SMAQMD BACT CLEARINGHOUSE

CATEGORY Type: **APC - BAGHOUSE**

BACT Category:

BACT Determination Number: 275	**BACT Determination Date:** 10/20/2020

Equipment Information

Permit Number: N/A -- Generic BACT Determination
Equipment Description: NUT SEASONING OPERATION
Unit Size/Rating/Capacity: Minor Source BACT
Equipment Location:

EXPIRED

BACT Determination Information

District Contact: Jeff Quok Phone No.: (916) 874-4863 email: jquok@airquality.org

ROCs	**Standard:**	No Standard
	Technology Description:	
	Basis:	
NOx	**Standard:**	No Standard
	Technology Description:	
	Basis:	
SOx	**Standard:**	No Standard
	Technology Description:	
	Basis:	
PM10	**Standard:**	99% Control
	Technology Description:	Fabric filter, baghouse, or equivalent
	Basis:	Achieved in Practice
PM2.5	**Standard:**	
	Technology Description:	Compliance with PM10 BACT Standard
	Basis:	Achieved in Practice
CO	**Standard:**	No Standard
	Technology Description:	
	Basis:	
LEAD	**Standard:**	No Standard
	Technology Description:	
	Basis:	

Comments: This is a generic BACT determination based on BACT determinations made, and published, by other air agencies in California and/or other States.

Printed: 10/20/2020

777 12th Street, Third Floor

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Sacramento, CA 95814

BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION

EXPIRED

DETERMINATION NO.: 275

DATE: October 20, 2020

ENGINEER: Jeffrey Quok

Category/General Equip Description: Nut Seasoning Operation

Equipment Specific Description: Nut Seasoning Operation

Equipment Size/Rating: Minor Source BACT

Previous BACT Det. No.: N/A

This BACT determination was performed for a Nut Seasoning Operation. The process consists of taking roasted/cooked nuts and mixing with wet and dry seasonings, spices, and flavoring. This BACT was determined under a project for A/C 26688 (Blue Diamond Growers).

BACT/T-BACT ANALYSIS

A: ACHIEVED IN PRACTICE (Rule 202, §205.1a):

The following control technologies are currently employed as BACT/T-BACT for nut seasoning operations by the following air pollution control districts:

District/Agency	Best Available Control Technology (BACT)/Requirements
US EPA	**BACT** Source: EPA RACT/BACT/LAER Clearinghouse The EPA BACT Clearinghouse did not contain any BACT determinations for nut seasoning operation. **T-BACT** The EPA BACT Clearinghouse did not contain any T-BACT determinations. **RULE REQUIREMENTS**: None

<table>
<tr><th>District/Agency</th><th>Best Available Control Technology (BACT)/Requirements</th></tr>
<tr><td>ARB</td><td><u>BACT</u>
Source: ARB BACT Clearinghouse

The ARB BACT Clearinghouse did not contain any BACT determinations for nut seasoning operation.

<u>T-BACT</u>
The ARB BACT Clearinghouse did not contain any T-BACT determinations.

<u>RULE REQUIREMENTS:</u>
None</td></tr>
<tr><td>SMAQMD</td><td><u>BACT</u>
Source: SMAQMD BACT Clearinghouse

There are no BACT standards published in the clearinghouse for this category.

<u>T-BACT</u>
There are no T-BACT standards published in the clearinghouse for this category.

<u>RULE REQUIREMENTS</u>:
None</td></tr>
<tr><td>South Coast AQMD</td><td><u>BACT</u>
Source: SCAQMD BACT Guidelines (Part D) for Non-Major Polluting Facilities, page 93 (Last Revised 2/1/19)
<table><tr><td colspan="2">Nut Roasting – Handling Equipment</td></tr><tr><td>VOC</td><td>No Standard</td></tr><tr><td>NOx</td><td>No Standard</td></tr><tr><td>SOx</td><td>No Standard</td></tr><tr><td>PM10</td><td>Baghouse</td></tr><tr><td>PM2.5</td><td>No Standard</td></tr><tr><td>CO</td><td>No Standard</td></tr></table>
<u>T-BACT</u>
There are no T-BACT standards published in the clearinghouse for this category.

<u>RULE REQUIREMENTS</u>:
None</td></tr>
</table>

<table>
<tr><th>District/Agency</th><th>Best Available Control Technology (BACT)/Requirements</th></tr>
<tr><td>San Diego County APCD</td><td><u>BACT</u>
Source: NSR Requirements for BACT (June 2011)

There are no BACT standards published in the clearinghouse for this category.

<u>T-BACT</u>
There are no T-BACT standards published in the clearinghouse for this category.

<u>RULE REQUIREMENTS</u>:
None</td></tr>
<tr><td>Bay Area AQMD</td><td><u>BACT</u>
Source: BAAQMD BACT Guideline
There are no BACT standards published in the clearinghouse for this category.

<u>T-BACT</u>
There are no T-BACT standards published in the clearinghouse for this category.

<u>RULE REQUIREMENTS</u>:
None</td></tr>
<tr><td>San Joaquin Valley APCD</td><td><u>BACT</u>
Source: SJVUAPCD BACT Guideline
Guideline 5.2.2 Almond Processing (8/23/2001)

<table>
<tr><td colspan="2">Almond Processing</td></tr>
<tr><td>VOC</td><td>No standard</td></tr>
<tr><td>NOx</td><td>No standard</td></tr>
<tr><td>SOx</td><td>No standard</td></tr>
<tr><td>PM10</td><td>99% control (Fabric filter, baghouse, or equal)</td></tr>
<tr><td>PM2.5</td><td>No standard</td></tr>
<tr><td>CO</td><td>No standard</td></tr>
</table>
<u>T-BACT</u>
There are no T-BACT standards published in the clearinghouse for this category.

<u>RULE REQUIREMENTS</u>:
None</td></tr>
</table>

The following control technologies have been identified and are ranked based on stringency.

SUMMARY OF ACHIEVED IN PRACTICE CONTROL TECHNOLOGIES	
VOC	No Standard
NOx	No Standard
SOx	No Standard
PM10	1. 99% Control (Fabric filter, baghouse, or equivalent) – [SJVAPCD] 2. Baghouse – [SCAQMD]
PM2.5	No Standard
CO	No Standard
NPOC	No Standard
(T-BACT)	No Standard

The following control technologies have been identified as the most stringent, achieved in practice control technologies:

BEST CONTROL TECHNOLOGIES ACHIEVED		
Pollutant	**Standard**	**Source**
VOC	No Standard	US EPA, CARB, SMAQMD, SCAQMD, SDAPCD, BAAQMD, SJVAPCD
NOx	No Standard	US EPA, CARB, SMAQMD, SCAQMD, SDAPCD, BAAQMD, SJVAPCD
SOx	No Standard	US EPA, CARB, SMAQMD, SCAQMD, SDAPCD, BAAQMD, SJVAPCD
PM10	99% Control (Fabric filter, baghouse, or equivalent)	SJVAPCD
PM2.5	No Standard	US EPA, CARB, SMAQMD, SCAQMD, SDAPCD, BAAQMD, SJVAPCD
CO	No Standard	US EPA, CARB, SMAQMD, SCAQMD, SDAPCD, BAAQMD, SJVAPCD
T-BACT	No Standard	US EPA, CARB, SMAQMD, SCAQMD, SDAPCD, BAAQMD, SJVAPCD

B. TECHNOLOGICALLY FEASIBLE AND COST EFFECTIVE (Rule 202, §205.1.b.):

Technologically Feasible Alternatives:

Any alternative basic equipment, fuel, process, emission control device or technique, singly or in combination, determined to be technologically feasible by the Air Pollution Control Officer.

The table below shows the technologically feasible alternatives identified as capable of reducing emissions beyond the levels determined to be "Achieved in Practice" as per Rule 202, §205.1.a.

Pollutant	Technologically Feasible Alternative
VOC	No other technologically feasible option identified
NOx	No other technologically feasible option identified
SOx	No other technologically feasible option identified
PM10	Baghouse with Polytetrafluoroethylene (PTFE) Bags (99.9% control efficiency)
PM2.5	Baghouse with Polytetrafluoroethylene (PTFE) Bags (99.9% control efficiency)
CO	No other technologically feasible option identified

PM2.5 is not explicitly stated in the BACT Determinations of SCAQMD and SJVAPCD, but implement PM10 BACT as PM2.5. PM2.5 is considered a subset of PM10, therefore BACT standards for PM2.5 will be considered equivalent to meeting the BACT standards for PM10.

Cost Effective Determination:

After identifying the technologically feasible control options, a cost analysis is performed to take into consideration economic impacts for all technologically feasible controls identified.

Maximum Cost per Ton of Air Pollutants Controlled

1. A control technology is cost-effective if the cost of controlling one ton of that air pollutant is less than the limits specified below:

Pollutant	Maximum Cost ($/ton)
VOC	17,500
NO_X	24,500
PM10	11,400
SO_X	18,300
CO	TBD if BACT triggered

Cost Effectiveness Analysis Summary

A cost analysis was performed based on EPA's OAQPS Air Pollution Control Cost Manual. SJVAPCD's *2015 Plan for the 1997 PM2.5 Standard* cost data for PTFE bags was used to determine the cost difference of installing PTFE bags vs standard polyester bags (See page C-229, http://www.valleyair.org/Air_Quality_Plans/docs/PM25-2015/2015-PM2.5-Plan_Bookmarked.pdf). The interest rate was based on the previous 6-month average interest rate on United States Treasury Securities (based on the life of the equipment) and addition of two percentage points and rounding up to the next higher integer rate. The labor (Occupation Code 51-8099: Plant and System Operators - Other) and maintenance (Occupation Code 49-2094: electrical and electronics commercial and industrial equipment repairers) rates were based on data from the Bureau of Labor Statistics. The PM10 removed is based on the PM10 reduction of using the technologically feasible baghouse with PTFE bags instead of a regular baghouse with polyester bags.

Baghouse with PTFE Bags:

As shown in Attachment B, the cost effectiveness for the PTFE baghouse to control PM10 was calculated to be **$112,320.74/ton**. The following basic parameters were used in the analysis.

PM10 Control level = 99.9%

PM10 Baseline Level = 99%

Total Capital Investment = $11,179

Direct Annual Cost = $16,950 per year

Indirect Annual Cost = $11,514 per year

Total Annual Cost = $28,464 per year

PM10 Removed = 0.253 tons per year

Cost of PM10 Removal = $112,320.74 per ton reduced

A detailed calculation of the cost effectiveness for PM10 removal with a PTFE baghouse is shown in Attachment B.

Conclusion: The analysis shows that PTFE bags would not be cost effective with a cost of $112,320.74 per ton which is greater then the $11,400 per ton cost effective threshold.

C. SELECTION OF BACT:

Based on the review of SMAQMD, SCAQMD, SDCAPCD, BAAQMD, SJVAPCD, CARB, and EPA BACT Clearinghouses and Technologically Feasible Alternatives, BACT for VOC, NOx, SOx, PM10, PM2.5, and CO will be the following:

BACT (#275) for Nut Seasoning Process		
Pollutant	**Standard**	**Source**
VOC	No Standard	US EPA, CARB, SMAQMD, SCAQMD, SDAPCD, BAAQMD, SJVAPCD
NOx	No Standard	US EPA, CARB, SMAQMD, SCAQMD, SDAPCD, BAAQMD, SJVAPCD
SOx	No Standard	US EPA, CARB, SMAQMD, SCAQMD, SDAPCD, BAAQMD, SJVAPCD
PM10	99% Control (Fabric filter, baghouse, or equivalent)	SJVAPCD
PM2.5	Compliance with PM10 BACT standards	SMAQMD
CO	No Standard	US EPA, CARB, SMAQMD, SCAQMD, SDAPCD, BAAQMD, SJVAPCD

T- BACT (#275) for Nut Seasoning Process		
Pollutant	**Standard**	**Source**
T-BACT	No Standard	US EPA, CARB, SMAQMD, SCAQMD, SDAPCD, BAAQMD, SJVAPCD

APPROVED BY: *Brian F Krebs* **DATE:** 10/20/2020

Attachment A

BACT Determinations from Air Districts

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
Best Available Control Technology (BACT) Guidelines for Non-Major Polluting Facilities*

10-20-2000 Rev. 0

Equipment or Process: Nut Roasting

	Criteria Pollutants					
Subcategory/ Rating/Size	**VOC**	**NOx**	**SOx**	**CO**	**PM_{10}**	**Inorganic**
Roaster		Natural Gas (1988)			Afterburner (≥ 0.3 second Retention Time at ≥ 1,400°F) (10-20-2000)	
Handling Equipment					Baghouse (10-20-2000)	

* Means those facilities that are not major polluting facilities as defined by Rule 1302 - Definitions

San Joaquin Valley
Unified Air Pollution Control District

Best Available Control Technology (BACT) Guideline 5.2.2*

Last Update: 8/23/2001

Almond Processing - Sizing Operation

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
PM10	99% control (Fabric filter baghouse, or equal)		

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a State Implementation Plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

***This is a Summary Page for this Class of Source**

Attachment B

PTFE Bag Cost Effective Analysis

PTFE BAGHOUSE COST EFFECTIVENESS CALCULATION

EPA AIR POLLUTION CONTROL COST MANUAL, Sixth Edition, EPA/452/B-02-001, January 2002

Cost Effectiveness = $ 112,320.74 $/ton

Equipment

Max allowable grain loading (District Rule 404)	0.1	g/dscf
Flow Rate	7,500	cfm
Min/hr	60	
Operating hours	24	hours
Operating Days	365	days
gr/lb	7000	
Baghouse control	0.99	
PTFE baghouse control	0.999	
Uncontrolled PM (lb/year)	56314.3	
Controlled Baghouse PM (lbs/year)	563.1	
Controlled PTFE Baghouse (lbs/year)	56.3	
PM10 Reduction (tons/year)	0.253	

Cost Estimation

Direct Costs (DC)

Purchased equipment costs (PEC)

Cost difference of PTFE bag vs Regular bag per SJVAPCD	$	3,025.00
See page C-229 (http://www.valleyair.org/Air_Quality_Plans/docs/PM25-2015/2015-PM2.5-Plan_Bookmarked.pdf)		
Instrumentation=0.1*A	$	302.50
Sales Tax=0.0875*A	$	264.69
Freight=0.05*A	$	1,512.50
Total=B	$	5,104.69

Direct Installation costs

Foundation and support=0.04*B	$	204.19
Handling & Erection=0.5*B	$	2,552.34
Electrical=0.08*B	$	408.38

Piping=0.01*B	$	51.05
Insulation for ductwork=0.07*B	$	357.33
Painting=0.04*B	$	204.19
Total	$	3,777.47
Total Direct Costs (DC)	$	8,882.16

Indirect Costs (IC)

Engineering=0.1*B	$	510.47
Construction and field expense=0.2*B	$	1 ,020.94
Contractor fees=0.1*B	$	510.47
Start-up=0.01*B	$	51.05
Performance Test=0.01*B	$	51.05
Contingencies=0.03*B	$	153.14
Total Indirect Cost (IC)	$	2,297.11
Total Capital Investment (DC+IC)	$	11,179.27

Direct Annual Costs

Operating labor

Operating Parameters		
Days per week		5
Weeks per year		52
Shifts per day		2
Operator (@$22.34/hr & 0.5 hr per shift)	$	5,808.40
Supervisor (15% operator)	$	871.26
Maintenance		
Labor (@19.75*0.5 per shift)		$5,135.00
Material (same as labor)		$5,135.00
Total Direct Annual Costs	$	16,949.66

Indirect Annual Costs

Overhead (0.6*(Operating+Supv+Maint labor+Maint Materials)	$	10,169.80
Admin Charges=0.02(Total Capital Investment)	$	223.59
Property Tax=0.01(Total Capital Investment)	$	111.79
Insurance=0.01(Total Capital Investment)	$	111.79
Interest Rate		5%
Equipment life (years)		20
CRF		0.080242587
Capital Recovery	$	897.05
Total Indirect Annual Costs	$	11,514.02

Total Annual Cost	$	28,463.68	per year
PM10 Removed		0.253	
Cost of PM10 Removal	$	112,320.74	