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**CF Industries, Inc.**

LOUISIANA REGION

March 23, 2007

PER 20070003

Dr. Chuck Carr Brown  
Assistant Secretary  
Office of Environmental Services  
Louisiana Department of Environmental Quality  
P.O. Box 4313  
Baton Rouge, LA 70821-4313

Re: **Emission Reduction Credit (ERC) Bank Application - No. 1 Ammonia Plant Carbon Dioxide Vent (5-65)**  
**CF Industries, Inc. Donaldsonville Nitrogen Complex**  
**Donaldsonville, Ascension Parish, Louisiana**  
**Agency Interest No. 2416, Title V Operating Permit No. 0180-00004-V1**

2007 MAR 27 PM 2:45  
DEQ - OES

Dear Dr. Brown:

Pursuant to the Louisiana Administrative Code (LAC) 33:III.615.A, CF Industries, Inc. (CF) is submitting this Emission Reduction Credit (ERC) Bank Application, involving the reduction of methanol and total volatile organic compound (VOC) emissions from the installation of a low methanol shift catalyst in the No. 1 Ammonia Plant. The catalyst reduces the emissions of methanol and total VOC from the No. 1 Ammonia Plant Carbon Dioxide Vent (Emission Point 5-65). The emissions of other permitted pollutants from this emission source, i.e., ammonia, alkanol amine, and carbon monoxide have not changed as a result of the emission reduction project. The catalyst was installed in the No. 1 Ammonia Plant in August 2006.

CF received approval for the emission reduction project via an "authorization to construct/approval to operate" dated January 30, 2006. An application which incorporates the emission reductions is pending LDEQ approval and was submitted in a modification application in March 2006 (pending Title V Permit No. 0180-00004-V2).

CF completed a stack test on the Ammonia No. 1 Carbon Dioxide Vent Stack on November 2, 2006 confirming the actual emission reduction. CF has chosen to use future potential emissions in calculating the emission reduction for banking purposes. Potential emission calculations have been included in Attachment A. The LDEQ sent a letter to CF dated March 1, 2007 stating that the results were accepted and that the unit is operating in compliance.

Due to Hurricanes Katrina/Rita and manufacturing curtailments due to poor economic conditions in 2004, the years 2002 and 2003 have been used to calculate baseline average actual emissions per LAC 33:III.605.A. The baseline emission calculations have been included in Attachment A as well.

Dr. Chuck Carr Brown  
Assistant Secretary  
March 23, 2007  
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The No. 1 Ammonia Plant Carbon Dioxide Vent (Emission Point 5-65) is exempt from the requirements of LAC 33:III.2115 as the concentration of VOC in the gas stream is <3000 ppmv as per LAC 33:III.2115.H.1.d. This is based on a memo by Louis Frey of CF Industries to Mike McDaniel of LDEQ dated September 16, 1991. Emission Point 5-65 is not required to comply with Chapter 51 (MACT requirements) as it emits only Class III TAPs. There are no federal MACT standards for this source (either pending or finalized).

If you have any questions or need additional information, please contact Morris Johnson at (225) 473-0271.

Sincerely,

CF INDUSTRIES, INC.



Louis M. Frey, III  
Vice President / General Manager  
Donaldsonville

LMF/cdd  
U:\MJ\ERC Request Cover Letter.doc  
Enclosure

cc: Morris Johnson (CF)  
Beth Darce (CF)  
Jeremy Acosta (CF)  
Valerie Barth (Trinity Consultants)

Department of Environmental Quality  
 Office of Environmental Services  
 Air Permits Division  
 P.O. Box 4313  
 Baton Rouge, LA 70821-4313  
 (225) 219-3181

# LOUISIANA

## ERC BANK APPLICATION

NO<sub>x</sub>  OR VOC



**COMPANY:** CF Industries, Inc. 2416  
(Agency Interest No.)

**FACILITY:** Donaldsonville Nitrogen Complex 0180-00004-V1  
(Permit No.)

**LOCATION:** Donaldsonville Ascension  
(Parish)  
 (City)

Highway 3089 Donaldsonville, LA 70346  
 (Physical Location)

**CONTACT:** Morris Johnson Manager, Energy & Environmental Affairs (225) 473-0271  
(Phone)  
 (Name) (Title)

**MAILING ADDRESS:** P.O. Box 468 Donaldsonville LA 70346  
 (Street or P.O. Box) (City) (State) (Zip Code)

5-65 August 2006 2002-2003  
 (Affected EIQ Source ID(s)) (Date of Actual Emissions Decrease) (Baseline Period)

	NO <sub>x</sub> (Chapter 22 only)		NO <sub>x</sub>	VOC
<b>ALLOWABLES BEFORE:</b>	N/A	N/A	N/A	31.9
	(May 1 - September 30)	(October 1 - April 30)	(TPY)	(TPY)
<b>AVG. ACTUAL EMISSIONS:</b>	N/A	N/A	N/A	29.7
	(May 1 - September 30)	(October 1 - April 30)	(TPY)	(TPY)
<b>CHAPTER 22 LIMIT:</b>	N/A	N/A	N/A	N/A
	(May 1 - September 30)	(October 1 - April 30)	(TPY)	(TPY)
<b>ALLOWABLES AFTER<sup>1</sup>:</b>	N/A	N/A	N/A	19.6
	(May 1 - September 30)	(October 1 - April 30)	(TPY)	(TPY)
<b>CREDITABLE CHANGE:</b>	N/A	N/A	N/A	10.1
	(May 1 - September 30)	(October 1 - April 30)	(TPY)	(TPY)

<sup>1</sup>Allowables should account for all applicable federal and state regulations, emissions limitations, compliance orders, consent decrees, etc. In the case of enforcement instruments, surplus reductions may be included as per he terms of the order or agreement. If no such terms are included, then the reductions are not surplus.

**CREDIBILITY:**

All applicable state and federal regulations that apply to the affected emission point(s) should be addressed in the cover letter to this document.

**RESPONSIBLE OFFICIAL CERTIFICATION:**

I hereby certify that the information contained in this ERC Bank Application and attached calculations is true and accurate to the best of my knowledge.

Louis M. Frey, III Vice President/General Manager-Donaldsonville (225) 473-8291  
 (Name) (Title) (Phone)

*Louis M. Frey* 3/22/07  
 (Signature) (Date)

**Emission Calculations, No. 1 Ammonia Plant Carbon Dioxide Vent (Source I.D. 5-65)  
2002-2003 Average Actual Emissions**

No. 1 NH3 Plant Production Rate: 547,688 TPY

Operating Rate: 52 wk/yr, 8,760 hr/yr

**Assumptions:**

- 1.182 tons CO<sub>2</sub> produced per ton NH<sub>3</sub> produced
- If vented from NH<sub>3</sub> plant, CO<sub>2</sub> conditions are:
  - 10 psig, 150 F, saturated with water
- 0.8 tons of CO<sub>2</sub> are consumed per ton of urea produced
- 57,300 TPY of CO<sub>2</sub> are sold (total for the entire facility)
- 2,408,600 TPY of NH<sub>3</sub> are produced (total from all four ammonia plants)
- 2,618,875 TPY of urea are produced (total for the entire facility)
- 10 ppm NH<sub>3</sub> in CO<sub>2</sub> condensate (none in dry CO<sub>2</sub>)
- 3.718 psia = partial pressure of water
- 24.7 psia = total pressure of CO<sub>2</sub> vent
- 15.053% = mole fraction of water in CO<sub>2</sub> vented

Note: These calculations are based on the 100% CO2 vent case.

Alkanol amine: 0.1 lb/ton ammonia produced - AP-42 Section 8.1-1

$$\begin{aligned} (547,688 \text{ tons/yr})(0.1 \text{ lb/ton})/(2,000 \text{ lb/ton}) &= 27.4 \text{ TPY} \\ (547,688 \text{ tons/yr})(0.1 \text{ lb/ton})/(8,760 \text{ hr/yr}) &= 6.3 \text{ lb/hr} \quad \text{average} \\ (6.3 \text{ lb/hr})(1.05) &= 6.6 \text{ lb/hr} \quad \text{maximum} \end{aligned}$$

Methanol:

MEOH = 200 ppmv (250 ppmv MAX) in exhaust.

(547,688 tons NH<sub>3</sub>/yr)(1.182 CO<sub>2</sub>/ton NH<sub>3</sub>)(2,000 lb/ton)

$$(547,688 \text{ tons NH}_3/\text{yr})(1.182 \text{ CO}_2/\text{ton NH}_3)(2,000 \text{ lb/ton}) / (8,760 \text{ hrs/yr})(60 \text{ min/hr}) = 56.0 \text{ moles/min CO}_2 \text{ vent gas}$$

$$\begin{aligned} (200 \text{ ppmv})(10^{-6})(56.0) &= 0.0112 \text{ moles/min methanol} \\ (0.0112 \text{ moles/min})(32 \text{ lb/mole})(60 \text{ min/hr}) &= 21.5 \text{ lb/hr} \end{aligned}$$

$$\begin{aligned} (250 \text{ ppmv})(10^{-6})(56.0) &= 0.0140 \text{ moles/min methanol} \\ (0.0140 \text{ moles/min})(32 \text{ lb/mole})(60 \text{ min/hr}) &= 26.9 \text{ lb/hr MAX} \end{aligned}$$

$$(21.5 \text{ lb/hr})(8,760 \text{ hr/yr})/(2,000 \text{ lb/ton}) = 94.2 \text{ TPY}$$

Amount of CO<sub>2</sub> Ventd from all four ammonia plants:

$$\begin{aligned} \text{Total CO}_2 &= 2,408,600 \text{ tons NH}_3 \times 1.182 = 2,846,965 \text{ TPY (100\%)} \\ \text{CO}_2 \text{ to Urea} &= 2,618,875 \text{ tons urea} \times 0.8 = -2,095,100 \text{ TPY} \\ \text{CO}_2 \text{ sold} &= -57,300 \text{ TPY} \\ \text{CO}_2 \text{ vented} &= 694,565 \text{ TPY (24.4\%)} \end{aligned}$$

Pollutant	100% Vent Case			24.4% Vent Case [1]		
	Average Emission Rate (lbs/hr)	Maximum Emission Rate (lbs/hr)	Annual Emission Rate (TPY)	Average Emission Rate (lbs/hr)	Maximum Emission Rate (lbs/hr)	Annual Emission Rate (TPY)
Alkanol Amine	6.3	6.6	27.4	1.5	1.6	6.7
Methanol	21.5	26.9	94.2	5.2	6.6	23.0
Total VOC	27.8	33.4	121.5	6.8	8.2	29.7

[1] Based on the assumption that CO2 is vented uniformly from all four ammonia plants.

**Emissions Summary**

<b>Pollutant</b>	<b>Average Emission Rate (lbs/hr)</b>	<b>Maximum Emission Rate [1] (lbs/hr)</b>	<b>Annual Emission Rate (tpy)</b>
Alkanol amine	1.5	6.3	6.7
Methanol	5.2	21.5	23.0
Total VOC	6.8	27.8	29.7

[1] Maximum lb/hr emissions are conservatively determined as being equal to the average lb/hr emissions under the 100% vent case.

**Actual No. 1 NH<sub>3</sub> Plant Production Rate**

Year	NH <sub>3</sub> #1 Total Annual Production, tons
2002	563,402
2003	531,974
Average	547,688

**Emission Calculations, No. 1 Ammonia Plant Carbon Dioxide Vent (Source I.D. 5-65)**  
**Estimated Potential Emissions After Installation of Low Methanol Catalyst**  
**(Emissions Reduction Project)**

**No. 1 NH<sub>3</sub> Plant Production Rate:** 591,300 TPY

**Operating Rate:** 52 wk/yr, 8,760 hr/yr

**Assumptions:**

- 1.182 tons CO<sub>2</sub> produced per ton NH<sub>3</sub> produced
- If vented from NH<sub>3</sub> plant, CO<sub>2</sub> conditions are:
  - 10 psig, 150 F, saturated with water
- 0.8 tons of CO<sub>2</sub> are consumed per ton of urea produced
- 57,300 TPY of CO<sub>2</sub> are sold (total for the entire facility)
- 2,408,600 TPY of NH<sub>3</sub> are produced (total from all four ammonia plants)
- 2,618,875 TPY of urea are produced (total for entire facility)
- 10 ppm NH<sub>3</sub> in CO<sub>2</sub> condensate (none in dry CO<sub>2</sub>)
- 3.718 psia = partial pressure of water
- 24.7 psia = total pressure of CO<sub>2</sub> vent
- 15.053% = mole fraction of water in CO<sub>2</sub> vented

**Note:** These calculations are based on the 100% CO<sub>2</sub> vent case.

**Alkanol amine:** 0.1 lb/ton ammonia produced - AP-42 Section 8.1-1

$(591,300 \text{ tons/yr})(0.1 \text{ lb/ton})/(2,000 \text{ lb/ton}) =$	29.6 TPY	
$(591,300 \text{ tons/yr})(0.1 \text{ lb/ton})/(8,760 \text{ hr/yr}) =$	6.8 lb/hr	average
$(6.8 \text{ lb/hr})(1.05) =$	7.1 lb/hr	maximum

**Methanol:**

MEOH = 100 ppmv (150 ppmv MAX) in exhaust.

$(591,300 \text{ tons NH}_3/\text{yr})(1.182 \text{ CO}_2/\text{ton NH}_3)(2,000 \text{ lb/ton})$   
 $(\text{mole CO}_2/44 \text{ lbs})(\text{yr}/8,760 \text{ hrs})(\text{hr}/60 \text{ min}) =$  60.4 moles/min CO<sub>2</sub> vent gas

$(100 \text{ ppmv})(10^{-6})(60.4) =$  0.0060 moles/min methanol  
 $(0.0060 \text{ moles/min})(32 \text{ lb/mole})(60 \text{ min/hr}) =$  11.6 lb/hr

$(150 \text{ ppmv})(10^{-6})(60.4) =$  0.0091 moles/min methanol  
 $(0.0091 \text{ moles/min})(32 \text{ lb/mole})(60 \text{ min/hr}) =$  17.4 lb/hr MAX

$(11.6 \text{ lb/hr})(8,760 \text{ hr/yr})/(2,000 \text{ lb/ton}) =$  50.8 TPY

**Amount of CO<sub>2</sub> Vented:**

**Emission Calculations, No. 1 Ammonia Plant Carbon Dioxide Vent (Source I.D. 5-65)**

**Estimated Potential Emissions After Installation of Low Methanol Catalyst**

**(Emissions Reduction Project)**

Total CO<sub>2</sub> = 2,408,600 tons NH<sub>3</sub> x 1.182 = 2,846,965 TPY (100%)  
 CO<sub>2</sub> to Urea = 2,618,875 tons urea x 0.8 = -2,095,100 TPY  
 CO<sub>2</sub> sold = -57,300 TPY  
 CO<sub>2</sub> vented = 694,565 TPY (24.4%)

Pollutant	100% Vent Case			24.4% Vent Case [1]		
	Average Emission Rate (lbs/hr)	Maximum Emission Rate (lbs/hr)	Annual Emission Rate (TPY)	Average Emission Rate (lbs/hr)	Maximum Emission Rate (lbs/hr)	Annual Emission Rate (TPY)
Alkanol Amine	6.8	7.1	29.6	1.6	1.7	7.2
Methanol	11.6	17.4	50.8	2.8	4.2	12.4
Total VOC	18.4	24.5	80.4	4.5	6.0	19.6

[1] Based on the assumption that CO<sub>2</sub> is vented uniformly from all four ammonia plants.

**Emissions Summary**

Pollutant	Average Emission Rate (lbs/hr)	Maximum Emission Rate [1] (lbs/hr)	Annual Emission Rate (tpy)
Alkanol Amine	1.6	6.8	7.2
Methanol	2.8	11.6	12.4
Total VOC	4.5	18.4	19.6

[1] Maximum lb/hr emissions are conservatively determined as being equal to the average lb/hr emissions under the 100% vent case.

**Reduction in Methanol Emissions from The No. 1 Ammonia Plant Carbon Dioxide  
Vent  
(Source I.D. 5-65)**

**Emissions Reduction Summary**

<b>Pollutant</b>	<b>Baseline Emissions (tpy)</b>	<b>Future Potential Emissions [1] (tpy)</b>	<b>Change in Emissions [2] (tpy)</b>
Total VOC [3]	29.7	19.6	-10.1

[1] Represents emissions after implementation of the Emissions Reduction Project.

[2] Represents Future Potential Emissions minus Baseline Emissions.

[3] Consists of methanol and alkanol amine which are speciated in the Baseline Actual and future Potential calculations.