RACT Plus Rule Adoption

Industrial Stakeholders Group

May 1\textsuperscript{st}, 2009
RACT Plus Rule Adoption

- Proposal appeared in NJ Register on Aug. 4, 2008
- Public hearing was held on Sept. 26, 2008
- Commissioner Signed Rule on March 20th, 2009
- Effective date of rule is May 19th, 2009
Affected Source Categories

1. Asphalt Used for Paving {Emulsified and Cutback Asphalt Paving} (VOC)
2. Asphalt Pavement Production Plants (NO\textsubscript{x})
3. Industrial/Commercial/Institutional Boilers & other Indirect Heat Exchangers (NO\textsubscript{x})
4. Boilers Serving Electric Generating Units (NO\textsubscript{x}, SO\textsubscript{2} & PM)
5. High Electric Demand Day Units (NO\textsubscript{x})
6. Glass Manufacturing Furnaces (NO\textsubscript{x})
7. VOC Stationary Storage Tanks (VOC)
8. New Control Technique Guidelines (CTGs) for three source categories (VOC)
9. Facility Specific Emission Limits and Alternative Emission Limits (VOC & NO\textsubscript{x})
10. Municipal Solid Waste Incinerators (NO\textsubscript{x})
11. Sewage Sludge Incinerators (NO\textsubscript{x})
Public Participation

Public Comments

Rule Category

- Glass
- Other
- AltNOx
- AltVOC
- CTG
- AsphProd
- AshpPave
- EGU/HED
- MSW
- ICI boilers
- VOC tanks
- General

Number of Comments

0 25 50 75 100 125
Federal Clean Air Act (CAA)

- USEPA sets National Ambient Air Quality Standards (NAAQS) for criteria pollutants
  - ozone ($O_3$), sulfur dioxide ($SO_2$), particulate matter ($PM_{10}$), lead, oxides of nitrogen ($NO_x$), and carbon monoxide (CO)

- USEPA designates an area’s attainment and classification
  - New Jersey is “moderate” nonattainment for 8-hour $O_3$

- Subpart 2 provisions
  - Reasonably Available Control Technology (RACT)
Ozone Health-based Standards

- **1-hour, 0.12 ppm ozone standard**
  - promulgated in 1979, revoked in June 2005
  - 4th highest daily maximum hourly average concentration not to exceed 0.12 ppm over 3 consecutive years
  - EPA determined 1-hour standard not sufficiently protective of public health

- **8-hour, 0.08 ppm ozone standard**
  - promulgated in 1997
  - 4th highest maximum 8-hour average concentration for 3 consecutive years not to exceed 0.08 ppm

- **NEW 2008 8-hour ozone standard, 0.075 ppm**
USEPA Guidance (for 1-hr ozone)

- Control Techniques Guideline (CTG) – control of volatile organic compounds (VOC) from stationary sources
- Alternate Control Techniques (ACT) – control of oxides of nitrogen (NO\textsubscript{x}) and VOC from stationary sources
Existing NJ RACT Rules

- **VOC RACT**
  - Subchapter 16 – Control and Prohibition of Air Pollution by Volatile Organic Compounds
    [N.J.A.C.7:27-16]
  - **NO\textsubscript{x} RACT**
    - Subchapter 19 – Control and Prohibition of Air Pollution by Oxides of Nitrogen
      [N.J.A.C.7:27-19]
1. Asphalt Used for Paving
(Emulsified and Cutback Asphalt Paving)

- Application of Cutback and Emulsified Asphalts
- Amend existing State specific rule (N.J.A.C.7:27-16.19): bans use of cutback or emulsified asphalt during ozone season (April 16th to October 14th) with exceptions
- Must comply commencing May 19th, 2009
- Control measures
  - Establish ban on use of non-compliant cutback or emulsified asphalt during ozone season
  - Lower VOC content limits (≤ 0.1% by wt or ≤ 6.0 ml oil distillate)
  - Require proper storage of non-compliant product in ozone season
2. Asphalt Pavement Production Plants

- All asphalt pavement production plants
- Amend existing State specific rule (N.J.A.C. 7:27-19.9): 200 ppmvd @7% O₂ (batch or drum mix)
- Control measures: adopt more stringent NOₓ limits based on fuel type and implement Best Management Practices

<table>
<thead>
<tr>
<th>Fuel</th>
<th>ppmvd (at 7% O₂)</th>
<th>lb/ton</th>
<th>lb/ton* (comparison to OTC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Gas</td>
<td>75</td>
<td>0.025</td>
<td>0.020</td>
</tr>
<tr>
<td>#2 Fuel Oil</td>
<td>100</td>
<td>0.040</td>
<td>0.090 (batch)</td>
</tr>
<tr>
<td>#4 FO &amp; heavier, and on-spec used oil, or mixture</td>
<td>125</td>
<td>0.050</td>
<td>0.090 (batch)</td>
</tr>
</tbody>
</table>

*Note: Addendum to OTC Resolution 06-02 Emission Guidelines
Asphalt Pavement Production Plants (continued)

- Sources greater than or equal to 100 MMBTU/ Hour must comply
  - May 1, 2010 if no physical modification needed to comply
  - May 1, 2011 if physical modification needed to comply

- Sources less than 100 MMBTU/ Hour must comply
  - May 1, 2011 if no physical modification needed to comply
  - May 1, 2012 if physical modification needed to comply
3. Industrial/Commercial/Institutional Boilers and other Indirect Heat Exchangers

- ICI boilers, $25 \geq$ and $< 250$ MMBtu/hr (medium to large) not including Refneries
- Amend existing State specific rules (N.J.A.C. 7:27-19.7)
Industrial/Commercial/Institutional Boilers and other Indirect Heat Exchangers (continued)

- Control measures
  - More stringent NO\textsubscript{x} limits for \( \geq 50 \text{ MMBtu/hr} \)
    (except other gaseous fuels and dual fuel burners using fuel oil and natural gas)
    - May 1, 2010 if no physical modification needed to comply
    - May 1, 2011 if physical modification needed to comply
  - New NO\textsubscript{x} limits for \( \geq 25 \) and < 50 MMBtu/hr
    - May 1, 2011 if no physical modification needed to comply
    - May 1, 2012 if physical modification needed to comply
## Industrial/Commercial/Institutional Boilers and other Indirect Heat Exchangers (continued)

- Maximum Allowable NO\textsubscript{x} Emission Rates

<table>
<thead>
<tr>
<th>Heat Input Rate (MMBtu/hr)</th>
<th>Fuel Type</th>
<th>Rate (lb/MMBtu)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 25 but &lt;100</td>
<td>Natural gas only</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>#2 fuel oil only</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>Other liquid fuels</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>Dual fuel using fuel oil and natural gas</td>
<td>0.12</td>
</tr>
<tr>
<td>≥ 100</td>
<td>Natural gas only</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>#2 fuel oil only</td>
<td>0.10*</td>
</tr>
<tr>
<td></td>
<td>Other liquid fuels</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>Dual fuel using fuel oil and for natural gas</td>
<td>0.20</td>
</tr>
</tbody>
</table>
4. **Boilers Serving Electric Generating Units**

- All electric generating boilers
- Control measures for **coal-fired** boilers effective December 15, 2012:
  - Adopt same PM (for existing sources) and SO₂ (30-day rolling average) emission limits as the multi-pollutant Mercury Rule at N.J.A.C. 7:27-27.7(d)
  - Particulate Matter, 0.0300 lb/MMBtu (all existing sources), or 0.0150 lb/MMBtu (new, or reconstructed particulate control devices)
  - SO₂, 0.150 lb/MMBtu (30-day rolling average) & 0.250 lb/MMBtu (24-hour daily)
  - NOₓ, 1.50 lb/ MWh (24-hour daily)
Maximum Allowable NO\textsubscript{x} Emission Rates (lb/MWh) for gas and oil-fired boilers effective May 1, 2015

<table>
<thead>
<tr>
<th>Boilers EGUs and HEDD</th>
<th>Type of fuel</th>
<th>Emission Rate (24-hour daily)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Natural Gas</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>No. 2 Fuel Oil &amp; lighter</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>Heavier than No. 2 Fuel Oil</td>
<td>2.00</td>
</tr>
</tbody>
</table>
5. High Electric Demand Day Units

- Peaking Units (gas and oil-fired combustion turbines and boilers)
- Amend existing State specific rules (N.J.A.C. 7:27-19)
- Available control measures (as applicable)
  - Ultra Low NO\textsubscript{x} Burners / SNCR
  - water injection
  - fuel switching
  - repowering & SCR (longer-term)
- Short-term (2009) – 28% reduction, flexible emission reduction plan
# High Electric Demand Day Units cont.

- **2015 Max. Allowable NO\textsubscript{x} Emission Rates (lb/MWh)**

<table>
<thead>
<tr>
<th>Type of Turbine*</th>
<th>Type of Fuel</th>
<th>Emission Rate (24-hour daily)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combined cycle or regenerative cycle</td>
<td>Gas</td>
<td>0.75</td>
</tr>
<tr>
<td></td>
<td>Oil</td>
<td>1.20</td>
</tr>
<tr>
<td>Simple cycle</td>
<td>Gas</td>
<td>1.00</td>
</tr>
<tr>
<td></td>
<td>Oil</td>
<td>1.60</td>
</tr>
</tbody>
</table>

*Note: NO\textsubscript{x} emission rates for HEDD boilers are same as oil & gas-fired EGUs. (See previous slide 12).*
Schedule for HEDD

- Submit 2009 Protocol no later than May 19th, 2009
  - Shows how emission reductions will be obtained and verified
  - Start implementing 2009 Protocol May 19th, 2009 through September 30, 2014

- Submit 2015 Plan for each HEDD unit by May 1, 2010
  - Detail how units will comply with 2015 standards
Reports for HEDD

- Annual report on obtaining 2009 plan reductions
  - Commence January 30, 2010 and continues through January 30, 2015

- Provide Annual Update on Progress to Meet 2015 Plan
  - First update January 30, 2011 and continue through January 30, 2015 for each non-compliant HEDD unit
6. Glass Manufacturing Furnaces

- Container (pressed and blown) and fiberglass furnaces
  - Existing standards revised and two new categories added
  - All standards apply May 1, 2010 but delay compliance until next rebuild
# Glass Manufacturing Standards

<table>
<thead>
<tr>
<th>Type of Glass</th>
<th>Existing Standards (NO(_x)/ton removed)</th>
<th>New Standards (NO(_x)/ton removed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Container</td>
<td>5.5</td>
<td>4.0</td>
</tr>
<tr>
<td>Specialty</td>
<td>11.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Fiberglass</td>
<td>N/A</td>
<td>4.0</td>
</tr>
<tr>
<td>Flat Glass</td>
<td>N/A</td>
<td>9.2</td>
</tr>
</tbody>
</table>
7. VOC Stationary Storage Tanks

- Floating roof tanks containing highly volatile VOC
- Amend existing State specific rules (N.J.A.C. 7:27-16.2)
- Control measures
  - tank inspections
  - degassing and cleaning emission control
  - slotted guide pole retrofits
  - deck fitting requirements for external floating roof tanks
  - control of roof landing losses
  - dome roof construction of external floating roof tanks
  - deck fitting requirements for internal floating roof tanks
  - seal requirements
Apply NSPS/SCAQMD Inspection Requirements to Existing Tanks

- **Deck Fitting and Seal Inspections**
  - Annually for external floating roof tanks (EFRTs)
  - Every 10 years, or each time tank is emptied and degassed for IFRTs

- **Annual visual inspection (through the hatch) for internal floating roof ranks (IFRTs)**
  - Includes checking space above the roof with a LEL meter.
Tank Degassing and Cleaning

- 95% control of emissions during ozone season
- Portable control (incineration, carbon adsorption, condenser)
- Compliance date: 5/01/10
Portable Tank Degassing Control
EFRTs-gasket deck fittings by September 16th, 2009
Slotted Guidepole-Retrofit with gasket, wipers, and pole sleeves by September 16\textsuperscript{th}, 2009
IFRTs-gasket fittings when tank returns to service (no later than 2020)
Retrofit EFRTs with domes when tanks are returned to service (no later than 2020) if vapor pressure is 3 psia or greater
Roof Landing Emissions

Landing a Floating Roof

Emptying draws fresh air under the deck.

Vacuum breaker vent

Standing Idle with a Liquid Heel

Depth of liquid heel is sufficient to continue to support breathing loss

Daily breathing expels vapors from under the deck

Filling Loss for a Landed Floating Roof

Incoming liquid displaces vapors from under the deck

Additional vapors are generated by the incoming liquid
Roof Landing Emissions (Cont’d)

- Roof height at lowest setting (EFRTs by September 16th, 2009, IFRTs upon return to service after being emptied and degassed)

- Facilities to submit plan to reduce roof height by modifying tanks, or have controls for landings, or equivalent measures, or

- Operate Range III gasoline storage tanks so that emissions average less than 5 tons per tank from 2011 through 2013, 4 tons per tank from 2014 through 2016, 3 tons per tank from 2017 through 2019, and 2 tons per tank from 2020 onward.

- Tanks with Federally enforceable limit on roof landings of less than 5 tons per year may be exempted.
Tank with vapor control for roof landings
VOC Stationary Storage Tanks Schedule

- Tank inspections
  - Annually commencing May 19\textsuperscript{th}, 2009

- Degassing and cleaning emission control
  - May 1 through September 30 commencing May 1, 2010

- Slotted guide pole retrofits
  - Commencing September 16\textsuperscript{th}, 2009

- Deck fitting requirements for \textbf{external} floating roof tanks
  - Commencing September 16\textsuperscript{th}, 2009
Control of roof landing losses
- Develop schedule to retrofit tanks as tanks are removed from service
- Implement retrofit schedule completing all retrofits no later than 10 years after adoption

Dome roof construction of external floating roof tanks
- Retrofit tanks with domes when tanks are removed from service, completing no later than May 1, 2020

Deck fitting requirements for internal floating roof tanks
- Retrofit deck fittings when tanks are removed from service, completing no later than May 1, 2020

Seal requirements
- Retrofit tank seals when tanks are removed from service, completing no later than May 1, 2020
8. **New Control Techniques Guidelines**

- **New CTGs effective October 5, 2006**
  - Flexible Packaging Printing Materials
  - Lithographic and Letterpress Printing Materials
  - Flat Wood Paneling Coatings
- **Amend existing State rules (N.J.A.C. 7:27-16.7)**
- **Implement Control Measures specified in CTG**
  - Implement recommended control and capture efficiencies no later than May 1, 2010
  - Set maximum allowable VOC content standards effective May 19th, 2009
  - Require Best Management Practices effective May 19th, 2009
9. Alternative and Facility-specific VOC & NO\textsubscript{x} Emission Limits

- Facility-specific Emission Limits (FSELS) and Alternative Emission Limits (AELs)
- Control measures
  - adopt a 10-yr approval authorization period (AELs)
  - reevaluate the existing AEL (NO\textsubscript{x} & VOC) and FSEL (VOC) approvals
Alternative and Facility-specific
VOC & NO\textsubscript{x} Emission Limits (continued)

- All existing FSEL & AEL approvals must be resubmitted to Department by August 17\textsuperscript{th}, 2009 for evaluation by Department
- During review applicant will continue to operate under existing approval
- Within 6 months of receipt Department will:
  - Approve
  - Modify
  - Disapprove
10. Municipal Solid Waste Incinerators

- Municipal solid waste (MSW) incinerators
- Adopt new rule
- Control measure: implement $\text{NO}_x$ limit, 150 ppmvd @ 7% oxygen
- Must comply with limit by July 18th, 2009 unless construction is necessary to comply
- If construction is necessary to comply then must comply by May 1, 2011
11. Sewage Sludge Incinerators

- Sewage sludge incinerators
- Adopt new rule
- Control measure: implement NO\textsubscript{x} limits
  - 7.0 lbs NO\textsubscript{x}/dry ton sludge, multiple hearth
  - 2.5 lbs NO\textsubscript{x}/dry ton sludge, fluidized bed
- Rule will require compliance by May 19\textsuperscript{th}, 2009 (All existing sources currently comply with new rule)
# NJ Estimated Emission Reductions

(from new and revised rules to be published in April 20, 2009, New Jersey Register)

<table>
<thead>
<tr>
<th>Source Category</th>
<th>Year</th>
<th>Pollutant (tpdO\textsubscript{3}/tpy)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>NO\textsubscript{x}</td>
</tr>
<tr>
<td>1. Asphalt used for paving</td>
<td>2009</td>
<td>----</td>
</tr>
<tr>
<td>2. Asphalt production plants</td>
<td>2010</td>
<td>0.21/43</td>
</tr>
<tr>
<td></td>
<td>2011</td>
<td>0.42/86</td>
</tr>
<tr>
<td></td>
<td>2012</td>
<td>0.64/132</td>
</tr>
<tr>
<td>3. ICI boilers &amp; other indirect heat exchangers</td>
<td>2010</td>
<td>2.2/740</td>
</tr>
<tr>
<td></td>
<td>2011</td>
<td>2.9/970</td>
</tr>
<tr>
<td>4. Boilers serving EGUs</td>
<td>2013</td>
<td>2.16/788</td>
</tr>
<tr>
<td>5. HEDD units</td>
<td>2009</td>
<td>19.8t/HEDD</td>
</tr>
<tr>
<td></td>
<td>2015</td>
<td>63.7t/HEDD</td>
</tr>
<tr>
<td>6. Glass mfg. furnaces</td>
<td>2012</td>
<td>3.2/1,170</td>
</tr>
<tr>
<td>7. VOC stationary storage tanks</td>
<td>2010</td>
<td>----</td>
</tr>
<tr>
<td></td>
<td>2011</td>
<td>2.73/637</td>
</tr>
<tr>
<td></td>
<td>2013</td>
<td>3.68/984</td>
</tr>
<tr>
<td></td>
<td>2016</td>
<td>5.10/1,504</td>
</tr>
<tr>
<td></td>
<td>2019</td>
<td>6.53/2,024</td>
</tr>
<tr>
<td>Source Category</td>
<td>Year</td>
<td>Pollutant (tpdO₃/tpy)</td>
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<tr>
<td>8. CTG: flat wood paneling*</td>
<td>2009</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2010→</td>
<td>0.08/19</td>
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<tr>
<td>9. CTG: flexible package printing</td>
<td>2009</td>
<td>0.08/19</td>
</tr>
<tr>
<td></td>
<td>2010→</td>
<td>0.43/104.6</td>
</tr>
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<tr>
<td>10. CTG: offset lithographic</td>
<td>2009</td>
<td>0.27/67</td>
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<tr>
<td>printing and letterpress printing</td>
<td>2010→</td>
<td>&gt;100 tpy</td>
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<td></td>
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<tr>
<td>11. FSEL</td>
<td>2009</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>12. AEL</td>
<td>2009</td>
<td></td>
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<tr>
<td>13. Municipal Solid Waste Incinerators</td>
<td>2009</td>
<td>0.27/67</td>
</tr>
<tr>
<td></td>
<td>2011</td>
<td>&gt;100 tpy</td>
</tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Sewage sludge incinerators</td>
<td>2009</td>
<td>0.27/67</td>
</tr>
<tr>
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<td></td>
</tr>
</tbody>
</table>

*no sources

**Best Management Practices will result in additional emission reductions
Rule Leads by Source Category

- **Rule Managers**
  - Allan Willinger: 3-1120
  - Kevin Greener: 4-3696

- **Asphalt Used for Paving**
  - Stella Oluwaseun-Apo: 7-0430

- **Asphalt Pavement Production**
  - Yaso Sivaganesh: 4-6349

- **ICI Boilers & MSWs**
  - Sunila Agrawal: 2-9202

- **EGUs w/ Boilers & HEDD Units**
  - Mike Hogan: 3-1124
  - Tonalee Key: 4-2036

- **Glass Manufacturing Furnaces**
  - Subhash Shah: 3-8224

- **VOC Stationary Storage Tanks**
  - Bennett Yalartai: 3-8253
  - Dave Owen: 3-1129

- **FSELs/AELs & Sewage Sludge Incinerators**
  - Yogesh Doshi: 3-7249

- **New CTGs**
  - Sharon Wallace: 3-8239
  - Joel Leon: 4-3019
Questions?

- For further information regarding current and recent rule proposals, visit the following website:

  - [www.nj.gov/dep/aqm/curformp.htm](http://www.nj.gov/dep/aqm/curformp.htm)