A.5 CARBON ADSORBER FOR VOC CONTROL–FACILITY E

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EXAMPLE COMPLIANCE ASSURANCE MONITORING:
CARBON ADSORBER FOR VOC CONTROL--FACILITY E

I. Background

A. Emissions Unit

Description:	Chemical Process
Identification:	NA
Facility:	Facility E Anytown, USA

B. Applicable Regulation, Emission Limit, and Monitoring Requirements

Regulation No.:	Permit
Regulated pollutant (PSEU):	VOC
Emission limit:	95 percent reduction by cycle
Monitoring requirements:	Continuously monitor inlet and outlet VOC concentration.

C. Control Technology: Three carbon adsorbers

II. Monitoring Approach

The key elements of the monitoring approach for VOC, including the indicators to be monitored, indicator ranges, and performance criteria, are presented in Table A.5-1.

TABLE A.5-1. MONITORING APPROACH

I. Indicator	VOC removal efficiency
Measurement Approach	The inlet and outlet VOC concentrations are monitored with VOC analyzers.
II. Indicator Range	An excursion is defined as an efficiency less than 95.5 percent for each bed cycle. Excursions trigger an inspection, corrective action, and a reporting requirement.
QIP Threshold[a]	Six excursions per semiannual reporting period.
III. Performance Criteria	
A. Data Representativeness[b]	Two analyzers are installed on the carbon adsorber, one at the inlet and one at the outlet vent. The minimum accuracy is ±1 percent of span.
B. Verification of Operational Status	NA
C. Quality Assurance and Control Practices	Monthly calibration is performed on the analyzers using calibration gas. Maximum calibration drift is ±2.5 percent of span. Operators may request that additional calibration checks be performed in between the scheduled monthly checks. Monthly health checks of the monitors are also performed. Annual preventive maintenance procedures are performed.
D. Monitoring Frequency	VOC concentrations are measured every 2 minutes.
Data Collection Procedures	Efficiencies are determined (based on VOC concentration measurements) and recorded every 2 minutes.
Averaging Period	Average efficiencies are determined by cycle, per bed for tracking of the bed efficiency.

[a]Note: The QIP is an optional tool for States; QIP thresholds are not required in the CAM submittal.
[b]Values listed for accuracy specifications are specific to this example and are not intended to provide the criteria for this type of measurement device in general.

JUSTIFICATION

I. Background

Emissions from the chemical process are vented to three carbon adsorber beds in parallel. The emissions are vented to one or two of the three carbon adsorbers at all times; one or two beds are online while the other(s) is regenerating. The carbon adsorbers are used to recover VOC. Bypass of the control device is not possible based on the PSEU design.

II. Rationale for Selection of Performance Indicators

VOC emissions from the chemical process are recovered with three carbon adsorbers in parallel. Monitoring of the inlet and outlet VOC concentration to calculate the recovery efficiency of the control device has been selected as the monitoring approach. This monitoring method is a direct measure of the control device performance and provides the best assurance that the carbon beds are operating properly. A decline in recovery efficiency indicates reduced performance of the carbon adsorber. For this system, maintaining a high recovery efficiency is desirable because the recovered VOC is reused in the process. The facility opted to install VOC CEMS that provide a direct measure of recovery efficiency. This information allows the facility to maximize VOC recovery.

III. Rationale for Selection of Indicator Ranges

The selected indicator range is “greater than 95.5 percent efficiency for each carbon bed cycle.” No upper indicator range limit is necessary. When an excursion occurs corrective action will be initiated, beginning with an evaluation of the occurrence to determine the action required to correct the situation. All excursions will be documented and reported. The selected QIP threshold level is six excursions per bed per semiannual reporting period. (Note: Establishing a proposed QIP threshold in the monitoring submittal is optional.) This level is less than 0.5 percent of the number of bed cycles in a semiannual reporting period. If the QIP threshold is exceeded in a semiannual reporting period, a QIP will be developed and implemented.

To monitor and evaluate performance, the carbon bed efficiency of each cycle for each bed is charted and evaluated using statistical techniques. The average and the upper and lower control limits (±3 standard deviations) are graphed. The process target level is 96 percent efficiency. The indicator range has been established at a level that is above the emission limitation (95 percent efficiency) but below the lower control limit during normal operating conditions.

Monitoring data were reviewed to determine whether the control efficiency is maintained during normal operation of the process and carbon adsorber. The average recovery efficiency per online cycle and the average daily efficiency for a 16-day period (May 6 to May 21, 1997) were reviewed for carbon bed 12; a total of 181 cycles for bed 12 were completed in these 16 days.

The cycle efficiency data are presented in Figure A.5-1. The average cycle efficiency ranged from 95.5 to 96.6 percent.

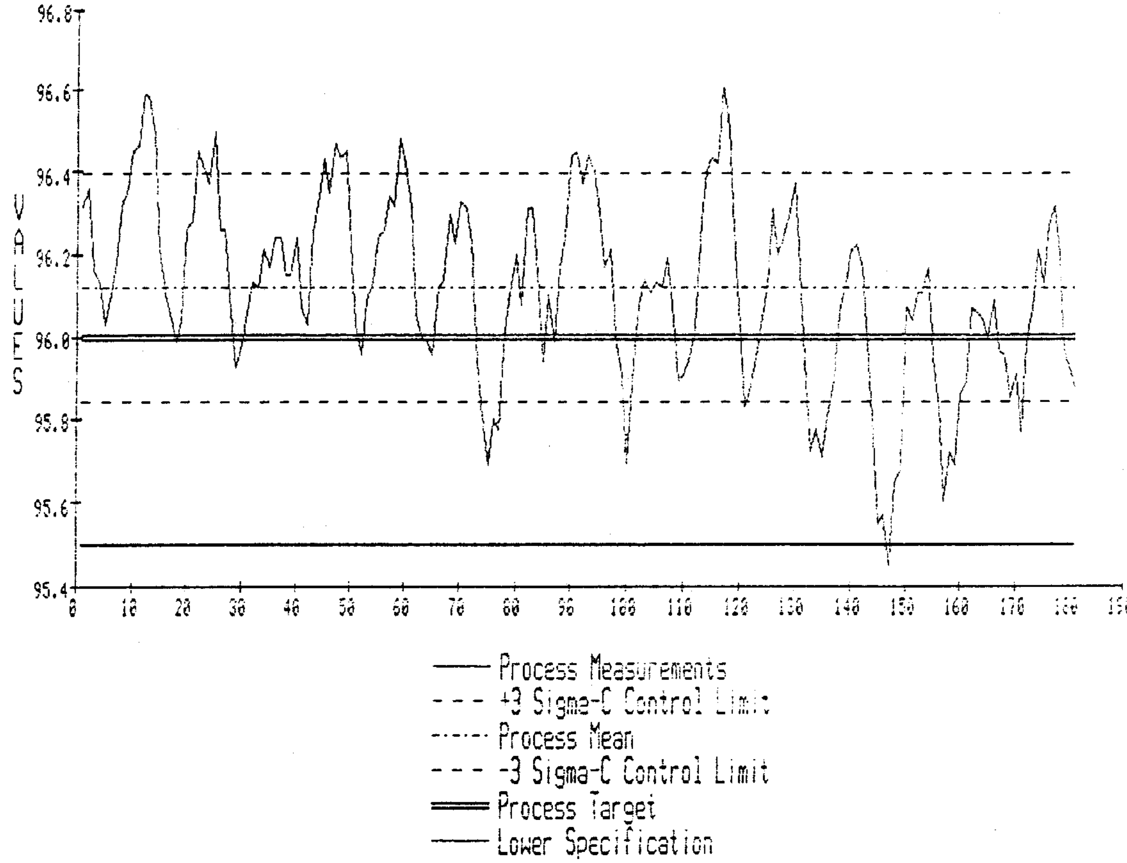
The upper and lower control limits (3 standard deviations) are 96.4 and 95.8 percent, respectively. During this 16-day period the selected indicator range of 95.5 percent (identified as the "lower specification" in Figure A.5-1) was exceeded once; i.e., one excursion occurred.

The daily average efficiencies are presented in Figure A.5-2. The daily average efficiencies ranged from 95.8 to 96.3 percent. During this 16-day period, the carbon adsorber bed was consistently operating with a recovery efficiency greater than or equal to 95 percent.

No performance test has been conducted on this control device and a performance test is not planned for the purpose of establishing the indicator range. The control efficiency is determined based upon the relative measurement of the inlet and outlet concentrations.

The monitors are calibrated monthly using calibration standards comprised of the single VOC present in the exhaust stream. Monthly calibrations were found to be sufficient based on calibration drift data collected over a 1 year period. These data indicate that calibration readings are consistent from month to month and rarely drift by more than ±2.5 percent of the span value.

% EFFICIENCY - CARBON BED 12 - BY CYCLE
FROM 5- 6-1997 TO 5-21-1997



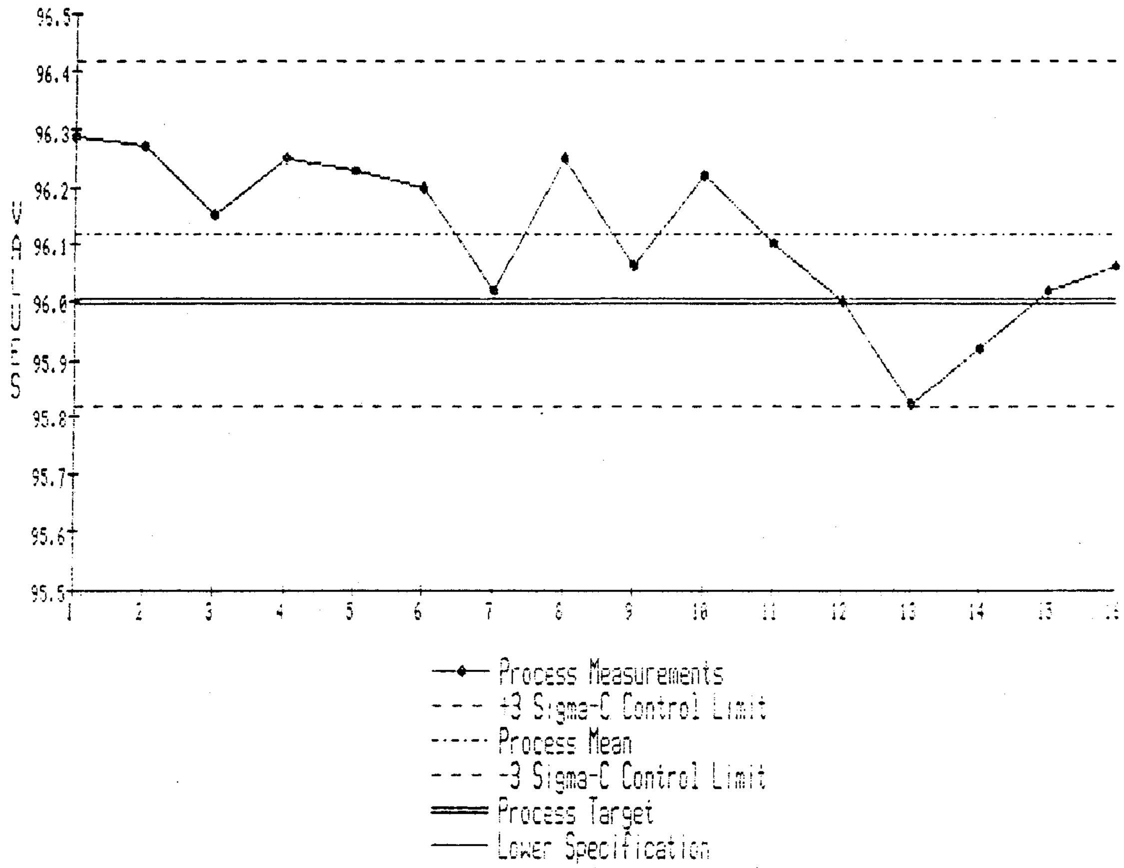
44 Points (24.3%) Out-of-Control: 10 11 12 13 14 22 23 25 45 47 48 49 59 60 74 75 76 77 90 91 93 94 [illegible]
1 Points (0.6%) Out-of-Spec: 147

Upper Control Limit	96.3931
Process Average	96.1191
Lower Control Limit	95.8451
Upper Specification	None
Process Target	96.0000
Lower Specification	95.5000
Sigma-S	0.2256
Sigma-C	0.0913
Sigma-S / Sigma-C	2.4705
N	181.0000

Points > UCL	23
Points < LCL	21
Points > USL	0
Points < LSL	1
Cycling ?	Yes
Run of 8 ?	Yes

Figure A.5-1.

% EFFICIENCY - CARBON BED 12 - DAILY AVERAGE
FROM 5- 6-1997 TO 5-21-1997



Points Out-of-Control: none
Points Out-of-Spec: none

Upper Control Limit	96.4159	Points > UCL	0
Process Average	96.1162	Points < LCL	0
Lower Control Limit	95.8166	Points > USL	0
Upper Specification	None	Points < LSL	0
Process Target	96.0000	Cycling ?	No
Lower Specification	95.5000	Run of 8 ?	No
Sigma-S	0.1382		
Sigma-C	0.0999		
Sigma-S / Sigma-C	1.3834		
N	16.0000		

Figure A.5-2.

A.18 CARBON ADSORBER FOR VOC CONTROL – FACILITY T

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EXAMPLE COMPLIANCE ASSURANCE MONITORING
CARBON ADSORBER FOR VOC CONTROL – FACILITY T

I. Background

A. Emissions Unit

Description:	Loading Rack
Identification:	LR-1
APCD ID:	SRU-1
Facility:	Facility T Anytown, USA

B. Applicable Regulation, Emission Limit, and Monitoring Requirements

Regulation:	Permit
Emission Limits: VOC:	 0.67 lb/1,000 gallons transferred (80 mg/L transferred)
Monitoring Requirements:	Monitor carbon adsorber outlet VOC concentration, monitor position of APCD bypass valve, conduct a leak detection and repair program.

C. Control Technology:

Carbon adsorber.

II. Monitoring Approach

The key elements of the monitoring approach are presented in Table A.18-1. The carbon adsorber outlet VOC concentration in percent by volume as propane is continuously monitored. The selected indicator range is based on a 1-hour rolling average concentration. Periodic leak checks of the vapor recovery unit also are conducted and the position of the carbon adsorber bypass valve is monitored to ensure bypass of the control device is not occurring.

Note: Facility T also monitors parameters related to the vapor tightness of connections and tank trucks and other parameters of the vapor recovery system, but this example focuses on the monitoring performed on the carbon adsorber.

TABLE A.18-1. MONITORING APPROACH

	Indicator No. 1	Indicator No. 2
I. Indicator	Outlet VOC concentration (percent).	Equipment leaks.
Measurement Approach	Breakthrough detector (NDIR analyzer).	Monthly leak check of vapor recovery system.
II. Indicator Range	An excursion is defined as an hourly average outlet VOC concentration of 4 percent by volume (as propane) or greater. When this level is reached or exceeded, the loading rack will be shut down via an automated interlock system. An excursion will trigger an investigation, corrective action, and a reporting requirement.	An excursion is defined as detection of a leak greater than or equal to 10,000 ppm (as methane) during normal loading operations. An excursion will trigger an investigation, corrective action, and a reporting requirement. Leaks will be repaired within 15 days.
III. Performance Criteria A. Data Representativeness	The analyzer is located at the carbon adsorber outlet.	A handheld monitor is used to check for leaks in the vapor collection system during loading operations.
B. Verification of Operational Status	NA	NA
C. QA/QC Practices and Criteria	Daily zero/span drift. Adjust if drift is greater than 2.5 percent of span.	Follow procedures in 40 CFR 60, Appendix A, Method 21.
D. Monitoring Frequency	The outlet VOC concentration is monitored every 2 minutes.	Monthly.
Data Collection Procedures	The data acquisition system (DAS) collects the outlet VOC concentration every 2 minutes and calculates a rolling 1-hour average. Periods when breakthrough is detected and the interlock system shuts down the loading rack also are recorded.	Records of inspections, leaks found, leaks repaired.
Averaging period	1 hour (rolling).	None.
APCD Bypass Monitoring:	A pressure gauge on the vapor header line is used to detect if the relief valve is open. The valve opens if the pressure reaches 18 inches H_2O. The DAS records the instantaneous pressure reading every 2 minutes.	

MONITORING APPROACH JUSTIFICATION

I. Background

The pollutant specific emissions unit (PSEU) is a vacuum regenerative carbon adsorber used to reduce VOC emissions from a gasoline loading rack. (Note: This facility is not a major source of HAP emissions and is not subject to 40 CFR 63, Subpart R, or 40 CFR 60, Subpart XX.) The maximum throughput of the loading rack is 43,000,000 gallons per month, and the facility operates 24 hours per day, 7 days per week.

The carbon adsorber has two identical beds, one adsorbing while the other is desorbing on a 15-minute cycle. Carbon bed regeneration is accomplished with a combination of high vacuum and purge air stripping which removes previously adsorbed gasoline vapor from the carbon and restores the carbon's ability to adsorb vapor during the next cycle. The vacuum pump extracts concentrated gasoline vapor from the carbon bed and discharges into a separator. Non-condensed gasoline vapor plus gasoline condensate flow from the separator to an absorber column which functions as the recovery device for the system. In the absorber, the hydrocarbon vapor flows up through the absorber packing where it is liquefied and subsequently recovered by absorption. Gasoline product from a storage tank is used as the absorbent fluid. The recovered product is simply returned along with the circulating gasoline back to the product storage tank A small stream of air and residual vapor exits the top of the absorber column and is recycled to the on-stream carbon bed where the residual hydrocarbon vapor is re-adsorbed.

II. Rationale for Selection of Performance Indicators

A non-dispersive infrared (NDIR) analyzer is used to monitor the carbon adsorber outlet VOC concentration in percent by volume as propane and ensure breakthrough is not occurring. This monitor provides a direct indicator of compliance with the VOC limit since it continuously measures the outlet VOC concentration in percent. An interlock system is used to shut down loading operations when an excursion occurs.

A monthly leak inspection program also is performed to ensure that the vapors released during loading are captured and conveyed to the vapor recovery unit. A handheld monitor is used to detect leaks in the vapor collection system. The position of the vapor recovery unit's relief valve is monitored to ensure the control device is not bypassed.

III. Rationale for Selection of Indicator Ranges

The indicator range for the breakthrough detector was selected based on engineering calculations. The VOC emission rate can be expressed as follows (see 40 CFR 60.503):

$$E = K \frac{V \times C}{L \times 10^6}$$

where:

E = emission rate of VOC, mg/L
V = volume of air/vapor mixture exhausted, scm
C = concentration of VOC, ppm
L = volume loaded, L
K = density of calibration gas, 1.83×10^6 mg/scm for propane

Assuming 100 percent displacement of all vapors into the vapor recovery unit (e.g., if 300,000 L are loaded, 300,000 L of vapor pass through the unit) and assuming that breakthrough is occurring, it may be conservatively assumed that V is equal to L (V is actually less than L if the carbon adsorber is operating properly). Converting the volume displaced/exhausted (300,000 L) to cubic meters (300 scm) and substituting 300 scm for V, 80 mg/L for E, and 1.83×10^6 mg/scm for K gives C equal to 43,700 ppm, or 4.4 percent. Therefore, the indicator range for the outlet VOC concentration is 4 percent (rolling hourly average), to provide a reasonable assurance of compliance with the VOC limit of 80 mg/L loaded. If the hourly average outlet VOC concentration reaches or exceeds 4 percent, the unit will be shut down and loading prevented via an automated interlock system. All excursions will be documented and reported. Figure A.18-1 presents both 2-minute instantaneous (dotted line) and hourly average (solid line) outlet VOC concentration data for a typical day's operation. The outlet VOC concentration typically is less than 0.5 percent as propane.

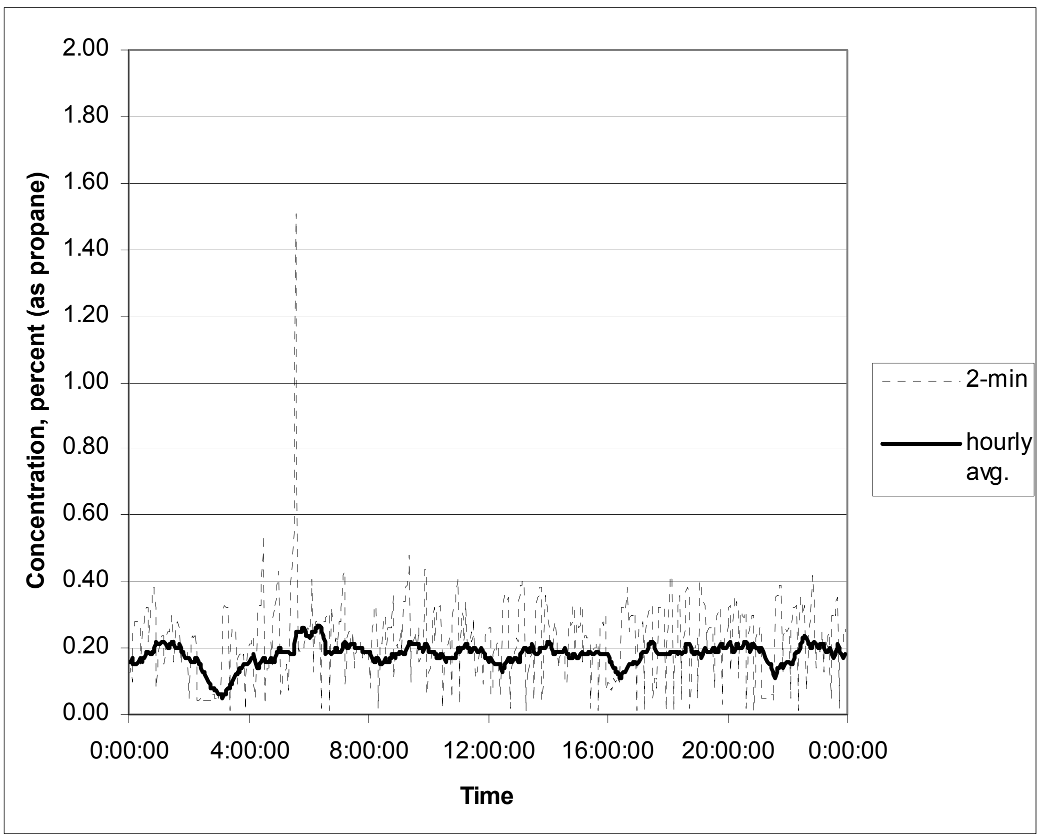

Figure A.18-1. A typical day's concentration data.

The most recent performance test conducted showed that the average hydrocarbon emissions were 10.37 mg/liter loaded. The average outlet concentration was 0.37 percent propane by volume, and the unit's efficiency was 98.6 percent.

For the second indicator, an excursion is defined as detection of a leak greater than or equal to 10,000 ppm (as methane) during normal loading operations. This is the limit established by the applicable requirement. If a leak is detected, corrective action will be initiated, and the leak will be repaired within 15 days. All excursions will be documented and reported.

Comment: During the review period, one commenter suggested setting an internal warning level for the bypass line pressure. For safety reasons, the bypass valve on the inlet APCD line is set to release at 18" w.c. With respect to APCD bypass, the CAM rule only requires that a facility monitor the bypass so that bypass events can be corrected immediately and reported. Consequently, establishing an indicator range at a level less than the release pressure is not required. However, if a facility wants to take extra precautions to avoid bypass events, it could establish a warning at a lower pressure, such as the 15" w.c., which would allow them to initiate corrective action before a bypass event, as suggested by this commenter.

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A.24 CARBON ADSORBER FOR VOC CONTROL--FACILITY EE

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EXAMPLE COMPLIANCE ASSURANCE MONITORING
CARBON ADSORBER FOR VOC CONTROL: FACILITY EE

I. Background

A. Emissions Unit

Description:	Loading Rack
Identification:	LR-1
APCD ID:	VRU-1
Facility:	Facility EE Anytown, USA

B. Applicable Regulation, Emission Limit, and Monitoring Requirements

Regulation:	Permit, State regulation
Emission Limits:	
VOC:	45 mg/liter of product loaded
Monitoring Requirements:	Monitor vacuum profile during carbon bed regeneration cycle, monitor for APCD bypass, test the carbon periodically, and conduct an inspection and maintenance program and a leak detection and repair program.

C. Control Technology: Carbon adsorber.

II. Monitoring Approach

The key elements of the monitoring approach are presented in Table A.24-1. The amount of time the regenerating carbon bed remains at or below -27 inches of Hg is monitored to ensure the bed has been fully regenerated. An inspection and maintenance program, including annual testing of the carbon activity, is conducted to verify proper operation of the vapor recovery unit (VRU). Periodic leak checks of the vapor recovery unit also are conducted and the carbon adsorber bypass valve is monitored to ensure bypass of the control device is not occurring.

Note: Facility EE also monitors parameters related to the vapor tightness of connections and tank trucks and other parameters of the vapor recovery system, but this example focuses on the monitoring performed on the carbon adsorber.

TABLE A.24-1. MONITORING APPROACH

	Indicator No. 1	Indicator No. 2	Indicator No. 3
I. Indicator	Regeneration cycle vacuum. Specifically, the time the regenerating carbon bed remains at or below -27 inches Hg.	Documentation of inspection and maintenance program and annual carbon testing.	Equipment leaks.
Measurement Approach	Pressure transmitter.	Proper VRU operation is verified by performing periodic inspections and maintenance. Daily checks include verification of gasoline flow, purge air flow, cycle time, valve timing, and operating temperatures. Annual checks include carbon testing and pump and motor maintenance.	Monthly leak check of vapor recovery system.
II. Indicator Range	An excursion occurs when the regenerating carbon bed remains at or below -27 inches Hg for less than 2.5 minutes. When an excursion occurs, the loading rack will be shut down via an automated interlock system. An excursion will trigger an investigation, corrective action, and a reporting requirement.	An excursion occurs if the inspection or annual carbon test is not performed or documented or if corrective action is not initiated within 24 hours to correct any problems identified during the inspection of the unit or carbon testing. An excursion will trigger an investigation, corrective action, and a reporting requirement.	An excursion is defined as detection of a leak greater than or equal to 10,000 ppm (as methane) during normal loading operations. An excursion will trigger an investigation, corrective action, and a reporting requirement. Leaks will be repaired within 15 days.
III. Performance Criteria A. Data Representativeness	The pressure during the regeneration cycle is measured in the vacuum pump suction line. The minimum accuracy of the pressure transmitter is ±1.0 percent.	VRU operation verified visually by trained personnel using documented inspection and maintenance procedures. Representative carbon sample obtained from both beds.	A handheld monitor is used to check for leaks in the vapor collection system during loading operations.
B. Verification of Operational Status	NA	NA	NA
C. QA/QC Practices and Criteria	Pressure transmitter is calibrated annually.	Personnel are trained on inspection and maintenance procedures and proper frequencies.	Follow procedures in 40 CFR 60, Appendix A, Method 21.
D. Monitoring Frequency	Continuously during each regeneration cycle.	Varies. Carbon testing performed annually.	Monthly.

(TABLE A.24-1. Continued.)

	Indicator No. 1	Indicator No. 2	Indicator No. 3
Data Collection Procedures	The data acquisition system (DAS) records the pressure profile during each regeneration cycle. Periods when the interlock system shuts down the loading rack also are recorded.	Results of inspections and any maintenance necessary are recorded in VRU operating log. Results of carbon testing are maintained onsite.	Records of inspections, leaks found, leaks repaired.
Averaging period	None.	None.	None.
APCD Bypass Monitoring:	The pressure in the VRU vapor line is monitored with a pressure transmitter to ensure bypass of the control device is not occurring. If the pressure in the VRU vapor line exceeds 18 inches of water, the safety relief valve opens and bypass occurs. All instances of control device bypass are recorded.		

MONITORING APPROACH JUSTIFICATION

I. Background

The pollutant specific emissions unit (PSEU) is a vacuum regenerative carbon adsorber used to reduce VOC emissions from the loading of petroleum products (heating oil, diesel fuel, and gasoline). (Note: This facility is not a major source of HAP emissions and is not subject to 40 CFR 63, Subpart R, "National Emission Standards for Gasoline Distribution Facilities" or 40 CFR 60, Subpart XX, "Standards of Performance for Bulk Gasoline Terminals.")

The carbon adsorber has two identical beds, one adsorbing while the other is desorbing on a 15-minute cycle. Carbon bed regeneration is accomplished with a combination of high vacuum and purge air stripping which removes previously adsorbed gasoline vapor from the carbon and restores the carbon's ability to adsorb vapor during the next cycle. The vacuum pump extracts concentrated gasoline vapor from the carbon bed and discharges into a separator. Non-condensed gasoline vapor plus gasoline condensate flow from the separator to an absorber column which functions as the recovery device for the system. In the absorber, the hydrocarbon vapor flows up through the absorber packing where it is liquefied and subsequently recovered by absorption. Gasoline product from a storage tank is used as the absorbent fluid. The recovered product is returned along with the circulating gasoline back to the product storage tank A small stream of air and residual vapor exits the top of the absorber column and is recycled to the on-stream carbon bed where the residual hydrocarbon vapor is re-adsorbed.

II. Rationale for Selection of Performance Indicators

The carbon adsorber system was custom-designed specifically for this installation based on the maximum expected loading and types of products loaded. The carbon beds and vacuum pump were sized appropriately. The vacuum profile during regeneration is an important variable in the performance of the VRU. If the carbon bed is overloaded, the time to achieve certain vacuum levels will be longer, and the bed will not be fully regenerated during the 15-minute cycle. Monitoring of the vacuum profile during regeneration, coupled with regular inspection and maintenance activities (including, daily verification of proper valve timing, cycle time, gasoline flow, and purge air flow) and annual testing of a carbon sample from each bed, serves to verify that the VRU is operating properly and provide a reasonable assurance of compliance.

A monthly leak inspection program is performed to ensure that the vapors released during loading are captured and conveyed to the VRU. A handheld monitor is used to detect leaks in the vapor collection system. The VRU's relief valve in the VRU vapor line also is monitored to ensure the control device is not bypassed. Bypass occurs when the pressure in the vapor line exceeds the safe limit.

III. Rationale for Selection of Indicator Ranges

An engineering analysis was performed based on the worst case loading conditions expected. That analysis shows that if the regenerating carbon bed stays at or below -27 in Hg for at least 2.5 minutes the bed will be properly regenerated and will have the capacity to meet the VOC emissions limit under worst case loading conditions. Therefore, an excursion occurs when the regenerating bed does not stay at or below -27 in. Hg for at least 2.5 minutes. The expected vacuum profile during heavy loading is presented in Table A.24-2. All excursions will be documented and reported. An interlock system is used to shut down loading operations when an excursion occurs. Typical operating data show that the beds stay at or below -27 in. Hg for more than 5 minutes of the regeneration cycle, as shown in Table A.24-3.

The most recent performance test showed emissions of 3.8 mg/liter of gasoline loaded, less than 10 percent of the VOC limit. The unit's efficiency was calculated as 99.99 percent. The exhaust concentration equivalent of 45 mg/L loaded calculated at the time of the performance test was approximately 33,100 ppmv VOC. Table A.24-4 shows exhaust VOC concentration data for both beds collected over a period of several weeks using a portable VOC analyzer. The data show the carbon adsorber operated well under the VOC emission limit.

TABLE A.24-2. WORST-CASE MODELED VACUUM PROFILE (HEAVIEST LOADING)

Minute	Inches Hg Vacuum
1	14.0
2	19.6
3	22.3
4	24.3
5	25.0
6	25.3
7	25.6
8	26.0
9	26.2
10	26.5
11	26.8
12	27.0
13	27.3
13:30	27.5
14-15	At 13:30, the bed is re-pressurized.

TABLE A.24-3. TYPICAL VACUUM PROFILE DURING REGENERATION CYCLE

Bed 1		Bed 2	
Minute	Inches Hg Vacuum	Minute	Inches Hg Vacuum
1	12.5	1	10
2	20.5	2	18
3	24	3	23
4	25	4	26
5	26	5	27.5
6	26.5	6	27.6
7	26.8	7	27.6
8	27	8	27.7
9	27.1	9	27.8
10	27.1	10	27.8
11	27.2	11	27.9
12	27.3	12	27.9
13	27.4	13	28
14	At 13:30, the bed is re-pressurized.	14	At 13:30, the bed is re-pressurized.
15		15	

TABLE A.24-4. SAMPLE WEEKLY EXHAUST VOC CONCENTRATION DATA

Week	Bed 1 (ppmv)	Bed 2 (ppmv)
1	6,000	6,500
2	4,800	5,200
3	7,900	5,100
4	8,450	6,240
5	9,000	6,450
6	9,500	11,000
7	9,110	7,500
8	10,000	8,000
9	12,000	9,500
10	8,000	6,500

For the second indicator, an inspection and maintenance program is conducted, following documented procedures. This program is performed by terminal operators and contracted maintenance personnel. The results of all inspections and any maintenance performed are recorded in the VRU operating log. An excursion is defined as failure to conduct or document the required inspections or maintenance activities or failure to initiate corrective action within 24 hours to correct any problems identified during the inspection. All excursions will be documented and reported.

For the third indicator, an excursion is defined as detection of a leak greater than or equal to 10,000 ppm (as methane) during normal loading operations. If a leak is detected, corrective action will be initiated, and the leak will be repaired within 15 days. All excursions will be documented and reported. Control device bypass also is monitored. Bypass occurs when the pressure in the VRU vapor line exceeds 18 inches of water and the safety relief valve opens. All instances of control device bypass are recorded.

Comment: For regenerative carbon absorbers, an annual carbon activity check provides the facility with information on the condition and activity of the carbon. An alternative to periodic carbon activity checks would be periodic checks of the outlet VOC concentration using a portable monitor, or periodic (e.g., annual) Method 25A tests.

Furthermore, if an additional level of confidence in the monitoring approach were desired (e.g., if the unit had a small margin of compliance with the VOC limit), one option would be to require more frequent periodic (e.g., quarterly) monitoring of the carbon bed outlet concentration with a portable VOC analyzer in lieu of the annual carbon testing.

Comment: During the review period, one commenter suggested setting an internal warning level for the bypass line pressure. For safety reasons, the bypass valve on the inlet APCD line is set to release at 18" w.c. With respect to APCD bypass, the CAM rule only requires that a facility monitor the bypass so that bypass events can be corrected immediately and reported. Consequently, establishing an indicator range at a level less than the release pressure is not required. However, if a facility wants to take extra precautions to avoid bypass events, it could establish a warning at a lower pressure, such as the 15" w.c., which would allow them to initiate corrective action before a bypass event, as suggested by this commenter.