SMAQMD BACT CLEARINGHOUSE

CATEGORY: **PHARMACEUTICAL PROCESS**

BACT Size: Minor Source BACT

PHARMACEUTICAL MANUFACTURING

BACT Determination Number: 85	**BACT Determination Date:** 11/14/2014

Equipment Information

Permit Number: N/A -- Generic BACT Determination
Equipment Description: PHARMACEUTICAL MANUFACTURING
Unit Size/Rating/Capacity: N/A
Equipment Location:

BACT Determination Information

ROCs	**Standard:**	
	Technology Description:	Refrigerated condensers, afterburners, carbon adsorbers, or scrubbers with a control efficiency of ≥ 90%.
	Basis:	Achieved in Pactice
NOx	**Standard:**	
	Technology Description:	-
	Basis:	
SOx	**Standard:**	
	Technology Description:	
	Basis:	
PM10	**Standard:**	
	Technology Description:	
	Basis:	
PM2.5	**Standard:**	
	Technology Description:	
	Basis:	
CO	**Standard:**	
	Technology Description:	
	Basis:	
LEAD	**Standard:**	
	Technology Description:	
	Basis:	

Comments: BACT for the control of VOC emissions is the use of afterburners, refrigerated condensers, carbon adsorbers, or scrubbers on the process vents with a capture/control of at least 90%. For those chemical streams which preclude a control of 90% because of their chemical or physical characteristics, a ≥ 0.3 second retention time at ≥ 1400 °F for afterburners and an exit gas temperature of -25°C for condensers will also be considered to satisfy BACT for those cases.

District Contact: Jeff Weiss Phone No.: (916) 874 - 4862 email: jweiss@airquality.org

777 12th Street, Third Floor

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Sacramento, CA 95814

BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION

DETERMINATION NO.: 85

DATE: November 5, 2014

ENGINEER: Jeff Weiss

Category/General Equip Description: Pharmaceutical Manufacturing Processes

Equipment Specific Description: Pharmaceutical Manufacturing

Equipment Size/Rating: Minor Source BACT

Previous BACT Det. No.: #12

This BACT determination will update Determination #12 which was made on March 6, 2003 for Pharmaceutical Manufacturing Processes.

BACT ANALYSIS

Step 1: Identify All Control Technologies

The following control technologies are currently employed as BACT for Pharmaceutical Manufacturing Processes by the following air pollution control districts:

District	(A)	Best Available Control Technology (BACT)
SMAQMD	AP AP AP	1. Afterburner (≥ 0.3 second retention time at ≥ 1400 °F) (B) 2. Refrigerated Condensers (B) 3. Carbon Adsorbers (B)
South Coast AQMD	AP AP AP	1. Afterburner (≥ 0.3 second retention time at ≥ 1400 °F) (B) 2. Refrigerated Condensers (B) 3. Carbon Adsorbers (B)
San Diego County APCD	TF TF	1. Carbon adsorber with a capture/destruction efficiency of ≥ 90% by weight. 2. Afterburner with a capture/destruction efficiency of ≥ 90% by weight.
Yolo-Solano AQMD	AP	1. Thermal oxidizer for a pharmaceutical pill coating line venting solvent emissions.
Bay Area AQMD	---	A BACT standard has not been established.

District	(A)	Best Available Control Technology (BACT)
San Joaquin Valley APCD	---	A BACT standard has not been established.

(A) AP = Achieved in Practice, TF = Technologically Feasible
(B) Emissions limit was not specified because a limit that applies to all equipment within the category is not possible. Refer to discussion (below).

The following control technologies have been identified:

1. Carbon Adsorbers
2. Incinerators/Afterburners/Thermal Oxidizers
3. Refrigerated Condensers
4. Scrubbers

Step 2: Eliminate Technologically Infeasible Options

All identified technologies are feasible.

Step 3: Rank Remaining Control Technologies by Control Effectiveness

1. Afterburners/Incinerators (≥ 0.3 second retention time at ≥ 1400 °F), ≥ 90% capture/control efficiency
2. Refrigerated Condensers, ≥ 90% capture/control efficiency
3. Carbon Adsorbers, ≥ 90% capture/control efficiency
4. Scrubbers, 10% to 90% capture/control efficiency (Control is VOC and working fluid dependent)

Except for scrubbers, the top three control technologies are equally effective at controlling VOCs. South Coast AQMD has identified BACT as the use of afterburners, refrigerated condensers, or carbon adsorbers. An emissions limit was not specified for these technologies because of the physical and chemical variability of chemical process streams. This variability precludes the possibility of a fixed control efficiency (ref: MSBACT Guidelines – Part C, page 34 (7/06)). San Diego County APCD echoes this point by labeling technology which has been achieved in practice as only technologically feasible when used at a control efficiency of 90%.

Therefore, the most effective control technology identified in Step 3 is the use of afterburners, refrigerated condensers, or carbon adsorbers that achieve a control efficiency of 90%. In regard to condensers, most pharmaceutical process streams achieve this level of control when operating condensers at a minimum exhaust gas temperature of -25°C, which has been achieved in practice. However, some process streams have physical and chemical properties which preclude a control of 90% as echoed in the BACT Clearinghouses. In such cases for afterburners, a ≥ 0.3 second retention time at ≥ 1400 °F, has been achieved in practice and will be considered to be BACT. In such cases for condensers, an exit gas temperature of -25°C has been achieved in practice and will be considered to be BACT.

Scrubbers are used primarily for acid gas destruction but they have the additional benefit of reducing VOC emissions. Since scrubbers are able to achieve control of VOCs by 90%, they also meet BACT if a control of 90% is documented.

Step 4: Select BACT

BACT for the control of VOC emissions from pharmaceutical manufacturing processes is the use of afterburners, refrigerated condensers, carbon adsorbers, or scrubbers on the process vents with a capture/control of at least 90%. For those chemical streams which preclude a control of 90% because of their chemical or physical characteristics, a ≥ 0.3 second retention time at ≥ 1400 ºF for afterburners and an exit gas temperature of -25ºC for condensers will also be considered to satisfy BACT for those cases.

REVIEWED BY: _____ **DATE:** 11-14-14

APPROVED BY: _____ **DATE:** 11/17/14