

December 23, 2022



Submitted Electronically
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Pennsylvania Department of Environmental Protection
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RE: Initial Notification of RACT III Applicability
Title V Operating Permit No. 46-00005
Merck Sharp & Dohme LLC
West Point, Pennsylvania Facility

Dear Mr. Rebarchak:

Merck Sharp and Dohme LLC (Merck) is providing this summary of "Additional RACT Requirements for Major Sources of NO_x and VOCs for the 2015 Ozone NAAQS" (RACT III) applicability for the Merck West Point, Pennsylvania facility (Facility). This submission is in accordance with the provisions of 25 Pa. Code §§129.111-129.115. This document is the required notification of applicability in accordance with 25 Pa. Code §129.115(a). In addition, this document includes the analysis of alternative reasonably available control technology (RACT) compliance required under 25 Pa. Code §129.114(i) for sources at the Facility that were subject to a previous alternative RACT evaluation that was previously approved by the Pennsylvania Department of Environmental Protection (PADEP) under 25 Pa. Code §129.99(e).

Facility Background and RACT III Rule Applicability

The Facility is a research and development (R&D) and pharmaceutical manufacturing facility. The primary operations at the Facility include biological operations, cleaning and disinfecting operations, and R&D. Ancillary or support operations include a powerhouse, which generates steam and electricity, and generators. The Facility operates under Title V Operating Permit (TVOP) No. 46-00005.

PADEP published 25 Pa. Code §§129.111-129.115, "Additional RACT Requirements for Major Sources of NO_x and VOCs for the 2015 Ozone NAAQS" (RACT III). The requirements or emissions limitations under RACT III supersede the requirements or emissions limitations of a RACT permit previously issued in accordance with 25 Pa. Code §§129.91-129.95 and §§129.96-129.100, except in cases where an existing RACT permit specifies more stringent requirements and/or emissions limitations. Compliance with applicable RACT III Rule requirements or emissions limitations must be demonstrated not later than January 1, 2023.

The RACT III Rule applies to major nitrogen oxide (NO_x) and/or major volatile organic compound (VOC) emitting facilities. 25 Pa. Code §121.1 defines major NO_x and VOC emitting facilities as follows:

- Major NO_x emitting facility – a facility-wide NO_x potential to emit (PTE) of greater than 100 tons per year (TPY).
- Major VOC emitting facility – a facility-wide VOC PTE of greater than 50 TPY.

The Facility is both a major NO_x and a major VOC emitting facility under 25 Pa. Code §121.1 and is subject to the NO_x and VOC provisions of RACT III in accordance with 25 Pa. Code §129.111(a). This notification is being made in accordance with the requirements of the RACT III Rule for the Facility's NO_x and VOC emitting sources.

Notification of Applicability and Compliance Proposal [25 Pa. Code §129.115(a)]

The following subsections provide the notification of applicability and compliance proposal required under 25 Pa. Code §129.115(a).

25 Pa. Code §129.115(a)(1) – Submission Deadline

Because the Facility was a major NO_x and VOC emitting facility prior to August 3, 2018, this submittal is being made on or before December 31, 2022, in accordance with 25 Pa. Code §129.115(a)(1)(i).

25 Pa. Code §129.115(a)(2) – Identification of Air Contamination Sources That Commenced Operation on or Before August 3, 2018

Table A-1 of Attachment A provides the RACT III Rule Applicability Summary, which identifies the following:

- Air contamination sources that are exempt from 25 Pa. Code §§129.112-129.114 because they are already subject to certain Chapter 129 RACT requirements [i.e., §§129.51, 129.52(a)-(k) and Table I categories 1-11, 129.52a-129.52e, 129.54-129.63a, 129.64-129.69, 129.71-129.75, 129.77, and 129.101-129.107].
- Air contamination sources subject to a presumptive RACT requirement or RACT emissions limitation in 25 Pa. Code §129.112.
- Air contamination sources subject to an alternative RACT requirement or RACT emissions limitation under 25 Pa. Code §129.114.

25 Pa. Code §129.115(a)(3) – Identification of Air Contamination Sources That Commenced Operation After August 3, 2018

Not Applicable (N/A) – the Facility was considered a major NO_x and VOC emitting facility prior to August 3, 2018. Therefore, 25 Pa. Code §129.111(b) does not apply. Those air contamination sources exempted from 25 Pa. Code §§129.112-129.114 because the individual source did not commence operation until after the RACT III Rule applicability date of August 3, 2018 are identified in Table A-1 of Attachment A.

25 Pa. Code §129.115(a)(4) – Identification of Air Contamination Sources That Emit Less Than 1 TPY

Table A-1 of Attachment A identifies the Facility's air contamination sources that are exempt from the RACT III Rule on the basis that they have a PTE less than 1 TPY of NO_x and/or VOC.

25 Pa. Code §129.115(a)(5) – Air Contamination Source Information (Commenced Operation on or Before August 3, 2018)

Table A-1 of Attachment A provides a Source Inventory that contains a description, including make, model, and location (as available) of each air contamination source subject to the RACT III Rule. The applicable RACT requirement or RACT emissions limitation for each source is provided in the RACT III Rule Applicability Summary as Table A-1 of Attachment A.

25 Pa. Code §129.115(a)(6) – Air Contamination Source Information (Commenced Operation After August 3, 2018)

N/A – because the Facility was considered a major NO_x and VOC emitting facility prior to August 3, 2018, 25 Pa. Code §129.115(a)(6) does not apply.

25 Pa. Code §129.115(a)(7) – Air Contamination Source Information (That Emit Less Than 1 TPY)

Table A-1 of Attachment A provides a Source Inventory that contains a description, including make, model, and location (as available) of each air contamination subject to the RACT III Rule. Table A-2 includes information sufficient to demonstrate that the listed sources have a PTE less than 1 TPY of NO_x or 1 TPY of VOC, as applicable.

25 Pa. Code §129.114(a), (b), or (c) – Alternative RACT Proposal

Merck has identified Source ID 754 [Building 70A-1 Generator (Peak)] as a source that requires an alternative RACT requirements or emissions limitations and proposed RACT for control of NO_x emissions. Source ID 754 is exempt from RACT requirements for VOC because potential VOC emissions are less than 1 TPY. For this source, Merck will submit an Alternative RACT proposal to PADEP presenting the case-by-case RACT analysis and the proposed alternative RACT requirements in accordance with 25 Pa. Code §129.114(d). The alternative proposal will be submitted as a significant operating permit modification application in accordance with 25 Pa. Code §129.114(f), under separate cover.

25 Pa. Code §129.114(i) – Analysis of Alternative RACT Compliance

Several sources at the Facility each require alternative RACT determinations and proposed RACT requirements or emissions limitations for control of NO_x or VOC emissions in accordance with 25 Pa Code §129.114(b) or (c) because they do not fall into a presumptive RACT category included in 25 Pa. Code §129.112. The affected sources were in operation prior to October 24, 2016, have not been modified or changed since October 24, 2016, and are not subject to presumptive RACT emissions limits under 25 Pa. Code §§129.112(c)(11) or (i)-(k). Merck is therefore submitting an analysis to demonstrate that compliance with the alternative RACT requirement or limitation previously approved by PADEP under 25 Pa Code §129.99(e) in place of a case-by-case analysis under 25 Pa Code §129.114(d). This submittal assures compliance with the provisions in subsections (a) - (c) and (e) - (h), under 25 Pa Code §129.114(i). The affected sources include:

- 033: Erie City Boiler 3
- 035: Keeler Boiler 5
- Disinfecting Operations (Source IDs 105: Biological Manufacturing, 107: Building 12, 108: Building 66, and 111: Building 62)
- Research and Development Activities

The following subsections provide the analysis of alternative RACT compliance in accordance with 25 Pa. Code §129.114(i)(1)(i).

25 Pa. Code §129.114(i)(1)(i)(A) – Identification of New Air Cleaning Devices, Air Pollution Control Technologies, or Techniques

Merck reviewed entries in the RACT/BACT/LAER Clearinghouse (RBLC) to determine if any new technologies were applicable to the units onsite. No new technically feasible technologies were discovered and the work practices for the affected unit are consistent with RBLC determinations.

25 Pa. Code §129.114(i)(1)(i)(B) – List Previously-Identified Technically Feasible Controls

The previously identified technically feasible controls identified and evaluated under 25 Pa. Code §§129.92(b)(1)-(3) that were included in Merck's 25 Pa. Code §129.99(d) RACT submittal, previously approved by PADEP, were as follows:

033: Erie City Boiler 3

Merck identified the following controls as technically feasible options:

- Good air pollution control practices
- Selective catalytic reduction
- Low-NO_x burners
- Ultra low-NO_x burners
- Flue gas recirculation

035: Keeler Boiler

Merck identified the following controls as technically feasible options for the Keeler Boiler:

- Good air pollution control practices
- Selective catalytic reduction
- Low-NO_x burners
- Ultra low-NO_x burners
- Flue gas recirculation

Disinfecting Operations (Source IDs 105: Biological Manufacturing, 107: Building 12, 108: Building 66, and 111: Building 62)

Merck identified the following controls to be technically feasible for Disinfecting Operations:

- Good air pollution control practices
- Thermal and catalytic oxidation
- VOC concentrator with thermal oxidation
- Carbon adsorption
- Wet scrubber

Research and Development Activities

Merck identified good air pollution control practices as the only technically feasible control option for Research and Development Activities.

25 Pa. Code §129.114(i)(1)(i)(C) – Summary of Previous Economic Feasibility Analyses

Merck considered the control technologies of the above-mentioned options and summarized the results of the previous control cost analyses.

**Table 1
 Summary of Technically Feasible Control Options Considered for Economic Feasibility**

Source	Technically Feasible Control Options	Economic Feasibility Cost Analysis Result
033: Erie City Boiler 3	Good Air Pollution Control Practices	Already in Use
	Selective Catalytic Reduction (SCR)	Economically Infeasible (\$14,623/ton NO _x removed)
	Low-NO _x Burners	Already Installed
	Ultra Low-NO _x Burners	Economically Infeasible (\$16,286/ton NO _x removed)
	Flue Gas Recirculation (FGR)	Economically Infeasible (\$7,253/ton NO _x removed)
035: Keeler Boiler 5	Good Air Pollution Control Practices	Already In Use
	SCR	Economically Infeasible (\$9,435/ton NO _x removed)
	Low-NO _x Burners	Already Installed
	Ultra Low-NO _x Burners	Economically Infeasible (\$9,563/ton NO _x removed)
	FGR	Economically Infeasible (\$9,483/ton NO _x removed)
Disinfecting Operations 105: Biological Manufacturing 107: Building 12 108: Building 66 111: Building 62	Good Air Pollution Control Practices	Already in Use
	Thermal Oxidization	Economically Infeasible (\$191,080/ton VOC removed)
	Catalytic Oxidization	Economically Infeasible (\$573,540/ton VOC removed)
	VOC Concentrator With Thermal Oxidation	Economically Infeasible (\$95,850/ton VOC removed)
	Carbon Adsorption	Economically Infeasible (\$532,580/ton VOC removed)
	Wet Scrubber	Economically Infeasible (\$469,180/ton VOC removed)
Research and Development Activities	Good Air Pollution Control Practices	Already in Use

25 Pa. Code §129.114(i)(1)(i)(D) – Statement of Economic Infeasibility

The summary of each economic feasibility analysis summarized above in Table 1 demonstrates that the cost effectiveness remains equal to or greater than the amounts of \$7,500 per ton of NO_x emissions reduced or \$12,000 per ton of VOC emissions reduced. The one exception is for the FGR control cost analysis for Erie City Boiler 3 (Source ID 033), which has been updated to reflect current prices in accordance with 25 Pa. Code §129.114(i)(1)(ii)(E). The updated control cost analysis for the Erie City Boiler 3 (Source ID 033) is included in Attachment B. The remainder of the information required by 25 Pa. Code §129.114(i)(1)(ii) has been addressed in the other sections of this letter addressing 25 Pa. Code §129.114(i)(1) and is not repeated.

033: Erie City Boiler 3

Merck considered SCR, ultra-low NO_x burners, and FGR as control options for this source, but each option was concluded to be economically infeasible. SCR and ultra-low NO_x burners were shown to be economically infeasible control options based on the previous analyses summarized in Table 1, while an updated control cost analysis was completed for FGR which is included in Table B-1 of Attachment B per 25 Pa. Code §129.114(i)(1)(ii). Low-NO_x burners are already installed and are in operation for this source. Good air pollution control practices represent RACT.

035: Keeler Boiler

Merck considered SCR, ultra-low NO_x burners, and FGR as control options for this source, but each option was concluded to be economically infeasible. Low-NO_x burners are already installed and are in operation for this source. Good air pollution control practices represent RACT.

Disinfecting Operations

Merck identified thermal and catalytic oxidation, VOC concentrator with thermal oxidation, carbon adsorption, and wet adsorption to be economically infeasible for these sources. Good air pollution control practices represent RACT for these sources.

Research and Development Activities

Merck identified good air pollution control practices as a technically and economically feasible control option and represents RACT for these sources.

25 Pa. Code §129.114(i)(1)(i)(E) – Additional Information

Upon request from PADEP, Merck will provide additional information to support the Alternative RACT Compliance Analysis included herein.

RACT III Rule Compliance and Recordkeeping

In accordance with 25 Pa. Code §129.115(f), Merck will keep sufficient records for demonstrating compliance with the RACT III Rule, including continued compliance with the RACT-specific recordkeeping conditions of the current TVOP. In accordance with 25 Pa. Code §129.115(k), all records will be maintained for at least five years, and will be made available to PADEP upon receipt of a written request.

For Boiler 7 (Source ID 041), Boiler 8 (Source ID 042), and Boiler 10 (Source ID 045), compliance with the NO_x emissions limit will be demonstrated using the existing continuous emissions monitoring system (CEMS). For sources identified in Table A-1 subject to a presumptive RACT numerical emissions limit, without a NO_x CEMS, Merck will continue to comply with an emissions source test on the existing RACT II schedule established. For the other sources

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within Table A-1 subject to RACT III requirements, the work practice standards and compliance actions will be completed in accordance with the RACT III rule as applicable.

For purposes of RACT, where Merck is required to maintain and operate the engines in accordance with manufacturer's specifications and good operating practices, Merck intends to comply with the requirement by either following manufacturer's specifications as applicable or following Merck's established generator preventative maintenance program.

If you have any additional questions, please contact Purva Prabhu at (215) 652-2783 or me at (215) 652-6459.

Sincerely,



Kinnari Patel
Director, West Point Safety & Environment

cc: D. O'Toole, Associate Vice President, GWES PA Operations (Merck)

Enclosures

**ATTACHMENT A –
SUPPORTING RACT III SUMMARY TABLES**

Table A-1
RACT III Rule Applicability Summary
Merck Sharp & Dohme LLC - West Point, PA

Source ID	Source Name	Make	Model	Location	Subject to RACT II?	NO _x RACT	RACT III Rule Reference	VOC RACT	RACT III Rule Reference
033	Erie City Boiler 3	Erie City	NB 16289	Building 2	Yes	Alternative; Analysis of a previously approved alternative RACT requirement or RACT emission limitation approved by the Department under 25 Pa. Code 129.99(e). Refer to the notification narrative for additional information.	25 Pa. Code §129.114(a) and (i)	Presumptive (unspecified combustion unit); Maintain and operate the source in accordance with manufacturer's specifications and good operating practices.	25 Pa. Code §129.112(d)
035	Keeler Boiler 5	Keeler	DS-10-20	Building 2	Yes	Alternative; Analysis of a previously approved alternative RACT requirement or RACT emission limitation approved by the Department under 25 Pa. Code 129.99(e). Refer to the notification narrative for additional information.	25 Pa. Code §129.114(a) and (i)	Presumptive (unspecified combustion unit); Maintain and operate the source in accordance with manufacturer's specifications and good operating practices.	25 Pa. Code §129.112(d)
041	Babcock Wilcox Boiler 7	Babcock & Wilcox	FM 120-97	Building 2	Yes	Presumptive (natural gas-fired/distillate oil-fired combustion unit/process heater >50 MMBtu/hr); 0.10 lb/MMBtu (when firing natural gas) calculated using a daily average 0.12 lb/MMBtu (when firing fuel oil) calculated using a daily average	25 Pa. Code §129.112(g)(1)(i-ii) and §129.115(b)(4)	Presumptive (unspecified combustion unit); Maintain and operate the source in accordance with manufacturer's specifications and good operating practices.	25 Pa. Code §129.112(d)
042	ABCO Boiler 8	ABCO Industries	Type D Water Tube	Building 2	Yes	Presumptive (natural gas-fired/distillate oil-fired combustion unit/process heater >50 MMBtu/hr); 0.10 lb/MMBtu (when firing natural gas) calculated using a daily average 0.12 lb/MMBtu (when firing fuel oil) calculated using a daily average	25 Pa. Code §129.112(g)(1)(i-ii) and §129.115(b)(4)	Presumptive (unspecified combustion unit); Maintain and operate the source in accordance with manufacturer's specifications and good operating practices.	25 Pa. Code §129.112(d)
045	Boiler 10	Alstom	Type D Water Tube	Building 2	Yes	Presumptive (natural gas-fired/distillate oil-fired combustion unit/process heater >50 MMBtu/hr); 0.10 lb/MMBtu (when firing natural gas) calculated using a daily average 0.12 lb/MMBtu (when firing fuel oil) calculated using a daily average	25 Pa. Code §129.112(g)(1)(i-ii) and §129.115(b)(4)	Presumptive (unspecified combustion unit); Maintain and operate the source in accordance with manufacturer's specifications and good operating practices.	25 Pa. Code §129.112(d)
039	Cogen II Gas Turbine	General Electric	Frame 5	Building 2	Yes	Presumptive (combined cycle/combined heat and power combustion turbine =>4,100 bhp and <180 MW); 42.0 ppmvd @ 15% O ₂ 30-day rolling average	25 Pa. Code §129.112(g)(2)(ii)(A)	Presumptive (combined cycle/combined heat and power combustion turbine =>4,100 bhp and <180 MW); 5.0 ppmvd @ 15% O ₂	25 Pa. Code §129.112(g)(2)(ii)(B)
043	Cogen III Gas Turbine	General Electric	Frame 6	Building 2	Yes	Presumptive (combined cycle/combined heat and power combustion turbine =>4,100 bhp and <180 MW); 42.0 ppmvd @ 15% O ₂ 30-day rolling average	25 Pa. Code §129.112(g)(2)(ii)(A)	Presumptive (combined cycle/combined heat and power combustion turbine =>4,100 bhp and <180 MW); 5.0 ppmvd @ 15% O ₂	25 Pa. Code §129.112(g)(2)(ii)(B)
105	Biological Manufacturing	<i>Disinfecting Operations:</i> Not Applicable (N/A) <i>Shell Freezers:</i> Merck	<i>Disinfecting Operations:</i> N/A <i>Shell Freezers:</i> Custom	<i>Disinfecting Operations:</i> Buildings 28, 29, 65, and 76 <i>Shell Freezers:</i> Buildings 28, 62, 66	Yes	Not Applicable (N/A) - There are no NO _x emissions from this source.	N/A	<i>Disinfecting Operations</i> - Alternative; Analysis of a previously approved alternative RACT requirement or RACT emission limitation approved by the Department under 25 Pa. Code 129.99(e). Refer to the notification narrative for additional information. <i>Shell Freezers</i> - Presumptive (VOC PTE is <2.7 tpy); Maintain and operate the shell freezers in accordance with manufacturer's specifications and good operating practices.	<i>Disinfecting Operations</i> - §129.114(c) <i>Shell Freezers</i> - §129.112(c)(2)
107	Building 12	N/A	N/A	Building 12	Yes	N/A - There are no NO _x emissions from this source.	N/A	Alternative; Analysis of a previously approved alternative RACT requirement or RACT emission limitation approved by the Department under 25 Pa. Code 129.99(e). Refer to the notification narrative for additional information.	25 Pa. Code §129.114(c) and (i)
108	Building 66	N/A	N/A	Building 66	Yes	N/A - There are no NO _x emissions from this source.	N/A	Alternative; Analysis of a previously approved alternative RACT requirement or RACT emission limitation approved by the Department under 25 Pa. Code 129.99(e). Refer to the notification narrative for additional information.	25 Pa. Code §129.114(c) and (i)
111	Building 62	N/A	N/A	Building 62	Yes	N/A - There are no NO _x emissions from this source.	N/A	Alternative; Analysis of a previously approved alternative RACT requirement or RACT emission limitation approved by the Department under 25 Pa. Code 129.99(e). Refer to the notification narrative for additional information.	25 Pa. Code §129.114(c) and (i)
112	Building 38 Disinfection Operations	N/A	N/A	Building 38	No	Exempt from the RACT III Rule because this source did not commence operation on or before August 3, 2018. Therefore, it does not meet the applicability criteria of 25 Pa. Code §129.111 and no RACT III requirements apply.	25 Pa. Code §129.111(a)	Exempt from the RACT III Rule because this source did not commence operation on or before August 3, 2018. Therefore, it does not meet the applicability criteria of 25 Pa. Code §129.111 and no RACT III requirements apply.	25 Pa. Code §129.111(a)
150	Emergency Generators (Installed btw 1997 and 1999) (36-A-1)	ONAN	100.0ENBA	Building 36A	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
150	Emergency Generators (Installed btw 1997 and 1999) (92-1)	ONAN	35 EK	Building 92	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
150	Emergency Generators (Installed btw 1997 and 1999) (62-3)	ONAN	150 GGKD 3372325	Building 62	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
150	Emergency Generators (Installed btw 1997 and 1999) (14-1)	CUMMINS	150.0GTA8.3 GS	Building 14	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)

**Table A-1
RACT III Rule Applicability Summary
Merck Sharp & Dohme LLC - West Point, PA**

Source ID	Source Name	Make	Model	Location	Subject to RACT II?	NO _x RACT	RACT III Rule Reference	VOC RACT	RACT III Rule Reference
152	Exempt Diesel Generator (NSPS IIII)	DQFAA-7526156	DQFAA	Building 28	No ^(b)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
153	Exempt NG Generators (NSPS JJJJ) (69-3)	Cummins	350GFEB	Building 69	No ^(b)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
153	Exempt NG Generators (NSPS JJJJ) (75C-2)	MTU Marathon Electric	10V0068 GS100	Building 75C	No ^(b)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
378	Misc. VOC Sources	AUR ^(c)	AUR ^(c)	AUR ^(c)	Yes	N/A - There are no NO _x emissions from this source.	N/A	Presumptive (VOC PTE is <2.7 tpy); Maintain and operate the source in accordance with manufacturer's specifications and good operating practices.	25 Pa. Code §129.112(c)(2)
	Diesel Fire Pump	AUR ^(c)	AUR ^(c)	Building 6	Yes ^(d)	Presumptive (an emergency standby engine operating less than 500 hours in a 12-month rolling period); Maintain and operate the source in accordance with manufacturer's specifications and good operating practices.	25 Pa. Code §129.112(c)(10)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
380	4 Shell Freezers Bldg 12/12A	Merck	Custom	Building 12/12A	Yes	N/A - There are no NO _x emissions from this source.	N/A	Presumptive (VOC PTE is <2.7 tpy); Maintain and operate the source in accordance with manufacturer's specifications and good operating practices.	25 Pa. Code §129.112(c)(2)
381	Bldg 12-1 Natural Gas Emergency Generator	Caterpillar	AUR ^(c)	Building 12	No	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
383	Refrigerated Trailer IC Engines	AUR ^(c)	AUR ^(c)	AUR ^(c)	No	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
732	Bldg 81 Generators (81-1) (Peak)	Caterpillar	SR4B (Engine: G3516B LE)	Building 81	Yes	Presumptive (lean burn stationary internal combustion engine =>500 bhp and <3,500 bhp); 3.0 g/bhp-hr	25 Pa. Code §129.112(g)(3)(i)(A)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
732	Bldg 81 Generators (81-2) (Peak)	Caterpillar	SR4B (Engine: G3516B LE)	Building 81	Yes	Presumptive (lean burn stationary internal combustion engine =>500 bhp and <3,500 bhp); 3.0 g/bhp-hr	25 Pa. Code §129.112(g)(3)(i)(A)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
733	Mobile Generator-1 (1,500 kW)	Caterpillar	PM3512C	Various	Yes	Presumptive (an emergency standby engine operating less than 500 hours in a 12-month rolling period); Maintain and operate the source in accordance with manufacturer's specifications and good operating practices.	25 Pa. Code §129.112(c)(10)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
734	Mobile Generator-2 (750 kW)	Caterpillar	3412	Various	Yes	Presumptive (an emergency standby engine operating less than 500 hours in a 12-month rolling period); Maintain and operate the source in accordance with manufacturer's specifications and good operating practices.	25 Pa. Code §129.112(c)(10)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
735	Bldg 44-E Generator	Stamford (Engine: Cummins)	HC153401L (Engine: GTA28)	Building 44	No	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
736	Bldg 82-1 Generator	Caterpillar	SR4 (Engine: G3406)	Building 82	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
737	Bldg 33-1 Generator	GM (Engine: EMD)	GM20-6435-E4 (Engine: A-20-C2)	Building 33	Yes	Presumptive (an emergency standby engine operating less than 500 hours in a 12-month rolling period); Maintain and operate the source in accordance with manufacturer's specifications and good operating practices.	25 Pa. Code §129.112(c)(10)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
738	Bldg 24-2 Generator	Caterpillar (Engine: Ransome)	G3412LE	Building 24	No	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
740	Bldg 16-1 Generator	N/A	N/A	N/A	Yes	N/A - Removed from site	N/A	N/A - Removed from site	N/A
741	Bldg 56-2 Generator	N/A	N/A	N/A	No	N/A - Removed from site	N/A	N/A - Removed from site	N/A

**Table A-1
RACT III Rule Applicability Summary
Merck Sharp & Dohme LLC - West Point, PA**

Source ID	Source Name	Make	Model	Location	Subject to RACT II?	NO _x RACT	RACT III Rule Reference	VOC RACT	RACT III Rule Reference
744	Bldg 78-1 Generator ^(e)	Caterpillar	SR4 (Engine: 3516)	Building 78	Yes	Presumptive (an emergency standby engine operating less than 500 hours in a 12-month rolling period); Maintain and operate the source in accordance with manufacturer's specifications and good operating practices.	25 Pa. Code §129.112(c)(10)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
745	No. 2 Fuel Oil Generators (1-1)	N/A	N/A	N/A	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
745	No. 2 Fuel Oil Generators (33-2)	N/A	N/A	N/A	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
745	No. 2 Fuel Oil Generators (37-1)	N/A	N/A	N/A	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
745	No. 2 Fuel Oil Generators (39-1)	N/A	N/A	N/A	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
745	No. 2 Fuel Oil Generators (45-1)	N/A	N/A	N/A	Yes	Presumptive (an emergency standby engine operating less than 500 hours in a 12-month rolling period); Maintain and operate the source in accordance with manufacturer's specifications and good operating practices.	25 Pa. Code §129.112(c)(10)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
745	No. 2 Fuel Oil Generators (61-1)	N/A	N/A	N/A	Yes	N/A - Removed from site	N/A	N/A - Removed from site	N/A
746	Propane Generators (2-1)	ONAN	12.5 JC-4R31	Building 2	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
746	Propane Generators (20-1)	KOHLER	20R82	Building 20	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
746	Propane Generators (35-2)	ONAN	35 EK	Building 35	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
747	Natural Gas Generators (28-1)	ONAN	75.0 KR-15R31	Building 28	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
747	Natural Gas Generators (44-3)	STAMFORD	UC1274f16	Building 44	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
747	Natural Gas Generators (53A-1)	CUMMINS	GTA250	Building 53A	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
747	Natural Gas Generators (65-1)	KOHLER	225R88	Building 65	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
748	Bldg 17-1 Generator (Peak)	Caterpillar	G3516-LE	Building 17	Yes	Presumptive (lean burn stationary internal combustion engine =>500 bhp and <3,500 bhp); 3.0 g/bhp-hr	25 Pa. Code §129.112(g)(3)(i)(A)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
749	VOC Storage Tanks	AUR ^(e)	AUR ^(e)	AUR ^(e)	No	N/A - There are no NO _x emissions from this source.	N/A	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
750	Post RACT Site NO _x & VOC Sources (Bldg 81 Stationary Water Utilities Pump)	Godwin/John Deere	4045DF270B	Building 81	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
750A	Portable Godwin Pumps (20.4 hp)	Godwin/Yanmar	3TNV88F-UGGE	Various	No	Exempt from the RACT III Rule because this source did not commence operation on or before August 3, 2018. Therefore, it does not meet the applicability criteria of 25 Pa. Code §129.111 and no RACT III requirements apply.	25 Pa. Code §129.111(a)	Exempt from the RACT III Rule because this source did not commence operation on or before August 3, 2018. Therefore, it does not meet the applicability criteria of 25 Pa. Code §129.111 and no RACT III requirements apply.	25 Pa. Code §129.111(a)

**Table A-1
RACT III Rule Applicability Summary
Merck Sharp & Dohme LLC - West Point, PA**

Source ID	Source Name	Make	Model	Location	Subject to RACT II?	NO _x RACT	RACT III Rule Reference	VOC RACT	RACT III Rule Reference
750A	Portable Godwin Pumps (62 hp)	Godwin/Isuzu	FT4 4LE2X	Various	No	Exempt from the RACT III Rule because this source did not commence operation on or before August 3, 2018. Therefore, it does not meet the applicability criteria of 25 Pa. Code §129.111 and no RACT III requirements apply.	25 Pa. Code §129.111(a)	Exempt from the RACT III Rule because this source did not commence operation on or before August 3, 2018. Therefore, it does not meet the applicability criteria of 25 Pa. Code §129.111 and no RACT III requirements apply.	25 Pa. Code §129.111(a)
751	Bldg 29-3 Generator	Caterpillar	3516B	Building 29	Yes	Presumptive (an emergency standby engine operating less than 500 hours in a 12-month rolling period); Maintain and operate the source in accordance with manufacturer's specifications and good operating practices.	25 Pa. Code §129.112(e)(10)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
752	Parts Cleaners	AUR ^(c)	AUR ^(c)	AUR ^(c)	No	N/A - There are no NO _x emissions from this source.	N/A	Exempt from the RACT III Rule because the source is subject to §129.63.	25 Pa. Code §129.111(a)
753	Bldg 66-1 Generator	Caterpillar	3512C	Building 66	Yes	Presumptive (an emergency standby engine operating less than 500 hours in a 12-month rolling period); Maintain and operate the source in accordance with manufacturer's specifications and good operating practices.	25 Pa. Code §129.112(e)(10)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
754	Bldg 70A-1 Generator (Peak)	Caterpillar	SR5 (Engine: C32)	Building 70A	Yes	Alternative; Case-by-Case RACT analysis required because the source is subject to a presumptive NO _x emissions limitation or requirement under §129.112(g)(3)(iii); however, potential NO _x emissions are >1.6 g/bhp-hr. An alternative analysis was not previously approved for the source.	25 Pa. Code §129.114(a)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
755	Bldg 75B-1 Generator	Caterpillar	SR4B (Engine: G3406TA)	Building 75B	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
756	Misc. Subpart ZZZZ Propane Generators (5-1)	ONAN	GGHE-4956969	Building 5	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
756	Misc. Subpart ZZZZ Propane Generators (21-1)	ONAN	GGFE556600	Building 21	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
758	Misc. Subpart ZZZZ NG Gens (36-1)	CUMMINS	125GGLA5869056	Building 36	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
758	Misc. Subpart ZZZZ NG Gens (38-6)	CUMMINS	800 GFLB	Building 38	Yes	Presumptive (an emergency standby engine operating less than 500 hours in a 12-month rolling period); Maintain and operate the source in accordance with manufacturer's specifications and good operating practices.	25 Pa. Code §129.112(e)(10)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
758	Misc. Subpart ZZZZ NG Gens (10-1)	CATERPILLAR	SR4	Building 10	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
758	Misc. Subpart ZZZZ NG Gens (01-3)	KATOLIGHT	N325FRZ4	Building 01	Yes	Presumptive (an emergency standby engine operating less than 500 hours in a 12-month rolling period); Maintain and operate the source in accordance with manufacturer's specifications and good operating practices.	25 Pa. Code §129.112(e)(10)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
758	Misc. Subpart ZZZZ NG Gens (56-3)	ONAN	GGFE5005477	Building 56	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
759	Bldg 95-2 Generator	Caterpillar	D50P2 (Engine: 1004TG)	Building 95	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
761	Mobile Central Utilities Pump (23.9 HP)	Godwin (Engine: Yanmar)	CD80D (Engine: 3TNV76)	Various	Yes ^(a)	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
762	Mobile Generator-7	N/A	N/A	N/A	Yes	N/A - Removed from site	N/A	N/A - Removed from site	N/A
763	Northeast Generator (Peak)	Caterpillar	G3516C	Various	No	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
764	Southeast Generator (Peak)	Caterpillar	G3516C	Various	No	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)

**Table A-1
RACT III Rule Applicability Summary
Merck Sharp & Dohme LLC - West Point, PA**

Source ID	Source Name	Make	Model	Location	Subject to RACT II?	NO _x RACT	RACT III Rule Reference	VOC RACT	RACT III Rule Reference
765	B29-4 Generator	Caterpillar	G3516C	Building 29	No	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
766	B62-4 Generator	Caterpillar	G3516B	Building 62	No	Exempt from the RACT III Rule because potential NO _x emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)	Exempt from the RACT III Rule because potential VOC emissions are < 1.0 tpy.	25 Pa. Code §129.111(c)
767	B38 Generator	Caterpillar	G3512	Building 38	No	Exempt from the RACT III Rule because this source did not commence operation on or before August 3, 2018. Therefore, it does not meet the applicability criteria of 25 Pa. Code §129.111 and no RACT III requirements apply.	25 Pa. Code §129.111(a)	Exempt from the RACT III Rule because this source did not commence operation on or before August 3, 2018. Therefore, it does not meet the applicability criteria of 25 Pa. Code §129.111 and no RACT III requirements apply.	25 Pa. Code §129.111(a)
768	B46-2 Generator	Caterpillar	G3512	Building 46	No	Exempt from the RACT III Rule because this source did not commence operation on or before August 3, 2018. Therefore, it does not meet the applicability criteria of 25 Pa. Code §129.111 and no RACT III requirements apply.	25 Pa. Code §129.111(a)	Exempt from the RACT III Rule because this source did not commence operation on or before August 3, 2018. Therefore, it does not meet the applicability criteria of 25 Pa. Code §129.111 and no RACT III requirements apply.	25 Pa. Code §129.111(a)
775	Temporary Engines - Caterpillar Engine (480 hp)	Caterpillar	AUR ^(c)	AUR ^(c)	No	Exempt from the RACT III Rule because this source did not commence operation on or before August 3, 2018. Therefore, it does not meet the applicability criteria of 25 Pa. Code §129.111 and no RACT III requirements apply.	25 Pa. Code §129.111(a)	Exempt from the RACT III Rule because this source did not commence operation on or before August 3, 2018. Therefore, it does not meet the applicability criteria of 25 Pa. Code §129.111 and no RACT III requirements apply.	25 Pa. Code §129.111(a)
775	Temporary Engines - MTU Engine, Crane (525 hp)	N/A	N/A	N/A	No	N/A - Removed from site	N/A	N/A - Removed from site	N/A
775	Temporary Engines - Isuzu Engine (35 hp)	N/A	N/A	N/A	No	N/A - Removed from site	N/A	N/A - Removed from site	N/A
N/A	Research & Development Activities	N/A	N/A	Various Research & Development Buildings	Yes	N/A - There are no NO _x emissions from this source.	N/A	Alternative; Analysis of a previously approved alternative RACT requirement or RACT emission limitation approved by the Department under 25 Pa. Code 129.99(e). Refer to the notification narrative for additional information.	25 Pa. Code §129.114(c) and (i)
770	B60-2 Generator	Caterpillar	G3516B	Building 60	No	Exempt from the RACT III Rule because this source did not commence operation on or before August 3, 2018. Therefore, it does not meet the applicability criteria of 25 Pa. Code §129.111 and no RACT III requirements apply.	25 Pa. Code §129.111(a)	Exempt from the RACT III Rule because this source did not commence operation on or before August 3, 2018. Therefore, it does not meet the applicability criteria of 25 Pa. Code §129.111 and no RACT III requirements apply.	25 Pa. Code §129.111(a)

^(a) This source was previously identified as a RACT II affected source. However, potential NO_x and VOC emissions from this source are less than 1 tpy. Please refer to Table A-2 for the potential emissions calculations.

^(b) Source was installed after the RACT II applicability date (i.e., July 20, 2012).

^(c) Information can be made available upon request (AUR).

^(d) The diesel fire pump was previously evaluated under Source ID 378 (Misc. VOC Sources) which was subject to presumptive requirements under RACT II.

^(e) Generator 78-1 has been deactivated as of 12/20/2022 and will be removed from the site in 2023.

Table A-2
RACT III List of Exempt Sources
Merck Sharp & Dohme LLC - West Point, PA

Source ID	Source Name	Rating/Throughput	Rating/Throughput Units	Annual Operating Hours	NO _x Permitted Limit/ Emissions Factor	NO _x Permitted Limit/ Emissions Factor Units	VOC Permitted Limit/ Emissions Factor	VOC Permitted Limit/ Emissions Factor Units	NO _x PTE (tpy)	VOC PTE (tpy)	Basis of Emissions Factor/PTE Notes
150	Emergency Generators (Installed btw 1997 and 1999) (36-A-1)	1.5	MMBtu/hr	100	4.08	lb/MMBtu ^(a)	0.118	lb/MMBtu ^(a)	0.3	8.9E-03	Rating and operating hours restriction from TVOP No. 46-00005, Section D., Source ID 150, Condition #013.
150	Emergency Generators (Installed btw 1997 and 1999) (92-1)	0.5	MMBtu/hr	500	4.08	lb/MMBtu ^(a)	0.118	lb/MMBtu ^(a)	0.5	1.5E-02	Rating and operating hours restriction from TVOP No. 46-00005, Section D., Source ID 150, Condition #013.
150	Emergency Generators (Installed btw 1997 and 1999) (62-3)	2	MMBtu/hr	100	4.08	lb/MMBtu ^(a)	0.118	lb/MMBtu ^(a)	0.4	1.2E-02	Rating and operating hours restriction from TVOP No. 46-00005, Section D., Source ID 150, Condition #013.
150	Emergency Generators (Installed btw 1997 and 1999) (14-1)	1.7	MMBtu/hr	100	4.08	lb/MMBtu ^(a)	0.118	lb/MMBtu ^(a)	0.3	1.0E-02	Rating and operating hours restriction from TVOP No. 46-00005, Section D., Source ID 150, Condition #013.
152	Exempt Diesel Generator (NSPS III)	1,490	HP	100	6.4	g/kW-hr	6.4	g/kW-hr	0.8	0.8	Emissions limits from TVOP No. 46-00005, Section D., Source ID 152, Condition #002. Operating hours restriction from Condition #004. Assumes NMHC + NO _x is 100% VOC.
153	Exempt NG Generators (NSPS JJJ) (69-3)	540	HP	300	2	g/hp-hr	1	g/hp-hr	0.4	0.2	Rating and emissions limit from TVOP No. 46-00005, Section D., Source ID 153, Condition #002.
153	Exempt NG Generators (NSPS JJJ) (75C-2)	177	HP	100	2	g/hp-hr	1	g/hp-hr	3.9E-02	2.0E-02	Operating hours restriction from Condition #003.
378	Diesel Fire Pump	150	HP	500	-	-	2.47E-03	lb/HP-hr ^(b)	N/A - Not claiming emission-based exemption	0.1	Assuming 500 hours per year limitation (emergency engine).
381	Bldg 12-1 Natural Gas Emergency Generator	-	-	-	-	-	-	-	0.47	0.19	Emissions limit from TVOP No. 46-00005, Section D., Source ID 381, Condition #001.
383	Refrigerated Trailer IC Engines ^(c)	25	kW	500	7.5	g/kW-hr	7.5	g/kW-hr	0.1	0.1	Emissions limit from TVOP No. 46-00005, Section D., Source ID 383, Condition #002. Assuming 500 hours per year limitation (emergency engine).
732	Bldg 81 Generators (81-1 and 81-2) (Peak)	-	-	-	-	-	-	-	N/A - Not claiming emission-based exemption	0.65	Emissions limit from TVOP No. 46-00005, Section D., Source ID 732, Condition #003.
733	Mobile Generator-1 (1,500 kW)	-	-	-	-	-	-	-	N/A - Not claiming emission-based exemption	0.2	Emissions limit from TVOP No. 46-00005, Section D., Source ID 733, Condition #002.
734	Mobile Generator-2 (750 kW)	-	-	-	-	-	-	-	N/A - Not claiming emission-based exemption	0.12	Emissions limit from TVOP No. 46-00005, Section D., Source ID 734, Condition #002.
735	Bldg 44-E Generator	-	-	-	-	-	-	-	0.64	0.09	Emissions limit from TVOP No. 46-00005, Section D., Source ID 735, Condition #003.
736	Bldg 82-1 Generator	1.88	Mcf/hr	250	250	lbs/yr	0.118	lb/MMBtu ^(a)	0.1	2.8E-02	NO _x emissions limit from TVOP No. 46-00005, Section D., Source ID 736, Condition #003. Operating hours restriction from Condition #004.
737	Bldg 33-1 Generator	26.5	MMBtu/hr	500	-	-	9.00E-02	lb/MMBtu ^(d)	N/A - Not claiming emission-based exemption	0.6	Operating hours restriction from Section D., Source ID 737, Condition #004.
738	Bldg 24-2 Generator	-	-	-	-	-	-	-	0.77	0.19	Emissions limit from TVOP No. 46-00005, Section D., Source ID 738, Condition #003.
744	Bldg 78-1 Generator	8.1	MMBtu/hr	400	-	-	0.118	lb/MMBtu ^(a)	N/A - Not claiming emission-based exemption	0.2	Operating hours restriction from Section D., Source ID 744, Condition #004.
745	No. 2 Fuel Oil Generators (1-1)	1.5	MMBtu/hr	100	4.41	lb/MMBtu ^(b)	0.35	lb/MMBtu ^(b)	0.3	2.6E-02	Operating hours restriction from Section D., Source ID 745, Condition #005.
745	No. 2 Fuel Oil Generators (33-2)	0.9	MMBtu/hr	100	4.41	lb/MMBtu ^(b)	0.35	lb/MMBtu ^(b)	0.2	1.6E-02	
745	No. 2 Fuel Oil Generators (37-1)	1.3	MMBtu/hr	100	4.41	lb/MMBtu ^(b)	0.35	lb/MMBtu ^(b)	0.3	2.3E-02	
745	No. 2 Fuel Oil Generators (39-1)	2.5	MMBtu/hr	100	4.41	lb/MMBtu ^(b)	0.35	lb/MMBtu ^(b)	0.6	4.4E-02	
745	No. 2 Fuel Oil Generators (45-1)	6.3	MMBtu/hr	100	3.2	lb/MMBtu ^(d)	9.00E-02	lb/MMBtu ^(d)	N/A - Not claiming emission-based exemption	2.8E-02	
746	Propane Generators (2-1)	0.2	MMBtu/hr	100	4.08	lb/MMBtu ^{(a)(e)}	0.118	lb/MMBtu ^{(a)(e)}	4.1E-02	1.2E-03	Operating hours restriction from Section D., Source ID 746, Condition #005.
746	Propane Generators (20-1)	0.9	MMBtu/hr	100	4.08	lb/MMBtu ^{(a)(e)}	0.118	lb/MMBtu ^{(a)(e)}	0.2	5.3E-03	Operating hours restriction from Section D., Source ID 746, Condition #005.

Table A-2
RACT III List of Exempt Sources
Merck Sharp & Dohme LLC - West Point, PA

Source ID	Source Name	Rating/ Throughput	Rating/ Throughput Units	Annual Operating Hours	NO _x Permitted Limit/ Emissions Factor	NO _x Permitted Limit/ Emissions Factor Units	VOC Permitted Limit/ Emissions Factor	VOC Permitted Limit/ Emissions Factor Units	NO _x PTE (tpy)	VOC PTE (tpy)	Basis of Emissions Factor/PTE Notes
746	Propane Generators (35-2)	0.5	MMBtu/hr	100	4.08	lb/MMBtu ^{(a)(e)}	0.118	lb/MMBtu ^{(a)(e)}	0.1	3.0E-03	Operating hours restriction from Section D., Source ID 746, Condition #005.
747	Natural Gas Generators (28-1)	0.9	MMBtu/hr	100	4.08	lb/MMBtu ^(a)	0.118	lb/MMBtu ^(a)	0.2	5.3E-03	Operating hours restriction from Section D., Source ID 747, Condition #005.
747	Natural Gas Generators (44-3)	1.8	MMBtu/hr	100	4.08	lb/MMBtu ^(a)	0.118	lb/MMBtu ^(a)	0.4	1.1E-02	Operating hours restriction from Section D., Source ID 747, Condition #005.
747	Natural Gas Generators (53A-1)	3.6	MMBtu/hr	100	4.08	lb/MMBtu ^(a)	0.118	lb/MMBtu ^(a)	0.7	2.1E-02	Operating hours restriction from Section D., Source ID 747, Condition #005.
747	Natural Gas Generators (65-1)	2.5	MMBtu/hr	100	4.08	lb/MMBtu ^(a)	0.118	lb/MMBtu ^(a)	0.5	1.5E-02	Operating hours restriction from Section D., Source ID 747, Condition #005.
748	Bldg 17-1 Generator (Peak)	-	-	800	-	-	0.99	lb/hr	N/A - Not claiming emission-based exemption	0.4	Emissions limit from TVOP No. 46-00005, Section D., Source ID 748, Condition #003. Operating hours restriction from Condition #006.
749	VOC Storage Tanks	4 tanks 7,000 gallon capacity or less	gallons	-	-	-	-	-	N/A - not a source of NO _x	<1	Actual emissions from worst case tank for 2021 calendar year were approximately 10 lb/yr (0.005 tpy). The tank throughput would need to increase by 200 times (which is not possible) in order to reach the 1 tpy threshold. Hence PTE from each tank is conservatively assumed as less than 1 tpy.
750	Post RACT Site NO _x & VOC Sources (Bldg 81 Stationary Water Utilities Pump)	62	HP	800	0.031	lb/HP-hr ^(b)	2.47E-03	lb/HP-hr ^(b)	0.8	0.1	Operating hours restriction from Section D., Source ID 750, Condition #002.
751	Bldg 29-3 Generator	-	-	-	-	-	-	-	N/A - Not claiming emission-based exemption	0.16	Emissions limit from TVOP No. 46-00005, Section D., Source ID 751, Condition #002.
753	Bldg 66-1 Generator	1,879	HP	500	-	-	0.29	g/hp-hr	N/A - Not claiming emission-based exemption	0.3	Emissions limit from TVOP No. 46-00005, Section D., Source ID 753, Condition #001. Operating hours restriction from Condition #004.
754	Bldg 70A-1 Generator (Peak)	1,219	HP	499	-	-	0.11	g/kW-hr	N/A - Not claiming emission-based exemption	0.1	Emissions limit from TVOP No. 46-00005, Section D., Source ID 754, Condition #001. Operating hours restriction from Condition #004.
755	Bldg 75B-1 Generator	2.50	MMBtu/hr	250	1.5	g/hp-hr	0.118	lb/MMBtu ^(a)	0.1	3.7E-02	Operating hours restriction from Section D., Source ID 755, Condition #004. Vendor-specific NO _x emissions factor.
756	Misc. Subpart ZZZZ Propane Generators (5-1)	0.80	MMBtu/hr	100	4.08	lb/MMBtu ^{(a)(e)}	0.118	lb/MMBtu ^{(a)(e)}	0.2	4.7E-03	Operating hours restriction from Section D., Source ID 756, Condition #001.
756	Misc. Subpart ZZZZ Propane Generators (21-1)	0.60	MMBtu/hr	100	4.08	lb/MMBtu ^{(a)(e)}	0.118	lb/MMBtu ^{(a)(e)}	0.1	3.5E-03	
758	Misc. Subpart ZZZZ NG Gens (36-1)	1.60	MMBtu/hr	100	4.08	lb/MMBtu ^(a)	0.118	lb/MMBtu ^(a)	0.3	9.4E-03	Operating hours restriction from Section D., Source ID 758, Condition #009.
758	Misc. Subpart ZZZZ NG Gens (38-6)	11.00	MMBtu/hr	400	-	-	0.118	lb/MMBtu ^(a)	N/A - Not claiming emission-based exemption	0.3	
758	Misc. Subpart ZZZZ NG Gens (10-1)	2.00	MMBtu/hr	100	4.08	lb/MMBtu ^(a)	0.118	lb/MMBtu ^(a)	0.4	1.2E-02	
758	Misc. Subpart ZZZZ NG Gens (01-3)	4.20	MMBtu/hr	250	-	-	0.118	lb/MMBtu ^(a)	N/A - Not claiming emission-based exemption	0.1	
758	Misc. Subpart ZZZZ NG Gens (56-3)	0.60	MMBtu/hr	100	4.08	lb/MMBtu ^(a)	0.118	lb/MMBtu ^(a)	0.1	3.5E-03	
759	Bldg 95-2 Generator	0.60	MMBtu/hr	100	7.5	g/kW-hr	7.5	g/kW-hr	0.1	0.1	Emissions limit from TVOP No. 46-00005, Section D., Source ID 759, Condition #002. Operating hours restriction from Condition #004. Assumes NMHC + NO _x is 100% VOC.
761	Mobile Central Utilities Pump (23.9 HP)	23.90	HP	1,000	0.031	lb/HP-hr ^(b)	2.47E-03	lb/HP-hr ^(b)	0.4	3.0E-02	Operating hours restriction from Section D., Source ID 761, Condition #002.

Table A-2
RACT III List of Exempt Sources
Merck Sharp & Dohme LLC - West Point, PA

Source ID	Source Name	Rating/ Throughput	Rating/ Throughput Units	Annual Operating Hours	NO _x Permitted Limit/ Emissions Factor	NO _x Permitted Limit/ Emissions Factor Units	VOC Permitted Limit/ Emissions Factor	VOC Permitted Limit/ Emissions Factor Units	NO _x PTE (tpy)	VOC PTE (tpy)	Basis of Emissions Factor/PTE Notes
763	Northeast Generator (Peak)	2,950	HP	400	0.67	g/kW-hr	0.4	g/kW-hr	0.6	0.4	Emissions limit from TVOP No. 46-00005, Section D., Source ID 763, Condition #001. Operating hours restriction from Condition #003.
765	B29-4 Generator	1,914	HP	500	0.5	g/hp-hr	0.25	g/hp-hr	0.5	0.3	Emissions limit from TVOP No. 46-00005, Section D., Source ID 765, Condition #004. Operating hours restriction from Condition #006.
766	B62-4 Generator	1,680	HP	500	0.5	g/hp-hr	0.25	g/hp-hr	0.5	0.2	Emissions limit from TVOP No. 46-00005, Section D., Source ID 766, Condition #004. Operating hours restriction from Condition #007.

^(a) Emissions factors from U.S. EPA AP-42, Chapter 3.2, Table 3.2-2 for natural gas combustion.

^(b) Emissions factors from U.S. EPA AP-42, Chapter 3.3, Table 3.3-1 for diesel fuel.

^(c) A limit of 500 hours was used to calculate PTE because each engine is limited to 500 hours of operation in a 12 consecutive month period.

^(d) Emissions factors from U.S. EPA AP-42, Chapter 3.4, Table 3.4-1 for diesel fuel.

^(e) Assumes the same emissions factors as that of natural gas.

Conversions:

2,000	lb/ton
0.75	kW/hp
453.592	g/lb
1,020	Btu/scf ^(f)
3.4E-03	MMBtu/kW-hr
7.48052	gal/scf
1,000	Mgal/MMgal

^(f) Heat content from U.S. EPA AP-42, Chapter 1.4.

**ATTACHMENT B –
CONTROL TECHNOLOGY COST ANALYSIS**

Table B-1
Chemical Engineering Plant Cost Index 2022 Adjustment
Merck Sharp & Dohme LLC - West Point, PA

Chemical Engineering Plant Cost Index (CEPCI) 2016	CEPCI October 2022	CEPCI Ratio
541.70	821.10	1.52

**Table B-2
Control Cost for Flue Gas Recirculation (FGR) for Erie City Boiler 3 (Source ID 033)
Merck Sharp & Dohme LLC - West Point, PA**

CAPITAL COSTS			ANNUALIZED COSTS			
COST ITEM	FACTOR	COST (\$)	COST ITEM	FACTOR	UNIT COST	COST (\$)
Direct Capital Costs ^(a)			Direct Annual Costs ^(a)			
<u>Purchased Equipment Costs</u>			<u>Maintenance and Operating Materials</u>			
FGR System ^(b)		\$140,000	Maintenance costs ^(l)	2.75% TCI		\$26,700
Control System Upgrades ^(c)		\$75,789	Operating Labor ^(m)			\$0
Total Equipment Cost	A	\$215,789	Total Direct Annual Costs		DAC	\$26,700
Instrumentation	0.10 A	\$21,579	Indirect Annual Costs ^(a)			
Freight	0.05 A	\$10,789	Overhead	60% of sum of operating, supervisor, and maintenance labor and maintenance materials		\$16,020
Total Purchased Equipment Cost	B	\$248,158	Administrative charges ⁽ⁿ⁾			\$10,680
<u>Direct Installation Costs</u>			Property taxes	1% TCI		\$9,709
Handling and erection ^(d)	0.10 B	\$24,816	Insurance	1% TCI		\$9,709
Electrical ^(e)	0.04 B	\$9,926	Capital recovery ^(o)	0.1856 CRF x TCI		\$180,158
Foundations and Supports ^(f)		\$73,970	<i>Expected lifetime of equipment ^(p)</i>	7 years		
Mechanical ^(g)		\$125,507	<i>at</i>	7% interest		
Safety Support ^(g)		\$30,316	Total Indirect Annual Costs		IDAC	\$226,276
Specialty construction items ^(g)		\$37,895	Total Annualized Cost			
Labor adjustments to union rate ^(g)		\$42,442				\$252,977
Total Direct Installation Cost		\$344,871	Cost Effectiveness (\$/ton)			
Total Direct Capital Cost	DC	\$593,029	Control Efficiency ^(q) :	33%	Annual Cost Per Ton of NO_x Removed:	
Indirect Capital Costs			Uncontrolled Emissions Rate ^(r) :	73.58 tons NO _x /yr	\$10,314	
Contingencies ⁽ⁱ⁾	0.20 B	\$49,632	Potential Controlled Emissions:	24.53 tons NO _x /yr		
General facilities ^(j)	0.05 DC	\$29,651				
Performance testing ^(k)		\$298,609				
Total Indirect Installation Cost	IC	\$377,892				
Total Capital Investment	TCI	\$970,921				

^(a) Cost estimates based on the U.S. EPA Office of Air Quality Planning and Standards (OAQPS) Control Cost Manual, Seventh Edition (November 2017), Section 1, Chapter 2 unless otherwise noted.

^(b) Cost information obtained from CCA Combustion Systems Proposal for Forced FGR Addition on the Erie City Boiler, dated December 8, 2022. This cost information is conservative; the actual cost of the FGR will be greater due to Merck-specific requirements.

^(c) Cost information based on a comprehensive budgetary cost estimate prepared by Merck (John Pacana, Robert Burch, and Robert Suda), dated August 18, 2016 adjusted to 2023 with CECPI.

^(d) Direct installation factor for handling and erection based on engineering judgment.

^(e) Electrical installation costs are assumed to be similar to the costs for a thermal incinerator, based on engineering judgment (e.g., controls).

^(f) Foundations and Supports cost is the sum of the costs for demolition, sitework preparation, and concrete, and is based on a comprehensive budgetary cost estimate prepared by Merck, dated August 18, 2016 adjusted to 2023 with CECPI.

^(g) Mechanical costs, safety support, specialty construction items, and labor adjustment are based on a comprehensive budgetary cost estimate prepared by Merck, dated August 18, 2016 adjusted to 2023 with CECPI.

⁽ⁱ⁾ Factor for contingencies is based on assumption from OAQPS Control Cost Manual, Seventh Edition (February 2018), Section 1, Chapter 2 that the cost of contingencies is inversely proportional to error (based on 20% probable error).

^(j) Cost factor for general facilities is based on OAQPS Control Cost Manual, Sixth Edition (January 2002), Section 4.2, Chapter 2, Table 2.5.

^(k) The performance testing cost is the sum of the costs for process hazard analysis (PHA)/hazard and operability study (HAZOP) analysis, asbestos testing and abatement, lead testing, and stack testing, and is based on a comprehensive budgetary cost estimate prepared by Merck, dated August 18, 2016 adjusted to 2023 with CECPI.

^(l) Maintenance costs were estimated based on the U.S. EPA OAQPS Alternative Control Techniques Document - NO_x Emissions from Process Heaters (Revised), Document No. EPA-453/R-93-034 (September 1993), Table 6-1.

^(m) Merck is conservatively assuming that no annual labor will be required.

⁽ⁿ⁾ Based on Equation 6.29 from OAPQS Control Cost Manual, Seventh Edition, Section 1, Chapter 2 (June 2019):

$$\text{Administrative Charges} = 0.03 \times \left(\left(\frac{\text{Operator}}{\text{Labor Cost}} \right) + 0.4 \times \left(\frac{\text{Annual Maintenance}}{\text{Cost}} \right) \right)$$

^(o) Based on Equation 2.71 in OAPQS Control Cost Manual, Seventh Edition, Section 1, Chapter 2. Assumes interest rate (i) of 7% and life of control (n) of 7 years^(p):

$$CRF = \frac{i(1+i)^n}{(1+i)^n - 1}$$

^(p) Because it is assumed that the Erie City Boiler 3 will be taken out of commission by the year 2030, the lifetime of equipment is estimated to be 7 years.

^(q) The control efficiency is based on the reduction of NO_x emissions from the current permitted (i.e., uncontrolled) 0.15 lb/MMBtu NO_x emissions rate to meet the most stringent applicable presumptive RACT emissions limitation of 0.10 lb/MMBtu, as specified in 25 Pa. Code §129.112(g)(1)(i).

^(r) Uncontrolled NO_x emissions rate based on Condition No. 003(a) of Section D (Source ID 033) of Merck's current TVOP No. 46-00005.

**ATTACHMENT C –
CERTIFICATION**

Merck Sharp & Dohme LLC – West Point, PA

Certification of Alternative RACT Compliance Analysis


I certify under penalty of law that the statements and information contained in this 25 Pa. Code §129.114(i) Alternative RACT Compliance Analysis are true, accurate, and complete. Furthermore, the Alternative RACT Compliance Analysis previously approved by PADEP under § 129.99(e) (relating to alternative RACT proposal and petition for alternative compliance schedule) assures compliance with the applicable provisions of 25 Pa. Code §129.114.

Darren O'Toole

Associate Vice President, GWES PA Operations

Name of Responsible Official

Title

 *FR DARREN O'TOOLE*

12/29/22

Signature of Responsible Official

Date

Merck Sharp & Dohme Corp.
P.O. Box 4
770 Sumneytown Pike
West Point, PA 19486 - 0004



To: Whom it May Concern
From: Darren O'Toole, AVP, GWES PA Operations
Date: 15DEC2022
RE: Grant of Authority

I, Darren O'Toole, AVP, GWES PA Operations, hereby authorize Doug Chubb, Director, Master Planning Strategy, to take all necessary and proper actions with respect to regulatory decisions made for Merck Sharp & Dohme facilities located in West Point, Upper Gwynedd, Spring House, and North Wales, PA.

Thank you.

Darren O'Toole

Darren O'Toole, AVP
GWES PA Operations