ozone attainment area.*

## Flares

- 59 Flares - VOC  
*Require continuous monitoring of flow rate, net heating value, and composition on flares (similar to HRVOC rules from HGB). VOC controls: Specific point source limit or cap & trade approach.*

## Heaters

- 60 Process heaters - NOx  
*Apply HGB emission specifications to 9 counties.*
- 61 Dryers, non-process heaters and ovens -NOx

## Incinerators

- 62 Incinerators - NOx  
*Apply HGB emission specifications to 9 counties.*

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- 63 General process vent gas control - VOC  
*Expand existing general vent gas rule to 5 new counties. The proposed measure raises the control efficiency for non-Synthetic Organic Chemical Manufacturing Industry (SOCMI) processes from 90% to 98%. Incinerators - emission testing to establish demonstrated compliance parameter levels (such as inlet and exhaust temperatures, flow rates, etc.).*

## Kiln Operations

- 64 Apply reasonably available controls (90% SO<sub>2</sub> and 50% NO<sub>x</sub> reduction) to all cement kilns in the region
- 65 Asphalt plant dryers and heaters  
*Control these sources at asphalt concrete manufacturing plants.*
- 66 Cement kilns - NO<sub>x</sub>  
*LoTOx- Selective Noncatalytic Reduction - Selective Catalytic Reduction (SNCR- SCR).*
- 67 Cement Kilns - VOC  
*Regenerative thermal oxidization.*
- 68 Aggregate Kilns - NO<sub>x</sub>  
*Apply HGB emission specifications to 9 counties.*
- 69 Brick Kilns - NO<sub>x</sub>
- 70 Lime kilns - NO<sub>x</sub>  
*Apply HGB emission specifications to 9 counties.*
- 71 Require that cement kilns only burn natural gas; Retrofit older kilns with improved NO<sub>x</sub> control technology
- 72 Require baghouses and scrubbers on existing sources at the Midlothian complex; Restrict fuel use to natural gas
- 73 Cement kilns-add stack gas controls and restrict fuel to natural gas
- 74 Cement Kilns  
*On April 19, 2000, the commission adopted new cement kiln rules as part of the ozone SIP control strategy for the DFW ozone nonattainment area. The rules required portland cement kilns in Bexar, Comal, Ellis, Hays, and McLennan Counties to meet specific NO<sub>x</sub> reductions.*

## Lime Technology and Processes

- 75 Lime spray dryer system (LSD)\*
- 76 Limestone forced oxidation system (LSFO)\*  
*LSFO is a process based on wet limestone scrubbing which reduces scaling and eliminates need for landfilling of the waste product. Currently the preferred FGD technology worldwide.*
- 77 Magnesium enhanced lime system (MEL)\*  
*In the MEL process, slaked lime, containing calcium hydroxide [Ca(OH)<sub>2</sub>] and a portion of magnesium hydroxide [Mg(OH)<sub>2</sub>], is used to react with SO<sub>2</sub>.*

## Management

- 78 Reschedule processes at stationary source - VOC and NO<sub>x</sub>  
*Limit the following activities on high ozone action days: repair, maintenance, cleaning, and other shutdown of production equipment at industrial facilities. Examples include prohibiting tank cleaning or process vessel depressurization at refineries.*
- 79 Date shifting (point sources) performing tests of emergency generators on forecast green or yellow days and not on forecast orange or red days
- 80 Early introduction of new, lower polluting technology
- 81 Tier I and Tier II controls in Ellis County
- 82 Add flexibility to current programs  
*This recommendation seeks to add more flexibility to existing stationary source rules by allowing sources to mitigate their emissions by reducing emissions from other less controlled or uncontrolled sources in lieu of complying with more costly controls under the existing framework. The purpose of this program is to achieve emission reductions and environmental improvement in a less costly and more efficient manner and, through compliance flexibility, to minimize the economic and job-related impacts of the Plan and potentially to reduce the size of the black box.*
- 83 Further Emission Reductions from Large VOC Sources (VOC) MSC-08  
*Facilities will be required to submit a plan to outline specific measures that would be implemented to reduce their overall emissions beyond the existing regulations and achieve a specified emission reduction target. The reduction targets will be based on technology-based control targets for various source categories and would take into account technical feasibility and cost-effectiveness.*
- 84 Remove Disincentives on Voluntary Measures  
*Stationary source operators may often be hesitant about making modifications or improvements to their permitted sources due to the potential impact on their facilities from rules which require a permit change or new source review for modifications that increase or decrease emissions. Recommendation was made to consider removing impediments potentially created by rules and regulations in order to achieve reductions from voluntary measures implemented by facilities for SIP purposes.*

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- 85 More accurate count of small sources with in the inventory is needed
- 86 Examine point source control possibilities within a 12-county area

**Metal Production**

- 87 Primary metal production - VOC  
*Implement work practice standards to minimize the amount of organics in furnace charge materials or require use of gas-fired preheater where the flame directly contacts the scrap charged. VOC emission specifications for cupola melting furnaces and mold/core production processes; capture and collection systems, thermal incinerators (afterburners).*
- 88 Secondary metal production - VOC  
*Implement work practice standards to minimize the amount of organics in furnace charge materials or require use of gas-fired preheater where the flame directly contacts the scrap charged. VOC emission specifications for cupola melting furnaces and mold/core production processes; capture and collection systems, thermal incinerators (afterburners).*
- 89 Primary metal production - NOx  
*Selective noncatalytic reduction (SNCR) for metallurgical furnaces.*
- 90 Secondary metal production - NOx  
*Selective noncatalytic reduction (SNCR) for metallurgical furnaces.*

**Oil and Gas Production**

- 91 Emission Reductions from Fugitive Emission Sources (VOC) - FUG-05  
*Further VOC emission reductions from fugitive emission sources, such as refineries, oil and gas production facilities, terminals, chemical plants, and manufacturing facilities. Implementation of facility-specific and SCAQMD-approved compliance plans to maximize compliance flexibility opportunities.*
- 92 Emission Reductions from Petroleum Refinery Flares (SOx) CMB-07  
*Emission Reductions from Petroleum Refinery Flares. This control measure applies to all gas flares used at petroleum refineries, sulfur recovery plants and hydrogen production plants. Step I-evaluate and assess to develop an accurate emissions inventory from flare operations. Step II-thoroughly investigate control options to identify the most feasible and cost-effective control strategies available to reduce emissions from refinery flares.*
- 93 Emission reductions from petroleum refinery Fluidized-bed catalytic cracking units (FCCUs) (PM10/NH3) CMB-09  
*Refine the emission inventory and reduce PM10, PM2.5 and NH3 emissions from petroleum fluid catalytic cracking units. Improve the operation of electrostatic precipitators (ESP) and cyclones presently installed on the catalytic cracking units & replace older equipment with new, more efficient models.*
- 94 Wastewater from coke cutting operations - VOC  
*Wastewater from coke cutting is not part of the refinery wastewater collection and treatment system. Include it in the existing collection and treatment system.*

**Pulp and Paper**

- 95 Pulping liquor furnaces - NOx  
*Apply HGB emission specifications to 9 counties.*
- 96 Pulp and paper - VOC  
*Maximum available control technology (MACT) standards require the control of hazardous air pollutant (HAP) emissions. VOC emissions are not specifically targeted by the MACT, but the control technologies upon which the standards are based will similarly reduce VOC emissions.*

**Selective Catalytic/Noncatalytic Reduction**

- 97 Hydrocarbonenhanced Selective Non-Catalytic Reduction (SNCR)  
*Inject small amount of natural gas to create radicals that enhance SNCR effectiveness at 1700 to 2000 °F. Emerging technology.*
- 98 Selective Noncatalytic Reduction (SNCR)  
*Inject ammonia-based reagent into upper furnace (1700-2000 degrees F) to destroy NOx.*
- 99 Selective Catalytic Reduction (SCR)  
*Ammonia added upstream of catalytic reactor installed upstream of air preheater (conventional), downstream of a hot ESP (low dust), or downstream of the cold ESP (tail end).*
- 100 Examine potential disbenefits associated with applying selective catalytic reduction (SCR) and nonselective catalytic reduction (NSCR) controls on fuel combustors (e.g., ammonia slip)
- 101 Rich Reagent Injection  
*Selective non-catalytic reduction (SNCR) system with reagent injection into a fuel rich zone of the OFA system. This variation of SNCR is still under demonstration.*

## Storage Tanks

- 102 i) Fugitive leaks - VOC- ii) Control emissions from valves and flanges - VOC  
*i)Expand current Chapter 115 rules to 5 counties- Lower Leak definitions- Institute audit provisions to improve actual reductions. ii) Control emissions from valves and flanges- Set a maximum leak limit for components- Target minimization and repair periods (reduce repair time)- If equipment leaks frequently, replace equipment.- Require inaccessible equipment to be replaced by superior technologies- Quantify mass emissions and impose emission caps- Increase inspections- Use remote sensing technologies to identify the largest leaking components.*
- 103 Storage tank inspections - VOC  
*The proposed control measure utilizes advanced/enhanced inspection devices/techniques to inspect storage tanks. Gas imaging cameras, internal remote inspection (robot), etc. These inspections would eliminate the necessity to empty a tank during the inspection process. Tank inspection and maintenance emissions would be reduced to a negligible amount.*
- 104 Industrial wastewater- VOC  
*30 TAC §§115.140-115.149 could be extended to 5 counties in Dallas-Fort Worth.*
- 105 Additional storage tank controls-VOC  
*Extending existing 115-storage tank rule from 4 counties to 5 new counties. Additional or more stringent requirements in existing storage tank rules.*

## Surface Coating

- 106 General surface coating application - VOC  
*Texas Administrative Code, Sections 115.420 - 115.429 can be expanded for 5 counties in Dallas-Fort Worth.*

<b>Total</b>	<b>106</b>
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