



Louisville Metro Air Pollution Control District
850 Barret Avenue
Louisville, Kentucky 40204-1745



xx/xx/2015

Federally Enforceable District Origin Operating Permit Statement of Basis

Company: D.D. Williamson & Co., Inc.

Plant Location: 1901 Payne Street, Louisville, KY 40206

Date Application Received: 8/14/2006

Date of Public Notice: 12/12/2015

District Engineer: Shannon Hosey

Permit No: O-0808-15-F

Plant ID: 0808

SIC Code: 2087

NAICS: 311930

Introduction:

This permit will be issued pursuant to District Regulation 2.17- *Federally Enforceable District Origin Operating Permits*. Its purpose is to limit the plant wide potential emission rates from this source to below major source threshold levels and to provide methods of determining continued compliance with all applicable requirements.

Jefferson County is classified as an attainment area for lead (Pb), nitrogen dioxide (NO₂), carbon monoxide (CO), 1 hr and 8 hr ozone (O₃), and particulate matter less than 10 microns (PM₁₀); and is a non-attainment area for the 1997 standard for particulate matter less than 2.5 microns (PM_{2.5}), unclassifiable for the 2012 standard for particulate matter less than 2.5 micron (PM_{2.5}) and partial non-attainment area for sulfur dioxide (SO₂).

Application Type/Permit Activity:

Initial Issuance

Permit Revision

Administrative

Minor

Significant

Permit Renewal

Compliance Summary:

Compliance certification signed

Compliance schedule included

Source is out of compliance

Source is operating in compliance

I. Source Information

1. **Product/Process Description:** The plant makes caramel colorings for the food industry. D.D. Williamson makes the colorings by heating sugar and water to a modest temperature (less than 310 F) and under low pressures (atmospheric to less than 60 psi). Some products require small additions of chemicals, such as aqueous ammonia. Some products are spray dried and sold as powders.
2. **Site Determination:** There are no other facilities that are contiguous or adjacent and under common control.
3. **Emission Unit Summary:**

Emission Unit	Equipment Description
U1	Six (6) cookers for liquid caramel
U2	Spray dryer and three (3) cooling cyclones

4. **Fugitive Sources:** There are no fugitive source emissions at this facility.
5. **Permit Revisions:**

Revision No.	Permit No.	Issue Date	Public Notice Date	Change Type	Change Scope	Description
Initial	128-01-F	11/05/2001	6/3/2001	Initial	Entire Permit	Initial Permit Issuance
NA	O-0808-15-F	xx/xx/2015	12/12/2015	Renewal	Entire Permit	Scheduled Permit Renewal; Removed equipment taken out of service; Incorporate Construction Permits 309-03-C, 317-03-C, 86-04-C and 535-08-C

6. **Construction Permit History:**

Permit Number	Description
309-03-C	One spray dryer, Niro SD250
317-03-C	One cyclone, Niro 1.18; two cyclones, Niro 1700; one wet scrubber controlling spray dryer PM
86-04-C	One 3,000 gallon reactor (#4)
535-08-C	One (1) 50-gallon caramel coloring cooker made by Vendome Copper with a flash tank and vacuum jet.

7. **Plant-wide Emission Summary:**

Pollutant	District Calculated Actual Emissions 2009	Major Source Status (based on PTE)
CO	1.67	No
NO _x	1.98	No
SO ₂	1.67	Yes
PM/PM ₁₀	3.99	Yes
VOC	0.11	No
Single HAP	0.04	No
Total HAPs	0.04	No

8. **Applicable Requirements:**

PSD 40 CFR 60 40 CFR 63 SIP
 NSR 40 CFR 61 District-Origin Other

9. **MACT Requirements:**

The source has no future MACT regulations.

10. **Referenced Federal Regulations in Permit:**

None

II. Regulatory Analysis

1. **Acid Rain Requirements:** The source is not subject to the Acid Rain Program.

2. **Stratospheric Ozone Protection Requirements:** Title VI of the CAAA regulates ozone depleting substances and requires a phase-out of their use. This rule applies to any facility that manufactures, sells, distributes, or otherwise uses any of the listed chemicals. This source does not manufacture, sell, or distribute any of the listed chemicals. The sources use of listed chemicals is that in fire extinguishers, chillers, air conditioners and other HVAC equipment.

3. **Prevention of Accidental Releases 112(r):** The source does not manufacture, process, use, store, or otherwise handle one or more of the regulated substances listed in 40 CFR Part 68, Subpart F, and District Regulation 5.15, *Chemical Accident Prevention Provisions*, in a quantity in excess of the corresponding specified threshold amount.¹

4. **40 CFR Part 64 Applicability Determination:** The source is not subject to 40 CFR Part 64 - *Compliance Assurance Monitoring for Major Stationary Sources*.

5. **Basis of Regulation Applicability**

a. **Plant-wide**

The source is a potential major source for the pollutants SO₂ and PM₁₀. Regulation 2.17 – *Federally Enforceable District Origin Operating Permits* establishes requirements to limit the plant wide potential emission rates to below major source threshold levels and to provide methods of determining continued compliance with all applicable requirements.

As defined by Regulation 5.00, section 1.13.5, in order to be an exempt stationary source in regards to STAR, the source has applied for an operating permit in accordance with Regulation 2.17 with emission limits that do not exceed the following:

¹ D.D. Williamson & Co., Inc. has deregistered from the 112(r) program.

Pollutant	Emissions (tpy)
SO ₂	25
PM ₁₀	25
Single HAP	5
Total HAP	12.5

Regulation 2.17, section 5.2 requires monitoring and record keeping to assure ongoing compliance with the terms and conditions of the permit. The owner or operator shall maintain all the required records for a minimum of 5 years and make the records readily available to the District upon request.

Regulation 2.17, section 7.2, requires stationary sources for which a FEDOOP is issued shall submit an annual compliance certification by April 15. In addition, as required by Regulation 2.17, section 5.2, the source shall submit an annual compliance report to show compliance with the permit, by March 1 of the following calendar year. Compliance reports and compliance certifications shall be signed by a responsible official and shall include a certification statement per Regulation 2.17, section 3.5.

b. **Applicable Regulations:**

Regulation	Title	Type
1.13	Control of Objectionable Odors in the Ambient Air	SIP
2.17	Federally Enforceable District Origin Operating Permits	SIP
7.06	Standards of Performance for New Indirect Heat Exchangers	SIP
7.08	Standards of Performance for New Process Operations	SIP
7.09	Standards of Performance for New Process Gas Streams	SIP

c. **Basis for Applicability**

Regulation	Basis for Applicability
1.13	Applies to sources which may emit Objectionable Odors
7.06	Applies to equipment installed after April 9, 1972, and subject to the PM, Opacity, and SO ₂ standards.
7.08	Establishes the requirements for PM emission from new processes that commences construction after September 1, 1976.
7.09	Applies to process gas streams subject to a standard of performance for sulfur dioxide and which commenced on or after April 19, 1972.

d. **Emission Unit U1 Caramel Coloring**

i. **Equipment**

Emission Point	Description	Applicable Regulations	Install Date
E1	Cooker #1 for liquid caramel coloring	1.13 and 7.09	1972
E2	Cooker #2 for liquid caramel coloring		1957
E3	Cooker #3 for liquid caramel coloring		1995
E4	Cooker #4 for liquid caramel coloring		2004
E5	Caramel coloring cooker with a flash tank and vacuum jet		2006

ii. **Control Device**

Control ID	Description	Performance Indicator	Range	Efficiency	Stack ID
C1	Venturi type wet scrubber	Vacuum	1.5" – 6" H ₂ O	98.6% for SO ₂ ²	S1

iii. **Standards/Operating Limits**1) **SO₂**

Per Regulation 7.09, section 4, the source shall not cause or allow at an affected facility the release of a process gas stream containing sulfur dioxide with a concentration greater than 0.2863 grains/dscf at 0% excess oxygen unless the resulting emission of sulfur dioxide is less than 40 tons a year and a modeling demonstration in accordance with Regulation 2.11 is made showing attainment and maintenance of the NAAQS for sulfur dioxide. The STAR exemption limit of 25 tons will ensure compliance with the 40 tons Regulation 7.09 limit.

2) **Odor**

Per Regulation 1.13, section 2.1, no person shall emit or cause to be emitted into the ambient air any substance that creates an objectionable odor beyond the person's property line.

e. **Emission Unit U2 Spray Drying**i. **Equipment**

Emission Point	Description	Applicable Regulations	Install Date
E6	Spray Dryer and three cooling cyclones	7.08	2003

ii. **Control Device**

Control ID	Description	Performance Indicator	Range	Efficiency	Stack ID
C2	Wet Scrubber	Water Flowrate	Nozzle 1 (18-24 gpm) Nozzle 2 & 3 (8-15 gpm) Nozzle 4 & 5 (5-10 gpm)	80% for PM ³	S2

iii.

2 On September 13 and 14, 2006, the source performed an EPA Reference Method 6 stack test on the venturi scrubber for SO₂ and NH₃ removal efficiency. The average SO₂ inlet emission rate was 50 lb/hr. The average SO₂ outlet emission rate was 0.70 lb/hr. This results in a control efficiency of 98.6% for SO₂ and 93.1% for NH₃.

3 On October 14, 2004, the source performed an EPA Method 5 stack test on the wet scrubber outlet for a PM emission rate. The average PM outlet emissions were 2.26 lb/hr. The average PM inlet emissions were not tested. Assuming the District's pre-approved control efficiency for scrubbers of 80%, the PM inlet emissions are calculated to be 11.32 lb/hr.

iv. **Standards/Operating Limits**

1) **Opacity**

Regulation 7.08, section 3.1.1 establishes an opacity standard of less than 20%.

2) **PM**

For emission points subject to Regulation 7.08 for PM, the PM emission standards are calculated per section 3.1.2 and 3.2. The equation to calculate the hourly PM emission limit $E = 3.59 * P^{0.62}$, where E is the allowable lb/hr PM emission limit and P is the process weight rate expressed in tons/hr.

f. **Emission Unit IA1**

i. **Equipment**

Emission Point	Description	Applicable Regulations
IA1	Natural Gas Boilers Boiler 1 – 6.3 MMBtu/hr Boiler 2 – 5 MMBtu/hr	7.06

ii. **Standards/Operating Limits**

1) **PM/PM₁₀**

Boilers 1 and 2 are subject to Regulation 7.06. In accordance with Regulation 7.06, section 4, the emission standard for PM₁₀ is 0.56 lb/MMBtu/hr for each boiler.

2) **Opacity**

Regulation 7.06, section 4.2 establishes opacity standards for boilers 1 and 2.

3) **SO₂**

Boilers 1 and 2 are subject to Regulation 7.06. In accordance with Regulation 7.06, section 5, the emission standard for SO₂ is 1.0 lb/MMBtu/hr for each boiler.

III. Other Requirements

- Temporary Sources:** The source did not request to operate any temporary facilities.
- Short Term Activities:** The source did not report any short term activities.
- Emissions Trading:** N/A
- Operational Flexibility:** The source did not request any operational flexibility.
- Compliance History:**

Incident #	Date	Regulations Violated	Result
02959	06/05/2002	Regulation 2.17, Section 03 Failure to Comply with FEDOOP Permit	Agreement \$1500
03565	12/16/2003	Regulation 1.13, Section 02 Failure to Control Objectionable Odors	Agreement \$375
03787	11/02/2005	Regulation 2.03, Section 05 Failure to Comply with District Permit	Agreement \$1500

Incident #	Date	Regulations Violated	Result
03857	03/02/2006	Regulation 1.13, Section 02 Failure to Control Objectionable Odors	Agreement \$750
03931	06/27/2006	Regulation 1.14, Section 02 Visible Fugitive Emissions Beyond the Property	Agreement \$750
04171	10/06/2009	Regulation 5.15, Section 68 Failure to Comply with Requirements of Program	US Court \$300,000
04172	03/14/2006	Regulation 2.03, Section 05 Permit Conditions – Not in Accordance with Application	Agreement \$375
04204	06/30/2006	Regulation 2.17, Section 03 Failure to Comply with FEDOOP Permit	Agreement \$1500
06593	01/13/2014	Regulation 1.13, Section 02 Failure to Control Objectionable Odors	Agreement \$750

6. **Calculation Methodology:**

EU U1, Caramel Production Operation:

NH_3 tpy = (Throughput of Ammonia Bisulfite (ABS) lb/yr) × (% remains in product) × (% NH_3 in ABS)/(2000 lb/ton) × (1 - scrubber efficiency) × (% consumed in reactions)

SO_2 tpy = (Throughput lb ABS/yr) × (% remains in product) × (% SO_2 in ABS) / (2000 lb/ton) × (1 -scrubber efficiency) × (% ABS consumed in reactions)

Ammonia Hydroxide tpy = (Throughput lb NH_4OH /yr) × (% ammonia) × (1 -scrubber efficiency) / (2000 lb/ton) × (% consumed in reactions)

EU U2, Powder Production:

TSP tpy = (Throughput lb/yr) × (0.10 load factor) × (1 - cyclone efficiency) × (1 - wet scrubber efficiency) / (2000 lb/ton)

EU IA1, Natural Gas Combustion

Natural Gas Combustion from AP-42, Chapter 1.4, Tables 1.4-1 through 1.4-4
Emissions (tons/yr) = Usage (MMSCF/yr) × (Emission Factor) / 2000 (lb/ton)

7. **Insignificant Activities:**

Equipment	Qty.	Regulation Basis
Emergency relief vents, stacks and ventilating systems	5	Regulation 1.02, Appendix A.3.10
Laboratory ventilating and exhausting systems which are not used for radioactive air contaminants	1	Regulation 1.02, Appendix A.3.11
Small dust collector that removes the dust from the headspace of a 200 gallon tank when powders are dumped into it. Less than 1 tpy	1	Regulation 1.02, Appendix A.3.21
Portable diesel or gasoline storage tanks with a maximum capacity of less than 500 gallons	2	Regulation 1.02, Appendix A.3.23

- 1) Insignificant activities identified in District Regulation 1.02, Appendix A, may be subject to size or production rate disclosure requirements.
- 2) Insignificant activities identified in District Regulation 1.02, Appendix A shall comply with generally applicable requirements.

- 3) The owner or operator shall annually submit an updated list of insignificant activities that occurred during the preceding year, with the compliance certification due April 15th.
- 4) Emissions from Insignificant Activities shall be reported in conjunction with the reporting of annual emissions of the facility as required by the District.
- 5) The owner or operator may elect to monitor actual throughputs for each of the insignificant activities and calculate actual annual emissions, or use Potential to Emit (PTE) as the annual emissions for each piece of equipment.
- 6) The District has determined that no monitoring, record keeping, or reporting requirements apply to the insignificant activities listed, except for the equipment that has an applicable regulation and permitted under an insignificant activity (IA) unit.