

Permit Amendment Source Analysis & Technical Review

Company	Valero Refining-Texas, L.P.	Permit Number	2501A
City	Houston	Project Number	205855
County	Harris	Account Number	HG-0130-C
Project Type	Amend	Regulated Entity Number	RN100219310
Project Reviewer	Tony Ionescu, P.E.	Customer Reference Number	CN600127468
Site Name	Houston Refinery		

Project Overview

Valero Refining which operates the Houston Refinery has submitted an amendment to permit 2501A to authorize emissions of hydrogen cyanide (HCN) from the FCCU. The estimated emissions are based on a limited amount of stack test data available from FCCUs at other similar Valero refineries. The requirement to conduct stack testing for HCN within 180 days of the approval of this amendment will be required by the newly drafted Special Condition No. 55, subparagraph D and the addition of Special Condition Nos. 65 and 66. In addition, Valero has requested the removal of Special Condition No. 60, subparagraph E which contained the requirement to document required benzene reductions designed to offset benzene increases authorized in an earlier amendment for the Crude Topper Unit. A detailed discussion of the justification of request is contained in the Process/Project Description and the Pollution Prevention, Sources, Controls and BACT sections below.

Emission Summary

Air Contaminant	Current Allowable Emission Rates (tpy)	Proposed Allowable Emission Rates (tpy)	Change in Allowable Emission Rates (tpy)
HCN	0	512.86	512.86
Benzene	0.71	0.28	-0.43

*Hydrogen Cyanide (HCN) is not a regulated pollutant for purposes of major NSR.

Compliance History Evaluation - 30 TAC Chapter 60 Rules

A compliance history report was reviewed on:	January 26, 2017
Site rating & classification:	9.41 / Satisfactory
Company rating & classification:	18.85 / Satisfactory
If the rating is 50<RATING<55, what was the outcome, if any, based on the findings in the formal report:	N/A
Has the permit changed on the basis of the compliance history or rating?	No

Public Notice Information - 30 TAC Chapter 39 Rules

Rule Citation	Requirement	
39.403	Is Public Notice Required?	Yes
	Date Application Received:	February 10, 2014
	Date Administratively Complete:	February 24, 2014
	Small Business Source?	No
	Date Leg Letters mailed:	February 24, 2014
39.603	Date Published:	March 20, 2014
	Publication Name:	Houston Chronicle
	Pollutants:	organic compounds, carbon monoxide, sulfur dioxide, nitrogen oxides, sulfuric acid, and particulate matter including particulate matter with diameters of 10 microns or less and 2.5 microns or less
	Date Affidavits/Copies Received:	April 4, 2014

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Rule Citation	Requirement	
	Is bilingual notice required?	Yes
	Language:	Spanish
	Date Published:	March 21, 2014
	Publication Name:	El Observador
	Date Affidavits/Copies Received:	April 4, 2014
	Date Certification of Sign Posting / Application Availability Received:	April 25, 2014
39.604	Public Comments Received?	No
	Hearing Requested?	No
	Meeting Request?	N/A
	Date Response to Comments sent to OCC:	N/A
	Consideration of Comments:	N/A
	Is 2nd Public Notice required?	Yes
39.602(c)	Date SB 709 Legislative Notification Sent:	N/A – received prior to effective date
39.419	Date 2nd Public Notice/Preliminary Decision Letter Mailed:	
39.413	Date Cnty Judge, Mayor, and COG letters mailed:	
	Date Federal Land Manager letter mailed:	
39.605	Date affected states letter mailed:	
39.603	Date Published:	
	Publication Name:	
	Pollutants:	hydrogen cyanide (HCN) Note: HCN was judged to be the only appropriate pollutant to be included in the 2 nd public notice, since this action will result in HCN emissions from the FCCU being authorized in the permit. There are no proposed increases from the FCCU of the allowables of the pollutants listed in the 1 st public notice.
	Date Affidavits/Copies Received:	
	Is bilingual notice required?	
	Language:	
	Date Published:	
	Publication Name:	
	Date Affidavits/Copies Received:	
	Date Certification of Sign Posting / Application Availability Received:	
	Public Comments Received?	
	Meeting Request?	
	Date Meeting Held:	
	Hearing Request?	
	Date Hearing Held:	
	Request(s) withdrawn?	
	Date Withdrawn:	

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Rule Citation	Requirement
	Consideration of Comments:
39.421	Date RTC, Technical Review & Draft Permit Conditions sent to OCC:
	Request for Reconsideration Received?
	Final Action:
	Are letters Enclosed?

Construction Permit & Amendment Requirements - 30 TAC Chapter 116 Rules

Rule Citation	Requirement	
116.111(a)(2)(G)	Is the facility expected to perform as represented in the application?	Yes
116.111(a)(2)(A)(i)	Are emissions from this facility expected to comply with all TCEQ air quality Rules & Regulations, and the intent of the Texas Clean Air Act?	Yes
116.111(a)(2)(B)	Emissions will be measured using the following method: Comments on emission verification:	To be determined based on stack testing in Special Condition No. 55
116.111(a)(2)(D)	Subject to NSPS? Subparts A, Db, Dc, J, Ja, K, Ka, Kb, GGG, GGGa & QQQ	Yes
116.111(a)(2)(E)	Subject to NESHAP? Subparts A, & FF	Yes
116.111(a)(2)(F)	Subject to NESHAP (MACT) for source categories? Subparts A, CC, UUU & DDDDD	Yes
116.111(a)(2)(H)	Nonattainment review applicability: The site is an existing named major source located in a county designated as being moderate nonattainment for ozone in which VOC and NOx are regulated as precursors. This project does not involve an increase in emissions of VOC or NOx. Nonattainment does not apply.	
116.111(a)(2)(I)	PSD review applicability: The site is an existing major source. HCN is not a regulated pollutant for purposes of Major NSR. PSD does not apply.	
116.111(a)(2)(L)	Is Mass Emissions Cap and Trade applicable to the new or modified facilities? If yes, did the proposed facility, group of facilities, or account obtain allowances to operate:	No N/A
116.140 - 141	Permit Fee: \$ 900.00 Applicable Outstanding Fees:	Fee certification: Yes N/A

Title V Applicability - 30 TAC Chapter 122 Rules

Rule Citation	Requirement
122.10(14)	Title V applicability: This site operates under Title V Permit No. O1381
122.602	Periodic Monitoring (PM) applicability: Compliance with emission rate allowables and other operational limits will be demonstrated by the following monitoring: Monitoring of sulfur fuel analysis, flare waste gas flow and composition, flare pilot flame, seal gap measurements of floating roof tanks, throughputs and fill/withdrawal rates of storage tanks, records of monitoring and repairs of fugitive components in VOC and ammonia services, measurement of NOx and CO emissions from process heaters, monitoring of cooling tower VOC and PM emissions, measurement of wastewater VOC content, and emissions, and records of emissions from MSS activities.

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122.604 **Compliance Assurance Monitoring (CAM) applicability:** The following facilities are subject to CAM: Main Refinery Flare and ULSD Flare Combined Emissions (EPNs 30FL1 and 30FL6), FCCU (EPN 42CB2201), and Tail Gas Incinerators for SRU Units 39 & 46 (EPNs 39CB2001 & 46CB6301). The flares will be monitored for VOC emissions through the monitoring of waste gas flow and composition, The FCCU Stack will be monitored for CO, SO₂, NO_x, and O₂. The tail gas incinerators will be monitored for SO₂, O₂. The waste gas collection system of all three systems will be monitored in accordance with Special Condition No.38.

Request for Comments

Received From	Program/Area Name	Reviewed By/Date	Comments
Region:	12	Regional comment has not been solicited.	The proposed permit specifies that stack testing be performed and that an application to amend or alter the permit be submitted subsequent to the test to submit test results.
City:	Houston		
County:	Harris		
ADMT:		Robert Castro / February 1, 2018	The air quality analysis performed to evaluate benzene impacts was determined to be acceptable.
EB&T:			
Toxicology:		Darrell McCant / July 21, 2017	The predicted impacts were approved because no short-term or long-term adverse health effects were expected to occur among the general public as a result of exposure to the proposed HCN emissions from the FCCU.
Comment resolution and/or unresolved issues:			

Process/Project Description

This project will update representations for the FCCU Regenerator (EPN EG-001) to include Hydrogen Cyanide (HCN) emissions. This item is being added to the permit at the direction of EPA. The emissions being added are not new but have always existed associated with the unit. Emissions are being added to the permit based on current representation with the understanding that stack testing must be performed and that an amendment to readdress the emissions will be filed subsequent to the stack test.

In addition, Valero has requested the removal of Special Condition No. 60, subparagraph E which requires the documentation of required benzene reductions designed to offset benzene increases authorized in an earlier amendment for the Crude Topper Unit (CTU). When the CTU was originally authorized, the Valero Houston Refinery was located in an Air Pollution Watch List (APWL) area for benzene. The proposed benzene increases for the CTU were required to be offset by decreases that would be documented by recordkeeping required in the special conditions. In November 2016, benzene was removed from APWL 1206. As a result, Valero requested the removal of the requirement to generate benzene decreases.

Pollution Prevention, Sources, Controls and BACT- [30 TAC 116.111(a)(2)(C)]

In response to the request to represent existing HCN emissions from the FCCU stack, stack testing for HCN was added to the special conditions in order to establish the actual level of emissions. Upon issuance of this project, the following changes will be made to the MAERT and permit special conditions.

MAERT

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EPN 42CB2201 (FCC Unit Stack) –HCN emission rates of 117.09 lb/hr and 512.86 tpy will be added to the permit.

Special Conditions

<u>Current Permit</u>	<u>Proposed Permit</u>	<u>Change</u>
55	55	Updated existing Stack Sampling condition to include specifying that HCN testing would be conducted at maximum federate to the FCCU catalyst regenerator
N/A	65	Requirement to conduct stack testing within 180 days of the approval of this amendment to determine the actual pattern and quantities of HCN being emitted from the FCCU stack.
N/A	66	Requirement to submit an application within 90 days upon the submittal of stack test results to the region specified in Special Condition 55 in order to update the representations and address BACT and methods for mitigating HCN emissions from the FCCUs.

In response to the applicant's request to remove the requirements of Special Condition Number 60 E, Valero was required to conduct modeling to demonstrate that the increase in benzene emissions, which would no longer be offset by a comparable decrease in benzene emissions in the APWL, would not result in unacceptable off property impacts. Refined modeling was performed by the applicant. An audit of the initial modeling results would have required the applicant to conduct site-wide modeling of benzene. Valero opted to conduct a fugitive component reconciliation count for the Crude Topper Unit. The results of the count resulted in lower benzene emissions, which were modeled by the ADMT staff.

Impacts Evaluation - 30 TAC 116.111(a)(2)(J)

Was modeling conducted?	Yes	Type of Modeling:	Screen3 / AERMOD
Will GLC of any air contaminant cause violation of NAAQS?			No
Is this a sensitive location with respect to nuisance?			No
[§116.111(a)(2)(A)(ii)] Is the site within 3000 feet of any school?			No
Additional site/land use information:			

Summary of Modeling Results

Off property impacts of HCN was modeled by the permit reviewer using the Screen 3 modeling program. Off property impacts were determined assuming the total emissions authorized in the cap were emitted from the worst case FCCU stack. The maximum ground level concentration was predicted to be 60 $\mu\text{g}/\text{m}^3$ which exceeded the short term ESL of 20 $\mu\text{g}/\text{m}^3$. In addition, the predicted annual max GLC of 4.8 $\mu\text{g}/\text{m}^3$ exceeded the annual ESL of 2 $\mu\text{g}/\text{m}^3$. Since the predicted impacts were over two times the short term and annual ESLs, the Toxicology Division was asked to review and comment on the acceptability of the impacts. The Toxicology Division concluded that no short-term or long-term adverse health effects were expected to occur among the general public as a result of exposure to the proposed HCN emissions from the FCCU.

Following the reconciliation count of fugitive components in benzene service, the revised benzene emissions from the Crude Topper Unit were modeled by ADMT. The ADMT audit concluded that the air quality analysis is acceptable. The results are summarized below.

Minor NSR Project-Related Modeling Results for Health Effects

Pollutant & CAS#	Averaging Time	GLCmax ($\mu\text{g}/\text{m}^3$)	10% ESL ($\mu\text{g}/\text{m}^3$)
benzene 71-43-2	1-hr	2.04	17

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Pollutant & CAS#	Averaging Time	GLCmax ($\mu\text{g}/\text{m}^3$)	10% ESL ($\mu\text{g}/\text{m}^3$)
benzene 71-43-2	Annual	0.41	0.45

Permit Concurrence and Related Authorization Actions

Is the applicant in agreement with special conditions?	Yes
Company representative(s):	Ms Iuliana Voicu
Contacted Via:	Telephone
Date of contact:	August 30, 2017
Other permit(s) or permits by rule affected by this action:	None
List permit and/or PBR number(s) and actions required or taken:	N/A

Tony Ionescu

Project Reviewer
Tony Ionescu, P.E.

Date

Section Manager
Kate Brown

Date