

**San Joaquin Valley
Unified Air Pollution Control District**

Best Available Control Technology (BACT) Guideline 4.12.2

Emissions Unit: Chemical Plants – Pump and Compressor Seals

Equipment Rating: All

Last Update: 3/1/2024

Pollutant	Achieved in Practice or contained in SIP	Technologically Feasible	Alternate Basic Equipment
VOC	Leak defined as a reading of methane in excess of 500 ppmv above background when measured per EPA Method 21 and an Inspection and Maintenance Program pursuant to District Rule 4455		

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 - Permit Specific BACT**

Best Available Control Technology Analysis

District BACT Guideline 4.12.2
Chemical Plants – Pumps and Compressor Seals

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I. Introduction

BACT is triggered for VOC emissions from pumps and compressor seals. The District's BACT Clearinghouse includes a guideline, 4.12.2, that addresses VOC emissions from pumps and compressor seals at chemical plants; however, that guideline was last updated on November 27, 2006. Since the guideline is outdated, a new BACT Analysis will be performed to determine BACT for pumps and compressor seals at chemical plants.

II. Source of emissions

VOC emissions occur from leaking pumps and compressor seals. Since emissions from fugitive components are greater than 2.0 lb/day for some of the permit units at this proposed facility, BACT is triggered for VOC emissions.

III. Top-Down BACT Analysis

BACT analysis for VOC Emissions

Step 1 - Identify All Possible VOC Control Technologies

The following BACT clearinghouse references were reviewed to determine whether any chemical plants have been required to employ VOC controls for pumps and compressor seals:

- EPA RACT/BACT/LAER clearinghouse
- CARB BACT clearinghouse
- South Coast AQMD (SCAQMD) BACT clearinghouse
- Bay Area AQMD (BAAQMD) BACT clearinghouse
- Sacramento Metro AQMD (SMAQMD) BACT clearinghouse
- San Joaquin Valley APCD (SJVAPCD) BACT clearinghouse

The EPA RACT/BACT/LAER Clearinghouse and CARB BACT Clearinghouses were searched; however, no guidelines were identified that would apply to valves and connectors at chemical plants.

A search of South Coast AQMD BACT Clearinghouse identified the following requirements:

South Coast BACT Requirements for Non-Major Polluting Facilities	
Category	BACT Requirement for VOCs
Compressor Fittings, Open Ended Pipes, Pressure Relief Devices, Valves, Pumps, Sampling Connections, Hatches, Sight-Glasses and Meters in VOC Service	Compliance with South Coast AQMD Rule 1173

Bay Area Air Quality Management District's Clearinghouse and Sacramento Metropolitan AQMD's BACT Clearinghouse did not include any guidelines for pumps and compressor seals operated at chemical plants.

The SJVAPCD clearinghouse includes BACT Guideline 4.12.2 for Chemical Plants – Pumps and Compressor Seals; however, the guideline was last updated in November 27, 2006. The requirements are shown in the table below:

SJVAPCD BACT Guideline 4.12.2 (11/27/2006)	
Category	BACT Requirement for VOCs
Chemical Plants – Pumps and Compressor Seals	Leak defined as a reading of methane in excess of 500 ppmv above background when measured per EPA Method 21 and an Inspection and Maintenance Program pursuant to District Rule 4455

A review of District rules revealed the following requirements:

Rule	Requirements for VOCs
South Coast Rule 1173 Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants	Leak defined as a reading of methane in excess of: <ul style="list-style-type: none"> • 50,000 ppm from a component in light liquid service. • 500 ppm from a component in heavy liquid service; or • Leak in excess of 10,000 ppm for a continuous 24 hour period for pumps and compressor seals
BAAQMD Regulation 8 Rule 18	Leak defined as a reading of methane in excess of 500 ppm for pumps and compressor seals

Equipment Leaks	
SMAQMD Rule 443 Leaks from Synthetic Organic Chemical and Polymer Manufacturing	Leak defined as a reading in methane equal to or greater than 10,000 ppm above background
SJVAPCD Rule 4455 Components at Petroleum Refineries, Gas Liquids Processing Facilities, and Chemical Plants	Minor Gas Leak defined as a reading of methane between 500 ppm to 10,000 ppm Major Gas Leak defined as a reading of methane greater than 10,000 ppm

A review of District permits for chemical plants revealed the following operations:

Facility Permit	VOC Control Requirement for Leaks
Seaboard Energy California C-4261-41-7	Pump and Compressor Seal leaks limited to 500 ppmv above background using EPA Method 21
SJV Biodiesel S-8986-3-0	Pump and Compressor Seal leaks limited to 500 ppmv above background using EPA Method 21
Calgren Renewable Fuels S-4214-0-0	Pump and Compressor Seal leaks limited to 500 ppmv above background using EPA Method 21
Pelican Renewables N-7365-0-0	Pump and Compressor Seal leaks limited to 500 ppmv above background using EPA Method 21
Canary Renewables N-7480-2-3	Pump and Compressor Seal leaks limited to 500 ppmv above background using EPA Method 21
Aemetis Advanced Fuels Keyes N-7488-0-1	Pump and Compressor Seal leaks limited to 500 ppmv above background using EPA Method 21

The following control options were identified based on the above information:

Option 1: Leaks from Pumps and Compressor Seals limited to 500 ppmv above background using EPA Method 21

This option is listed as achieved in practice in the District's current BACT Guideline and has been achieved at multiple facilities within the District.

No options more stringent than Option 1 were identified.

Step 2 - Eliminate Technologically Infeasible Options

All of the items listed in step 1 are technologically feasible. Therefore, none can be eliminated.

Step 3 - Rank Remaining Control Technologies by Control effectiveness

Rank	Capture and Control Efficiency	Status
1. Leak defined as a reading of methane in excess of 500 ppmv above background when measured per EPA Method 21 and an Inspection and Maintenance Program pursuant to District Rule 4455	N/A	Achieved in Practice

Step 4 - Cost Effectiveness Analysis

There is not technologically feasible control options identified. A cost analysis is not required for achieved in practice control options.

Step 5 - Select BACT

The applicant is proposing the achieved in practice control option of limiting leaks from pumps and compressor seals to 500 ppmv above background. Therefore, BACT for VOC emissions is satisfied.