



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Street address: 629 East Main Street, Richmond, Virginia 23219

Mailing address: P.O. Box 1105, Richmond, Virginia 23218

www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4020
1-800-592-5482

MEMORANDUM

TO: Regional Directors, Director – Air Permits, Director – Air Compliance, Director – Data Analysis and Planning, Director – Air Quality Analysis, Director – Regulatory Affairs, Air Permit Managers, Air Compliance Managers

CC: James J. Golden - Director of Operations
Jeffery Steers – Director of Central Operations

FROM: Michael G. Dowd – Director, Air Division

SUBJECT: **APG-354; Permitting and BACT Applicability under Chapter 80 Article 6**
(Replaces APG-352 dated 9/26/2003, APG-354 and APG-354A dated 01/05/2009 and revised 04/17/2009)

DATE: May XX, 2015

I. Introduction

This document provides guidance to air permitting staff concerning the minor New Source Review (NSR) permitting and state Best Available Control Technology (BACT) applicability based on the revised Article 6 regulation (9 VAC 5, Chapter 80, Article 6). The revised Article 6 regulation became effective November 7, 2012.

As written, Article 6 is generally applicable to “construction” of a “new stationary source”, “construction” of any “project” at a previously established stationary source (i.e., “modification”), and reductions in stack outlet elevation at a previously established stationary source. As provided in 9 VAC 5-80-1100, there is an exception to this general applicability for “any stationary source, emissions unit or facility that is exempt under the provisions of 9 VAC 5-80-1105”. When considering the applicability of Article 6, the indicated approach would be to first consider whether the proposed activity meets the general applicability criteria (i.e., does the proposed action fit within the definition of any of the trigger terms, e.g., “construction” or “modification”) and, if it does, determine whether the activity qualifies for exemption under

9 VAC 5-80-1105. An activity that does not meet applicability provisions (e.g., does not meet the definition of “construction” or “modification”) of Article 6 does not need to be evaluated under the 9 VAC 5-80-1105 exemption criteria.

This guidance applies only to 9 VAC 5, Chapter 80, Part II, Article 6 permitting and associated BACT applicability under 9 VAC 5-50-260 B & C for [regulated pollutants](#)¹ other than toxic pollutants. The application of the remainder of this guidance is not necessary if the action can be deemed exempt based solely on portions of provisions of 9 VAC 5-80-1105 A which do not require exemption determination under 9 VAC 5-80-1105 B through D as a group, along with E and F.

This guidance is not intended to cover every possible situation, but should be applicable in most scenarios. Check with the regional air permit manager and/or Central Office staff if a deviation from the guidance is being considered.

This guidance is divided into two sections – one for **New Stationary Sources** (Greenfield sources) and the other for **Projects (proposed changes at an existing stationary source)**.

II. Definitions

The following definitions are from Article 6 at 9 VAC 5-80-1110 C.

“Addition” refers to the construction or installation of an emissions unit at an existing stationary source. It can also include an emissions unit that is relocated to an existing stationary source from another stationary source.

"Best available control technology" or "BACT" is an emissions limitation (including a visible emission standard) that is based on the maximum degree of emission reduction for any pollutant which would be emitted from a new stationary source or project which the Board, on a case-by-case basis, taking into account energy, environmental and economic impacts and other costs, determines is achievable for the new stationary source or project through the application of production processes or available methods, systems and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant.

"Construction" means fabrication, erection, installation, demolition, relocation, addition, replacement, or modification of an emissions unit that would result in a change in the uncontrolled emission rate.

"Emissions unit" means any part of a stationary source which emits or would have the potential to emit any regulated air pollutant. Note: per the definition of “stationary source,” a “nonroad engine” is not part of a stationary source and therefore is not an “emissions unit” or “affected emissions unit” for the purpose of Article 6.

"Existing stationary source" means any stationary source other than a new stationary source.

¹ A list of regulated pollutants under Article 6 is provided in Attachment 1. Permitting and BACT applicability for toxic pollutants will be addressed in a separate guidance document.

"Modification" means any physical change in, or change in the method of operation of, an emissions unit that increases the uncontrolled emission rate of any regulated air pollutant emitted into the atmosphere by the unit or that results in the emission of any regulated air pollutant into the atmosphere not previously being emitted. (See Article 6 for list of exceptions to this definition). Modification includes partial replacement of an emissions unit. (e.g., If a spray coating line composed of multiple application stations has been previously presented and treated as a single emissions unit, replacement of a single spray paint booth on this line is evaluated as a potential modification; not a replacement.)

"New stationary source (Greenfield)" means any stationary source to be constructed at or relocated to a previously undeveloped site.

"Project" means any change at an existing stationary source consisting of the addition, replacement, or modification of one or more emissions units.

"Replacement" means the substitution of an emissions unit for a similar emissions unit located at a stationary source, which will thereafter perform the same function as the replaced emissions unit. Replacement includes only the replacement of the entire emissions unit. Non-routine replacement of components in an emission unit is to be treated as a modification if it meets that definition. Exemption criteria for replacement units are given in 9 VAC 5-80-1105 A.2. Replacement activities are covered under the definition of "project" and therefore can also be considered under the exemption provisions at 9 VAC 5-80-1105 D using the difference between the annual uncontrolled emissions of the replacement unit as compared to the annual uncontrolled emissions of the unit replaced (refer to Table 1 when using 9 VAC 5-80-1105 D for replacement).

"[Uncontrolled Emission Rate](#)"² means the emission rate of a regulated pollutant from an emissions unit when operating at maximum capacity without air pollution control equipment. Air pollution control equipment includes control equipment that is not vital to its operation, except that its use enables the owner to conform to applicable air pollution control laws and regulations. Annual uncontrolled emissions shall be based on the maximum annual rated capacity (based on 8,760 hours of operation per year) of the emissions unit, unless the emissions unit or stationary source is subject to state and federally enforceable permit conditions that limit the annual hours of operation. Enforceable permit conditions on the type or amount of material combusted, stored, or processed may be used in determining the uncontrolled emission rate of an emissions unit or stationary source.

"Undeveloped site" means any site or facility at which no emissions units are located at the time the permit application is deemed complete, or at the time the owner begins actual construction, whichever occurs first. An undeveloped site also includes any site or facility at which all of the emissions units have been determined to be shut down pursuant to the provisions of 9 VAC 5-20-220. For the purpose of application of this definition in this guidance, "emissions units" does not include units which would not be subject to registration under 9 VAC 5-20-160 (e.g., If natural gas fired space heat units less than 10 MMBTU/hr

² The Source Category Guidance for Uncontrolled Emission Rate calculations is provided in Attachment 2.

were the only emissions units at a shell building, the presence of these units would not preclude the site from being considered an undeveloped site.)

III. New Stationary Source (Greenfield Source)

"New stationary source (Greenfield)" under Article 6 means any stationary source to be constructed at or relocated to a previously undeveloped site.

Permit applicability test for a New Stationary Source:

9 VAC 5-80-1105 C states: *The exemption of new stationary sources shall be determined as specified below:*

New stationary sources with uncontrolled emission rates less than all of the emission rates specified below [provided in Attachment 1] shall be exempt from the provisions of this article [Article 6]. The uncontrolled emission rate of a new stationary source is the sum of the uncontrolled emission rates of the individual affected emissions units. Facilities exempted by subsection B of this section shall not be included in the summation of uncontrolled emissions for purposes of exempting new stationary sources under this subsection.

The procedure for calculating the "Uncontrolled Emission Rate (UER)" for the Article 6 permit applicability test for a new stationary source is summarized in Table 1 and described below:

- Step 1: List all of the emissions units at the new stationary source.
- Step 2: Delete from the list developed in Step 1 any emissions units that are individually exempt under 9 VAC 5-80-1105 B.
- Step 3: Calculate the annual UER for each regulated pollutant listed in 9 VAC 5-80-1105 C.1 for each of the affected emissions units (the remaining emissions units determined in Step 2). Include fugitive emissions, unless all of the emissions at the new stationary source will be fugitive. If all the emissions at the new stationary source are fugitive, Article 6 does not apply to the source (see 9 VAC 5-80-1105 C.3).
- Step 4: Sum the annual UER from the affected emissions units and compare the result with the exempt emission rates for the regulated pollutants listed in 9 VAC 5-80-1105 C.1 (Attachment 1). An Article 6 permit will be required if any of the listed pollutants are emitted at rates equal to or exceeding the emission rates in 9 VAC 5-80-1105 C.1.
- Step 5: Regardless of the exemption status determined in Step 4, if the source emits toxic pollutants that are not exempt under 9 VAC 5-80-1105 E and F, then an Article 6 permit will be required.

BACT applicability test for a New Stationary Source:

9 VAC 5-50-260 B states: *A new stationary source shall apply best available control technology (BACT) for each regulated pollutant for which there would be an UER equal to or greater than the levels in 9 VAC 5-80-1105 C.*

Each affected emissions unit (i.e., remaining emissions units described in Step 3 above) emitting a pollutant subject to permitting (i.e., any of the listed pollutants emitted at rates equal to or exceeding the exemption rates in 9 VAC 5-80-1105 C.1) shall have BACT applied for that listed pollutant.

The following examples illustrate how permitting and BACT applicability are determined at a new stationary source:

Example 1: A new stationary source (Greenfield source) proposes to install three boilers (1, 2 and 3):

Boiler 1:	5 MMBtu/hour	(natural gas and oil)
Boiler 2:	12 MMBtu/hour	(natural gas and oil)
Boiler 3:	20 MMBtu/hour	(natural gas and oil)

Step 1: List all of the emissions units at the “new stationary source”.

Boilers 1, 2 and 3

Step 2: Delete from the list developed in Step 1 any emissions units that are individually exempt under 9 VAC 5-80-1105 B.

Boiler 1 is deleted as it is exempt based on 9 VAC 5-80-1105 B.1.a(3) (assumes proposed source would be located in an ozone attainment area).³

Step 3: Calculate the annual UER for each regulated pollutant listed in 9 VAC 5-80-1105 C for each of the affected emissions units determined in Step 2.

The affected emissions units are Boilers 2 and 3. The annual UER for each regulated pollutant for Boilers 2 and 3 are summed as stated in the permit applicability test from Table 1, Part 1 for a Proposed New Stationary Source.

Step 4: Sum the annual UER from the affected emissions units and compare the result with the exempt emission rates for the regulated pollutants listed in 9 VAC 5-80-1105 C.1.

The annual UER of Boilers 2 and 3 are compared with the exempt emission rates in the table below:

³ Note that, although Boiler 1 is exempt under Article 6, emissions from Boiler 1 would need to be included if the facility were evaluated for permitting under PSD (Article 8) or Title V (Article 1).

Example 1: UER at a New Stationary Source (Boilers)

Pollutant	UER for Boiler 2 (tons/yr)	UER for Boiler 3 (tons/yr)	UER for Source (Boiler 2 + Boiler 3) (tons/yr)	Exemption Levels (tons/yr)
PM*	0.76	1.27	2.03	25
PM10	0.88	1.46	2.34	15
PM2.5	0.59	0.98	1.57	10
SO ₂	27.04**	45.07**	72.11	40
CO	4.27	7.12	11.39	100
VOC	0.28	0.47	0.75	25
NO _x	7.62	12.70	20.32	40

* See Attachment 3 for PM exemption determination. PM emissions are filterable only whereas PM10 and PM2.5 are total including condensable emissions.

**0.5% sulfur content is used to calculate UER (See Attachment 2 for details).

Permitting Applicability: Since the UER of SO₂ is above the respective exemption threshold, the new stationary source (i.e., Boilers 2 and 3) is subject to Article 6 permitting requirements.

BACT Applicability: If permitting applicability is triggered for a pollutant, then BACT applicability is also triggered for that same pollutant. Therefore, since permitting is triggered for SO₂, BACT is also triggered for SO₂. Note that BACT is triggered for both Boilers 2 and 3, even though SO₂ emissions from Boiler 2 are below the exempt emission rate. Also, Boiler 1 is not subject to BACT as Boiler 1 is exempt from Article 6 requirements. (see 9 VAC 5-80-1105 B.).

Example 2: A new stationary source (Greenfield source) proposes to install a spray paint booth. The source proposes to use several types of coatings and cleaning solvent. The coatings contain no regulated HAPs.

Spray Gun Capacity:	10.0 gallons coating/hour
Solids Transfer Efficiency:	60%
Coating A:	VOC content: 3.0 lbs VOC/gallon coating Solids Content: 50% Density: 7.0 lb/gal
Coating B:	VOC Content: 2.0 lbs VOC/gallon coating Solids Content: 75% Density: 7.0 lb/gal
Coating C:	VOC Content: 1.0 lbs VOC/gallon coating Solids Content: 70% Density: 7.0 lb/gal
Proposed Fiberglass Filter Control:	95%
Proposed Throughput of Coatings:	5000 gallon/year
Proposed Throughput of Cleaning Solvent:	500 gallon/year VOC Content: 8.5 lb VOC/gal

Step 1: List all of the emissions units at the “new stationary source”.

The only emission unit is the paint spray paint booth.

Step 2: Delete from the list developed in Step 1 any emissions units that are individually exempt under 9 VAC 5-80-1105 B.

There are no emission units exempted under 9 VAC 5-80-1105 B.

Step 3: Calculate the annual UER for each regulated pollutant listed in 9 VAC 5-80-1105 C for each of the affected emissions units determined in Step 2.

The annual UER for each regulated pollutant for the spray paint booth is determined as stated in the permit applicability test from Table 1, Part 1 for a Proposed New Stationary Source. Only emissions of particulate matter and VOC are expected from a spray paint booth.

Particulate emissions are calculated using the worst case of all the coatings which would be Coating B.

PM Calculation

$$\begin{aligned} \text{UER for PM} &= (10 \text{ gal/hr}) \times (7.0 \text{ lb/gal}) \times (0.75) \times (1-0.60) \times (8760 \text{ hr/yr}) \times (\text{ton} \\ &\quad \text{PM}/2000 \text{ lb PM}) \\ &= \mathbf{92.0 \text{ tons PM/year}} \text{ (PM is assumed to be equal to PM10 and PM2.5)} \end{aligned}$$

VOC emissions are calculated using the worst case of all the coatings which would be Coating A (Reference Attachment 2 for why VOC from cleaning solvents are not used).

VOC Calculation

$$\begin{aligned} \text{UER for VOC} &= (10 \text{ gal/hr}) \times (3.0 \text{ lb VOC/gal}) \times (8760 \text{ hr/yr}) \times (\text{ton VOC}/2000 \text{ lb VOC}) \\ &= \mathbf{131.4 \text{ tons VOC/year}} \end{aligned}$$

Step 4: Sum the annual UER from the affected emissions units and compare the result with the exempt emission rates for the regulated pollutants listed in 9 VAC 5-80-1105 C.1.

The annual UER of the spray paint booth is compared with the exempt emission rates in the table below:

Example 2: UER at a New Stationary Source (Paint Booth)

Pollutant	UER for Source* (tons/yr)	Exemption Levels (tons/yr)
PM**	92.0	25
PM10	92.0	15
PM2.5	92.0	10
VOC	131.4	25

* See Attachment 2 for Source Category Guidance for Spray Booth

** See Attachment 3 for PM exemption determination

Permitting Applicability: Since the UER of PM, PM10, PM2.5 and VOC are above the respective exemption threshold, the new stationary source (i.e., spray paint booth) is subject to Article 6 permitting requirements.

BACT Applicability: If permitting applicability is triggered for a pollutant then BACT applicability is also triggered for that same pollutant. Therefore, since permitting is triggered for PM, PM10, PM2.5 and VOC, BACT is also triggered for PM, PM10, PM2.5 and VOC.

IV. Project (Emission changes at existing stationary sources)

“Project” under Article 6 means any change at an existing stationary source consisting of the addition, replacement, or modification of one or more emissions units. (Note: The definition of “modification” in Article 6 provides exceptions for certain specified changes to emissions units which are not considered modifications regardless of whether there is an increase in uncontrolled emissions. Increases from a unit which qualifies for one of these exceptions are not included when calculating the emissions increase for a project.)

Permit applicability test for a Project:

9 VAC 5-80-1105 D states: *The exemption of projects shall be determined as specified below:*

A project that would result in increases in uncontrolled emission rates at the stationary source less than all of the emission rates specified below [provided in Attachment 1] shall be exempt from the provisions of this article [Article 6]. The uncontrolled emission rate increase of a project is the sum of the uncontrolled emission rate increases of the individual affected emissions units. Uncontrolled emissions rate decreases are not considered as part of this calculation. Facilities exempted by subsection B of this section shall not be included in the summation of uncontrolled emissions for purposes of exempting projects under this subsection.

The procedure for calculating the “increases in uncontrolled emission rate” for the Article 6 Permit Applicability test for a project is summarized in Table 1 and described below:

Step 1: List all of the emissions units being added, replaced and modified as part of the project.

Step 2: Determine whether each emissions unit meets the criteria for “modification” in Article 6 as described at 9 VAC 5-80-1110. If the proposed change(s) do(es) not meet the Article 6 definition of “modification”, then Article 6 would not apply and there is no need to evaluate the proposal for exemption under 9 VAC 5-80-1105.

Assuming the proposed change does meet the definition of modification, proceed as follows: delete from the list developed in Step 1 any emissions units that are individually exempt under 9 VAC 5-80-1105 B. Also delete any replacement units which meet all the exemption provisions of 9 VAC 5-80-1105 A.2.a. Note, this includes an executed shutdown agreement and, if applicable, a minor amendment to any previously issued minor NSR permit for the replaced unit (if such permit(s) limited the potential to emit of the replaced unit).

Step 3: Calculate the annual UER increase (new uncontrolled emissions minus current uncontrolled emissions) for each regulated pollutant listed in 9 VAC 5-80-1105 D.1 for each of the affected emissions units determined in Step 2. Use the permit applicability test summarized in Table 1 for determining the annual UER increase for addition, modification and replacement of emissions units. Include fugitive emissions, unless all of the emissions at the “project” will be fugitive. If all the emissions of the project are fugitive, Article 6 does not apply to the project (see 9 VAC 5-80-1105 D.3).

Step 4: Sum the annual UER increase from the affected emissions units and compare the resulting “UER increases” with the exempt emission rates for the regulated pollutants listed in 9 VAC 5-80-1105 D.1 (Attachment 1). An Article 6 permit will be required if any of the listed pollutants are emitted at rates equal to or exceeding the exempt emission rates in 9 VAC 5-80-1105 D.1.

Step 5: Regardless of the exemption status determined in Step 4, if the source emits toxic pollutants that are not exempt under 9 VAC 5-80-1105 E and F, then an Article 6 permit will be required.

BACT Applicability for a Project:

9 VAC 5-50-260 C states: *A project shall apply best available control technology for each regulated pollutant for which there would be an increase in the uncontrolled emission rate equal to or greater than the levels in 9 VAC 5-80-1105 D. This requirement applies to each affected emissions unit in the project.*

If permitting applicability is triggered for a pollutant, then BACT applicability is triggered for that same pollutant and would apply to each affected emissions unit that emits the pollutant. For a project, “affected emissions units” are the added (new and relocated), modified, and replacement units that are part of the project (i.e., remaining emissions units described in Step 3 above).

The following examples illustrate how permitting and BACT applicability are determined at a Project:

Example 3: The existing facility (a permitted source) proposes to increase the permitted fuel throughput for its boiler (B1).

Boiler B1 (Permitted Unit):	55 MMBtu/hr (No. 2 Distillate Oil at 0.05%S)
Current Permitted Throughput:	1,500,000 gallons/yr
Proposed Throughput:	2,500,000 gallons/yr

Since the proposed change is a “modification” of an emissions unit at an existing stationary source, this will be considered a “project” under Article 6 (see Table 1, Part 2.D - Modified Emission Units)

Step 1: List all of the emissions units being added, replaced and modified as part of the project.

The only emissions unit affected under this project is the boiler (B1).

Step 2: Delete from the list in Step 1 any emissions units that are individually exempt under 9 VAC 5-80-1105 B.

There are no emissions units exempted under 9 VAC 5-80-1105 B.

Step 3: Calculate the annual UER increase (new uncontrolled emissions minus current uncontrolled emissions) for each regulated pollutant listed in 9 VAC 5-80-1105 D.1 for the affected emissions units. Use the permit applicability test summarized in Table 1 for determining the annual uncontrolled emission increase for addition, modification and replacement of emission units.

In this case, the permit applicability test from Table 1 would be Part 2.D - Modified Emissions Units:

$$UER\ increase = New\ Uncontrolled\ Emissions\ (NUE) - Current\ Uncontrolled\ Emissions\ (CUE)$$

NUE = emissions while operating at Maximum Rated Capacity (MRC) at 8760 hrs/yr, without controls (since the requested throughput of 2,500,000 gallons per year is not yet an enforceable permit limitation)

CUE = emissions while operating at MRC at current throughput limit (i.e., 1,500,000 gallons/yr), without controls

Step 4: Sum the annual UER increases from the affected emissions units and compare the resulting UER increase with the exempt emission rates for the regulated pollutants listed in 9 VAC 5-80-1105 D.1.

The annual UER increase of the Boiler B1 is compared to the exemption levels and summarized in the table below:

Example 3: UER increase for a Project (Modified Emission Unit)

Pollutant	NUE (tons/y)	CUE (tons/yr)	UER increase = NUE – CUE (tons/yr)	Exemption Levels (tons/yr)
PM*	3.49	1.50	1.99	15
PM10	4.02	1.73	2.29	10
PM2.5	2.71	1.16	1.54	6
SO ₂	12.39**	5.33***	7.07	10
CO	8.73	3.75	4.98	100
VOC	0.35	0.15	0.20	10
NO _x	34.91	15.00	19.91	10

* See Attachment 3 for PM exemption determination. PM emissions are filterable only whereas PM10 and PM2.5 are total including condensable emissions.

** 0.05% sulfur is used to calculate NUE, since only the throughput limit is proposed to be changed, not the sulfur content.

***0.05% sulfur content is used to calculate CUE based on the current permit requirement

Permitting Applicability: Since the UER increase of NO_x is above the respective exemption thresholds, the project is subject to Article 6 permitting requirements.

BACT Applicability: If permitting applicability is triggered for a pollutant, then BACT applicability is also triggered for that same pollutant and would apply to each affected emissions unit that emits the pollutant. Therefore, since permitting is triggered for NO_x, BACT is also triggered for NO_x for Boiler B1.

Example 4: The existing facility proposes to install two diesel-fired emergency generators (EG-1 and EG-2).

Diesel Engine Powered Generator 1 (EG-1)	600 kW
Diesel Engine Powered Generator 2 (EG-2)	600 kW

Since the proposed change is an “addition” of emissions units at an existing source, this will be considered a “project” under Article 6 (see Table 1, Part 2.A - Addition of Emissions Units)

Step 1: List all of the emissions units being added, replaced and modified as part of the project.

The affected emissions units under this project are Generator 1 (EG-1) and Generator 2 (EG-2).

Step 2: Delete from the list in Step 1 any emissions units that are individually exempt under 9 VAC 5-80-1105 B.

There are no emissions units exempted under 9 VAC 5-80-1105 B.

(Note: The size-class exemption threshold in 9 VAC 5-80-1105 B.2.b for emergency generators is based on the aggregate electrical output; the aggregate electrical output from the two emergency generators is 1,200 kW, which is above the size-class exemption threshold of 1,125 kW.)

Step 3: Calculate the annual UER increase (new uncontrolled emissions minus current uncontrolled emissions) for each regulated pollutant listed in 9 VAC 5-80-1105 D.1 for the affected emissions units determined in Step 2. Use the permitting applicability test summarized in Table 1 for determining the annual uncontrolled emissions increase for addition, modification and replacement of emissions units.

In this case, the permit applicability test from Table 1 would be Part 2.A - Addition of Emissions Units:

$$\text{UER increase} = \text{New Uncontrolled Emissions (NUE)} - \text{Current Uncontrolled Emissions (CUE)}$$

NUE = emissions from the new unit while operating at MRC at 8760 hrs/yr, without controls

CUE = Zero, since the generators are new emissions units. Therefore, the UER increase is equal to the NUE from the units (UER increase = NUE)

Step 4: Sum the annual UER increases from the affected emissions units and compare the resulting UER increase with the exempt emission rates for the regulated pollutants listed in 9 VAC 5-80-1105 D.1.

The annual UER increase of the project is equal to the sum of the UER increase for EG-1 and the UER increase for EG-2. Uncontrolled emissions from each of the generators are based on 500 hours of operation because they are emergency units.⁴

⁴ The use of 500 hours for determination of uncontrolled emissions is from APG-570 dated 5/15/2009. This example is not intended to independently establish use of 500 hrs/yr as guidance but rather reflects use of APG-570 current at the time this document was signed. It is the permit writer's responsibility to ensure the underlying guidance is still valid if using this example as the basis/justification for an Article 6 exemption determination.

Example 4: UER increase for a Project (Addition of Emission Units)

Pollutant	NUE of EG-1 (tons/yr)	NUE of EG-2 (tons/yr)	UER increase of the Project (tons/yr)	Exemption Levels (tons/yr)
PM*	0.14	0.14	0.28	15
PM10	0.14	0.14	0.28	10
PM2.5	0.14	0.14	0.28	6
SO ₂	0.08**	0.08**	0.16	10
CO	111	111	2.21	100
VOC	0.14	0.14	0.28	10
NO _x	4.83	4.83	9.66	10

* See Attachment 3 for PM exemption determination

**0.05% sulfur is used to calculate NUE (See Attachment 2 for details)

As shown in the table above, the project is exempt from Article 6 permitting requirements for all regulated pollutants because the UER increase of the project is less than the exemption threshold for each regulated pollutant.

Step 5: Regardless of the exemption status determined in Step 4, if the source emits toxics pollutants that are not exempt under 9 VAC 5-80-1105 E and F, an Article 6 permit will be required.

The generators are exempt from toxics review per 9 VAC 5-80-1105 E.1 and 9 VAC 5-60-300 C.7.

Permitting Applicability: Since the project is exempt from Article 6 permitting requirements for regulated pollutants and toxics pollutants, the project is exempt from minor NSR permitting.

BACT Applicability: BACT is not applicable as the project is exempt from Article 6 permitting requirements.

Example 5: The existing facility (a permitted source) proposes to replace a distillate oil-fired boiler (currently permitted) with a new natural gas boiler. The replacement boiler will perform the same function (providing steam for process) as the replaced boiler and can potentially operate 8760 hrs/yr. The facility has requested to amend the existing permit to reflect this replacement.

Boiler B1 (Permitted Unit):	55 MMBtu/hr (No. 2 Distillate Oil at 0.05%S)
Current Permitted Throughput:	3,000,000 gallons/yr
Replacement boiler:	60 MMBtu/hr (Natural Gas)

Since the proposed change is a “replacement” of an emissions unit at an existing stationary source, this will be considered a “project” under Article 6 (see Table 1, Part 2.G - Replacement Emission Units).

Step 1: List all of the emissions units being added, replaced and modified as part of the project.

The affected emission units under this project are the replacement boiler and the existing boiler (B1).

Step 2: Delete from the list in Step 1 any emissions units that are individually exempt under 9 VAC 5-80-1105 B. Also delete the replacement units which meet all the exemption provisions of 9 VAC 5-80-1105 A.2.a.

There are no emissions units exempted under 9 VAC 5-80-1105 B.

The replacement exemption provisions of 9 VAC 5-80-1105 A.2.a are not applicable since the replacement boiler is greater in size than the existing boiler.

Step 3: Calculate the annual UER increase (new uncontrolled emissions minus current uncontrolled emissions) for each regulated pollutant listed in 9 VAC 5-80-1105 D.1 for the affected emissions units determined in Step 2. Use the permit applicability test summarized in Table 1 for determining the annual UER increase for addition, modification and replacement of emissions units.⁵

In this case, the permit applicability test from Table 1 would be 2.G - Replacement Emission Units:

$$\text{UER increase} = \text{New Uncontrolled Emissions (NUE)} - \text{Current Uncontrolled Emissions (CUE)}$$

$$\text{NUE} = \text{emissions from the replacement boiler while operating at MRC at 8760 hrs/yr, without controls}$$

$$\text{CUE} = \text{emissions from the existing boiler while operating at MRC at current throughput limit (i.e., 3,000, 000 gallons/yr), without controls}$$

Step 4: Sum the annual UER increases from the affected emissions units and compare the resulting UER increase with the exempt emission rates for the regulated pollutants listed in 9 VAC 5-80-1105 D.1.

⁵ Note that from a regulatory perspective, the two units are one, and this is evidenced by the calculation methods used in evaluating the UER, below.

The annual UER increase of the project is compared to the exemption levels and summarized in the table below:

Example 5: UER increase for a Project (Replacement Emissions Unit)

Pollutant	NUE (tons/y)	CUE (tons/yr)	UER increase = NUE – CUE (tons/yr)	Exemption Levels (tons/yr)
PM*	0.48	3.00	0***	15
PM10	1.93	3.45	0***	10
PM2.5	1.93	2.33	0***	6
SO ₂	0.15	10.65**	0***	10
CO	21.35	7.50	13.85	100
VOC	1.4	0.30	1.10	10
NO _x	25.42	30.00	0***	10

* See Attachment 3 for PM exemption determination. PM emissions are filterable only, whereas PM10 and PM2.5 are total including condensable emissions.

** 0.05% sulfur content is used to calculate CUE based on the current permit requirement.

*** The UER increases of an emissions unit cannot be less than zero.

As shown in table above, the project is exempt from minor NSR permitting for all regulated criteria pollutants because the UER increase of the project is less than the exemption threshold for each regulated pollutant.

Step 5: Regardless of the exemption status determined in Step 4, if the source emits toxics pollutants that are not exempt under 9 VAC 5-80-1105 E and F, an Article 6 permit will be required.

The boilers are exempt from toxics review per 9 VAC 5-80-1105 E.1 and 9 VAC 5-60-300 C.7.

Permitting Applicability: Since the project is exempt from Article 6 permitting requirements for regulated pollutants and toxics pollutants, the project is exempt from minor NSR permitting. Note, although the project is exempt from minor NSR permitting, the permit is being amended at the request of the owner to reflect the replacement emission unit and change in fuels.⁶

BACT Applicability: BACT is not applicable as the project is exempt from Article 6 permitting requirements. However, since the replaced unit was covered by a NSR permit and the replacement unit is treated as the same unit for NSR, the replacement unit remains subject to BACT for any pollutant previously subject to BACT. While this replacement action does not trigger new BACT applicability, it will be necessary to adjust previously established BACT emissions limits since the limits in the current permit would exceed the potential to

⁶ It is anticipated that most exempt replacement actions for units previously permitted under minor NSR will require changes to the permit(s) in order to accurately identify the replacement unit in the permit and ensure that any associated conditions of the previous permit approval continue to apply to the replacement unit (or are updated if appropriate). In the event that the content of the current permit does not obligate the owner to apply for a permit amendment and the owner chooses not to request a permit amendment, it may be necessary to initiate a reopening for cause as provided in 9VAC5-80-1260 C and 9VAC5-80-1330.

emit⁷ for the replacement unit as shown above in Example 5 table. Since the owner has not requested any limit of annual fuel use or hours of operation for the replacement boiler, new annual limitations (at 8760 hrs/yr) and corresponding short-term limits would be established for each pollutant showing a reduction in potential to emit (to comply with Article 6) and also to each pollutant showing an increase (to accommodate the owners request for permit amendment). If the amended permit establishes limits for pollutants not previously subject to BACT, the authority for these limits is 9 VAC 5-80-1180.

Example 6: The existing facility (a permitted source) proposes to replace a distillate oil fired boiler (currently permitted) with a new natural gas boiler. The replacement boiler will perform the same function (providing steam for process) as the replaced boiler and can potentially operate 8760 hrs/yr. Along with the replacement of boiler (B1), the facility also wants to install a new boiler (B2).

Boiler B1 (Permitted Unit):	55 MMBtu/hr (No. 2 Distillate Oil at 0.05%S)
Current Permitted Throughput:	3,000,000 gallons/yr
Replacement Boiler:	60 MMBtu/hr (Natural Gas)
Boiler B2 (New Unit):	20 MMBtu/hr (No.2 Distillate Oil)

Since the proposed change includes the “addition” of an emissions unit and the “replacement” of an emissions unit at an existing source, this will be considered a “project” under Article 6 (see Table 1, Part 2.A - Addition of Emissions Unit and Part 2.G - Replacement Emissions Unit).

Step 1: List all of the emissions units being added, replaced and modified as part of the project.

The affected emission units under this project are the replacement boiler, the existing boiler (B1) and the new boiler (B2).

Step 2: Delete from the list in Step 1 any emissions units that are individually exempt under 9 VAC 5-80-1105 B. Also delete the replacement units which meet all the exemption provisions of 9 VAC 5-80-1105 A.2.a.

There are no emissions units exempted under 9 VAC 5-80-1105 B.

The replacement exemption provisions of 9 VAC 5-80-1105 A.2.a are not applicable since the replacement boiler is greater in capacity than the existing boiler.

Step 3: Calculate the annual UER increase (new uncontrolled emissions minus current uncontrolled emissions) for each regulated pollutant listed in 9 VAC 5-80-1105 D.1 for

⁷9VAC5-80-1180 C. – “Minor NSR permits may contain emissions standards as necessary to implement the provisions of this article and 9VAC5-50-260. The following criteria apply in establishing emission standards to the extent necessary to assure that emissions levels are enforceable as a practical matter: (9VAC5-80-1180 C.2.) In no case shall a standard result in emissions which would exceed the emissions rate based on the potential to emit of the emissions unit.”

the affected emissions units determined in Step 2.⁸ Use the permit applicability test summarized in Table 1 for determining the annual uncontrolled emission increase for replacement of emissions units.

Replacement of Boiler B1:

In this case, the permit applicability test from Table 1 would be Part 2.G - Replacement Emissions Units:

$$\text{UER increase} = \text{New Uncontrolled Emissions (NUE)} - \text{Current Uncontrolled Emissions (CUE)}$$

NUE = emissions from the replacement boiler while operating at MRC at 8760 hrs/yr, without controls

CUE = emissions from the existing boiler B1 while operating at MRC at current throughput limit (i.e., 3,000, 000 gallons/yr), without controls

Example 6: UER increase for Boiler B1 Replacement

Pollutant	NUE (tons/y)	CUE (tons/yr)	UER increase = NUE – CUE (tons/yr)
PM	0.48	3.00	0**
PM10	1.93	3.45	0**
PM2.5	1.93	2.33	0**
SO ₂	0.15	10.65*	0**
CO	21.35	7.50	13.85
VOC	1.40	0.30	1.10
NO _x	25.42	30.00	0**

* 0.05% sulfur content is used to calculate CUE based on the current permit requirement.

** The UER increases of an emissions unit cannot be less than zero.

New Boiler B2:

In this case, the permit applicability test from Table 1 would be Part 2.A - Addition of Emissions Units:

$$\text{UER increase} = \text{New Uncontrolled Emissions (NUE)} - \text{Current Uncontrolled Emissions (CUE)}$$

NUE = emissions from the new boiler B2 while operating at MRC at 8760 hrs/yr, without controls

⁸ Note that from a regulatory perspective, the two units are one, and this is evidenced by the calculation methods used in evaluating the UER.

CUE = Zero since boiler B2 is a new emissions unit; therefore the UER increase is equal to the NUE from the unit (UER increase = NUE)

Example 6: UER increase for the Addition of Boiler 2

Pollutant	NUE (tons/yr)	CUE (tons/yr)	UER increase = NUE (tons/yr)
PM	1.27	0	1.27
PM10	1.46	0	1.46
PM2.5	0.98	0	0.98
SO ₂	45.07*	0	45.07
CO	3.17	0	3.17
VOC	0.13	0	0.13
NO _x	12.70	0	12.70

* 0.5% sulfur is used to calculate NUE (See Attachment 2 for details).

Step 4: Sum the annual UER increases from the affected emissions units and compare the resulting UER increase with the exempt emission rates for the regulated pollutants listed in 9 VAC 5-80-1105 D.1.

The annual UER increase of the project is compared to the exemption levels and summarized in the table below:

Example 6: UER increase for the Project

Pollutant	UER for Boiler 1 (tons/yr)	UER for Boiler 2 (tons/yr)	UER increase of the Project (B1 + B2) (tons/yr)	Exemption Levels (tons/yr)
PM*	0	1.27	1.27	15
PM10	0	1.46	1.46	10
PM2.5	0	0.98	0.98	6
SO ₂	0	45.07	45.07	10
CO	13.85	3.17	17.02	100
VOC	1.10	0.13	1.23	10
NO _x	0	12.70	12.70	10

* See Attachment 3 for PM exemption determination. PM emissions are filterable only whereas PM10 and PM2.5 are total including condensable emissions.

Permitting Applicability: Since the UER increase of SO₂ and NO_x are above the respective exemption thresholds, the project is subject to Article 6 permitting requirements.

BACT Applicability: If permitting applicability is triggered for a pollutant, then BACT applicability is triggered for that same pollutant and would apply to each affected emissions unit that emits the pollutant. Therefore, since permitting is triggered for SO₂ and NO_x, BACT is also triggered for SO₂ and NO_x. Note that BACT is triggered for both Boiler B1 (replacement boiler) and Boiler B2 (new boiler), even though SO₂ and NO_x emissions from Boiler B1 are below the exempt emission rate.

Example 7: The existing facility (a permitted source) proposes to increase the permitted coating throughput for its spray paint booth. VOC emissions from the spray paint booth are controlled by a carbon adsorber and particulate emissions are controlled by fiberglass filter. The coating contains no regulated HAPs.

Spray Gun Capacity:	15.0 gallons coating/hour
Solids Transfer Efficiency:	50%
VOC Content:	3.0 lbs VOC/gallon
Density of Coating:	8.5 lbs/gallon
Solids Content:	60%
Carbon Adsorber Control:	97%
Fiberglass Filter Control:	95%
Current Permitted Throughput:	15,000 gallons coating/year
Proposed Throughput:	30,000 gallons coating/year

Since the proposed change is a “modification” of an emissions unit at an existing source, this will be considered a “project” under Article 6 (see Table 1, Part 2.D - Modified Emission Units)

Step 1: List all of the emissions units being added, replaced and modified as part of the project.

The only emissions unit affected under this project is the spray paint booth.

Step 2: Delete from the list in Step 1 any emissions units that are individually exempt under 9 VAC 5-80-1105 B.

There are no emissions units exempted under 9 VAC 5-80-1105 B.

Step 3: Calculate the annual UER increase (new uncontrolled emissions minus current uncontrolled emissions) for each regulated pollutant listed in 9 VAC 5-80-1105 D.1 for the affected emissions units determined in Step 2. Use the permit applicability test summarized in Table 1 for determining the annual uncontrolled emission increase for addition, modification and replacement of emissions units.

In this case, the permit applicability test from Table 1 would be Part 2.D - Modified Emissions Units:

$$\text{UER increase} = \text{New Uncontrolled Emissions (NUE)} - \text{Current Uncontrolled Emissions (CUE)}$$

NUE = emissions while operating at MRC at 8760 hrs/yr, without controls (since the requested throughput of 30,000 gallons/year is not yet an enforceable permit limitation)

CUE = emissions while operating at MRC at current throughput limit (i.e., 15,000 gallons/year), without controls

Only emissions of particulate matter and VOC are expected from a spray paint booth. Calculations for each pollutant are shown below.

PM Calculation:

$$\begin{aligned} \text{NUE for PM} &= (15 \text{ gal/hr}) \times (8.5 \text{ lb/gal}) \times (0.6) \times (1-0.5) \times (8760 \text{ hr/yr}) \times (\text{ton PM}/2000 \text{ lb PM}) \\ &= 167.5 \text{ tons PM/year (PM is assumed to be equal to PM10 and PM2.5)} \end{aligned}$$

$$\begin{aligned} \text{CUE for PM} &= (15,000 \text{ gal/yr}) \times (8.5 \text{ PM/gal}) \times (0.6) \times (1-0.5) \times (\text{ton PM}/2000 \text{ lb PM}) \\ &= 19.1 \text{ tons PM/year} \end{aligned}$$

$$\begin{aligned} \text{UER increase for PM} &= \text{NUE} - \text{CUE} = 167.5 \text{ tons/year} - 19.1 \text{ tons/year} \\ &= \mathbf{148.4 \text{ tons PM/year}} \end{aligned}$$

VOC Calculation:

$$\begin{aligned} \text{NUE for VOC} &= (15 \text{ gal/hr}) \times (3.0 \text{ lb VOC/gal}) \times (8760 \text{ hr/yr}) \times (\text{ton VOC}/2000 \text{ lb VOC}) \\ &= 197.1 \text{ tons VOC/year} \end{aligned}$$

$$\begin{aligned} \text{CUE for VOC} &= (15,000 \text{ gal/yr}) \times (3.0 \text{ lb VOC/gal}) \times (\text{ton VOC}/2000 \text{ lb VOC}) \\ &= 22.5 \text{ tons VOC/year} \end{aligned}$$

$$\begin{aligned} \text{UER increase for VOC} &= \text{NUE} - \text{CUE} \\ &= 197.1 \text{ tons/year} - 22.5 \text{ tons/year} \\ &= \mathbf{174.6 \text{ tons VOC/year}} \end{aligned}$$

Step 4: Sum the annual UER increases from the affected emissions units and compare the resulting UER increase with the exempt emission rates for the regulated pollutants listed in 9 VAC 5-80-1105 D.1.

The annual UER increase of the spray paint booth is compared to the exemption levels and summarized in the table below:

Example 7: UER increase for a Project (Modified Emissions Unit)*

Pollutant	NUE (tons/y)	CUE (tons/yr)	UER increase = NUE – CUE (tons/yr)	Exemption Levels (tons/yr)
PM**	167.5	19.1	148.4	15
PM10	167.5	19.1	148.4	10
PM2.5	167.5	19.1	148.4	6
VOC	197.1	22.5	174.6	10

* See Attachment 2 for Source Category Guidance for Spray Booth.

** PM is assumed to be equal to PM10 and PM2.5. See Attachment 3 for PM exemption determination.

Permitting Applicability: Since the UER increase of PM, PM10, PM2.5 and VOC are above the respective exemption thresholds, the project is subject to Article 6 permitting requirements.

BACT Applicability: If permitting applicability is triggered for a pollutant, then BACT applicability is triggered for that same pollutant. Since permitting is triggered for PM, PM10, PM2.5, and VOC, BACT would also be triggered for PM, PM10, PM2.5, and VOC.

Example 8: The existing facility (a permitted source) proposes to decrease the permitted fuel throughput for its boiler (B1). The facility has requested to amend the existing permit to reflect this reduction in fuel throughput.

Boiler B1 (Permitted Unit):	55 MMBtu/hr (No. 2 Distillate Oil at 0.05%S)
Current Permitted Throughput:	2,500,000 gallons/yr
Proposed Throughput:	1,500,000 gallons/yr

Since the only change is the reduction in fuel throughput, this proposal cannot result in an increase in the uncontrolled emission rate for any unit at the facility. There are no modified, added, or replacement units; therefore, there are no affected emissions units. The applicability criteria of 9 VAC 5-80-1100 A are not met and 9 VAC 5-80-1105 is irrelevant.

Permitting Applicability: Since there is no project, the permit is being amended at the request of the owner to reflect the reduction in fuel throughput and corresponding decrease in emission limits.

BACT Applicability: BACT is not applicable as there is no project. However, since this boiler was covered by a NSR permit, the boiler remains subject to BACT for any pollutant previously subject to BACT.

Example 9: The existing facility (a permitted source) proposes to reduce the permitted solids transfer efficiency for its spray paint booth due to new product dimensions. To offset some of this reduction, the facility also proposes to reduce their permitted coating throughput. VOC emissions from the spray paint booth are controlled by a carbon adsorber and particulate emissions are controlled by a fiberglass filter. The coating contains no regulated HAPs.

Spray Gun Capacity:	15.0 gallons coating/hour
VOC Content:	3.0 lbs VOC/gallon
Density of Coating:	8.5 lbs/gallon
Solids Content:	60%
Carbon Adsorber Control:	97%
Fiberglass Filter Control:	95%
Current Permitted Throughput:	15,000 gallons coating/year

Proposed Throughput:	12,000 gallons coating/year
Current Permitted Solids Transfer Efficiency:	90%
Proposed Solids Transfer Efficiency:	60%

Since the proposed change is a “modification” of an emissions unit at an existing source (proposed revision of an existing operating limit that has the potential to increase the UER of at least one emission unit), this will be considered a “project” under Article 6 (see Table 1, Part 2.D - Modified Emission Units)

Step 1: List all of the emissions units being added, replaced and modified as part of the project.

The only emissions unit affected under this project is the spray paint booth.

Step 2: Delete from the list in Step 1 any emissions units that are individually exempt under 9 VAC 5-80-1105 B.

There are no emissions units exempted under 9 VAC 5-80-1105 B.

Step 3: Calculate the annual UER increase (new uncontrolled emissions minus current uncontrolled emissions) for each regulated pollutant listed in 9 VAC 5-80-1105 D.1 for the affected emissions units determined in Step 2. Use the permit applicability test summarized in Table 1 for determining the annual uncontrolled emission increase for addition, modification and replacement of emissions units.

In this case, the permit applicability test from Table 1 would be Part 2.D - Modified Emissions Units:

$$UER\ increase = New\ Uncontrolled\ Emissions\ (NUE) - Current\ Uncontrolled\ Emissions\ (CUE)$$

NUE = emissions while operating at MRC, uncontrolled transfer efficiency (worst-case of 50% for standard coating equipment/product combinations) and at current throughput, without controls (since the requested throughput of 12,000 gallons/year is not yet an enforceable permit limitation and it is unnecessary to remove the current throughput limit to accommodate the new throughput limit)

CUE = emissions while operating at MRC at current throughput limit (i.e., 15,000 gallons/year) and current transfer efficiency limit, without controls

Only emissions of particulate matter and VOC are expected from a spray paint booth. Calculations for each pollutant are shown below.

PM Calculation:

$$NUE\ for\ PM = (15,000\ gal/yr) \times (8.5\ lb/gal) \times (0.6) \times (1-0.5) \times (ton\ PM/2000\ lb\ PM)$$

$$= 19.1 \text{ tons PM/year (PM is assumed to be equal to PM10 and PM2.5)}$$

$$\begin{aligned} \text{CUE for PM} &= (15,000 \text{ gal/yr}) \times (8.5 \text{ lb/gal}) \times (0.6) \times (1-0.9) \times (\text{ton PM}/2000 \text{ lb PM}) \\ &= 3.8 \text{ tons PM/year} \end{aligned}$$

$$\begin{aligned} \text{UER increase for PM} &= \text{NUE} - \text{CUE} \\ &= 19.1 \text{ tons/year} - 3.8 \text{ tons/year} \\ &= \mathbf{15.3 \text{ tons PM/year}} \end{aligned}$$

VOC Calculation:

$$\begin{aligned} \text{NUE for VOC} &= (15,000 \text{ gal/yr}) \times (3.0 \text{ lb VOC/gal}) \times (\text{ton VOC}/2000 \text{ lb VOC}) \\ &= 22.5 \text{ tons VOC/year} \end{aligned}$$

$$\begin{aligned} \text{CUE for VOC} &= (15,000 \text{ gal/yr}) \times (3.0 \text{ lb VOC/gal}) \times (\text{ton VOC}/2000 \text{ lb VOC}) \\ &= 22.5 \text{ tons VOC/year} \end{aligned}$$

$$\begin{aligned} \text{UER increase for VOC} &= \text{NUE} - \text{CUE} \\ &= 22.5 \text{ tons/year} - 22.5 \text{ tons/year} \\ &= \mathbf{0 \text{ tons VOC/year}} \end{aligned}$$

Step 4: Sum the annual UER increases from the affected emissions units and compare the resulting UER increase with the exempt emission rates for the regulated pollutants listed in 9 VAC 5-80-1105 D.1.

The annual UER increase of the spray paint booth is compared to the exemption levels and summarized in the table below:

Example 9: UER increase for a Project (Modified Emissions Unit)*

Pollutant	NUE (tons/y)	CUE (tons/yr)	UER increase = NUE – CUE (tons/yr)	Exemption Levels (tons/yr)
PM**	19.1	3.8	15.3	15
PM10	19.1	3.8	15.3	10
PM2.5	19.1	3.8	15.3	6
VOC	22.5	22.5	0	10

* See Attachment 2 for Source Category Guidance for Spray Booth

**PM is assumed to be equal to PM10 and PM2.5. See Attachment 3 for PM exemption determination

Permitting Applicability: Since the UER increase of PM, PM10 and PM2.5 are above the respective exemption thresholds, the project is subject to Article 6 permitting requirements.

BACT Applicability: If permitting applicability is triggered for a pollutant, then BACT applicability is triggered for that same pollutant. Since permitting is triggered for PM, PM10 and PM2.5, BACT would also be triggered for PM, PM10 and PM2.5.

List of Regulated Pollutants for New Stationary Sources and Projects

The list of Regulated Pollutants for New Stationary Sources and Projects are provided below.

New Stationary Sources

The exemption rates of regulated pollutants for New Stationary Sources (see 9 VAC 5-80-1105 C.1):

Pollutant	Emissions Rate
Carbon Monoxide	100 tpy
Nitrogen Oxides	40 tpy
Sulfur Dioxide	40 tpy
Particulate Matter	25 tpy
Particulate Matter (PM10)	15 tpy
Particulate Matter (PM2.5)	10 tpy
Volatile organic compounds	25 tpy
Lead	0.6 tpy
Fluorides	3 tpy
Sulfuric Acid Mist	6 tpy
Hydrogen Sulfide (H ₂ S)	9 tpy
Total Reduced Sulfur (including H ₂ S)	9 tpy
Reduced Sulfur Compounds (including H ₂ S)	9 tpy
Municipal waste combustor organics (measured as total tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans)	3.5 x 10 ⁻⁶ tpy
Municipal waste combustor metals (measured as particulate matter)	13 tpy
Municipal waste combustor acid gases (measured as the sum of SO ₂ and HCl)	35 tpy
Municipal solid waste landfill emissions (measured as nonmethane organic compounds)	22 tpy

Attachment 1

List of Regulated Pollutants for New Stationary Sources and Projects

Projects

The exemption rates of regulated pollutants for projects (see 9 VAC 5-80-1105 D.1):

Pollutant	Emissions Rate
Carbon Monoxide	100 tpy
Nitrogen Oxides	10 tpy
Sulfur Dioxide	10 tpy
Particulate Matter	15 tpy
Particulate Matter (PM10)	10 tpy
Particulate Matter (PM2.5)	6 tpy
Volatile organic compounds	10 tpy
Lead	0.6 tpy
Fluorides	3 tpy
Sulfuric Acid Mist	6 tpy
Hydrogen Sulfide (H ₂ S)	9 tpy
Total Reduced Sulfur (including H ₂ S)	9 tpy
Reduced Sulfur Compounds (including H ₂ S)	9 tpy
Municipal waste combustor organics (measured as total tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans)	3.5 x 10 ⁻⁶ tpy
Municipal waste combustor metals (measured as particulate matter)	13 tpy
Municipal waste combustor acid gases (measured as the sum of SO ₂ and HCl)	35 tpy
Municipal solid waste landfill emissions (measured as nonmethane organic compounds)	22 tpy

Uncontrolled Emission factors and Source Category Guidance:

When calculating the uncontrolled emission rate of the unit, the following guidance should be used:

- If representative stack test data is available from the unit or from a similar unit (if the unit is not controlled) then the permitting staff may use this emission factor at 8760 hours/year.
- If stack test data is not available, use the worst case emission factor at 8760 hours/year.
- Where the emission factor contains a variable, use the worst case variable.
- If no emission factor is available or you are not sure of the worst case variable and there is an allowable emission rate for the source type in 9 VAC 5 Chapter 40 (Existing Source Rules), use the allowable rate from the appropriate rule.

Following is the specific source category guidelines for uncontrolled emission calculations:

1. Sulfur Content of Fuels for boilers:

Determine sulfur content based on the following guidelines:

- 0.5% sulfur for No. 1 and 2 distillate oil based on the ASTM definition,
- Rule 4-8 (for your region) for No. 4 or higher residual oil and coal, and
- AP-42 emission factors for bio-oils, natural gas, and wood waste.

2. Sulfur Content of Fuels for Generators and Fire Pumps:

- 0.05% sulfur for No. 1 and 2 distillate oil based on the ASTM definition.

3. Spray Booth:

- Maximum gun capacity at 8760 hours/yr (the spray gun nozzle capacity is usually given in volume or mass per time),
- VOC content of the worst case coating proposed (does not need to consider cleaning solvent VOC content),
- Solid content of the worst case coating proposed for calculating PM emissions, and
- Transfer efficiency can be used to calculate uncontrolled emissions for particulate emissions.

Determination of Permitting and BACT exemption for PM:

If the PM emission rate is below the exemption thresholds in 9 VAC 5-80-1105 C or D, respectively, then PM emissions are exempt (i.e., not subject to further review under Article 6 and not subject to BACT under 9 VAC 5-50-260).

If the PM emissions rate is in excess of the applicable 9 VAC 5-80 1105 C or D exemption rate and information is adequate for the staff to determine emissions of either PM10 or PM2.5, exemption for PM will be as follows:

- If both PM10 and PM2.5 can be calculated and both are exempt, PM is exempt.
- If both PM10 and PM2.5 can be calculated, but one (or both) is not exempt, then PM is not exempt.
- If only one of the pollutants PM10 or PM2.5 can be calculated (no information is available for the other) and the one which can be calculated is exempt, PM is exempt.
- If only one of the pollutants PM10 or PM2.5 can be calculated and this pollutant is not exempt then PM is not exempt.

Table 1: Implementing Minor NSR Exemption Criteria & Determining BACT Applicability*
(* This Table does not address minor NSR permit exemptions for toxic pollutants or BACT applicability for toxic pollutants.)

Type of change to Source	Type of Emissions unit Change	Are there Previous Permit Limits on the Unit?	If so, are the Previous Permit Limits being Changed? ⁹	Permit Exemption/ BACT Applicability ¹ (Based on increases in “uncontrolled emission rate” (UER)) ²
1. Emission Increase from Construction of any New Stationary Source (Greenfield Source) (Exemption determination and BACT applicability is based upon the UER of all emissions units proposed for construction.) ³				
Proposed New Stationary Source	New or Relocated Emissions Units	-	-	UER of the New Stationary Source.² UER of a new stationary source is the sum of the UER of the individual affected emission units. ²
2. Emission Changes from Project⁴ (Exemption determination and BACT applicability is based upon the increase in UER of the Project. UER increase of a project is the sum of the UER increases of the individual “affected emissions units” ⁵ . UER increase = New Uncontrolled Emissions (NUE) – Current Uncontrolled Emissions (CUE) . The UER increase of an emission unit cannot be less than zero.)				
Project ⁴	A. Addition of Emissions Units	-	-	(NUE - CUE) of each New or Relocated Unit.² NUE = Maximum Rated Capacity (MRC) at 8760 hrs/yr without controls. CUE = 0 since it is a new unit.
	B. Modified Emissions Units ⁶	No	-	(NUE - CUE) for each Modified Unit.² NUE = MRC at 8760 hrs/yr without controls. CUE = MRC at 8760 hrs/yr without controls.
	C. Modified Emissions Units ⁶	Yes	No	(NUE - CUE) for each Modified Unit.² NUE = MRC at current throughput limit without controls. CUE = MRC at current throughput limit without controls.
	D. Modified Emissions Units ⁶	Yes	Yes	(NUE - CUE) for each Modified Unit.² NUE = MRC at 8760 hrs/yr without controls. CUE = MRC at current throughput limit without controls.
	E. Replacement Emissions Unit ⁷	No ⁸	-	(NUE - CUE) for Replacement Unit.² NUE = MRC at 8760 hrs/yr without controls of the replacement unit. CUE = MRC at 8760 hrs/yr without controls of the unit being replaced.
	F. Replacement Emissions unit ⁷	Yes ⁸	No	(NUE - CUE) for Replacement Unit.² NUE = MRC at current throughput limit without controls of the replacement unit. CUE = MRC at current throughput limit without controls of the unit being replaced.
	G. Replacement Emissions unit ⁷	Yes ⁸	Yes	(NUE - CUE) for Replacement Unit.² NUE = MRC at 8760 hrs/yr without controls of the replacement unit. CUE = MRC at current throughput limit without controls of the unit being replaced.

¹ **Greenfield Source Permit and BACT Applicability** - The “new stationary source” is subject to Article 6 permitting if the source’s UER for any pollutant is equal to or greater than the respective permitting threshold in **9 VAC 5-80-1105 C**. Each emissions unit (except for **9 VAC 5-80-1105 B** listed units) emitting a pollutant subject to permitting shall have BACT applied for that pollutant.

¹ **Project Permit and BACT Applicability** - The “project” is subject to Article 6 permitting if the project’s increase in UER for any pollutant is equal to or greater than the respective permitting threshold in **9 VAC 5-80-1105 D**. Each “affected emissions unit” (except for **9 VAC 5-80-1105 B** listed units) that emits a pollutant subject to permitting shall apply BACT for that pollutant.

² Annual uncontrolled emissions shall be based on the maximum annual rated capacity (based on 8,760 hours of operation per year) of the emissions unit, unless the emissions unit or stationary source is subject to state and federally enforceable permit conditions that limit the annual hours of operation. Enforceable permit conditions on the type or amount of material combusted, stored, or processed may be used in determining the uncontrolled emission rate of an emissions unit or stationary source.

³ Emission units exempted by **9 VAC 5-80-1105 B** shall not be included.

⁴ A project is “any change at an existing stationary source consisting of the addition, replacement or modification of one or more emissions units.” .

⁵ For a project, “affected emissions units” are the added (new and relocated), modified, and replacement units that are part of the project.

⁶ Based on the definition of “modification” in Article 6, a unit must experience a change which causes an increase to its uncontrolled emissions rate (including emission of a pollutant not previously emitted) in order for the unit to qualify as a modified emissions unit. Therefore, if a project includes a physical change or change in the method of operation to a unit but this change does not cause the unit to have an increase in the uncontrolled emissions of any pollutant, this unit is not an “affected emissions unit”, is not part of the “project”, and is not subject to BACT.

⁷ “Replacement” means substitution of an emissions unit for an emission unit located at a stationary source, which will thereafter perform the same function as the replaced emissions unit. Note that this category of unit only covers situations where the entire emissions unit is replaced. Replacement of components of an emissions unit is reviewed to determine if qualifies as a modified unit. Replacement units may be exempted under **9 VAC 5-80-1105 A.2.a**. If a replacement unit is presented as exempt under **9 VAC 5-80-1105 A.2** and meets all the listed criteria for this exemption, such unit is not included in the project summation of UER increase for any project which may be associated with the **9 VAC 5-80-1105 A.2.a**-exempt replacement, as from a regulatory perspective, both the original unit being replaced and the replacement unit are considered one unit.

⁸ This is the permit limits on the unit being replaced.

⁹ For the purpose of calculating NUE, “change” means a proposed revision (increase or decrease) to an existing operating/emission limit that has the potential to result in an increase in the UER of one or more emission units (example: an increase in a throughput limit). For a proposed revision (increase or decrease) to an existing operating/emission limit that does not have the potential to result in an increase in the UER of one or more emission units, the original/unrevised limit should be used when calculating NUE (example: a decrease in a throughput limit). A proposed operating/emission limit (higher or lower) is never utilized to calculate NUE. Any operating/emission limits that are not proposed to be changed would still be considered enforceable limits when calculating NUE.