ALLEGHENY COUNTY HEALTH DEPARTMENT
AIR QUALITY PROGRAM

June 26, 2023

SUBJECT: **Reasonably Available Control Technology (RACT III) Determination**
Synthomer Jefferson Hills LLC (0058)
2200 State Highway 837,
West Elizabeth, PA 15088-7311
Allegheny County

Installation Permit No. 0058

TO: JoAnn Truchan, P.E.
Section Chief, Engineering

FROM: Helen O. Gurvich
Air Quality Engineer

I. Executive Summary

Synthomer Jefferson Hills LLC facility (Synthomer) is defined as a major source of VOC emissions and was subjected to a Reasonable Achievable Control Technology III (RACT III) review by the Allegheny County Health Department (ACHD) required for the 2015 Ozone National Ambient Air Quality Standard (NAAQS). The findings of the review established that the Synthomer facility is subject to both presumptive RACT III and case-by case RACT III requirements and the requirements are summarized below.

Table 1 Technically and Financially Feasible Control Options Summary for VOC

Unit ID	Emissions Unit	Financially Feasible Control Option	Current VOC PTE	RACT Reduction	Revised VOC PTE	Annualized Control Cost ($/yr)	Cost Effectiveness ($/ton VOC removed)
There are no additional technically and financially feasible control options available for VOC reduction from RACT II to RACT III.							

These findings are based on the following documents:

- RACT analysis performed by Synthomer Jefferson Hills LLC (Synthomer RACT III Analysis.pdf) – Submitted on December 14, 2022
- RACT II permit No.0058-I026a, issued September 30, 2020 (EPA approval on October 21, 2021, 86 FR 58223)

II. Regulatory Basis

On October 26, 2015, the US EPA revised the ozone NAAQS. To meet the new standards, ACHD requested all major sources of NO_X (potential emissions of 100 tons per year or greater) and all major sources of VOC (potential emissions of 50 tons per year or greater) to reevaluate NO_X and/or VOC RACT for incorporation into Allegheny County's portion of the PA SIP. ACHD has also incorporated by reference 25 Pa. Code, §§129.111-115 under Article XXI, §2105.08 ("RACT III").

This document is the result of ACHD's determination of RACT submitted by the subject source and supplemented with additional information as needed by ACHD. The provisions of RACT III will replace those of the previous RACT I and RACT II.

As part of the RACT regulations codified in 25 Pa. Code §§ 129.111—129.115 (relating to additional RACT requirements for major sources of NO_x and VOCs for the 2015 ozone NAAQS) (RACT III), ACHD has adopted the Pennsylvania Department of Environmental Protection's established method under § 129.114(i) (relating to alternative RACT proposal and petition for alternative compliance schedule) for an applicant to demonstrate that the alternative RACT compliance requirements incorporated under § 129.99 (relating to alternative RACT proposal and petition for alternative compliance schedule) (RACT II) for a source that commenced operation on or before October 24, 2016, and which remain in force in the applicable operating permit continue to be RACT under RACT III as long as no modifications or changes were made to the source after October 24, 2016. The date of October 24, 2016, is the date specified in § 129.99(i)(1) by which written RACT proposals to address the 1997 and 2008 8-hour ozone National Ambient Air Quality Standard (NAAQS) were due to the Department from the owner or operator of an air contamination source located at a major NO_X emitting facility or a major VOC emitting facility subject to § 129.96(a) or (b) (relating to applicability).

The procedures to demonstrate that RACT II is RACT III are specified in § 129.114(i)(1)(i), 129.114(i)(1)(ii) and 129.114(i)(2), that is, subsection (i), paragraphs (1) and (2). An applicant may submit an analysis, certified by the responsible official, that the RACT II permit requirements remain RACT for RACT III by following the procedures established under subsection (i), paragraphs (1) and (2).

Paragraph (1) establishes cost effectiveness thresholds of $7,500 per ton of NO_X emissions reduced and $12,000 per ton of VOC emissions reduced as ''screening level values'' to determine the amount of analysis and due diligence that the applicant shall perform if there is no new pollutant specific air cleaning device, air pollution control technology or technique available at the time of submittal of the analysis. Paragraph (1) has two subparagraphs.

Subparagraph (i) under paragraph (1) specifies that the applicant that evaluates and determines that there is no new pollutant specific air cleaning device, air pollution control technology or technique available at the time of submittal of the analysis and that each technically feasible air cleaning device, air pollution control technology or technique evaluated for the alternative RACT requirement or RACT emission limitation approved by the Department (or appropriate approved local air pollution control agency) under § 129.99(e) had a cost effectiveness equal to or greater than $7,500 per ton of NO_X emissions reduced or $12,000 per ton of VOC emissions reduced shall include the following information in the analysis:

- A statement that explains how the owner or operator determined that there is no new pollutant specific air cleaning device, air pollution control technology or technique available.
- A list of the technically feasible air cleaning devices, air pollution control technologies or techniques previously evaluated under RACT II.
- A summary of the economic feasibility analysis performed for each technically feasible air cleaning device, air pollution control technology or technique in the previous bullet and the cost effectiveness of each technically feasible air cleaning device, air pollution control technology or technique as submitted previously under RACT II.
- A statement that an evaluation of each economic feasibility analysis summarized in the previous bullet demonstrates that the cost effectiveness remains equal to or greater than $7,500 per ton of NO_X emissions reduced or $12,000 per ton of VOC emissions reduced.

Subparagraph (ii) under paragraph (1) specifies that the applicant that evaluates and determines that there is no new pollutant specific air cleaning device, air pollution control technology or technique available at the time of submittal of the analysis and that each technically feasible air cleaning device, air pollution control technology or technique evaluated for the alternative RACT requirement or RACT emission limitation approved by the Department (or appropriate approved local air pollution control agency) under § 129.99(e) had a cost effectiveness less than $7,500 per ton of NO_X emissions reduced or $12,000 per ton of VOC emissions reduced shall include the following information in the analysis:

- A statement that explains how the owner or operator determined that there is no new pollutant specific air cleaning device, air pollution control technology or technique available.
- A list of the technically feasible air cleaning devices, air pollution control technologies or techniques previously evaluated under RACT II.
- A summary of the economic feasibility analysis performed for each technically feasible air cleaning device, air pollution control technology or technique in the previous bullet and the cost effectiveness of each technically feasible air cleaning device, air pollution control technology or technique as submitted previously under RACT II.
- A statement that an evaluation of each economic feasibility analysis summarized in the previous bullet demonstrates that the cost effectiveness remains less than $7,500 per ton of NO_X emissions reduced or $12,000 per ton of VOC emissions reduced.
- A new economic feasibility analysis for each technically feasible air cleaning device, air pollution control technology or technique.

Paragraph (2) establishes the procedures that the applicant that evaluates and determines that there is a new or upgraded pollutant specific air cleaning device, air pollution control technology or technique available at the time of submittal of the analysis shall follow.

- Perform a technical feasibility analysis and an economic feasibility analysis in accordance with § 129.92(b) (relating to RACT proposal requirements).
- Submit that analysis to the Department (or appropriate approved local air pollution control agency) for review and approval.

The applicant shall also provide additional information requested by the Department (or appropriate approved local air pollution control agency) that may be necessary for the evaluation of the analysis submitted under § 129.114(i).

III. Facility Description

The Synthomer Jefferson Hills LLC facility (Synthomer) produces synthetic hydrocarbon resins from C_5 feedstock, monomers, solvents and catalysts by way of cationic polymerization. Resins produced include aliphatic, aliphatic/aromatic, aromatic and liquid resins for use in adhesives, plastics, rubber, graphic arts and numerous other products.

The plant is comprised of three polymerization processes (C5, MP-Poly, and WW-Poly), a resin hydrogenation process, four finishing processes (LTC1, LTC2, and C-5), and an emulsion process, five boilers ranging from 18.6 MM Btu/hr to 38.2 MM Btu/hr, a wastewater treatment plant, a pilot plant for testing formulations and processes and approximately 200 storage tanks of various sizes.

The facility is a major source of Volatile Organic Compounds (VOC) and Hazardous Air Pollutants (HAPs) as defined in Article XXI, 2101.20. Detailed descriptions of the relevant emissions units are provided in the following tables.

The last full compliance evaluation (FCE) at Synthomer was conducted on June 28, 2022 and the facility was found to be in non-compliance. The following deviations were identified during this evaluation:

- Exceedances of the annual VOC emission limit for Tank 53 during 2020 and 2021 based on emission inventory submittal documents;
- Exceedances of the short-term limit on natural gas combustion for C-5 Hot Oil Furnace as monthly averages during September 2020, January 2021, July 2021, and October 2021;
- Failure to report a breakdown occurring April 19, 2021 within 60 minutes of occurrence and failure to submit a follow-up report within 7 days. The breakdown involved excess VOC and HAP emissions from the Water-White Polymerization (WW Poly) process; and
- Failure to report breakdowns occurring January 27, 2022 and June 18, 2022 within 60 minutes of occurrence.

These violations have been corrected to the satisfaction of the Department. The facility currently has no violations.

There were no modifications or changes made to the facility after October 24, 2016. There have been no changes to this facility since the RACT II permit, #0058-I026a, was issued on September 30, 2020.

Synthomer is a major source of VOC emissions. Synthomer does not emit 100 tons per year or greater of NO_X and is thus not a major source for NO_X emissions.

Table 2 Facility Sources Subject to Case-by-Case RACT III

Source ID	Description	Rating	VOC PTE (TPY)	Case-by-Case Limit (RACT II)	"Not Applicable" to RACT III	Case-by-Case Limit (RACT III)	RACT II as RACT III
S055	Pastillating Belts, UHF Filter – C-5 operations, point & fugitive (IP #0058-I018a)	22,000 lbs/hr	7.30	Good operating practices	NA	No change from RACT II, §129.114(i)(1)(i)	Y
S034	Filtrate system (filtrate receiver, neutralizer, solvent wash tank, heel tank, Funda filter) – MP Poly Unit (IP #0058-I022a)	103,000,000 lbs/yr	10.33	Condensers, good operating practices	NA	No change from RACT II, §129.114(i)(1)(i)	Y
S013	Feed dryers and regeneration – WW Poly Unit (IP #0058-I023a)	80,000,000 lbs/yr	4.86	Condensers, good operating practices	NA	No change from RACT II, §129.114(i)(1)(i)	Y
S020	West Filtrate Receiver - WW Poly Unit (IP #0058-I023a)	80,000,000 lbs/yr	5.11	Condensers, good operating practices	NA	No change from RACT II, §129.114(i)(1)(i)	Y
S023	Solvent Wash Receiver - WW Poly Unit (IP #0058-I023a)	80,000,000 lbs/yr	7.52	Good operating practices	NA	No change from RACT II, §129.114(i)(1)(i)	Y
S027	East Filtrate Receiver - WW Poly Unit (IP #0058-I023a)	80,000,000 lbs/yr	5.11	Good operating practices	NA	No change from RACT II, §129.114(i)(1)(i)	Y
S025	Storage Tanks 73/75/76/77- WW Poly Unit (IP #0058-I023a)	75,200 gal each	5.4	Good operating practices	Storage tanks with capacity of 2000 gal or more are subject to ACHD regulations on §2105.12	NA	NA

Source ID	Description	Rating	VOC PTE (TPY)	Case-by-Case Limit (RACT II)	"Not Applicable" to RACT III	Case-by-Case Limit (RACT III)	RACT II as RACT III
S109	#1 Vacuum System – LTC Process (IP #0058-I016a)	67,240,000 lbs/yr	3.80	Good operating practices	NA	No change from RACT II, §129.114(i)(1)(i)	Y
S110	#2 Vacuum System – LTC Process (IP #0058-I016a)	67,240,000 lbs/yr	8.09	Good operating practices	NA	No change from RACT II, §129.114(i)(1)(i)	Y
S114	#1/#2 Pastillator Belt – LTC Process (IP #0058-I016a)	67,240,000 lbs/yr	2.80	Good operating practices	NA	No change from RACT II, §129.114(i)(1)(i)	Y
S004	Metering Tanks (tanks 103 and 104, metering tank, catalyst catch tank, Mott filter, Heel tank) – Hydrogenation Unit (IP #0058-I027a))	22,500,000 lbs/yr	12.97	Throughput restriction of 22.5 MM lbs/yr; Condensers, good operating practices	NA	No change from RACT II, §129.114(i)(1)(i)	Y
S012	Storage tanks 102, 105, 106 - Hydrogenation Unit (based on December 2019 testing by Eastman)	2 - 6,000 gal each; 1 – 10,000 gal	6.3	Throughput restriction of 22.5 MM lbs/yr	Storage tanks with capacity of 2,000 gal or more are subject to ACHD regulations on §2105.12	NA	NA
S007	Vent tanks, Autoclaves #1 and #2 - Hydrogenation Unit (IP #0058-I027a))	Autoclaves - 1,000 gal each	15.13	Throughput restriction of 22.5 MM lbs/yr; Condensers, good operating practices	NA	No change from RACT II, §129.114(i)(1)(i)	Y
F033, F034, F035	Tanks 702A, 702B, 702C – Wastewater Treatment Plant (new IP application)	50,000 gal each	8.84	Good operating practices	NA	No change from RACT II, §129.114(i)(1)(i)	Y
F027	Bio Aeration Tank - Wastewater Treatment Plant (IP #0058-I025)	47,304,000 gal/yr	15.25	Good operating practices	NA	No change from RACT II, §129.114(i)(1)(i)	Y
S085	Double Drum Dryer – Dresinate Production Line (IP #0058-I012a)	500 lbs/hr	5.48	Good operating practices	NA	No change from RACT II, §129.114(i)(1)(i)	Y
	Fugitive Emissions from Equipment Leaks (valves, pumps, pipe connectors, etc.)	NA	64.10	LDAR program	NA	No change from RACT II, §129.114(i)(1)(i)	Y

Table 3 Facility Sources Subject to Presumptive RACT III per PA Code 129.112

Description	Rating	Stack ID	VOC PTE (TPY)	Basis for Presumptive	Presumptive RACT Requirement
Resin Kettles #9 and #10 - C5 Operations	140 MM lbs/yr	S053, S054	1.81	< 2.7 TPY VOC	Install, maintain and operate the source in accordance with the manufacturer's specifications and with good operating practices
Pastillating Belts (Fugitive) – C5 Operations	22,000 lbs/hr	S055	1.09	< 2.7 TPY VOC	Install, maintain and operate the source in accordance with the

Description	Rating	Stack ID	VOC PTE (TPY)	Basis for Presumptive	Presumptive RACT Requirement
					manufacturer's specifications and with good operating practices
Reactor – MP Poly Unit	103 MM lbs/yr	S029	1.65	< 2.7 TPY VOC	Install, maintain and operate the source in accordance with the manufacturer's specifications and with good operating practices
North and South Reactors – WW Poly Unit	80 MM lbs/yr	S017	1.78	< 2.7 TPY VOC	Install, maintain and operate the source in accordance with the manufacturer's specifications and with good operating practices
#4 Vacuum System – LTC Operations	67.24 MM lb/yr	S124	1.46	< 2.7 TPY VOC	Install, maintain and operate the source in accordance with the manufacturer's specifications and with good operating practices
Neutralizer and reactor – Pilot Plant	21 acfm	S155	2.2	< 2.7 TPY VOC	Install, maintain and operate the source in accordance with the manufacturer's specifications and with good operating practices
Tank RK2 – Emulsion Process	1,000 gal	NA	1.21	< 2.7 TPY VOC	Install, maintain and operate the source in accordance with the manufacturer's specifications and with good operating practices

Table 4 Facility Sources Exempt from RACT III per PA Code 129.111(c) [< 1 TPY VOC]

Description	Rating	Stack ID	VOC PTE (TPY)
C-5 Operations (Installation Permit #0058-I011d)			
Thermal Oxidizer or Carbon Beds for 500 battery tanks, if TO downtime	140 MM lbs/yr	S044 S044A	0.26
Hot Oil Furnace	10.33 MMBtu/hr	S056	0.29
Resin Kettle #8	140 MM lbs/yr	S052	0.38
Sparkler Filter with condenser	140 MM lbs/yr	S312	0.05
Sparkler Precoat	140 MM lbs/yr	NA	0.01
Resin Product Loading	140 MM lbs/yr	NA	0.94
Raw material tank T-500	112,251 gal	S058	0.19
Raw material tank T-511	15,228 gal	S274	0.1
MP Polymerization Unit (Installation Permit #0058-I022a)			
Storage tank T-301	75,202 gal	NA	0.46
Storage tank T-302	75,202 gal	NA	0.46
Storage tank T-303	75,202 gal	NA	0.46
Preblend Tank	103 MM lbs/yr	S035	0.99
Dryers regeneration, Precoat tank, Mole sieve drain tank	103 MM lbs/yr	S033	0.51
WW Polymerization Unit (Installation Permit #0058-I023a)			
Feed Dryer regeneration	404 reg/yr	S013a	0.01
East Preblend tank	80 MM lbs/yr	S014	0.57
North Preblend tank	80 MM lbs/yr	S015	0.57
Slurry tank	80 MM lbs/yr	S016	0.02
North Neutralizer	80 MM lbs/yr	S018	0.31
Funda Filter Steam Out/Flushing	80 MM lbs/yr	S019	0.01
Funda Filter Condensate Tank	80 MM lbs/yr	S019a	0.00
South Neutralizer	80 MM lbs/yr	S021	0.31
Reclaim Pot	80 MM lbs/yr	S022	0.13
Storage Tank 10	110,159 gal	S195	0.29
Storage Tank 22	15,863 gal	S206	0.03
Storage Tank 24	15,863 gal	S208	

Description	Rating	Stack ID	VOC PTE (TPY)
Storage Tank 23	15,863 gal	S207	0.03
Storage Tank 25	15,863 gal	S209	
Storage Tank 27	16,257 gal	S211	0.04
Storage Tank 26	16,257 gal	S210	0.42
Storage Tank 28	16,257 gal	S212	
Storage Tank 29	16,257 gal	S213	
Storage Tank 34	169,000 gal	S074	0.27
Storage Tank 71	75,200 gal	S230	0.29
Storage Tank 72	75,200 gal	S231	0.42
Storage Tank 200	25,381 gal	S239	0.18
Storage Tank 201	25,381 gal	S240	
Storage Tank 202	25,381 gal	S241	
Storage Tank 204	41,878 gal	S300	0.04
Storage Tank 205	25,381 gal		
Storage Tank 206	25,381 gal		
Storage Tank 207	25,381 gal		
Storage Tank 66	75,200 gal	S228	0.3
Storage Tank 67	75,200 gal	S026	0.9
LTC Process Operations (Installation Permit #0058-I016b)			
Reclaim Solution Tank	67.24 MM lbs/yr	S108	0.29
Resin Kettle #5	67.24 MM lbs/yr	S111	0.16
Resin Kettle #6	67.24 MM lbs/yr	S112	0.12
Resin Kettle #7	67.24 MM lbs/yr	S113	0.34
Berndorf Belt	67.24 MM lbs/yr	S165	0.53
#1/#2 oil/water separator	67.24 MM lbs/yr	S110A	0.01
#4 oil/water separator	67.24 MM lbs/yr	S125	0.01
Drumming operation	67.24 MM lbs/yr	NA	0.09
Truck loading	67.24 MM lbs/yr	NA	0.18
LTC #2 Heater	8.8 MM Btu/hr	S107	0.25
LTC #4 Heater	10 MM Btu/hr	S119	0.28
Wastewater Treatment Plant (Installation Permit #0058-I025)			
Tanks 701A and 701B, Back Porch Sumps	Tanks – 50,000 gal each; sumps – 17,500 gal total	S147	0.48
Bio Clarifier	55,000 gal	F028	0.11
Sludge Batch Tank	5,200 gal	F036	0.00
Sludge Solids Handling	6,000 gal	F037	0.00
Dresinate Production Line (Installation Permit #0058-I012a)			
Tank R-1-A	9,518 gal	S187	0.01
Tank 782	10,000 gal	S290	0.01
Emulsion Process (based on stack testing in 2007)			
Tank RK1	1,000 gal	-	0.67
Blend tanks 1, 2, 3, and 4	1,2 – 6,000 gal each; 3,4 – 5,000 gal each	S162	0.28
Other Storage Tanks (facility judgement, based on material stored)			
Tank 4	88,128 gal	S190	<1
Tank 80	24,881 gal	S091	<1
Tank 151	1,504,044 gal	S236	<1
Tank 208	25,381 gal	S244	<1
Tank 252	30,457 gal	S248	<1
Tank 261	20,728 gal	S256	<1
Tank 262	20,080 gal	S038	<1
Tank 263	20,080 gal	S257	<1
Tank 264	20,080 gal	S258	<1
Tank 265	20,080 gal	S259	<1
Tank 365	20,728 gal	S266	<1

Description	Rating	Stack ID	VOC PTE (TPY)
Tank 761	9,518 gal	S283	<1
Tank 762	9,518 gal	S284	<1
Tank 763	9,518 gal	S285	<1
Tank 764	17,500 gal	NA	<1
Tank 766	3,760 gal	S288	<1
Tank 773	9,518 gal	NA	<1
Tank 775	9,518 gal	S287	<1
Tank 783	9,518 gal	S160	<1
Combustion Sources			
Unilux Boiler 1 (IP #0058-I020)	18.6 MM Btu/hr	S141	0.44
Unilux Boiler 2 (IP #0058-I020)	18.6 MM Btu/hr	S141	0.44
Unilux Boiler 3 (IP #0058-I020)	18.6 MM Btu/hr	S143	0.44
Unilux Boiler 4 (IP #0058-I020)	18.6 MM Btu/hr	S143	0.44
Boiler house emergency generator (IP #0058-I020)	250 kW	F100	0.01
Trane Boiler	38 MM Btu/hr	S144	0.92

Table 5 Facility Storage Tanks "Not Applicable" to RACT III

(Storage tanks with capacity of 2,000 gallons or more are "not applicable" to RACT III due to being subject to ACHD storage tank regulations at §2105.12, which is incorporated into the Pennsylvania SIP under the Control Techniques Guidelines)

Tank ID	Stack ID	Process Area	VOC Controls	Capacity
50	S216	C5 Unit	None	528,765 gal
52	S218	C5 Unit	None	528,765 gal
53	S219	C5 Unit	None	528,765 gal
54	S060	C5 Unit	None	1,469,451 gal
55	S061	C5 Unit	None	579,585 gal
121	S064	C5 Unit	None	19,432 gal
123	S066	C5 Unit	None	20,080 gal
124	S097	C5 Unit	None	24,864 gal
161	S238	C5 Unit	None	158,630 gal
366	S267	C5 Unit	None	20,132 gal
367	S268	C5 Unit	None	20,132 gal
504	S059	C5 Unit	None	62,817 gal
601	S269	C5 Unit	None	108,291 gal
602	S270	C5 Unit	None	108,291 gal
100	S001	Hydro Unit	Condenser	6,016 gal
101	S001	Hydro Unit	Condenser	6,016 gal
102	S012	Hydro Unit	Condenser	6,016 gal
105	S012	Hydro Unit	Condenser	6,016 gal
106	S012	Hydro Unit	Condensers	10,282 gal
2	S189	Miscellaneous	None	169,205 gal
9	S194	Miscellaneous	None	110,159 gal
12	S197	Miscellaneous	None	110,159 gal
13	S198	Miscellaneous	None	110,159 gal
14	S199	Miscellaneous	None	110,159 gal
15	S200	Miscellaneous	None	110,159 gal
16	S201	Miscellaneous	None	110,159 gal
35	S075	Miscellaneous	None	169,205 gal
78	S232	Miscellaneous	None	169,205 gal
150	S235	Miscellaneous	None	1,504,044 gal
160		Miscellaneous	None	158,630 gal

250	S246	Miscellaneous	None	30, 457 gal
251	S247	Miscellaneous	None	30, 457 gal
254	S249	Miscellaneous	None	15,275 gal
257	S252	Miscellaneous	None	15,275 gal
382	S271	Miscellaneous	None	19,625 gal
408	NA	Miscellaneous	None	9,776 gal
510	NA	Miscellaneous	None	100,000 gal
513	S275	Miscellaneous	None	3,714 gal
514	S276	Miscellaneous	None	3,714 gal
68	S024	WW Poly Unit	Condenser	75,202 gal
69	S024	WW Poly Unit	Condenser	75,202 gal
73	S025	WW Poly Unit	Condenser	75,202 gal
74	S024	WW Poly Unit	Condenser	75,202 gal
75	S025	WW Poly Unit	Condenser	75,202 gal
76	S025	WW Poly Unit	Condenser	75,202 gal
77	S025	WW Poly Unit	Condenser	75,202 gal

IV. RACT Determination

The Technically Feasible Control Options for sources where it was determined that an economic analysis is required for Synthomer are detailed in Table 6. All control cost analyses were conducted pursuant to procedures provided in US EPA's Office of Air Quality Planning and Standards (OAQPS) Control Cost Manual, 7th Edition.

Since these processes commenced operation before October 24, 2016, have not been modified, and are subject to RACT II requirements under 25 Pa Code §129.99(e), which satisfy §129.114(c), these sources meet the requirements for §129.114(i). The facility and ACHD reviews of the RBLC database, common industry knowledge, and an internet search showed that there are no new technically feasible control devices or methods for these processes. Therefore, RACT III for these processes shall be continued compliance with RACT I and RACT II requirements.

Table 6 – Technically Feasible VOC Control Cost Comparisons (RACT II)
(All information taken from the ACHD Technical Support Document for RACT II, IP #0058-I026, dated April 21, 2020)

Control Option		S109 LTC	S110 LTC	S114 LTC	S013 & S013a WW Poly	S020 WW Poly	S023 WW Poly	S027 WW Poly
Thermal Oxidation (98%)	tpy VOC Removed	3.6	7.6	2.6	4.6	4.8	7.1	4.8
	Cost	$143,908	$148,047	$311,632	$156,264	$183,607	$175,518	$175,934
	$/ton	40,137	19,443	118,251	34,162	38,176	24,798	36,653
Catalytic Oxidation (98%)	tpy VOC Removed	3.6	7.6	2.6	4.6	4.8	7.1	4.8
	Cost	$134,852	$135,637	$254,524	$138,270	$154,741	$148,790	$149,202
	$/ton	37,705	17,814	96,581	30,228	32,174	21,022	31,084
Carbon Adsorption (fixed bed)	tpy VOC Removed	3.5	7.4	2.4	4.4	4.7	6.9	4.7
	Cost	$181,762	$179,679	$180,804	$154,297	$156,903	$156,790	$155,442

(90-95%)	**$/ton**	52,426	24,343	74,706	34,797	33,654	22,852	33,073
Rotary Concentrator/ Oxidation (98%)	**tpy VOC Removed**	3.6	7.6	2.6	4.6	4.8	7.1	4.8
	Cost	$184,606	$184,634	$219,307	$184,832	$187,503	$186,464	$186,464
	$/ton	51,616	24,249	83,218	40,408	38,986	26,345	38,847
Refrigerated Condenser (95%)	**tpy VOC Removed**	3.5	7.4	2.6	4.4	4.7	6.9	4.7
	Cost	$136,399	$138,457	$1,296,659	$149,704	$219,179	$189,142	$192,802
	$/ton	39,342	18,758	507,565	33,761	47,011	27,567	41,022

Table 6 – Technically Feasible VOC Control Cost Comparisons (RACT II) (continued)
(All information taken from the ACHD Technical Support Document for RACT II, IP #0058-I026, dated April 21, 2020)

Control Option		**S025 WW Poly**	**S055 C-5**	**S034 MP Poly**	**S004 Hydro**	**S007 Hydro**	**S012 Hydro**	**S085 Dresinate**
Thermal Oxidation (98%)	**tpy VOC Removed**	5.1	5.8	9.7	12.2	14.1	5.9	5.2
	Cost	$154,798	$526,415	$177,803	$165,140	$174,148	$146,413	$345,875
	$/ton	30,178	90,761	18,288	13,536	12,335	24,692	66,816
Catalytic Oxidation (98%)	**tpy VOC Removed**	5.1	5.8	9.7	12.2	14.1	5.9	5.2
	Cost	$137,691	$412,727	$150,236	$142,844	$147,584	$135,286	$280,531
	$/ton	26,843	71,160	15,452	11,708	10,454	22,816	54,193
Carbon Adsorption (fixed bed) (90-95%)	**tpy VOC Removed**	5.0	5.4	8.9	10.3	13.0	5.4	4.8
	Cost	$156,423	$207,403	$158,992	$161,638	$161,521	$180,771	$186,358
	$/ton	31,458	38,408	17,807	15,693	12,458	33,197	39,200
Rotary Concentrator/ Oxidation (98%)	**tpy VOC Removed**	5.1	5.8	9.7	12.2	14.1	5.9	5.2
	Cost	$184,776	$285,728	$186,833	$185,480	$186,486	$184,620	$229,409
	$/ton	36,022	49,263	19,216	15,203	13,209	31,136	44,317
Refrigerated Condenser (95%)	**tpy VOC Removed**	5.0	5.7	9.4	11.5	13.7	5.7	5.0
	Cost	$146,875	$2,920,397	$193,751	$160,986	$182,016	$137,554	$1,504,896
	$/ton	29,538	512,350	20,557	13,999	13,300	23,931	299,894

ACHD has determined that thermal oxidation, catalytic oxidation, carbon adsorption (fixed bed), rotary concentrator/oxidation, and refrigerated condenser are technically feasible control options for controlling VOC emissions from the processes of the Synthomer facility, but they are deemed financially infeasible due to their high cost per ton removed.

Also, the facility determined that, based on the configuration and operation of these tanks, it is not technically feasible to enclose or capture and control the following sources that are subject to case-by-case analysis:

- Tanks 702A, 702B, 702C (Wastewater Treatment Plant): all of these tanks are open-top tanks used for pre-treatment prior to the biological treatment operations. There is no reasonable method to capture emissions from these open-top tanks. Enclosure or a floating roof is not technically feasible due to the tank configuration and operation. Pursuant to RACT II, ACHD concurred that capture and control of emissions from these tanks was not technically feasible
- Bio Aeration Tank (Wastewater Treatment Plant): this biological treatment tank is open to the atmosphere. There is no reasonable method to capture the emissions from this operation. Enclosure or

a floating roof is not technically feasible due to the tank configuration and operation. Pursuant to RACT II, ACHD concurred that capture and control of emissions from this tank was not technically feasible.

- Fugitive Emissions Control: In its RACT II Evaluation document, ACHD determined that it was unnecessary to conduct RACT evaluations on the equipment component leak emissions. The facility is subject to the Miscellaneous Organic NESHAPS (MON) rule. Under the MON, the facility is required to have a Leak Detection and Repair (LDAR) program. These requirements are relatively stringent, and ACHD stated that it does not believe more stringent requirements would be considered cost-effective. Finally, ACHD stated that the MON LDAR requirements "are considered RACT II for the emissions from equipment leaks." Synthomer continues to comply with those LDAR requirements and believes that ACHD's RACT II determination is still valid for RACT III.

The option provided in §129.114(i)(1)(i) allows for a "limited" analysis for sources that had a RACT II cost effectiveness of equal to or greater than $12,000 per ton of VOC reduced. An economic evaluation is not required under this provision of the rule.

Pursuant to §129.114(i)(1)(ii), an economic analysis is required for all Alternative RACT III sources that had a RACT II cost effectiveness of less than $12,000 per ton of VOC reduced. An economic evaluation was conducted by Synthomer for the two (2) sources (Hydro Unit vents S004 and S007) subject to this rule provision. A summary of the results is provided in Table 7. All control cost analyses were conducted pursuant to procedures provided in USEPA's Air Pollution Control Cost Manual, 7th Edition (the most recent edition).

Table 7 – Technically Feasible VOC Control Cost (RACT III)

Control Option		S004 Hydro	S007 Hydro
Recuperative Oxidation (98%)	**tpy VOC Removed**	12.6	14.7
	Cost	$187,768	$212,285
	$/ton	14,910	14,462
Regenerative Oxidation (98%)	**tpy VOC Removed**	12.6	14.7
	Cost	$251,046	$258,716
	$/ton	19,935	17,625
Catalytic Oxidation (98%)	**tpy VOC Removed**	12.6	14.7
	Cost	$175,745	$189,025
	$/ton	13,956	12,877
Carbon Adsorption (fixed bed) (90-95%)	**tpy VOC Removed**	12.3	14.4
	Cost	$422,415	$598,354
	$/ton	34,297	41,681
Rotary Concentrator/ Oxidation* (98%)	**tpy VOC Removed**	NA	NA
	Cost	NA	NA
	$/ton	NA	NA
Refrigerated Condenser (95%)	**tpy VOC Removed**	11.7	13.7
	Cost	$168,806	$223,573
	$/ton	14,485	16,307

*The control type is not technically feasible for this process - Rotary Concentrators are for large flow streams (> 7,500 cfm).

Technically feasible control option for the two Hydro Unit sources subject to economic evaluation exceeds the RACT III "screening level threshold" value of $12,000 per ton of VOC removed. Control options with costs above this threshold are considered to be economically infeasible.

V. RACT III Summary

Synthomer proposes that no physical, operational, or permit changes are needed in regard to the RACT III requirements, other than incorporating references to the applicable RACT III regulations.

The Department has analyzed the facility's proposal for considering RACT II requirements as RACT III and also performed an independent analysis. Based on the information provided by the facility and independently verified by the Department, ACHD has determined that the RACT II requirements satisfy the RACT III requirements. The RACT III requirements are identical to the RACT II requirements and are as stringent as RACT II.

Table 7 RACT I, RACT II, and RACT III Summary

Unit ID	Permit Condition No.	RACT I Requirement	RACT II Requirement	RACT III Requirement
C-5 Operations – Storage Tanks	V.A.2.a		§129.99 §129.100	Removed from the Permit
	V.A.2.b	Order #257, 1.7	§129.99	
C-5 Operations – Pastillating Belts #1 and #2 (S055)	V.B.2.a		§129.99 §129.100	§129.114 §129.115
	V.B.2.b	Order #257, 1.7	§129.99	§129.114
MP Poly Unit (S034)	V.C.1.b	Order #257, 1.7	§129.99	§129.114
	V.C.1.c	Order #257, 1.2.A	§129.99	§129.114
	V.C.1.d	Order #257, 1.1.C	§129.99	§129.114
	V.C.2.a	Order #257, 1.1 & 1.2	§129.99	§129.114
	V.C.3.a	Order #257, 1.5	§129.100	§129.115
	V.C.4.a		§129.99 §129.100	§129.114 §129.115
	V.C.4.b	Order #257,1.7	§129.99	§129.114
WW Poly Unit (S013, S020, S023, S027)	V.D.1.b	Order #257, 1.3 & 1.4	§129.99	§129.114
	V.D.2.a	Order #257, 1.1 & 1.2	§129.99	§129.114
	V.D.3.a	Order #257, 1.5	§129.100	§129.115
	V.D.3.b	Order #257, 1.5	§129.100	§129.115
	V.D.4.a		§129.99 §129.100	§129.114 §129.115
	V.D.4.b	Order #257, 1.7	§129.99	§129.114
LTC Process Operations (S108, S109, S110, S111, S112, S113, S114)	V.F.1.b	Order #257, 1.1.H	§129.99	§129.114
	V.F.1.c		§129.99 §129.100	§129.114 §129.115
	V.F.2.a		§129.100	§129.115
	V.F.2.b		§129.100	§129.115
	V.F.3.a	Order #257, 1.5	§129.100	§129.115
	V.F.4.a		§129.99 §129.100	§129.114 §129.115
	V.F.4.b	Order #257, 1.7	§129.99	§129.114
	V.G.2.a		§129.99	§129.114

Unit ID	Permit Condition No.	RACT I Requirement	RACT II Requirement	RACT III Requirement
Dresinate Production Line (S085)			§129.100	§129.115
	V.G.2.b	Order #257, 1.7	§129.99	§129.114
Hydrogenation Unit (S004, S007, S012)	V.H.1.a		§129.99	§129.114
	V.H.1.b	Order #257, 1.3	§129.99	§129.114
	V.H.2.a	Order #257, 1.5	§129.100	§129.115
	V.H.2.b	Order #257, 1.5	§129.100	§129.115
	V.H.3.a		§129.99	§129.114
	V.H.4.a		§129.99 §129.100	§129.114 §129.115
	V.H.4.b	Order #257, 1.7	§129.99	§129.114
Wastewater Treatment Plant (F027, F033, F034, F035)	V.I.1.a		§129.99 §129.100	§129.114 §129.115
	V.I.1.b	Order #257, 1.7	§129.99	§129.114