CONSTRUCTION PERMIT AMENDMENT

PERMIT NUMBER: CP08-031

**ORIGINAL PREVENTION OF SIGNIFICANT DETERIORATION (PSD)
PERMIT TO CONSTRUCT AN
AIR CONTAMINANT SOURCE
ISSUED ON SEPTEMBER 29, 2006 (CP05-0058) AND
AMENDED ON July 28, 2008 (CP08-010)
TO:**

Cargill Lactic Acid
650 Industrial Road
Blair, Nebraska 68008-2649

FOR THE SPECIFIC MODIFICATION OF:

A Lactic Acid Production Facility

TO BE LOCATED AT:

650 Industrial Road
Blair, Nebraska 68008

IS HEREBY AMENDED AS FOLLOWS:

- Allow the construction of three pre-seed vessels, three seed vessels, and two fermentation vessels.
- Allow for an increase in maximum product capacity of lactic acid.
- Allow the fermentation process to vent directly to the atmosphere.
- Allow construction of an additional cooling tower (EP 35-95) and increased capacity of existing cooling towers (EPs 35-91 and 35-93)

Pursuant to Chapter 14 of the Nebraska Air Quality Regulations, the public has been notified by prominent advertisement of this proposed construction permit amendment and the thirty (30) day period allowed for comments has elapsed. This construction permit supersedes the construction permit amendment CP08-010 issued July 28, 2008, to Cargill Lactic Acid and approves the construction of three pre-seed vessels three seed vessels two fermentation vessels and a cooling tower.

The revisions to Conditions XIII.(D), (E), (F), and (M)(5) of permit CP05-0058, revisions to Conditions XIII.(A), (I)(1), (I)(2), and (I)(3) of permit CP08-010, and addition of Conditions XIII.(H)(1), (H)(2), (H)(3), and (M)(6) do not trigger any additional requirements under Nebraska Title 129. All other

provisions of the original issued permit are still in effect, and in concert with this construction permit amendment, constitute the effective construction permit. This construction permit amendment shall be attached to the original construction permit and maintained with it henceforth.

This construction permit supersedes the construction permit amendment (CP08-010) issued on July 28, 2008, in its entirety.

This permit may contain abbreviations and symbols of units of measure, which are defined in 40 CFR Part 60.3. Other abbreviations may include, but are not limited to, the following: Best Available Control Technology (BACT), Hazardous Air Pollutant (HAP), Prevention of Significant Deterioration (PSD), Regenerative Thermal Oxidizer (RTO), Volatile Organic Compounds (VOC).

This permit is issued with the following conditions under the authority of Title 129 - Nebraska Air Quality Regulations as amended May 17, 2009:

Specific Conditions

Condition XIII.(A) now reads:

(A) The source is permitted to construct a lactic acid production facility consisting of the following emission points: {Title 129, Chapter 19}

Emission Point (EP)	Equipment Description (Quantity)
EPs 35-10 and 35-11	Nutrient Dump Tank Dust Collectors (2)
EPs 35-12a and 35-13a	Lime Silo Receiver Dust Collectors (2)
EPs 35-12b and 35-13b	Lime Silo Bin Vent Dust Collectors (2)
EP 35-43	Filter Aid Weigh Hopper Dust Collector
EP 35-44	Filter Aid Dissolving Tank Scrubber
EP 35-45	Filter Aid Silo Dust Collector
EP 35-91	Fermentation Cooling Tower
EP 35-93	Process Cooling Tower
EP 35-94	Regenerative Thermal Oxidizer (RTO) – Controls emissions from the following Finishing Process Equipment: Vacuum Pumps (11), Process Tanks (4), and Process Units (3)
TK-35192a, TK-35192b, and TK-35192c	Seed Vessels (3)
TK-35191a, TK-35191b, and TK-35180	Pre-Seed Vessels (3)
TK-35202 thru TK-35206 and TK-35222 thru TK-35226	Fermenters (10)
35-95	Fermentation Cooling Tower
------	Paved Road Fugitives
------	Dumpster

Condition XIII.(D) now reads:

(D) Total production of dry basis lactic acid at this facility shall not exceed 47,000,000 pounds during any calendar month and 470,000,000 pounds during any 12 consecutive calendar month period. {Title 129, Chapter 19}

Condition XIII.(E) now reads:

(E) PM_{10} emission rates from the listed emission points shall not exceed the following limits: {Title 129, Chapter 19}

Emission Point	**Equipment Description**	**PM_{10} Emission Limits**	
		(lb/hr)	(ton/year)
EP 35-10	Nutrient Dump Tank Dust Collector	0.05	0.22
EP 35-11	Nutrient Dump Tank Dust Collector	0.05	0.22
EP 35-12a	Lime Silo Receiver Dust Collector	0.10	0.44
EP 35-12b	Lime Silo Bin Vent Dust Collector	0.03	0.13
EP 35-13a	Lime Silo Receiver Dust Collector	0.10	0.44
EP 35-13b	Lime Silo Bin Vent Dust Collector	0.03	0.13
EP 35-43	Filter Aid Weigh Hopper Dust Collector	0.09	0.38
EP 35-44	Filter Aid Dissolving Tank Scrubber	0.21	0.94
EP 35-45	Filter Aid Silo Dust Collector	0.09	0.38
EP 35-91	Fermentation/Evaporation Cooling Tower	0.096	4.19
EP 35-93	Process Cooling Tower	1.12	4.88
EP 35-95	Fermentation Cooling Tower	0.66	2.91
	Paved Road Fugitives	1.37 *	3.01

* Based on 12 hours per day (4,380 hours per year)

NOTE: For the purposes of the table, a year is defined as any 12 consecutive calendar month period.

Condition XIII.(F) now reads:

The following conditions apply to: Cooling towers:

(1) The cooling towers shall be properly installed, operated, and maintained. The manufacturer's operation and maintenance manual, or its equivalent, detailing proper operation, inspection, and maintenance of the cooling tower shall be kept on site and readily available to Department representatives. (Title 129, Chapter 19)

(2) The designed drift loss shall not exceed 0.005 percent. Verification of the designed drift loss shall be by manufacturer's specification. Manufacturer's drift loss specification shall be kept on site and readily available to Department representatives, upon request. (Title 129, Chapter 19)

(3) The rolling 12-month average TDS concentration in the cooling water shall not exceed 5,000 ppm. A TDS sample shall be collected and tested at a minimum of once per calendar month. (Title 129, Chapter 19)

Condition XIII.(H) is a new condition and reads:

The following conditions apply to: FERMENTATION OPERATIONS:

(1) Total VOC emissions from the three (3) pre-seed vessels, three (3) seed vessels, and ten (10) fermenters shall not exceed 21.0 tons in any period of twelve (12) consecutive calendar months. At no time during the first eleven (11) calendar months shall emissions exceed 21.0 tons. Emissions shall be calculated using hours of operation and lb/hr emission rates as established during testing as required by Condition XIII.(H)(3). {Title 129, Chapter 19}

(2) Total HAP emissions from the three (3) pre-seed vessels, three (3) seed vessels, and 10 fermenters shall not exceed 0.85 tons in any period of 12 consecutive calendar months. At no time during the first 11 calendar months shall emissions exceed 0.85 tons. Emissions shall be calculated using hours of operation and lb/hr emission rates as established during testing as required by Condition XIII.(H)(3). {Title 129, Chapter 27}

(3) In order to demonstrate compliance with Conditions XIII.(H)(1) and (H)(2), and to verify the assumptions used in the permit application, the source shall conduct a performance test for VOC and HAPs on the fermentation source streams. The performance test shall be conducted in accordance with Condition XIII.(J). VOC emissions shall be expressed as total mass of VOC. {Title 129, Chapter 34}

Conditions XIII.(I)(1), (2), and (3) now read:

(I) The following conditions apply to: LACTIC ACID FINISHING PROCESS:

(1) VOC and HAP emissions from the eleven (11) finishing process vacuum pumps, the four (4) finishing process tanks, and the three (3) finishing process units, collectively referred to as the finishing process equipment shall be controlled by one (1) 9 MMBtu/hr natural gas-fired regenerative thermal oxidizer (RTO). {Title 129, Chapter 19 and Chapter 27}

(2) BACT for VOCs for the finishing process equipment shall be an RTO with a minimum VOC control efficiency of 98 percent and a VOC outlet emission rate not to exceed 5.53 lb/hr (3-hour or test method average). The source shall comply with these limits, except as provided in Condition XIII.(I)(3). {Title 129, Chapter 19}

(3) During the first 12 months following initial startup (here-in referred to as the demonstration period), the RTO shall have a minimum control efficiency of 95% and an outlet emission rate not to exceed 13.83 lb/hr (3-hour or test method average) instead of a minimum control efficiency of 98% and an outlet emission rate not to exceed 5.53 lb/hr as listed in Condition XIII.(I)(2).

If the source does not expect to meet the VOC emission limits under normal operating conditions as stated in Condition XIII.(I)(2) after the 12-month demonstration period has elapsed, an RTO Performance Report shall be submitted to the Department no less than 90 days prior to the end of the 12-

month demonstration period. This report shall include a performance assessment of the RTO, including data for parameters monitored during testing and a proposed revised emission limit, provided that the proposed revised emission limit shall not exceed 13.83 lb/hr. Parameters to be monitored shall include, but not be limited to, temperature, destruction efficiency, fuel usage, collateral emissions, production capacity and the maximum VOC control efficiency that was achieved during the demonstration period under steady state conditions. The report should also include any other information as necessary to justify why the emission limit in Condition XIII.(I)(2) cannot be achieved. Upon submittal of the RTO Performance Report, the source shall operate the RTO in compliance with the proposed revised emission limit until such time as the Department rejects the limit, or accepts the limit and issues an alternative BACT limit by means of a subsequent PSD permit.

Condition XIII.(M)(5) now reads

(5) Records documenting Total Dissolved Solids (TDS) sample readings and calculations demonstrating compliance with Condition XIII.(F)(3).

Condition XIII.(M)(6) is a new condition and reads:

(6) Emissions calculations for each calendar month and each period of 12 consecutive calendar months to demonstrate compliance with Conditions XIII.(H)(1) and (2).

The undersigned issues this document on behalf of the Director in accordance with Title 129 – Nebraska Air Quality Regulations.

November 2, 2009

Date

Jay D. Ringenberg
Deputy Director of Programs

FACT SHEET

Cargill Lactic Acid
650 Industrial Road
Blair, Nebraska 68008

November 2, 2009

DESCRIPTION OF THE FACILITY OR ACTIVITY:

In February 2000 Cargill, Inc. and the Dow Chemical Company constructed a lactide polymer production facility originally permitted under the name Cargill-Dow Polymers, LLC (facility identification number (FID#) 69585). In July 2006, Cargill-Dow Polymers changed its name to NatureWorks, LLC (NatureWorks). Since that time NatureWorks has been modified several times and became wholly owned by Cargill Inc (Cargill). In November 2007, Teijin invested in NatureWorks and Cargill decided to split NatureWorks into two separate facilities, NatureWorks (with the original FID#69585), which produces lactide polymers and Cargill Lactic Acid (CLA, FID# 91164) which produces lactic Acid.

The lactic acid produced by CLA is utilized by NatureWorks to produce lactide polymers. The polymers are sold in the form of pellets that can be used to manufacture a wide variety of polymer products. The standard industrial classification (SIC) code 2821 (Plastic Materials, Synthetic Resins & Nonvulcan Elastomers) pertains to this operation (North American industrial classification (NAICS) code 325211-Plastic Materials and Resin Manufacturing). The facility is located adjacent to Cargill Inc.'s wet corn milling operation and ethanol complex at 650 Industrial Rd in Blair, Nebraska.

Table 1 contains a summary of the permitting history for CLA. A more detailed history can be found in the permitting files maintained by the NDEQ.

CLA has two active construction permits, the first issued on September, 29 2006 (CP05-0058) and a construction permit amendment issued on July, 26 2008 (CP08-010).

CP05-0058 was issued because testing indicated that potential emissions from the combined NatureWorks and CLA facility exceeded the prevention of significant deterioration (PSD) thresholds as well as the established permit limits.

CP08-010 was the first permit the NDEQ issued that only applies to CLA. This permit amended conditions established in CP05-0058 to allow for the construction of a new evaporator (Dist3) and waste dumpster. This permit superseded previous construction permit CP07-0041 and incorporated the modifications approved in that permit.

On June 3, 2008 CLA submitted an application (CP08-031) to increase final product capacity from 400,000,000 pounds per year to 470,000,000 pounds per year. This will require the construction of several new emissions units. The new equipment will consist of: three pre-seed vessels, three seed vessels two fermenters and a cooling tower. Additionally there will be an increase in water circulation at the two existing cooling towers in order to accommodate the new emissions units. Because this project was submitted very shortly after the issuance of CP08-010 CLA has requested that potential emissions from both projects be aggregated together in order to ensure compliance with PSD rules.

During the initial public comment period CLA contacted the NDEQ and indicated that an additional modification to one of the existing cooling towers (EP 35-91) is necessary to complete the modifications

proposed in CP08-031. The modification proposed in application CP09-021 consists of the addition of a sixth cooling tower cell to EP 35-91. This modification will result in an increase in potential particulate matter (PM) emissions and PM smaller than or equal to 10 microns (PM_{10}) of approximately 2.33 tons per year (tpy) and 0.70 tpy respectively. The potential emissions increase from the proposed modification would not trigger the construction permitting thresholds in Title 129 if considered an independent project; however this project can be aggregated with CP08-031 and requires a modification to their construction permit.

Because this modification was proposed after the construction permit was originally submitted for public comment (and will subsequently have to be resubmitted for public comment) but before the permit was issued, the NDEQ determined that it was necessary for CLA to submit the changes as a separate application (CP09-021) and submit an additional construction permit fee. In order to keep the permit easily understandable the proposed modifications from CP09-021 have been incorporated into this permitting action (CP08-031) and no new permit will be issued for application CP09-021. The changes proposed in CP09-011 require that this permitting action be re-submitted for public comment before being issued.

CP08-031 will supersede CP08-010 in its entirety. After the issuance of this permit, CP05-0058 and CP08-031 will be the only two permits active that are applicable to CLA.

Table 1: Permits Issued to CLA/ NatureWorks / Cargill Dow

Permit Number	Date Issued	Permitted activities	Status
69585C01	02/03/00	Initial construction permit for a 150,000 tpy lactide polymer production facility (Cargill Dow Polymers, LLC). Emission limits are established for PM_{10} SO_2 NO_x CO and VOC.	Superseded by 69585M01
69585C02	05/08/01	Initial construction permit for lactic acid production facility (Cargill Dow Polymers, LLC) to provide raw material to the lactide polymer facility. Emission limits are established for PM_{10} and VOC. Maximum lactic acid production is limited to 400,000,000 lb/yr.	Superseded by 69585MC2
69585M01	01/29/02	Revisions to permit 69585c01 to incorporate as-built modifications to the lactide polymer production facility. This permit superseded 69585C01.	Superseded by CP07-0018
69585MC2	11/06/02	Revisions to permit 69585C02 to incorporate as-built modifications to the lactic acid production facility. This permit superseded 69585C02.	Superseded by CP05-0058
CP06-0006	7/20/06	Facility (combined lactic acid/polymer facility) changes name from Cargill Dow, LLC to NatureWorks, LLC This permit allows for the construction of a deduster system (CDP13a) and emissions from this emission point shall be controlled by a fabric filter.	Expired/Not Constructed

Permit Number	Date Issued	Permitted activities	Status
CP05-0058 (PSD)	09/29/06	Performance testing done by NatureWorks in 2003 indicated that VOC emissions from the lactic acid plant exceeded the limits established in permit 69585M01. Subsequent testing in 2004 and 2005 indicated that emissions from the vacuum pumps are greater than expected and that process streams that were not thought to contain VOCs do in fact contain VOCs. These tests demonstrated that emissions from NatureWorks are greater than the 100 tpy PSD threshold. A RTO was determined to be BACT technology for NatureWorks and the vacuum pumps (35-48 – 35-54) will be routed to the new RTO (35-94). New emission limits are established for PM_{10}, SO_2, NO_x, CO, VOC and HAPs.	Active
CP07-0041	09/18/07	Modification to permit CP05-0058. CP05-0058 did not require fermenter emissions be routed to the RTO to control VOC emissions because it was believed that the system could be configured in such a way that VOCs would stay in the process stream until they reached the finishing process and could be controlled by the RTO. NatureWorks determined that this method was not as reliable as initially thought and a new control method is necessary. A new, larger RTO is approved to replace the previous one so that fermenter emissions can be effectively controlled.	Superseded by CP08-010
CP07-0018 (PSD)	04/09/08	Modification to permit 69585M01 to reconfigure the lactide polymer production facility so that maximum production capability can be met and incorporate "de-duster" project from expired permit CP06-0006. Additionally, performance testing in October 2007 indicated that the NatureWorks facility could not meet the previously established limits for VOC and CO. HAP emissions were also greater than expected. NatureWorks determined that BACT for CO, VOC, and HAPs would be to control these emissions with the RTO constructed to control emission at the lactic acid production facility (permit CP05-0058). NatureWorks resized the RTO to 9 MMBtu/hr to accommodate the facility changes. This permit superseded permit 69585M01.	Active

Permit Number	Date Issued	Permitted activities	Status
CP08-010 (PSD)	07/28/08	Permit amendment for Cargill Lactic Acid (formerly NatureWorks, LLC) to allow the construction of a third evaporator and associated dumpster (Dist3) and require its emissions be routed to the RTO (35-94). This permit revises both CP05-0058 and CP07-0041. The evaporators are considered part of the finishing process; the whole finishing process is controlled by the RTO (35-94). This is the first permit issued for the lactic acid production facility (Cargill Lactic Acid) as a separate entity from the lactide production facility (NatureWorks). The permits issued to the lactic acid facility, while it was still part of the NatureWorks (and Cargill Dow) facility, are still applicable.	Superseded by CP08-031
CP08-031 (PSD)	N/A	Modification to increase production capability at Cargill Lactic Acid to 470,000,000 lb/yr. Approved changes to the facility include: • Addition of three pre-seed vessels (TK35191a, TK3191b, and TK35180) • Addition of three seed vessels (TK35192a, TK35192b, and TK35192c) • Addition of two production fermenters ((TK35206, and TK35226). • Addition of a third cooling tower (EP-35-95) and an increase in product capacity from the two existing cooling towers (EP35-91 and EP35-93) • Fermenters (Dist1-Dist3) are no longer controlled by the RTO (35-94). • Emission limits for PM and PM_{10} have been updated to include potential emissions from the RTO	Proposed
CP09-021 (PSD)	N/A	Addition of a single cooling tower cell to EP 35-91. Modification was submitted while CP08-031 was on public notice and therefore required the submission of a new construction permit application. No permit was issued under this number; the requested changes were incorporated into CP08-031.	N/A

TYPE AND QUANTITY OF AIR CONTAMINANT EMISSIONS ANTICIPATED:

Emissions consist of particulate matter (PM), PM less than or equal to 10 micrometers in diameter (PM_{10}), volatile organic compounds (VOC) and hazardous air pollutants (HAP) from the proposed modification.

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PM and PM_{10} emissions result from cooling tower losses. Cooling tower losses were estimated using "Calculating Realistic PM10 Emissions from Cooling Towers" by Joel Riesman and Gordon Frisbie.

VOC and HAP emissions will occur as a result of modifications to the fermentation process. Expected emissions from fermentation are based on pilot test data gathered in May 2007 from this facility while operating at 220 million pounds per year. At the time of the test the fermentation process was not controlled by the RTO and is representative of the proposed facility configuration. Because the lactic acid production process is organic in nature the potential emissions from the fermentation process are multiplied by a factor of two to account for any unexpected variations that may occur. Additionally performance testing is required to verify that the fermentation process will operate as predicted.

In order to achieve the increase in capacity, several new emissions units will need to be constructed. The new units allowed by this permit are: three Pre-Seed Vessels (TK35191a, TK3191b, and TK35180), three Seed Vessels (TK35192a, TK35192b, and TK35192c), two Production Fermenters (TK35206 and TK35226), and a third cooling tower (35-95).

Potential emissions from the proposed construction and facility wide emissions are presented in Table 2 and Table 3 below.

Table 2: Potential Increase in Emissions from the Proposed Modification.

Regulated Pollutant	**Emissions** (tons/year)
Particulate Matter (PM)	17.16
PM smaller than or equal to 10 microns (PM_{10})	5.15
Volatile Organic Compounds (VOC)	20.94
Hazardous Air Pollutants (HAPs):	
Acetaldehyde	0.85
Total HAPs	0.85

Table 3: Facility Wide Emissions after the Issuance of this Permit

Regulated Pollutant	**Potential Emissions after proposed modification** (tons/year)
Particulate Matter (PM)	46.53
PM smaller than or equal to 10 microns (PM_{10})	18.57
Oxides of Nitrogen (NO_x)	1.93
Sulfur Dioxide (SO_2)	5.71
Carbon Monoxide (CO)	20.03
Total Reduced Sulfur(TRS)	0.54
Volatile Organic Compounds (VOC)	45.16
Hazardous Air Pollutants (HAPs)	5.00

Cooling Towers (35-91, 35-93, and 35-95)

CLA has two existing cooling towers (35-91 and 35-93) and will construct a third (35-95) as part of this modification. The two existing cooling towers have had their water circulation rates increased (35-91will increase from 15,000 gal/min to 25,500 gal/min and 35-93 will increase from 21,000 gal/min to 29,750 gal/min) to accommodate for increased production capacity. No changes to drift loss (0.005 %) or TDS concentration (5,000 ppm) limits will be made. The new cooling tower (35-95) will subject to both the drift loss and TDS requirements.

Finishing Process RTO (35-94)

Criteria Pollutant emissions from the finishing process emissions will come from the combustion of natural gas in the RTO. Since the RTO will not be modified as part of this project, criteria pollutant emissions are not expected to change. CLA will leave the maximum firing rate of the RTO at 9 MMBtu/hr to ensure that it is capable of achieving the required control efficiency and to allow for potential expansion to the finishing process in the future.

VOC and HAP emissions have been estimated to be similar to the emissions levels permitted in CP05-0058 based on performance testing conducted in 2007 and because the configuration of the facility will be very similar to what was permitted. Two significant differences exist between the old and new configuration. First, a new evaporator (Dist 3) was approved for construction in permit CP08-010. Dist 3 will have a greater efficiency than either of the existing units (Dist 1 and Dist2). When Dist 3 becomes operational Dist 1 will be removed from regular operation. It is expected that because Dist 3 has a greater efficiency than Dist 1 potential finishing process emissions should decrease.

The second significant difference in the facility configuration is the size of the RTO. CP07-0041 approved the resizing of the RTO from 4 MMBtu/hr to 9MMBtu/hr. Because the RTO will only combust natural gas as a fuel source it will contribute to the emissions of VOC and HAPs.

Performance testing (required by permit Condition XIII.(I)(5) of CP05-0058) will be necessary to verify that the assumptions made and potential emissions calculations are correct and the facility can comply with permit limits.

Haul Roads (CDP16)
CLA has indicated that due to increases in efficiency in the lactic acid production process there will be no additional truck traffic at CLA. CP08-010 approved the construction of a new evaporator (Dist 3) was noted to be significantly more efficient than the existing evaporators (Dist 1 and Dist2). CP08-0010 also indicated that only Dist 2 and Dist 3 will be operational once Dist 3 is constructed. CLA has indicated that while there may be an increase in the raw materials necessary to produce the lactic acid the amount waste product created by Dist 2 and Dist 3 and gypsum (used as an additive in the waste product to make disposal easier) required will decrease at a greater rate, reducing the amount of total truck traffic necessary to operate (more raw material in, less waste out). CLA has requested that haul road emissions remain at the currently permitted levels to ensure compliance with permit limits.

APPLICABLE REQUIREMENTS AND VARIANCES OR ALTERNATIVES TO REQUIRED STANDARDS:

Chapter 4 – Ambient Air Quality Standards:

If viewed as a stand alone project the proposed modification submitted by CLA would not trigger any review of Ambient Air Quality Standards (AAQS). CLA has acknowledged that this project may be considered along with the modifications made in construction permit CP08-010 and that if emissions from the two projects are aggregated together an AAQS study may be warranted. CLA submitted an air dispersion modeling analysis as part of their permit application. A summary of the results has been provided below.

1. Air Quality Impact Analysis

The air quality impact analysis for the modification to the Cargill Lactic Acid (CLA) facility in Blair, Nebraska consists of a refined modeling analysis to demonstrate that the proposed modification will not cause or contribute to any NAAQS or PSD Class II increment violation of those pollutants with concentrations above the respective significant impact levels (SILs) in Table 1.0-1 of the Department's

Atmospheric Dispersion Modeling Guidance for Permits (09/05). The analysis includes nearby facilities obtained from NDEQ, City of Omaha Public Works Department, and the Iowa Department of Natural Resources (IDNR). A refined analysis was completed using a five, one-year consecutive meteorological records as per guidelines found in 40 CFR Part 51, Appendix W, Section 9.0 with a specification for 24-hour and annual PM_{10} because this is the pollutant and averaging periods for which the maximum concentrations from the modification to the Cargill Lactic Acid facility were predicted to exceed SILs. The specifics of the air quality impact analysis can be found in the facility's permitting file at the NDEQ.

2. Refined Modeling Analysis for NAAQS and PSD Increment Compliance

The purpose of the refined modeling analysis is to demonstrate that the proposed project will not cause or contribute to applicable violations NAAQS or increments values for PM_{10} (24-hour, & annual). The Nebraska and the National AAQS are shown below:

Nebraska and National PM_{10} Ambient Air Quality Standards and PSD class II Increments

Pollutant	Averaging Period	Ambient Air Quality Standards (ug/m^3)		PSD Class II Allowable Increments (ug/m^3)	
		National	Nebraska	National	Nebraska
PM_{10}	24-hour [a]	150	150	30	30
PM_{10}	Annual	50	50	17	17

[a] Concentration is allowed to be exceeded five times in a five-year period or one time in a one-year period at a single receptor.

The ambient air quality impact analysis takes into account the combined impacts of emissions from the proposed Cargill Lactic Acid facility, nearby facilities, and background concentrations due to distant major and minor sources and natural sources. The PSD Class II impact analysis takes into account the combined impacts of emissions from the proposed Cargill Lactic Acid facility and increment consuming nearby facilities. Based on the potential emissions from the proposed facility, nearbys, and background concentrations, the analysis demonstrates that the facility is expected to be in compliance with the NAAQS and PSD Class II increment values. The modeling submitted by CLA does not include emissions from the addition of a sixth cooling tower cell to EP 35-91. The NDEQ does not feel that the addition of a single cooling tower cell will significantly change the results of the modeling that was conducted or exceed any applicable PM/PM_{10} standards; CLA was not required to submit additional modeling for the modification to EP 35-91.

2.1. PM_{10} Results

The PM_{10} results for the NAAQS and the PSD Class II increment analysis are shown in the tables below. The analysis was completed using five consecutive one-year meteorological records, years 2003 through 2007. As shown in the tables, the NAAQS maximum annual concentration and the high-second-high 24-hour added to the background and demonstrates there are no NAAQS violations. Maximum annual and the high-second-high 24-hour concentrations compared to the PSD Class II increments also demonstrates there will be no PSD Class I increment violations.

NAAQS Maximum PM_{10} Impacts

Averaging Period	Year	UTM Coordinates (m)		Concentration (ug/m^3)	Background (ug/m^3)	Total (ug/m^3)	NAAQS (ug/m^3)
		X UTM	Y UTM				
24-Hour	2003	741444.12	4603183.5	38.0	60	98.0	150
	2004	741444.12	4603461.0	29.7		89.7	
	2005	741444.12	4603183.5	33.6		93.6	
	2006	741444.12	4603461.0	29.3		89.3	
	2007	741444.12	4603461.0	27.3		87.3	
Annual	2003	741762.12	4601318.0	7.28	25	32.3	50
	2004	741725.12	4602639.0	7.00		32.0	
	2005	741694.12	4603183.5	7.35		32.4	
	2006	741694.12	4603183.5	7.51		32.5	
	2007	741694.12	4603183.5	7.67		32.7	

PSD Class II Maximum PM_{10} Concentration

Averaging Period	Year	UTM Coordinates (m)		Concentration (ug/m^3)	PSD Class II Allowable Increment (ug/m^3)
		X UTM	Y UTM		
24-Hour	2003	741444.12	4603461.0	22.2	30
	2004	741731.12	4601218.0	23.2	
	2005	741962.12	4601324.0	22.6	
	2006	741732.12	4601317.0	23.6	
	2007	741732.12	4601317.0	22.3	
Annual	2003	741762.12	4601318.0	6.99	17
	2004	741962.12	4601324.0	6.51	
	2005	741725.12	4602639.0	6.22	
	2006	741732.12	4601317.0	7.03	
	2007	741725.12	4602639.0	7.00	

3. Air Quality Impact Summary

The analyses of the proposed Cargill Lactic Acid facility demonstrates that the facility will comply with applicable PM_{10} Ambient Air Quality Standards and PSD Class II increment standards.
To ensure that assumptions used in the modeling remain valid, the facility will have to meet stack height requirements for the various point sources (e.g., baghouse, cyclone), to restrict public access to the facility (e.g., installing a fence in accordance with NDEQ guidelines or implementing other equivalent public access restrictions), to conduct best management practices for maintenance of the haul roads, and to conduct performance testing to verify emissions from major point sources. If the results of the testing are significantly higher than the corresponding values used in the modeling, then the facility may need to remodel to show compliance with the NAAQS and increment.

Chapter 17 – Construction Permit Requirements: A construction permit has been requested by CLA in accordance with Section 014.02 to incorporate significant changes into their construction permits. The source-wide (e.g. all Cargill-owned facilities at the Cargill-Blair complex) potential emissions after this permitting action are such that the source is in the $3,000 permit fee category, in accordance with Section

003.01. A second fee of $3,000 was submitted for the proposed modification to the cooling tower (EP 35-91) because the application for the modification (#09-021) was received after this permit had been published for public comment.

Chapter 18 – New Source Performance Standards (NSPS), and 40 CFR Part 60: No additional NSPS requirements become applicable to the facility as a result of this permitting action

Chapter 19 – Prevention of Significant Deterioration (PSD): The Cargill-Blair complex currently consists of Cargill's wet corn milling operation/ethanol facility and a source group under the SIC code 28 that consists of several joint ventures and other businesses at the complex (Cargill Lactic Acid, NatureWorks LLC, Cargill Polyols LLC and PGLA-1 Company). The SIC code 28 source group is considered a single source, while the wet corn milling operation and ethanol facility comprise a separate source, as discussed in the 1999 memo to file-65024-9P, for purposes of PSD. The SIC code 28 group is currently a major PSD source because their combined current and actual VOC emissions are greater than 100 tons per year (sources with 2 digit SIC code 28 are considered "chemical process plants", which is one of the 28 listed source categories with 100 ton per year PSD thresholds).

CLA has requested that this permit be issued as a PSD permit acknowledging that the increase in potential emissions from this project and the previous project (CP08-010) should be aggregated and altogether would trigger PSD requirements. CLA submitted an updated BACT analysis for VOC because potential uncontrolled emissions of this pollutant will exceed the PSD modification threshold (40 tpy VOC). Detailed information on the BACT analysis provided by CLA can be found in the permitting files available at the NDEQ and previous permit fact sheets.

PSD Best Available Control Technology (BACT)

Pursuant to 40 CFR 52.21(j)(3), a major modification shall apply BACT for each regulated NSR pollutant for which it would result in a significant net emissions increase at the source. This requirement applies to each proposed emission unit at which a net emissions increase in the pollutant would occur as a result of a physical change or change in the method of operation in the unit. Best available control technology (BACT) is defined as an emission limitation established based on the maximum degree of pollutant reduction, determined on a case-by-case basis, considering technical, economic, energy, and environmental factors. However, BACT cannot be less stringent than emission limits established by an applicable NSPS.

CLA proposes to revert to the requirements approved by CP05-0058, which requires the finishing process be controlled by a regenerative thermal oxidizer (RTO) and does not require any control for the fermentation process. The Department received a detailed BACT analysis with permit application CP08-031. A brief summary of the BACT analysis is provided below; details can be found in the permitting files.

CLA evaluated several different control technologies which may be applicable to a fermentation process including: routing to the existing 9 MMBtu/hr RTO or constructing a new RTO, constructing a flare, and use of a wet scrubber or bioscrubber. A detailed BACT analysis for this project was submitted with the application for CP08-031 and has been reviewed by the department a brief summary is provided below.

The fermentation process requires significant amounts of air for the microorganisms that produce the lactic acid. The high airflow required by fermentation makes any combustion based control devices (RTO or flare) technically infeasible because the pollutant concentration of the waste stream will drop below the levels required to ensure proper combustion and will require the addition of supplemental fuels to ensure the combustion process does not die. Adding additional fuel to the combustion process will

ensure the destruction of some pollutants (VOC and HAP) but would cause a significant increase in others (NO_x SO_x and CO) which would make the intended control device ineffective.

CLA also reviewed the possibility of using several different types of scrubbers to control VOC emissions. Scrubbers are not traditionally used to control VOC emissions from fermenters and a pilot test would be required to determine their effectiveness. A cost analysis performed by CLA determined that the use of scrubbers to control VOC emission would be infeasible

CLA believes that in this case the use of any of the proposed control technologies is technically or economically infeasible and therefore proposes that no additional control be required for the new process equipment. The initial permit issued to CLA (CP05-0058) determined that no emission control for fermentation was necessary to comply with PSD requirements. In a later construction permit (CP07-0041) NatureWorks (now CLA) indicated that fermentation emissions would be routed into the finishing process and would therefore be controlled by the RTO. With the addition of new seed vessels and fermentation tanks CLA has determined that this is no longer possible.

CLA conducted additional analyses on growth of animals, soil and vegetation, and visibility impacts of this project and concluded the no significant adverse impact would occur as a result of the operation of CLA.

Chapter 20 – Particulate Matter Emissions:

Each permitted emission rate limitation ensures that the process weight rate limitations will not be exceeded. The following formula was used to determine compliance for CLA because the maxim amount of lactic acid processed at this facility (470,000,000 lb/yr or 26.83 tph) is less than 60,000 lb/hr (525,600,000 lb/yr), $E=4.10\ p^{(0.67)}$ where E = rate of emission in lb/hr, and p = process rate in tons/hr. The facility's allowable PM emissions are 37.15 lb/hr (162.7 tons per year). Since the facility wide PM emissions are only 3. 64 lb/hr the facility is expected to be in compliance with the process weight rate limitation.

Title 129, Chapter 20, Section 002 – Particulate Emissions from combustion Sources

The facility is expected to be in compliance with this regulation because the only fuel combusted in the RTO is natural gas. This fuel is considered a "clean fuel" with regard to particulate emissions.

Title 129, Chapter 20, Section 004 – Opacity

The RTO is subject to the opacity standard (20% Opacity Limit) specified in this section. It is unlikely that the RTO would exceed this standard due to the exclusive use of natural gas as a fuel. The fuel is considered a "clean fuel" with regard to particulate emissions.

Chapter 24 – Sulfur Compound Emissions: The exclusive use of natural gas in the RTO will ensure compliance with Section 001.

Chapter 27 – Hazardous Air Pollutants: CLA has indicated that potential HAP emissions increase will occur because new fermentation equipment will be constructed and the existing fermentation equipment will no longer be controlled by the RTO (none of the fermentation equipment will be controlled). Because construction permit CP08-010 can be considered contemporaneous with this permit and will be superseded by this permitting action potential HAP increases from that permitting action must also be considered when evaluating determining the applicability of standards from Chapter 27.

Construction permit CP08-010 allowed for the resizing of the RTO (incorporated from construction permit CP07-0041) as well as the construction of additional emission units as part of the finishing process; it did not approve the construction of any new fermentation equipment and required all fermentation equipment emissions be controlled by the RTO. To determine the potential emissions increase for this permitting action CLA must compare the potential emissions after the issuance of this permit to the potential emissions of CP05-0058 (the newest active permitting action prior to the issuance of CP08-010). Total HAP emissions permitted by CP05-0058 were 2.11 tpy. Potential HAP emissions after this project will be 5.00 tpy total HAPs and 4.49 tpy of acetaldehyde.

The potential increase in HAPs is:
Total combined HAPs = 5.00 tpy – 2.11 tpy = 2.89 tpy
Acetaldehyde= 4.49 tpy- (0.90)* x 2.11tpy = 2.61 tpy

*Construction permit CP05-0058 does not contain a breakdown of individual HAPs emitted from CLA. For this calculation it is assumed that the ratio of acetaldehyde to total HAPs is the same (4.49 tpy acetaldehyde/5.00 tpy total HAPs = 0.90) before and after the proposed modification. In all likelihood the ratio of acetaldehyde to total HAPs will be lower before the modification than after, making the potential increase in acetaldehyde slightly higher than calculated (between 2.61 tpy and 2.89 tpy).

CLA proposes that the Best Available Control Technology assessment provided for PSD (Chapter 19) satisfies the requirements of Chapter 27. The data submitted with this permitting action and potential emissions limitations from previous permits indicate that the majority of HAPs emitted by CLA will be from the finishing process (4.14 tpy) controlled by the RTO, a smaller amount (0.86 tpy) will be emitted from the fermentation process.

A RTO will be required to control HAP emissions from the finishing process to ensure compliance with the standards of Chapter 27.

Chapter 28 – Hazardous Air Pollutant Emission Standards (MACT): This facility is not subject to any additional MACT/NESHAP standards as a result of this project. CLA is not themselves a major source for HAPs, but the facilities that make up the SIC code 28 source group are major for HAPs, CLA is expected to comply with all major source requirements CLA is subject to 40 CFR 63 Subpart FFFF (MON) and Cargill Lactic Acid is required to comply with the applicable requirements of Subpart FFFF. CLA utilizes a batch fermentation process and the vents to the atmosphere are Group 2 vents (see Subpart FFFF for the definition of a group 2 vent)

Subpart FFFF – National Emission Standards for Hazardous Air Pollutants for Miscellaneous Organic Chemical Manufacturing: This subpart, adopted by reference in Title 129, Chapter 28, Section 001.78, applies to major HAP facilities (≥10 tons/year of individual HAP or ≥ 25 tons/year of combined HAPs, which own or operate miscellaneous organic chemical manufacturing process units (MCPU). An MCPU includes equipment necessary to operate a miscellaneous organic chemical manufacturing process, as defined in §63.2550 (process includes reaction, recovery, separation, purification, or other activity, operation, manufacture, or treatment which are used to produce a product or isolated intermediate) that produce an organic chemical(s) in the specified SIC, and it processes, uses, or produces HAP.

CLA utilizes a batch fermentation process which is subject to MON standards. A Group 2 process vent is defined as any batch process vent that does not meet the definition of a Group 1 process vent. Group 1 batch process vents are all vents at an existing facility whose total HAP emissions meet or exceed 10,000 lb/year (5 tons/yr). Potential facility wide HAP emissions from CLA are 5.0 tons/year {no, see lower

table on pg 2}; this includes HAPs from processes that do not vent through the fermentation vents, therefore all vents at this facility are classified as Group 2 vents and no additional control is required for this subpart.

Permit conditions specific to the proposed permit are discussed as follows:

Additional information on previous permitting actions to CLA can be found in the fact sheet accompanying permit CP08-010 in the permit file.

Revisions to the original conditions have been identified in the following ways; added items are bold and underlined, while removed items have a strikethrough. The description of changes to the permit conditions are in italics.

Condition XIII.(A) has been revised to reflect the facility configuration after the issuance of this permit. Two new fermenters and the eight existing fermenters now vent directly to the atmosphere. In addition three pre-seed vessels, three seed vessels and a new cooling tower have been added to the emission unit.

Condition XIII.(A) now reads:

(A) The source is permitted to construct a lactic acid production facility consisting of the following emission points: {Title 129, Chapter 19}

Emission Point (EP)	Equipment Description (Quantity)
EPs 35-10 and 35-11	Nutrient Dump Tank Dust Collectors (2)
EPs 35-12a and 35-13a	Lime Silo Receiver Dust Collectors (2)
EPs 35-12b and 35-13b	Lime Silo Bin Vent Dust Collectors (2)
EP 35-43	Filter Aid Weigh Hopper Dust Collector
EP 35-44	Filter Aid Dissolving Tank Scrubber
EP 35-45	Filter Aid Silo Dust Collector
EP 35-91	Fermentation Cooling Tower
EP 35-93	Process Cooling Tower
EP 35-94	Regenerative Thermal Oxidizer (RTO) – Controls emissions from the following Finishing Process Equipment: Vacuum Pumps (11), ~~Fermenters (8)~~, Process Tanks (4), and Process Units (3)
TK-35192a, TK-35192b, and TK-35192c	**Seed Vessels (3)**
TK-35191a, TK-35191b, and TK-35180	**Pre-Seed Vessels (3)**
TK-35202 thru TK-35206 and TK-35222 thru TK-35226	**Fermenters (10)**
35-95	**Fermentation Cooling Tower**
------	Paved Road Fugitives
------	Dumpster

Condition XIII.(D) has been updated to allow an increase in capacity of lactic acid (dry basis) from 40,000,000 lb/mo and 400,000,000 lb/yr to 47,000,000 lb/mo and 470,000,000 lb/yr as requested by CLA.

Condition XIII.(E) Has been updated to reflect revised PM_{10} emission limits for equipment listed. Emission limits for the two existing cooling towers, EP 35-91 and 35-93, were updated to reflect increased water flow through the cooling tower. Emissions limit for the new cooling tower, EP 35-95 was added to this condition. In addition, the "total" emission limit was removed because it is simply the sum of the listed emission limits, therefore is redundant. There is no PM10 emission limit for the natural gas-fired RTO since it is primarily a function of natural gas combustion alone..

In previous permits emissions from EP35-91 were calculated using a drift loss that was significantly lower than what is required by the construction permit. In order to conservatively calculate emissions from this cooling tower a drift loss of 0.005% is used. This is consistent with the requirements of permit Condition XIII.(F) and the potential emission calculations for the other two cooling towers.

Condition XIII.(E) now reads

(E) PM_{10} emission rates from **<u>the listed emission points</u>** ~~this facility~~ shall not exceed the following limits: {Title 129, Chapter 19}

Emission Point	Equipment Description	PM_{10} Emission Limits	
		(lb/hr)	(ton/year)
EP 35-10	Nutrient Dump Tank Dust Collector	0.05	0.22
EP 35-11	Nutrient Dump Tank Dust Collector	0.05	0.22
EP 35-12a	Lime Silo Receiver Dust Collector	0.10	0.44
EP 35-12b	Lime Silo Bin Vent Dust Collector	0.03	0.13
EP 35-13a	Lime Silo Receiver Dust Collector	0.10	0.44
EP 35-13b	Lime Silo Bin Vent Dust Collector	0.03	0.13
EP 35-43	Filter Aid Weigh Hopper Dust Collector	0.09	0.38
EP 35-44	Filter Aid Dissolving Tank Scrubber	0.21	0.94
EP 35-45	Filter Aid Silo Dust Collector	0.09	0.38
EP 35-91	Fermentation/Evaporation Cooling Tower	~~0.08~~/**<u>0.96</u>**	~~0.33~~/**<u>4.19</u>**
EP 35-93	Process Cooling Tower	~~1.00~~**<u>1.12</u>**	~~4.37~~**<u>4.88</u>**
<u>EP 35-95</u>	**<u>Fermentation Cooling Tower</u>**	**<u>0.66</u>**	**<u>2.91</u>**
	Paved Road Fugitives	1.37 *	3.01
~~Total~~		~~4.75~~	~~17.80~~

* Based on 12 hours per day (4,380 hours per year)

NOTE: For the purposes of the table, a year is defined as any 12 consecutive calendar month period. ~~The yearly limits are all based on 8,760 hours per year.~~ ~~The source conducted emissions testing in accordance with the 2002 construction permit and the results indicated that the source was in compliance with the permit limits~~.

Condition XIII.(F) has been updated to require the new cooling tower (EP 35-95) to meet the drift loss and total dissolved solids (TDS) requirements. The source also requested that the requirement for continuous TDS monitoring be removed because it is much more costly than monthly testing and only provides minimal additional environmental protection. The department has reviewed the permitting

history for this facility and determined that continuous TDS monitoring of the cooling towers is unnecessary and revised this condition to be more consistent with other facilities operating cooling towers. Cargill is now required to test TDS concentrations once per calendar month and keep a rolling12-month average.

XIII.(F) Now Reads:

~~(F) Drift loss from the cooling towers (EPs 35-91and 35-93) shall not exceed 0.005% as guaranteed by the vendor. The cooling tower water system shall use an integrated monitoring and control system designed and calibrated such that Total Dissolved Solids (TDS) will not exceed 5,000 ppm. {Title 129, Chapter 19}~~

The following conditions apply to: Cooling towers:

(1) The cooling towers shall be properly installed, operated, and maintained. The manufacturer's operation and maintenance manual, or its equivalent, detailing proper operation, inspection, and maintenance of the cooling tower shall be kept on site and readily available to Department representatives. (Title 129, Chapter 19)

(2) The drift loss shall not exceed 0.005 percent. Verification of drift loss shall be by manufacturer's specification. Manufacturer's drift loss specification shall be kept on site and readily available to Department representatives, upon request. (Title 129, Chapter 19)

(3) The rolling 12-month average TDS concentration in the cooling water shall not exceed 5,000 ppm. A TDS sample shall be collected and tested at a minimum of once per calendar month. (Title 129, Chapter 19)

Condition XIII.(H) has been added back into the permit. This condition was removed because fermentation operations were expected to be routed to the finishing process RTO, making a separate condition limiting emissions from fermentation redundant and was removed in CP07-0041. Because the fermentation process is expanding and will no longer be controlled by the finishing process RTO, it is now necessary to limit and verify (test) emissions from the fermentation process.

XIII.(H) now Reads:

The following conditions apply to: FERMENTATION OPERATIONS:

(1) Total VOC emissions from the three (3) pre-seed vessels, three (3) seed vessels, and ten (10) fermenters shall not exceed 21.0 tons in any period of twelve (12) consecutive calendar months. At no time during the first eleven (11) calendar months shall emissions exceed 21.0 tons. Emissions shall be calculated using hours of operation and lb/hr emission rates as established during testing as required by Condition XIII.(H)(3). {Title 129, Chapter 19}

(2) Total HAP emissions from the three (3) pre-seed vessels, three (3) seed vessels, and 10 fermenters shall not exceed 0.85 tons in any period of 12 consecutive calendar months. At no time during the first 11 calendar months shall emissions exceed 0.85 tons. Emissions shall be calculated using

hours of operation and lb/hr emission rates as established during testing as required by Condition XIII.(H)(3). {Title 129, Chapter 27}

(3) In order to demonstrate compliance with Conditions XIII.(H)(1) and (H)(2), and to verify the assumptions used in the permit application, the source shall conduct a performance test for VOC and HAPs on the fermentation source streams. The performance test shall be conducted in accordance with Condition XIII.(J). VOC emissions shall be expressed as total mass of VOC. {Title 129, Chapter 34}

Condition XIII.(I) has been updated to reflect the removal of fermentation emissions from the RTO emission limits. No finishing process emission units will be modified therefore emission limits will be set at the levels permitted in CP05-005. In order to ensure that all pollutants emitted by the finishing process are effectively controlled, the RTO will continue to operate at a maximum rate of 9MMBtu/hr.

Conditions XIII.(I)(1), (2), and (3) now read:

(I) The following conditions apply to: LACTIC ACID FINISHING PROCESS ~~AND FERMENTATION~~ OPERATIONS:

(1) VOC and HAP emissions from the eleven (11) finishing process vacuum pumps, the four (4) finishing process tanks, and the three (3) finishing process units, collectively referred to as the finishing process equipment, ~~and from the eight (8) fermenters~~, shall be controlled by one (1) 9 MMBtu/hr natural gas-fired regenerative thermal oxidizer (RTO). {Title 129, Chapter 19 and Chapter 27}

(2) BACT for VOCs for the finishing process equipment ~~and fermenters~~ shall be an RTO with a minimum VOC control efficiency of 98 percent and a VOC outlet emission rate not to exceed ~~5.62~~ **5.53** lb/hr (3-hour or test method average). The source shall comply with these limits, except as provided in Condition XIII.(I)(3). {Title 129, Chapter 19}

(3) During the first 12 months following initial startup (here-in referred to as the demonstration period), the RTO shall have a minimum control efficiency of 95% and an outlet emission rate not to exceed ~~14.05~~ **13.83** lb/hr (3-hour or test method average) instead of a minimum control efficiency of 98% and an outlet emission rate not to exceed ~~5.62~~ **5.53** lb/hr as listed in Condition XIII.(I)(2).

If the source does not expect to meet the VOC emission limits under normal operating conditions as stated in Condition XIII.(I)(2) after the 12-month demonstration period has elapsed, an RTO Performance Report shall be submitted to the Department no less than 90 days prior to the end of the 12-month demonstration period. This report shall include a performance assessment of the RTO, including data for parameters monitored during testing and a proposed revised emission limit, provided that the proposed revised emission limit shall not exceed ~~14.05~~ **13.83** lb/hr. Parameters to be monitored shall include, but not be limited to, temperature, destruction efficiency, fuel usage, collateral emissions, production capacity and the maximum VOC control efficiency that was achieved during the demonstration period under steady state conditions. The report should also include any other information as necessary to justify why the emission limit in Condition XIII.(I)(2) cannot be achieved. Upon

submittal of the RTO Performance Report, the source shall operate the RTO in compliance with the proposed revised emission limit until such time as the Department rejects the limit, or accepts the limit and issues an alternative BACT limit by means of a subsequent PSD permit.

Condition XIII.(M)(5) has been revised to account for the removal of the continuous TDS monitoring requirements and addition of weekly TDS sampling and monthly rolling average calculations.

Condition XIII.(M)(5) now reads

(5) Records documenting Total Dissolved Solids (TDS) sample readings and calculations demonstrating compliance with Condition XIII.(F)(3).

Condition XIII.(M)(6) has been added back in to the construction permit. This condition is the companion condition to Condition XIII.(H) which requires documentation to verify that the fermentation process is operating in accordance with this construction permit.

Condition XIII.(M)(6) now reads:

(6) Emissions calculations for each calendar month and each period of 12 consecutive calendar months to demonstrate compliance with Conditions XIII.(H)(1) and (2).

STATUTORY OR REGULATORY PROVISIONS ON WHICH PERMIT REQUIREMENTS ARE BASED:

Applicable regulations: Title 129 - Nebraska Air Quality Regulations as amended May 17, 2009.

PROCEDURES FOR FINAL DETERMINATION WITH RESPECT TO THE PROPOSED CONSTRUCTION PERMIT:

The public notice, as required under NAQR Chapter 14, shall be published on September 1, 2009, in the Enterprise Publishing Company newspaper in Blair. Persons or groups shall have 30 days from that issuance of public notice (September 30, 2009) to provide the NDEQ with any written comments concerning the proposed permit action and/or to request a public hearing, in accordance with NAQR Chapter 14. If a public hearing is granted by the Director, there will be a notice of that meeting published at least 30 days prior to the hearing. Persons having comments or requesting a public hearing may contact:

W. Clark Smith-Permitting Section Supervisor
Air Quality Division
Nebraska Department of Environmental Quality
PO Box 98922
Lincoln, Nebraska 68509-8922

If no public hearing is requested, the permit may be granted at the close of the 30-day comment period. If a public hearing is requested, the Director of the NDEQ may choose to extend the date on which the permit is to be granted until after that public hearing has been held. During the 30-day comment period, persons requiring further information should contact:

Daniel LeMaistre
Air Quality Division-Permitting Section
Nebraska Department of Environmental Quality
PO Box 98922
Lincoln, Nebraska 68509-8922

Telephone inquiries may be made at:

(402) 471-2189

TDD users please call 711 and ask the relay operator to call us at (402) 471-2186.

Fact Sheet Attachment: Permit-Limited Emissions
Cargill Lactic Acid- Blair
Facility ID# 91164
Potential Emissions Summary

Potential Emissions from Proposed Construction

Pollutant	Emission Rate lb/hr	tpy
PM	3.92	17.16
PM_{10}	1.18	5.15
VOC	10.44	20.94
HAPs		
Acetaldehyde	0.20	0.85
Total HAPs	0.20	0.85

55.67

Potential Emissions after the issuance of CP08-031

Pollutant	Emission Rate[2] lb/hr	tpy
PM[1]	11.31	46.53
PM_{10}[1]	4.42	18.57
NO_x	0.44	1.93
SO_x	1.30	5.71
CO	3.36	20.03
Total Reduced Sulfur (TRS)	0.12	0.54
VOC	10.44	45.16
HAPs		
Acetaldehyde	1.03	4.49
Propionaldehyde	0.10	0.44
Hexane	0.02	0.07
Total HAPs	1.14	5.00

[1] The potential increase in PM/PM_{10} emissions do not yield the expected facility wide PTE when compared to the those values mentioned in Permit CP08-010. There are several reasons for this:

(a) the calculation methodology for cooling tower calculations has been updated to be more representative of actual emissions since the cooling towers were last modified. These changes in calculation methodology lowered the overall amount of PM_{10} expected from these emission units.

(b) One of the cooling towers (35-91) used a drift loss that was lower than required by the construction permit.

For purposes of these calculations potential emissions from this unit were calculated using the higher permit-limited drift loss making the calculation more conservative.

[2] Emission Rates for NOx SOx CO and TRS have not changed. VOC and HAP emissions are based on testing conducted by CLA in 2007 and performance testing is required.

Fact Sheet Attachment: Permit-Limited Emissions
Cargill Lactic Acid- Blair
Facility ID# 91164
Emission Point ID: Fermentation Operations (TK-35192a, TK-35192b, TK35-192c, TK-35191a, TK35191b, TK-35180,TK35202 thru TK35206, and TK35222 thru TK35226)

Potential Fermentation Operations Emissions

	May 2007 Test Data[1]	Units	Potential Scaled Emissions	Units	Safety factor[3]	permit limits[3]	Units
Production Rate	220	lb/MMBtu	470	lb/MMBtu	--	470	lb/MMBtu
VOC emissions	4.9	ton/yr	10.47	ton/yr	2	20.94	ton/yr
HAP emissions	0.2	ton/yr	0.43	ton/yr	2	0.85	ton/yr

[1]-CLA conducted a performance test of their facility in May 2007 while operating at a maximum capacity of 220 million pounds per year with fermentation exhausting directly to the atmosphere. The configuration proposed in construction permit application CP08-010 will be the same as the May 2007 configuration. Additional testing will be required to verify actual emissions are consistent with the potential emission calculations

[2]-Potential emissions after the increase in production have been scaled linearly based on the May 2007 test data. Because fermentation is an organic process potential emissions will scale linearly while the total airflow required to complete the fermentation reaction will increase exponentially.

[3]-A safety factor of two has been added to account for any unforeseen variations in the fermentation process that may increase potential emissions.

Fact Sheet Attachment: Permit-Limited Emissions
Cargill Lactic Acid- Blair
Facility ID# 91164
Emission Point ID: Finishing Process RTO (35-94)

RTO Emissions

Potential Emissions from the 9MMBtu/hr RTO (Finishing Process) were estimated in CP07-004 and did not contain any fermentation operations emissions. Since the RTO will be operating in the manner specified in CP07-0041 no new emissions calculations for the RTO have been performed. Because a new distillation unit was permitted in CP08-010 performance testing will be required to verify these emission calculations.

Total Firing Capacity	9.0	MMBtu/hr
Heating Value:	1,050	BTU/cf
Maximum Fuel Use:	78,840	MMBtu/yr

Pollutant	Emission Factor [1] (lb/MMBtu)	Emission Rate (lb/hr)	Potential Emissions (tons/yr)
PM	0.0076	0.07	0.30
PM_{10}	0.0076	0.07	0.30
NO_x	0.0400	0.36	1.58
SO_x	0.0006	0.01	0.02
CO	[2]	3.36	14.72
VOC	[3]	5.53	24.22
HAP[4]	[3]	0.95	4.15

[1] Criteria Pollutant Emission factors from AP-42, Tables 1.4-1, 1.4-2, 1.4-3, and 1.4-4, except NO_x, and CO. NO_x and CO emissions are based off of vendor guarantees.

[2] CO emissions based of a vendor guarantee of 35 parts per million by volume (ppmv). Details of this calculation can be found in the fact sheet accompanying CP07-0041.

[3] VOC and HAP emissions are based on performance testing conducted by CLA in 2007

[4] Largest Potential HAP expected is Acealdehyde. Smaller amounts of Propionaldehyde and Hexane are expected from RTO use.

Fact Sheet Attachment: Permit-Limited Emissions
Cargill Lactic Acid- Blair
Facility ID# 91164
Emission Point ID: Cooling Tower Emissions

New Cooling Tower-Fermentation Cooling Tower (EP 35-95)

Basis: Mass balance calculations based on circulation rates, TDS, & drift loss.
Cooling water has a presumed density of 8.33 lb/gal.
All parameters set based on manufacturers and/or facility information.
Drift loss based on specification provided by cooling tower vendor.

Pollutant	Circulation (per cell) gal/hr	Number of Cells	TDS ppm	Drift Loss percent	Op hours hr/yr	PTE lb/hr	PTE tpy	Previously permitted limit tpy	Increase in emissions tpy
PM	1,062,900	1	5,000	0.005	8,760	2.21	9.70	0	9.70
PM_{10}	1,062,900	1	5,000	0.005	8,760	0.66	2.91	0	2.91

PTE PM (lb/hr) = Circulation (gal/hr) x Density (lb/gal) x TDS (ppm) x Drift loss (%) / 1,000,000
PTE PM (ton/yr) = PTE PM/PM-10 (lb/hr) x Operating hr/yr x 1 ton/2000 lbs
PTE PM_{10} (lb/hr) = Circulation (gal/hr) x Density (lb/gal) x TDS (ppm) x Drift loss (%) / 1,000,000*0.30
PTE PM_{10} (ton/yr) = PTE PM_{10} (lb/hr) x Operating hr/yr x 1 ton/2000 lbs

The 0.30 coefficient used when calculating PM_{10} emissions from the cooling tower is taken from "Calculating Realistic PM_{10} Emissions from Cooling Towers", Joel Reisman and Gordan Frisbie, Abstract NO. 216, Presented at the 2001 Air and Waste Management Associations 94th Annual Conference and Exhibition in Orlando FL, June 25-28.

Existing Cooling Tower-Fermentation Cooling Tower (EP 35-91)

Basis: Mass balance calculations based on circulation rates, TDS, & drift loss.
Cooling water has a presumed density of 8.33 lb/gal.
All parameters set based on manufacturers and/or facility information.
Drift loss based on specification provided by cooling tower vendor.

Pollutant	Circulation (per cell) gal/hr	Number of Cells	TDS ppm	Drift Loss percent	Op hours hr/yr	PTE lb/hr	PTE tpy	Previously permitted limit[1] tpy	Increase in emissions tpy
PM	255,000	6	5,000	0.005	8,760	3.19	13.96	8.21	5.75
PM_{10}	255,000	6	5,000	0.005	8,760	0.96	4.19	2.46	1.73

[1]- Previous permits calculated the PTE of this unit using a drift loss of 0.0002%. This is inconsistent with construction permit CP05-0058 which requires this cooling tower to have a drift loss of less than 0.005%. For this fact sheet and the permit it accompanies it is assumed that this cooling tower has a drift loss of 0.005% as required by CP05-0058 to ensure that all potential emissions are accounted for.
PTE PM (lb/hr) = Circulation (gal/hr) x Density (lb/gal) x TDS (ppm) x Drift loss (%) / 1,000,000
PTE PM (ton/yr) = PTE PM/PM-10 (lb/hr) x Operating hr/yr x 1 ton/2000 lbs
PTE PM_{10} (lb/hr) = Circulation (gal/hr) x Density (lb/gal) x TDS (ppm) x Drift loss (%) / 1,000,000*0.30
PTE PM_{10} (ton/yr) = PTE PM_{10} (lb/hr) x Operating hr/yr x 1 ton/2000 lbs

The 0.30 coefficient used when calculating PM_{10} emissions from the cooling tower is taken from "Calculating Realistic PM_{10} Emissions from Cooling Towers", Joel Reisman and Gordan Frisbie, Abstract NO. 216, Presented at the 2001 Air and Waste Management Associations 94th Annual Conference and Exhibition in Orlando FL, June 25-28.

Fact Sheet Attachment: Permit-Limited Emissions
Cargill Lactic Acid- Blair
Facility ID# 91164
Emission Point ID: Cooling Tower Emissions
Existing Cooling Tower-Process Cooling Tower (EP 35-93)

Basis: Mass balance calculations based on circulation rates, TDS, & drift loss.
Cooling water has a presumed density of 8.33 lb/gal.
All parameters set based on manufacturers and/or facility information.
Drift loss based on specification provided by cooling tower vendor.

Pollutant	Circulation (per cell) gal/hr	Number of Cells	TDS ppm	Drift Loss percent	Op hours hr/yr	PTE lb/hr	PTE tpy	Previously permitted limit[1] tpy	Increase in emissions tpy
PM	255,000	7	5,000	0.005	8,760	3.72	16.28	14.56	1.72
PM_{10}	255,000	7	5,000	0.005	8,760	1.12	4.88	4.37	0.51

[1]-Emissions taken from construction permit CP05-0058

PTE PM (lb/hr) = Circulation (gal/hr) x Density (lb/gal) x TDS (ppm) x Drift loss (%) / 1,000,000

PTE PM (ton/yr) = PTE PM/PM-10 (lb/hr) x Operating hr/yr x 1 ton/2000 lbs

PTE PM_{10} (lb/hr) = Circulation (gal/hr) x Density (lb/gal) x TDS (ppm) x Drift loss (%) / 1,000,000*0.30

PTE PM_{10} (ton/yr) = PTE PM_{10} (lb/hr) x Operating hr/yr x 1 ton/2000 lbs

The 0.30 coefficient used when calculating PM_{10} emissions from the cooling tower is taken from "Calculating Realistic PM_{10} Emissions from Cooling Towers", Joel Reisman and Gordan Frisbie, Abstract NO. 216, Presented at the 2001 Air and Waste Management Associations 94th Annual Conference and Exhibition in Orlando FL, June 25-28.