

US EPA ARCHIVE DOCUMENT



Corpus Christi Refineries

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P.O. Box 2608
Corpus Christi, Texas 78403-2608

July 3, 2013

Ms. Erica G. Le Doux
U.S. Environmental Protection Agency, Region 6
Air Permits Section (6PD-R)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Re: Flint Hills Resources Corpus Christi, LLC - West Refinery
PSD Greenhouse Gas Permit Application
Domestic Crude Project
Revisions to PSD Greenhouse Gas Application

Dear Ms. Le Doux:

On behalf of Flint Hills Resources Corpus Christi, LLC (FHR), I am submitting revisions to the PSD greenhouse gas (GHG) permit application FHR submitted to EPA Region 6 on December 18, 2012. The permit application seeks to authorize a project at FHR's West Refinery to allow the refinery to process a larger percentage of domestic crude oil. Specifically, FHR is proposing the following changes:

1. Revising the baseline actual emissions for the CCR Hot Oil Heater (39BA3901, JJ-4), the DHT Stripper Reboiler (37BA2, KK-3), and the Mid-plant Cooling Tower (44EF1, F-S-201) to be based on years 2011 and 2012 rather than 2010 and 2011. A revised Table 2-F and other pages in the application associated with this change are provided in Attachment A.
2. Revising the fugitive component counts associated with the DHT Unit (F-37) and the fugitive emission rate calculations for the West Crude Unit (F-40). Revised calculations for these two units are provided in Attachment A.
3. Correcting wording on Page 48 of the application to reflect that CO₂ emissions from controlling MSS fugitive emissions were based on the "Crude Oil" factor from Table C-1, which is consistent with the representations in the calculations.

In the event you have additional questions or would like to discuss further, please contact Daren Knowles at (361) 242-8301.

Sincerely,

A handwritten signature in blue ink, appearing to read 'VP' followed by a stylized signature.

Valerie Pompa
Vice President and Manufacturing Manager

VP/DK/syw
Air 13-232; W 3 N 22

Enclosures

cc: Air Section Manager, TCEQ, Region 14, Corpus Christi, w/enclosure
Mr. Kris L. Kirchner, P.E., Waid Environmental, Austin, w/enclosure
Mr. Jeff Robinson, EPA Region 6, w/enclosure (via email)
Ms. Melanie Magee, EPA Region 6, w/enclosure (via email)



ATTACHMENT A
Revised Application Pages

Section 3.0

PREVENTION OF SIGNIFICANT DETERIORATION (PSD) APPLICABILITY

Applicability

FHR's West Refinery is a petroleum refinery and an existing major source of GHG emissions because the potential to emit GHGs prior to the modifications associated with this project is greater than 100 tons/yr GHG on a mass basis and greater than 100,000 tons/yr CO₂e. As shown in the following table and in Table 2-F provided at the end of this section, the project is a major modification for GHGs because the emissions increases resulting from the project, without considering any emissions decreases, are greater than 75,000 tons/yr CO₂e and 0 tons/yr GHG on a mass basis.

This project—including construction of the new emission units, changes to existing emission units, and emissions increases from upstream and downstream affected units—will not trigger federal PSD for any non-GHG new source review (NSR)-regulated pollutants. In fact, the overall project will result in decreased emissions of non-GHG pollutants, with the exception of ammonia. Therefore, for non-GHG pollutants, construction of new emission units and changes to existing emission units are subject only to Texas minor NSR requirements. Emission information for these non-GHG NSR pollutants is set forth in the relevant Texas minor NSR permit applications, and is not provided in this GHG-only application.

Emission Calculation Methods

Existing modified sources—that is, those sources undergoing a physical change or change in method of operation—may use the actual-to-projected actual test of 40 C.F.R. § 52.21(a)(2)(iv) to determine if there will be an emission increase that triggers PSD for GHG. Nevertheless, and simply for ease of calculation, for existing modified sources the source's actual emissions for 2011 and 2012 are compared voluntarily to its future potential to emit to calculate emission increases. For new sources, the future potential to emit after the project is fully operational is used to establish the emissions increase. For those sources that are not new or modified but are affected upstream or downstream of the project due to an increase in utilization rate, an incremental increase in actual emissions is calculated based on the expected increased utilization rate. For those sources that are not new or modified but are affected upstream or downstream of the project due to debottlenecking, EPA in the *Holcim* memorandum takes the position that the 2-year actual emissions from the most recent two years and the future potential to emit after the project must be evaluated to determine each source's emissions increase.¹ For the Marine Vapor Combustor (EPN VCS-1), FHR uses the 2-year actual emissions and potential to emit based only on the loading of naphtha and gasoline and heavier materials since those are the only materials for which FHR is proposing to increase the throughput.

¹ FHR does not agree that the actual-to-potential test is mandated by the PSD regulations for all changes that can be characterized as "debottlenecking," but FHR will conservatively follow the EPA guidance in this permit application.

Pollutant	PSD Emissions Increase (tons/yr)	PSD Threshold (tons/yr)
Carbon Dioxide (CO ₂)	359,920	N/A
Methane (CH ₄)	28	N/A
Nitrous Oxide (N ₂ O)	1	N/A
Total GHG (mass basis)	360,064	0
CO ₂ e	360,843	75,000

**TABLE 2F
PROJECT EMISSIONS INCREASE**



Pollutant ⁽¹⁾ :		GHG (mass basis)		2011		2012		Permit:			
Baseline Period:		A		B		A		N/A			
1	Affected or Modified Facilities ⁽²⁾	FIN	EPN	Permit NO.	Actual Emissions ⁽³⁾ (tons/yr)	Baseline Emissions ⁽⁴⁾ (tons/yr)	Proposed Emissions ⁽⁶⁾ (tons/yr)	Projected Actual Emissions (ton/yr)	Difference (A-B) ⁵ (tons/yr)	Correction ⁽⁷⁾ (ton/yr)	Project Increase ⁽⁸⁾ (tons/yr)
2	39BA3901		JJ-4	N/A	25892	25892	70417	N/A	44526	N/A	44526
3	Various Boilers		Various Boilers	N/A	N/A	N/A	54693	N/A	54693	N/A	54693
4	37BA2		KK-3	N/A	13571	13571	40393	N/A	26822	N/A	26822
5	45BD3		V-8	N/A	N/A	N/A	29	N/A	29	N/A	29
6	LW-8		VCS-1	N/A	N/A	N/A	3282	N/A	3282	N/A	3282
7	F-SATGAS3		F-SATGAS3	N/A	0.00	0.00	6.44	N/A	6.44	N/A	6.44
8	14-UDEX		F-14-UDEX	N/A	0.00	0.00	0.01	N/A	0.01	N/A	0.01
9	37		F-37	N/A	0.00	0.00	0.15	N/A	0.15	N/A	0.15
10	39		F-39	N/A	0.00	0.00	0.06	N/A	0.06	N/A	0.06
11	40		F-40	N/A	0.00	0.00	0.32	N/A	0.32	N/A	0.32
12	42		F-42	N/A	0.00	0.00	0.91	N/A	0.91	N/A	0.91
PAGE SUBTOTAL: ⁽⁹⁾										Total	359,749

TCEQ-20470 (Revised 10/08) Table 2F
These forms are for use by facilities subject to air quality permit requirements and may be revised periodically. (APDG 5915v1)

**TABLE 2F
PROJECT EMISSIONS INCREASE**



Pollutant ⁽¹⁾ :		GHG (mass basis)		2011		to		2012		Permit:		N/A	
Baseline Period:		A		B		A		A		A		A	
Affected or Modified Facilities ⁽²⁾	FIN	EPN	Permit NO.	Actual EGissions ⁽³⁾ (tons/yr)	Baseline Emissions ⁽⁴⁾ (tons/yr)	Proposed Emissions ⁽⁶⁾ (tons/yr)	Projected Actual Emissions (ton/yr)	Difference (A-B) ⁵ (tons/yr)	Correction ⁽⁷⁾ (ton/yr)	Project Increase ⁽⁸⁾ (tons/yr)	PAGE SUBTOTAL: ⁽⁹⁾		
											Total	360,064	
13	P-GB	F-GB	N/A	0.00	0.00	0.04	N/A	0.04	N/A	0.04			
14	P-VOC	F-TK-VOC	N/A	0.00	0.00	0.29	N/A	0.29	N/A	0.29			
15	44EF1	F-S-201	N/A	0.10	0.10	0.74	N/A	0.63	N/A	0.63			
16	44EF2	F-S-202	N/A	0.00	0.00	0.55	N/A	0.55	N/A	0.55			
17	08FB142	FB142	N/A										
18	08FB147	FB147	N/A										
19	08FB137	FB137	N/A										
20	40FB4010	FB4010	N/A										
21	40FB4011	FB4011	N/A										
22	MSSFUGS-DC	MSSFUGS-DC	N/A	0.00	0.00	312	N/A	312	N/A	312			
23													
24													
25													
PAGE SUBTOTAL: ⁽⁹⁾											315	360,064	

**TABLE 2F
PROJECT EMISSIONS INCREASE**



Pollutant ⁽¹⁾ :		CO ₂ e		2011		2012		Permit:		
Baseline Period:		A		B		A		N/A		
Affected or Modified Facilities ⁽²⁾	FIN	EPN	Permit NO.	Actual Emissions ⁽³⁾ (tons/yr)	Baseline Emissions ⁽⁴⁾ (tons/yr)	Proposed Emissions ⁽⁵⁾ (tons/yr)	Projected Actual Emissions (ton/yr)	Difference (A-B) ⁵ (tons/yr)	Correction ⁽⁷⁾ (ton/yr)	Project Increase ⁽⁸⁾ (tons/yr)
1	SATGASHTR	SATGASHTR	N/A	0	0	230610	N/A	230610	N/A	230610
2	39BA3901	JJ-4	N/A	25914	25914	70478	N/A	44564	N/A	44564
3	Various Boilers	Various Boilers	N/A	N/A	N/A	54740	N/A	54740	N/A	54740
4	37BA2	KK-3	N/A	13577	13577	40428	N/A	26851	N/A	26851
5	45BD3	V-8	N/A	N/A	N/A	31	N/A	31	N/A	31
6	LW-8	VCS-1	N/A	N/A	N/A	3508	N/A	3508	N/A	3508
7	F-SATGAS3	F-SATGAS3	N/A	0	0	135	N/A	135	N/A	135
8	14-UDEX	F-14-UDEX	N/A	0	0	0.2	N/A	0.2	N/A	0.2
9	37	F-37	N/A	0	0	3	N/A	3	N/A	3
10	39	F-39	N/A	0	0	1	N/A	1	N/A	1
11	40	F-40	N/A	0	0	7	N/A	7	N/A	7
12	42	F-42	N/A	0	0	19	N/A	19	N/A	19
PAGE SUBTOTAL: ⁽⁶⁾										360470
Total										

**TABLE 2F
PROJECT EMISSIONS INCREASE**



Pollutant ⁽¹⁾ : CO ₂ e		2011		2012		Permit: N/A				
Baseline Period:		A		B		A				
Affected or Modified Facilities ⁽²⁾	Permit NO.	Actual Emissions ⁽³⁾ (tons/yr)		Proposed Emissions ⁽⁶⁾ (tons/yr)		Projected Actual Emissions (ton/yr)		Difference (A-B) ⁵ (tons/yr)	Correction ⁽⁷⁾ (ton/yr)	Project Increase ⁽⁸⁾ (tons/yr)
		FIN	EPN	Baseline Emissions ⁽⁴⁾ (tons/yr)	Actual Emissions ⁽³⁾ (tons/yr)	Proposed Emissions ⁽⁶⁾ (tons/yr)	Projected Actual Emissions (ton/yr)			
13	P-GB	F-GB	N/A	0	0	0	1	N/A	N/A	1
14	P-VOC	F-TK-VOC	N/A	0	0	0	6	N/A	N/A	6
15	44EF1	F-S-201	N/A	2	2	2	15	N/A	N/A	13
16	44EF2	F-S-202	N/A	0	0	0	12	N/A	N/A	12
17	08FB142	FB142	N/A	N/A	N/A	N/A	28	N/A	N/A	28
18	08FB147	FB147	N/A							
19	08FB137	FB137	N/A							
20	40FB4010	FB4010	N/A							
21	40FB4011	FB4011	N/A							
22	MSSFUGS-DC	MSSFUGS-DC	N/A	0	0	0	313	N/A	N/A	313
23										
24										
25										
PAGE SUBTOTAL: ⁽⁹⁾						Total				
								373		
								360843		

**Greenhouse Gas Fugitive Emission Rate Estimates
West Crude
New Components**

FIN:	40
EPN:	F-40
Operating schedule (hr/yr):	8760

Fugitive Emission Calculations:

Emission Source	Source Count	Uncontrolled Emission Factor ¹ (lb/hr-source)	Control Factor ²	Hourly Emissions (lb/hr)
Valves - Gas	120	0.059	97%	0.212
Valves - Gas (DM)	3	0.059	75%	0.0443
Valves - Light Liquid	268	0.024	97%	0.193
Valves - Light Liquid (DM)	3	0.024	75%	0.018
Valves - Heavy Liquid	0	0.00051	0%	0
Pumps - Light Liquid	1	0.251	85%	0.0377
Pumps - Light Liquid (Sealless)	4	0.251	100%	0
Pumps - Heavy Liquid	2	0.046	0%	0.092
Flanges - Gas	308	0.00055	75%	0.0424
Flanges - Light Liquid	678	0.00055	75%	0.0932
Flanges - Heavy Liquid	0	0.00055	30%	0
Compressors	0	1.399	85%	0
Pressure Relief Valves ³	2	0.35	100%	0
Sampling Connections	0	0.033	97%	0
Total Hourly Emissions				0.733
Total Annual Emissions				3.21

Sample Calculations: Valve Emissions = (120 valves)(0.059 lb/hr-source)(1 - 0.97)
= 0.212 lb/hr

Annual Emissions = (0.733 lb/hr)(8760 hr/yr)(1 ton/2000 lb)
= 3.21 tons/yr

Emissions Speciation

Contaminant	Contaminant Code	Maximum Speciated Composition by Component (Wt %)	Hourly Speciated Emission Rates (lb/hr)	Annual Speciated Emission Rates (tons/yr)
Methane	60000	10.00%	0.073	0.321

NOTES:

- (1) The emission factors used are refinery factors from the TCEQ Fugitive Guidance Document dated October 2000.
- (2) The control factors are for a 28VHP program from the TCEQ Fugitive Guidance Document dated October 2000. Heavy liquid flanges have a 30% control efficiency applied as a result of the weekly AVO monitoring. Difficult to monitor (DM) sources are monitored annually.
- (3) PRVs are routed to a flare or are equipped with a rupture disk upstream or downstream with a pressure gauge.

EMISSION RATES

Pollutant	GHG Annual Emissions	Global Warming	CO ₂ e Annual
Methane (CH ₄)	0.32	21	6.74
Total	0.32		6.74

COOLING TOWER GREENHOUSE GAS EMISSIONS
Baseline Emissions

Cooling Tower	EPN	FIN	2011 VOC Emission Rate (tons/yr)	2012 VOC Emission Rate (tons/yr)	2-Yr Average VOC Emission Rate (tons/yr)	Weight % Methane (CH ₄) (%)	GHG Emissions (tons/yr)	Global Warming Potential **	CO ₂ e Emissions (tons/yr)
Mid Plant Cooling Tower	F-S-201	44EF1	1.23	0.83	1.03	10	0.10	21	2.16

* Global warming potentials are from Table A-1 in 40 CFR 98, Subpart A.

** Cooling tower VOC emissions are estimated with an emissions factor of 0.7 lb/MMgal from AP-42 Table 5.1-2, dated January 1995. The cooling water is monitored for VOC.

MSS Fugitive Emissions from Process Vessel and Equipment Openings to Atmosphere

GHG emission rates from process vessel and equipment openings are estimated based on the volume released to the atmosphere and the GHG content. Volume and GHG content represented in the calculations are used to estimate annual emission rates conservatively and may vary.

Combustion Emissions from Controlling MSS Fugitive Emissions

CO₂ emission rates are estimated using Equation C-1b and the emission factor for "Crude Oil" in Table C-1 in 40 C.F.R. Part 98, Subpart C and converting from metric tons to short tons. CH₄ and N₂O are estimated using Equation C-8b and the emission factors for "Petroleum" in Table C-2 in 40 C.F.R. Part 98, Subpart C and converting from metric tons to short tons. The factors for "Crude Oil" and "Petroleum" from Tables C-1 and C-2 are used rather than factors for natural gas because they result in more conservative emission rate estimates.

CO₂e emissions are defined as the sum of the mass emissions of each individual GHG adjusted for its GWP. CO₂e emission rates for each GHG are estimated by multiplying the emission rates for each GHG by its GWP value provided in Table A-1 of 40 C.F.R. Part 98, Subpart A.