PROPOSED AMENDED RULES 1147, 1100, & PROPOSED RULE 1147.1
WORKING GROUP MEETING #2

APRIL 17, 2019
SCAQMD
DIAMOND BAR, CA
AGENDA

- Update on Rule 1147 Survey
- Summary of Working Group #1
- Overview of Rule 1147 Series
- Preliminary BARCT Analysis
  - Assessment of SCAQMD Regulatory Requirements
  - Assessment of Emission Limits of Existing Units
- Additional Considerations
- Next Steps
Physical surveys were mailed out on 03/22/2019

Objective: To identify permit limits and annual usage for existing equipment located in SCAQMD

Completed survey requested by April 26, 2019
SUMMARY OF PREVIOUS WORKING GROUP

- Background on RECLAIM transition
- Overview of BARCT assessment
  - Technology Assessment
  - Cost Effectiveness
- Initial concepts of PAR 1147, PR 1147.1 and PR 1100
- Initial evaluation of affected universe
- Rule 1147 Survey to collect additional information to quantify impacted equipment
<table>
<thead>
<tr>
<th>Proposed Amended Rule 1147</th>
<th>Proposed Rule 1147.1</th>
<th>Proposed Rule 1147.2</th>
<th>Proposed Rule 1147.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>• NOx reductions from miscellaneous sources</td>
<td>• NOx reductions from large miscellaneous combustion</td>
<td>• NOx reductions from metal melting and heat treating furnaces</td>
<td>• NOx reductions for equipment at asphalt and aggregate facilities</td>
</tr>
<tr>
<td>• Approximately 2701 facilities</td>
<td>• To be determined</td>
<td>• Approximately 243 facilities</td>
<td>• Approximately 8 facilities</td>
</tr>
</tbody>
</table>
BARCT ANALYSIS**
OVERVIEW

*BARCT analysis is conducted for each equipment category and fuel type
+This analysis does not include equipment from PR 1147.2 and 1147.3 universe
## Current Rule 1147 Limits (3% O₂, Dry)

### Gaseous Fuel-Fired Equipment

<table>
<thead>
<tr>
<th>Process Temperature</th>
<th>≤ 800°F</th>
<th>&gt; 800°F &lt; 1200°F</th>
<th>≥ 1200°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt Manufacturing Operation</td>
<td>40 ppm</td>
<td>60 ppm</td>
<td></td>
</tr>
<tr>
<td>Afterburner, Degassing Unit, Remediation Unit, Thermal Oxidizer, Catalytic Oxidizer or Vapor Incinerator</td>
<td>60 ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burn-off Furnace, Burnout Oven, Incinerator or Crematory with or without Integrated Afterburner</td>
<td>60 ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaporator, Fryer, Heated Process Tank, or Parts Washer</td>
<td>60 ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metal Heat Treating, Metal Melting Furnace, Metal Pot, or Tar Pot</td>
<td>60 ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oven, Dehydrator, Dryer, Heater, Kiln, Calciner, Cooker, Roaster, Furnace, or Heated Storage Tank</td>
<td>30 ppm</td>
<td>60 ppm</td>
<td></td>
</tr>
<tr>
<td>Make-Up Air Heater or other Air Heater located outside of building with temperature controlled zone inside building</td>
<td>30 ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tenter Frame or Fabric or Carpet Dryer</td>
<td>30 ppm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Unit or Process Temperature</td>
<td>30 ppm</td>
<td>60 ppm</td>
<td></td>
</tr>
</tbody>
</table>

### Liquid Fuel-Fired Equipment

| All liquid fuel-fired Units | 40 ppm | 60 ppm |
## 2015 RECLAIM BARCT FOR MISC. COMBUSTION EQUIPMENT (FOR REFERENCE ONLY)

### Assessment of SCAQMD Regulatory Requirements

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>BARCT Emission Factor</th>
<th>Command and Control Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>≤ 800°F</td>
</tr>
<tr>
<td>Asphalt Heater, Concrete</td>
<td>0.036 lb/mmbtu</td>
<td>30 ppm</td>
</tr>
<tr>
<td>Delacquering Furnace</td>
<td>0.036 lb/mmbtu</td>
<td>30 ppm</td>
</tr>
<tr>
<td>Iron/Steel Foundry</td>
<td>0.055 lb/mmbtu</td>
<td>45 ppm</td>
</tr>
<tr>
<td>Metal Heat Treating Furnace</td>
<td>0.055 lb/mmbtu</td>
<td>45 ppm</td>
</tr>
<tr>
<td>Metal Forging Furnace (Preheated Combustion Air)</td>
<td>0.055 lb/mmbtu</td>
<td>45 ppm</td>
</tr>
<tr>
<td>Metal Melting Furnaces</td>
<td>0.055 lb/mmbtu</td>
<td>45 ppm</td>
</tr>
<tr>
<td>Other Heater (24F-1)</td>
<td>0.036 lb/mmbtu</td>
<td>30 ppm</td>
</tr>
<tr>
<td>Ovens, Kilns, Calciners, Dryers, Furnaces</td>
<td>0.036 lb/mmbtu</td>
<td>30 ppm</td>
</tr>
<tr>
<td>Steel Hot Plate Furnace</td>
<td>0.055 lb/mmbtu</td>
<td>45 ppm</td>
</tr>
<tr>
<td>Sec. Aluminum</td>
<td>0.055 lb/mmbtu</td>
<td>45 ppm</td>
</tr>
<tr>
<td>Sec. Lead</td>
<td>0.055 lb/mmbtu</td>
<td>45 ppm</td>
</tr>
</tbody>
</table>
### RULE 1147 COMPLIANCE SCHEDULE
(UNITS ≥325,000 BTU/HR)

<table>
<thead>
<tr>
<th>Equipment Category</th>
<th>Emissions Greater Than One Pound Per Day</th>
<th>Emissions Less Than One Pound Per Day</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New Units</strong></td>
<td>Demonstrate compliance with Rule 1147 at the time of permitting</td>
<td></td>
</tr>
<tr>
<td>Any unit installed after January 1, 2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Existing Units</strong></td>
<td>Demonstrate compliance with rule NOx limits when unit or combustion system is modified or replaced; OR unit becomes 15 years old</td>
<td>Demonstrate compliance with NOx limits when unit or combustion system is modified, replaced, or relocated*; OR unit becomes 35 years old*</td>
</tr>
<tr>
<td>Any unit in-use (operating) before January 1, 2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Specific Existing Units</strong></td>
<td>Demonstrate compliance with rule NOx limits when unit or combustion system is modified or replaced</td>
<td></td>
</tr>
<tr>
<td>1. Heated process tanks, parts washers, and evaporators in-use (operating) before January 1, 2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Heated process tanks, parts washers, and evaporators installed and operating with an SCAQMD permit before January 1, 2014</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Remediation units installed between December 5, 2008 and March 1, 2012</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Relocation exemption available for existing less than 1 pound/day units when owner relocates entire facility

*Facilities may choose to conduct biennial emissions test in lieu of meeting rule requirements
Facilities may demonstrate NOx emissions of < 1 LB/Day by complying with one of the following:

1. Unit heat input rating of <325,000 BTU/hr
2. Unit with permit condition limiting NOx emissions of < 1 LB/Day
3. Recordkeeping* of monthly average emissions of < 1 LB/Day*
4. Recordkeeping* of total monthly emissions of < 22 LBs/Month*
5. Recordkeeping* of natural gas usage of <7,692 cubic feet per day*
6. Daily recordkeeping* of unit operation and the following specified rated heat input capacities operating less than or equal to the specified number of hours per day in the following table:

<table>
<thead>
<tr>
<th>Unit Rating (BTU/hr)</th>
<th>Daily Hour Limit</th>
<th>Monthly Hour Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>325,000 to 400,000</td>
<td>16</td>
<td>352</td>
</tr>
<tr>
<td>400,001 to 500,000</td>
<td>14</td>
<td>308</td>
</tr>
<tr>
<td>500,001 to 800,000</td>
<td>8</td>
<td>176</td>
</tr>
<tr>
<td>800,001 to 1,000,000</td>
<td>6</td>
<td>132</td>
</tr>
<tr>
<td>1,000,001 to 1,200,000</td>
<td>5</td>
<td>110</td>
</tr>
</tbody>
</table>

* Demonstration of recordkeeping requirements must be based off of a unit-specific non-resettable time meter or fuel meter.
Rule 1147 limits do not apply to equipment rated below 325,000 BTU/hr

Equipment rated between 325,000 BTU/hr and 2,000,000 BTU/hr are not the focus of this rulemaking
RULE 1147 RECLAIM UNIVERSE
INDUSTRY OVERVIEW

<table>
<thead>
<tr>
<th>Type of Industry Category</th>
<th>Total Number of Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>57</td>
</tr>
<tr>
<td>Services</td>
<td>7</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>5</td>
</tr>
<tr>
<td>Public Administration</td>
<td>4</td>
</tr>
<tr>
<td>Transportation &amp; Public Utilities</td>
<td>3</td>
</tr>
<tr>
<td>Construction</td>
<td>2</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>2</td>
</tr>
<tr>
<td>Mining</td>
<td>2</td>
</tr>
<tr>
<td>Oil and Gas Extraction</td>
<td>1</td>
</tr>
<tr>
<td>Finance, Insurance, Real Estate</td>
<td>1</td>
</tr>
<tr>
<td>Transportation and Public Utilities</td>
<td>1</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>85</strong></td>
</tr>
</tbody>
</table>

Assessment of Emission Limits of Existing Units:
- Manufacturing: 67%
- Services: 8%
- Retail Trade: 6%
- Public Administration: 5%
- Transportation & Public Utilities: 3%
- Other: 11%
<table>
<thead>
<tr>
<th>Type of Equipment</th>
<th>Total Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oven/Dryer/Heater/Furnace/Kiln/Heated Process Tanks</td>
<td>219</td>
</tr>
<tr>
<td>Afterburner/Thermal Oxidizer/Oxidizer/Regenerative Thermal Oxidizer</td>
<td>80</td>
</tr>
<tr>
<td>Autoclave</td>
<td>16</td>
</tr>
<tr>
<td>Fryer</td>
<td>13</td>
</tr>
<tr>
<td>Crematory</td>
<td>5</td>
</tr>
<tr>
<td>Burn-off Oven/ Incinerator</td>
<td>8</td>
</tr>
<tr>
<td>Chiller</td>
<td>3</td>
</tr>
<tr>
<td>Turbine (Diesel)</td>
<td>3</td>
</tr>
<tr>
<td>Spray Coating Operation(^1)</td>
<td>3</td>
</tr>
<tr>
<td>Kettle/Tar Pot</td>
<td>2</td>
</tr>
<tr>
<td>Singeing Machine</td>
<td>2</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td><strong>355</strong></td>
</tr>
</tbody>
</table>

\(^1\) Some heated spray booths are permitted under heater.
Staff conducted analysis of each Rule 1147 category for applicable RECLAIM equipment

Information analyzed for each equipment category:

- Total number of impacted units
- Units with Emission limit greater than that of Rule 1147 limits
- Units with Emission limit less than or equal to Rule 1147 limits
**Emission Limit Assessment:**

Ovens, Dryers, Heaters, Furnaces, Kilns, and Heated Process Tanks
Total of 219 ovens, dryers, heaters, furnaces, kilns, and heated process tanks

Equipment in this category is used in a large variety of processes and industries

Current Rule 1147 Limit:

<table>
<thead>
<tr>
<th>Process Temperature</th>
<th>≤ 800°F</th>
<th>&gt; 800°F &lt; 1200°F</th>
<th>≥ 1200°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emission Limit</td>
<td>30 ppm</td>
<td>60 ppm</td>
<td></td>
</tr>
</tbody>
</table>

92 out of 219 impacted units permitted with emission limits above 60 ppm

127 out of 219 impacted units permitted with emission limits below or equal to 60 ppm

Those complying with limits 30 ppm or lower are likely due to BACT
RULE 1147 RECLAIM UNIVERSE
OVENS/DRYERS/HEATERS/FURNACES/KILNS/HEATED PROCESS TANKS

Assessment of Emission Limits of Existing Units

219 Units
Units With Emissions Greater Than Rule 1147 Limits

92 Units
Of the 92 units that are > 60 ppm:
- Equipment sizes ranged from 0.08 to 84 MMBtu/hr
- 12 units were rated greater than or equal to 10 MMBtu/hr
- 15 units were rated between 10 MMBtu/hr and 5 MMBtu/hr
- 65 units were rated below 5 MMBtu/hr

Further investigation will be conducted for two units that are >130 lbs/mmscf (~102 ppm)
RULE 1147 RECLAIM UNIVERSE
OVENS/DRYERS/HEATERS/FURNACES/KILNS/HEATED PROCESS TANKS

Assessment of Emission Limits of Existing Units

Units With Emissions Less Than or Equal to Rule 1147 Limits

127 Units
Of the 127 units that are ≤ 60 ppm:

- Equipment sizes ranged from 0.8 to 39 MMBtu/hr
- 22 units were rated greater than or equal to 10 MMBtu/hr
- 61 units were rated between 10 MMBtu/hr and 5 MMBtu/hr
- 44 units were rated below 5 MMBtu/hr
Emission Limit Assessment:
Afterburners, Thermal Oxidizers, Oxidizers, Regenerative Thermal Oxidizers
80 afterburners, thermal oxidizers, oxidizers, regenerative thermal oxidizers

Equipment in this category are used as pollution control equipment for pollutants such as VOC

Current Rule 1147 Limit:

<table>
<thead>
<tr>
<th>Process Temperature</th>
<th>≤ 800°F</th>
<th>&gt; 800°F &lt; 1200°F</th>
<th>≥ 1200°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emission Limit</td>
<td>60 ppm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

52 out of 80 units have emission limits above 60 ppm

28 out of 80 units have emission limits below or equal to 60 ppm
RULE 1147 RECLAIM UNIVERSE
AFTERBURNERS/THERMAL OXIDIZERS/OXIDIZERS/REGENERATIVE THERMAL OXIDIZERS

Assessment of Emission Limits of Existing Units

30 PPM (BACT)

60 PPM

80 Units

Permit Emission Limits (PPM)
Units With Emissions Greater Than Rule 1147 Limits

52 Units
Of the 52 units > 60 ppm:

- Equipment sizes ranged from 0.17 to 173 MMBtu/hr
- 3 units were rated greater than or equal to 10 MMBtu/hr
- 11 units were rated between 10 MMBtu/hr and 5 MMBtu/hr
- 38 units were rated below 5 MMBtu/hr

Some thermal oxidizers identified meet the definition of Flares in Rule 1118.1
Assessment of Emission Limits of Existing Units

RULE 1147 RECLAIM UNIVERSE
AFTERBURNERS/ THERMAL OXIDIZERS/ OXIDIZERS/ REGENERATIVE THERMAL OXIDIZERS

Units With Emissions Less Than or Equal to Rule 1147 Limits

Equipment Size (MMBtu/hr)

28 Units
Of the 28 units ≤ 60 ppm:

- Equipment sizes ranged from 0.43 to 44.1 MMBtu/hr
- 7 units were rated greater than or equal to 10 MMBtu/hr
- 7 units were rated between 10 MMBtu/hr and 5 MMBtu/hr
- 14 units were rated below 5 MMBtu/hr

Current BACT* for afterburners, thermal oxidizers, and catalytic oxidizer is 30 ppm @ 3% O2 (burner emissions only)

*From 02/01/2019 revision of South Coast AQMD BACT Guidelines
Emission Limit Assessment:  
Autoclaves
16 autoclaves

Equipment in this category are used primarily in the aerospace applications.

Autoclaves are considered as “Other Unit or Process Temperature” in Rule 1147 with the following current rule limit:

<table>
<thead>
<tr>
<th>Process Temperature</th>
<th>≤ 800 °F</th>
<th>&gt; 800 °F&lt;br&gt;≤ 1200 °F</th>
<th>≥ 1200 °F</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 ppm</td>
<td></td>
<td>60 ppm</td>
<td></td>
</tr>
</tbody>
</table>

13 out of 16 impacted units permitted with emission limits above 60 ppm.

3 out of 16 impacted units permitted with emission limits below or equal to 60 ppm.
RULE 1147 RECLAIM UNIVERSE AUTOCLAVES

Assessment of Emission Limits of Existing Units

16 Units

Permit Emission Limit (PPM)
RULE 1147 RECLAIM UNIVERSE AUTOCLAVES

Assessment of Emission Limits of Existing Units

Units With Emissions Greater Than Rule 1147 Limits

Equipment Size (MMBtu/hr)

RECLAIM Equipment

13 Units
Of the 13 units > 60 ppm:
- Equipment sizes ranged from 5.5 to 15.6 MMBtu/hr
- 7 units were rated greater than or equal to 10 MMBtu/hr
- 6 units were rated between 10 MMBtu/hr and 5 MMBtu/hr

Low size variation among impacted equipment

Equipment located across 4 facilities
RULE 1147 RECLAIM UNIVERSE AUTOCLAVES

Assessment of Emission Limits of Existing Units

Units With Emissions Less Than or Equal to Rule 1147 Limits

- 3 Units

Equipment Size (MMBtu/hr)

ReCLAIM Equipment
Of the 3 units at 30 ppm:

- Equipment sizes are similar in size and ranged from 24.0 to 24.3 MMBtu/hr

- All three units are located in separate facilities

- Demonstrates that 30 ppm emission limits for autoclaves are achievable
Emission Limit Assessment:

Fryers
RULE 1147 RECLAIM UNIVERSE FRYERS

- 13 fryers
- Equipment in this category are used primarily in food preparation
- Current Rule 1147 Limit:

<table>
<thead>
<tr>
<th>Process Temperature</th>
<th>60 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 800° F</td>
<td></td>
</tr>
<tr>
<td>&gt; 800 °F&lt;br&gt;≤ 1200° F</td>
<td></td>
</tr>
<tr>
<td>≥ 1200 °F</td>
<td></td>
</tr>
</tbody>
</table>

- 12 out of 13 impacted units permitted with emission limits above 60 ppm
- 1 out of 13 impacted units permitted with emission limits below or equal to 60 ppm
RULE 1147 RECLAIM UNIVERSE FRYERS

Assessment of Emission Limits of Existing Units

Permit Emission Limit (PPM)

60 PPM

13 Units
Assessment of Emission Limits of Existing Units

RULE 1147 RECLAIM UNIVERSE
FRYERS

Units With Emissions Greater Than Rule 1147 Limits

12 Units
Of the 13 units > 60 ppm:

- 12 units have emission limits greater than Rule 1147 limits
  - Equipment sizes ranged from 0.6 to 4.0 MMBtu/hr
  - 9 out of 13 pieces of equipment located at one facility

- One unit with emission limit less than or equal to 60 ppm is rated to 0.98 MMBtu/hr
Emission Limit Assessment:
Crematory
RULE 1147 RECLAIM UNIVERSE
CREMATORY

- 5 crematory units
- Equipment in this category are used to burn away various organic materials at high temperatures
- Current Rule 1147 Limit:

<table>
<thead>
<tr>
<th>Process Temperature</th>
<th>≤ 800° F</th>
<th>&gt; 800° F &lt; 1200° F</th>
<th>≥ 1200° F</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 ppm</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- All 5 impacted units were permitted with emission limits above 60 ppm
RECLAIM Equipment

Assessment of Emission Limits of Existing Units

RULE 1147 RECLAIM UNIVERSE CREMATORY

5 Units

Permit Emission Limit (PPM)

60 PPM

0 20 40 60 80 100 120
Assessment of Emission Limits of Existing Units

RULE 1147 RECLAIM UNIVERSE CREMATORY

Units With Emissions Greater Than Rule 1147 Limits

- 5 Units

Unit Size (MMBtu/hr)
- All units are > 60 ppm
- Equipment sizes ranged from 0.48 to 3.5 MMBtu/hr
- All 5 pieces of equipment are located in one facility
Emission Limit Assessment:
Burn-Off Ovens and Incinerators
8 burn-off oven/incinerator units

Equipment in this category are used to burn away various in-organic materials at high temperatures

Current Rule 1147 Limit:

| Process Temperature |  
|---------------------|-----------------------|
| ≤ 800°F             | > 800°F < 1200°F      | ≥ 1200°F              |
| 60 ppm              |

7 out of 8 impacted units permitted with emission limits above 60 ppm

1 out of 7 impacted units permitted with emission limits below or equal to 60 ppm
RULE 1147 RECLAIM UNIVERSE
BURN-OFF OVEN / INCINERATOR

Assessment of Emission Limits of Existing Units

8 Units
Rule 1147 Reclaim Universe
Burn-Off Oven / Incinerator

Units With Emissions Greater Than Rule 1147 Limits

7 Units
Of the 7 units > 60 ppm:

- Equipment sizes ranged from 1.00 to 4.76 MMBtu/hr

- One unit ≤ 60 ppm
  - Unit is rated at 14 MMBtu/hr
Emission Limit Assessment:
Adsorption Chillers
3 adsorption chillers

Adsorption Chillers are exempt from the “Boiler or Steam Generator” definition of Rule 1146(b) which puts them into Rule 1147.

Adsorption Chillers are considered as “Other Unit or Process Temperature” in Rule 1147 with the following current rule limit:

<table>
<thead>
<tr>
<th>Process Temperature</th>
<th>≤ 800° F</th>
<th>&gt; 800° F &lt; 1200° F</th>
<th>≥ 1200° F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emission Limit</td>
<td>30 ppm</td>
<td>60 ppm</td>
<td></td>
</tr>
</tbody>
</table>

All 3 impacted units were permitted with emission limits of 20 ppm (below 30 ppm limit of Rule 1147).
Emission Limit Assessment:
Micro-Turbines (Diesel)
3 diesel fired micro-turbines

Turbines that are less than 0.3 megawatt (MW) are exempt from the applicability of Rule 1134 and diesel fueled micro-turbines do not qualify for the exemption under Rule 219(b)(1) which puts them into Rule 1147 applicability

- Staff is contemplating removing exemption for turbines in Rule 1147 applicability

Diesel fueled equipment are considered as “Liquid Fueled” in Rule 1147 with the following current rule limit:

<table>
<thead>
<tr>
<th>Process Temperature</th>
<th>40 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 800° F</td>
<td></td>
</tr>
<tr>
<td>&gt; 800° F</td>
<td></td>
</tr>
<tr>
<td>&lt; 1200° F</td>
<td></td>
</tr>
<tr>
<td>≥ 1200° F</td>
<td></td>
</tr>
</tbody>
</table>

All 3 impacted units were permitted with emission limits of 77 ppm
RULE 1147 RECLAIM UNIVERSE MICRO-TURBINES (DIESEL)

Assessment of Emission Limits of Existing Units

3 Units

RECLAIM Equipment

Permit Emission Limit (PPM)

40 PPM

3 Units
RULE 1147 RECLAIM UNIVERSE
MICRO-TURBINES (DIESEL)

Units With Emissions Greater Than Rule 1147 Limits

3 Units
All three micro-turbines are located at the same facility.

Units are currently permitted to meet 77 ppm NOx and limited to less than 300 hours of operation per year.
Emission Limit Assessment:
Spray Coating Operations
3 spray coating units

Equipment in this category are used as make-up air heaters to cure coating applications

Current Rule 1147 Limit:

<table>
<thead>
<tr>
<th>Process Temperature</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(\leq 800^\circ F)</td>
<td>&gt; 800 (^\circ F)</td>
<td>(\geq 1200^\circ F)</td>
</tr>
<tr>
<td>(&lt; 1200^\circ F)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

30 ppm

All 3 impacted units permitted with emission limits above 30 ppm
RULE 1147 RECLAIM UNIVERSE
SPRAY COATING OPERATIONS

Assessment of Emission Limits of Existing Units

3 Units

10 20 30 40 50 60 70 80 90 100 110

RECLAIM Equipment

Permit Emission Limit (PPM)

30 PPM

3 Units
Assessment of Emission Limits of Existing Units

RULE 1147 RECLAIM UNIVERSE
SPRAY COATING OPERATIONS

Units With Emissions Greater Than Rule 1147 Limits

3 Units

Unit Size (MMBtu/hr)

RECLAIM Equipment
All three impacted units are permitted at the RECLAIM default emission factor of 130 lbs/mmscf

Unit size range from 1.0 to 2.5 MMBtu/hr

Additional make-up heaters could be classified as heaters
Emission Limit Assessment:
Kettles and Tar Pots
2 kettle and tar pots

- One natural gas fired Kettle
- One diesel fuel fired Tar Pot

Kettles are classified as “Other Unit or Process Temperature” and diesel fueled tar pots are classified under “Liquid Fuel-Fired Units” in Rule 1147 with the following current rule limit:

<table>
<thead>
<tr>
<th>Equipment Categories</th>
<th>Process Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≤ 800°F</td>
</tr>
<tr>
<td>Other Unit or Process Temperature</td>
<td>30 ppm</td>
</tr>
<tr>
<td>All Liquid Fuel-Fired Units</td>
<td>40 ppm</td>
</tr>
</tbody>
</table>
RULE 1147 RECLAIM UNIVERSE KETTLES / TAR POTS

Assessment of Emission Limits of Existing Units

2 Units

Permit Emission Limit (PPM)

Diesel Fuel

40 PPM

60 PPM

2 Units
Assessment of Emission Limits of Existing Units

Rule 1147 Reclaim Universe
Kettles / Tar Pots

Units With Emissions Greater Than Rule 1147 Limits

1 Unit (Diesel Fuel)
Natural gas fired Kettle is permitted to meet a NOx limit of 20 ppm

Diesel fuel fired Tar Pot is permitted to the RECLAIM default emission factor of 130 lbs/mmscf
Emission Limit Assessment:
Singeing Machines
RULE 1147 RECLAIM UNIVERSE
SINGEING MACHINES

- 2 singeing machines
- Impacted equipment are used to burn off projecting fibers (such as hairs and textile)
- Singeing machines are considered as “Other Unit or Process Temperature” in Rule 1147 with the following current rule limit:

<table>
<thead>
<tr>
<th>Process Temperature</th>
<th>30 ppm</th>
<th>60 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 800°F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 800°F &lt; 1200°F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 1200°F</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Both units are permitted at RECLAIM default emission factor of 130 lbs/mmscf
- Both units are located at the same facility
RULE 1147 RECLAIM UNIVERSE
SINGEING MACHINES

Assessment of Emission Limits of Existing Units

Permit Emission Limit (PPM)

- 30 PPM
- 60 PPM

2 Units
RULE 1147 RECLAIM UNIVERSE
SINGEING MACHINES

Assessment of Emission Limits of Existing Units

Units With Emissions Greater Than Rule 1147 Limits

<table>
<thead>
<tr>
<th>Unit Size (MMBtu/hr)</th>
<th>RECLAIM Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Units</td>
<td></td>
</tr>
</tbody>
</table>

0 1 2 3 4 5 6 7 8 9

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Current Rule 1147 limits all afterburner, degassing unit, remediation unit, thermal oxidizer, catalytic oxidizer or vapor incinerator to 60 ppm NOx for all process temperatures.

- As recommended from third party review of the February 2017 Final Technology Assessment for Rule 1147 Small and Low Emissions Sources.
- Also noted that preferred burner type of afterburner applications cannot easily meet 30 ppm NOx in process less that 800°F.

Current BACT* for afterburners, thermal oxidizers, and catalytic oxidizer is 30 ppm @ 3% O2 (burner emissions only).

*From 02/01/2019 revision of SCAQMD BACT Guidelines
NEXT STEPS

- Evaluate Survey Results – Due April 26, 2019
- BARCT Analysis - Sample equipment from all applicable Rule 1147 categories
- Next Working Group Meeting – Late May
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Proposed Amended Rules 1147, 1100 and Proposed Rule 1147.1

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