

# AIR QUALITY CONSTRUCTION PERMIT

## PREVENTION OF SIGNIFICANT DETERIORATION

**PERMIT NUMBER:** CP07-0079

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**Facility Name:** Cargill Inc.

**NDEQ Facility ID#:** 57902

**Mailing Address:**

PO Box 300

Blair, Nebraska 68008-0300

**Facility Location:**

650 Industrial Road

Blair, Washington County, Nebraska 68008

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**Project Description:** Installation of up to four (4) temporary natural-gas fired boilers with a total combined heat input of 200 MMBtu/hr.

**Standard Industrial Classification (SIC) Code:** 2046, Wet Corn Milling

**Revised or Superseded Construction Permits:** None

Pursuant to Chapter 14 of the Nebraska Air Quality Regulations, the public has been notified by prominent advertisement of this proposed construction of an air contaminant source and the thirty (30) day period allowed for comments has elapsed. This construction permit approves the proposed project as identified in the air quality construction permit application #07-0079 received December 27, 2007, including any supporting information received prior to issuance of this permit. Additional details of the proposed project, including estimated pollutant emissions caused by the project, can be found in the accompanying Fact Sheet.

Compliance with this permit shall not be a defense to any enforcement action for violation of an ambient air quality standard. The permit holder, owner, and operator of the facility shall assure that the installation, operation, and maintenance of all equipment is in compliance with all of the conditions of this permit.

The undersigned issues this permit on behalf of the Director under the authority of Title 129 – Nebraska Air Quality Regulations as amended February 16, 2008.

**D R A F T**

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Date

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Jay D. Ringenberg  
Deputy Director of Programs

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**I. ABBREVIATIONS, SYMBOLS, and UNITS OF MEASURE**

AP-42	Compilation of Air Pollutant Emission Factors, Volume I, Stationary Point and Area Sources	NAAQS	National Ambient Air Quality Standards
		NDEQ	Nebraska Department of Environmental Quality
BACT	Best Available Control Technology	NESHAP	National Emission Standards for Hazardous Air Pollutants
bhp	Brake Horsepower	NO <sub>2</sub>	Nitrogen Dioxide
Btu	British Thermal Unit	NO <sub>x</sub>	Nitrogen Oxides
bu	Bushel	NSPS	New Source Performance Standard
		NSR	New Source Review
CAA	Clean Air Act		
CE	Control Equipment		
CEM	Continuous Emissions Monitor	PAL	Plant-wide Applicability Limit
CEMS	Continuous Emissions Monitoring System	Pb	Lead
cf	Cubic feet	PbR	Permit-by-Rule
CFR	Code of Federal Regulations	PE	Professional Engineer
CO	Carbon Monoxide	PM	Particulate Matter
CO <sub>2</sub>	Carbon Dioxide	PM <sub>10</sub>	Particulate Matter with and aerodynamic diameter equal to or less than 10 microns
CP	Construction Permit	PM <sub>2.5</sub>	Particulate Matter with and aerodynamic diameter equal to or less than 2.5 microns
DGS	Distillers Grains with Solubles		
DDGS	Dry Distillers Grains with Solubles		
D-EtOH	Denatured Ethanol		
DGS	Distiller Grains with Solubles		
dscf	Dry Standard Cubic feet	ppb	Parts per Billion
dscfm	Dry Standard Cubic feet per minute	ppm	Parts per Million
EMIS	Emergency Management Information System	ppmvd	Parts per Million by Volume, dry
EPA	Environmental Protection Agency	PSD	Prevention of Significant Deterioration
EQC	Environmental Quality Council	PTE	Potential to Emit
EP	Emission Point		
ESP	Electrostatic Precipitator	RATA	Relative Accuracy Test Audit
EtOH	Ethanol		
EU	Emission Unit	RMP	Risk Management Plant
		RTO	Regenerative Thermal Oxidizer
FGR	Flue Gas Recirculation		
FIP	Federal Implementation Plan	scf	Standard Cubic Feet
FR	Federal Register	SIC	Standard Industrial Classification
ft	Feet	SIP	State Implementation Plan
FTIR	Fourier Transform Infrared	SO <sub>2</sub>	Sulfur Dioxide
GACT	Generally Available Control Technology	SO <sub>x</sub>	Sulfur Oxides
H <sub>2</sub> S	Hydrogen Sulfide	TDS	Total Dissolved Solids
HAP	Hazardous Air Pollutant	TO	Thermal Oxidizer
HC	Hydrocarbon	tpy	Tons per year
HP	Horsepower	TRS	Total Reduced Sulfur
hr	Hour	TSP	Total Suspended Particulate Matter
LDAR	Leak Detection and Repair	ULNB	Ultra Low NO <sub>x</sub> Burner
LNB	Low NO <sub>x</sub> Burner	UST	Underground Storage Tank
MACT	Maximum Achievable Control Technology	UTM	Universal Transverse Mercator
Mgal	One thousand gallons	VHAP	Volatile Hazardous Air Pollutant
MMBtu	Million British Thermal Units	VMT	Vehicle Miles Traveled
MMscf	One million standard cubic feet	VOC	Volatile Organic Compound
MSDS	Material Safety Data Sheet	WDGS	Wet Distillers Grains with Solubles
MW	Megawatt		

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**I. GENERAL CONDITIONS**

- (A) This permit is not transferable to another source or location. {Chapter 17}
- (B) Holding of this permit does not relieve the owner or operator of the source from the responsibility to comply with all applicable portions of the Nebraska Air Quality Regulations and any other requirements under local, State, or Federal law. Any permit noncompliance shall constitute a violation of the Nebraska Environmental Protection Act and the Federal Clean Air Act, and is grounds for enforcement action or permit revocation. {Chapter 41 & Chapter 17, Section 011}
- (C) Application for review of plans or advice furnished by the Director will not relieve the owner or operator of legal compliance with any provision of these regulations, or prevent the Director from enforcing or implementing any provision of these regulations. {Chapter 37}
- (D) Any owner or operator who failed to submit any relevant facts or who submitted incorrect information in a permit application shall, upon becoming aware of such failure or incorrect submittal, promptly submit such supplementary facts or corrected information. If the owner or operator wishes to make changes at the source that will result in change(s) to values, specifications, and/or locations of emission points that were indicated in the permit application (or other supplemental information provided by the owner or operator and reviewed by the Department in issuance of this permit), the owner or operator must receive approval from the Department before the change(s) can be made. In addition, any modification which may result in an adverse change to the air quality impacts predicted by atmospheric dispersion modeling (such as changes in stack parameters or increases in emission rates, potential emissions, or actual emissions) shall have prior approval from the Department. The owner or operator shall provide all necessary information to verify that there are no substantive changes affecting the basis upon which this permit was issued. Information may include, but not be limited to, additional engineering, modeling and ambient air quality studies. {Chapter 17, Section 006, 007, & 008}
- (E) Approval to construct, reconstruct and/or modify the source will become invalid if a continuous program of construction is not commenced within 18 months after the date of issuance of the construction permit, if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable period of time. {Chapter 17, Section 012}
- (F) The owner/operator of the source shall provide the following notifications to the Department:
- (1) The date construction, reconstruction or modification commenced as defined in Chapter 1, Section 031. Notification shall be postmarked no later than 30 days after such date and include a summary description of whether the requirement was met through: {Chapter 17, Section 012}
- (a) Initiating physical on-site construction activities of a permanent nature that meet the definition of “begin actual construction”, or
- (b) Entering into binding agreements or contractual obligations. If this option is used, the notice shall also include a brief summary of each binding agreement or contractual obligation entered into, the date of the agreement or contract, and why it cannot be cancelled or modified without substantial loss to the owner or operator.

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- (2) The date of initial startup of operations postmarked within 15 days after such date. {Chapter 7, Section 002.03}
- (G) The owner or operator shall allow the Department, EPA or an authorized representative, upon presentation of credentials to: {Neb. Rev. Statute §81-1504}
- (1) Enter upon the owner or operator's premises at reasonable times where a source subject to this permit is located, emissions-related activity is conducted or records are kept, for the purpose of ensuring compliance with the permit or applicable requirements;
- (2) Have access to and copy, at reasonable times, any records, for the purpose of ensuring compliance with the permit or applicable requirements;
- (3) Inspect at reasonable times any facilities, pollution control equipment, including monitoring and air pollution control equipment, practices, or operations, for the purpose of ensuring compliance with the permit or applicable requirements;
- (4) Sample or monitor at reasonable times substances or parameters for the purpose of ensuring compliance with the permit or applicable requirements.
- (H) When requested by the Department, the owner or operator shall submit completed emission inventory forms for the preceding year to the Department by March 31 of each year. {Chapter 6}
- (I) Open fires are prohibited except as allowed by Chapter 30.
- (J) Particulate Matter – General Requirements: {Chapter 32}
- (1) The owner or operator shall not cause or permit the handling, transporting or storage of any material in a manner, which allows particulate matter to become airborne in such quantities and concentrations that it remains visible in the ambient air beyond the property line.
- (2) The owner or operator shall not cause or permit the construction, use, repair or demolition of a building, its appurtenances, a road, a driveway, or an open area without applying all reasonable measures to prevent particulate matter from becoming airborne and remaining visible beyond the property line. Such measures include, but not limited to, paving or frequent cleaning of roads, driveways and parking lots; application of dust-free surfaces; application of water; and planting and maintenance of vegetative ground cover.
- (K) If and when the Director declares an air pollution episode as defined in Chapter 38, Sections 003.01B, 003.01C, or 003.01D, the owner or operator shall immediately take all required actions listed in Title 129, Appendix I until the Director declares the air pollution episode terminated.
- (L) This permit may be revised (reopened and reissued) or revoked for cause in accordance with Title 129 and Title 115, Rules of Practice and Procedure. Conditions under which this permit will be revised or revoked for cause, include but are not limited to: {Chapter 15, Section 006}
- (1) A determination by the Director, or the Administrator of EPA that:
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- (a) the permit must be revised to ensure compliance with the applicable requirements;
  - (b) the permit contains a material mistake or that inaccurate statements were made in the emissions standards or other terms or conditions of the permit.
- (2) The existence at the source of unresolved noncompliance with applicable requirements or a term or condition of the permit, and refusal of the owner or operator to agree to an enforceable schedule of compliance to resolve the noncompliance;
  - (3) The submittal by the owner or operator of false, incomplete, or misleading information to the Department or EPA;
  - (4) A determination by the Director that the source or activity endangers human health or the environment and that the danger cannot be removed by a revision of the permit; or
  - (5) The failure of the owner or operator to pay a penalty owed pursuant to court order, stipulation and agreement, or order issued by the Administrator of the EPA.

## **II. SPECIFIC CONDITIONS**

- (A) Recordkeeping: Records of all measurements, results, inspections, and observations as required to ensure compliance with all applicable requirements shall be maintained on-site as follows:
  - (1) All calculations and records required throughout this permit shall be completed no later than the fifteenth (15<sup>th</sup>) day of each calendar month and shall include all information through the previous calendar month, unless otherwise specified in this permit.
  - (2) All records required throughout this permit shall be kept for a minimum of five years and shall be clear and readily accessible to Department representatives, unless otherwise specified in this permit.
  - (3) Copies of all notifications, reports, test results, and plans.
  - (4) Calibration records for all operating parameter monitoring equipment.
  - (5) Operation and Maintenance manuals detailing proper operation and maintenance of all permitted emission units, required control equipment, and required monitoring equipment shall be kept for the life of the equipment.
  - (6) Records documenting equipment failures, malfunctions, or other variations, including date and time of occurrence, remedial action taken, and when corrections were made to each piece of permitted equipment, required control equipment, and required monitoring equipment.
- (B) All permitted emission units, control equipment, and monitoring equipment shall be properly installed, operated, and maintained.
- (C) Any emissions due to malfunctions, unplanned shutdowns, and ensuing start-ups that are, or may be, in excess of applicable emission limits shall be reported to the Department in accordance with Chapter 35, Section 005.

- (D) The performance tests required in the permit shall be completed and submitted to the NDEQ as follows: {Chapter 34}
- (1) Performance tests shall be conducted while operating at full capacity within sixty (60) days after reaching the maximum capacity, but not more than 180 days after the start-up of operations of each unit, unless otherwise specified by the NDEQ.
  - (2) Testing shall be conducted according to the methodologies found in Title 129, Chapter 34, Section 002, or other NDEQ approved methodologies.
  - (3) Performance tests shall be conducted for a minimum of three (3) one hour runs unless another run time is specified by the applicable Subpart or as deemed appropriate by the NDEQ.
  - (4) The owner or operator of a source shall provide the NDEQ at least thirty (30) days written notice prior to testing to afford the NDEQ an opportunity to have an observer present. The owner or operator shall also provide the NDEQ with an emissions testing protocol at least thirty (30) days prior to testing.
  - (5) The owner or operator shall monitor the operating parameters for process and control equipment during the performance testing required in the permit.
  - (6) A written copy of the test results signed by the person conducting the test shall be provided to the NDEQ within forty-five (45) days of completion of the test and will, at a minimum, contain the following items:
    - (a) A description of the source's operating parameters (i.e. production rates, firing rates of combustion equipment, fuel usage, etc.), control equipment parameters (i.e. baghouse fan speeds, scrubber liquid flow rates, etc.), and ambient conditions (i.e. weather conditions, etc.) during testing.
    - (b) Copies of all data sheets from the test run(s).
    - (c) A description and explanation of any erroneous data or unusual circumstance(s) and the cause for such situation.
    - (d) A final conclusion section describing the outcome of the testing.

**III.(A) Specific Conditions for Natural Gas-Fired Boilers**

- (1) Permitted Emission Points: The source is permitted to construct up to four (4) natural gas-fired boilers with a total combined heat input rate of no more than 200 million Btu per hour (MMBtu/hr).
- (2) Emission Limitations and Testing Requirements: Pollutant emission rates from each emission point identified in the table below shall not exceed the permitted limits. Initial performance testing, if required, shall be conducted in accordance with Specific Condition II.(D).

Emission Point ID#	Pollutant	Permitted Limit	Averaging Period	Basis for Permit Limit	Initial Performance Testing Required (Yes/No)
20Temp	NO <sub>x</sub>	0.04 lb/MMBtu	3-hr or test method average	Chapter 19	Yes <sup>[1]</sup>
20Temp	CO	0.072 lb/MMBtu	3-hr or test method average	Chapter 19	Yes

<sup>[1]</sup> Relative Accuracy Test Audit (RATA) for CEMS monitoring devices required for boilers in NSPS subpart Db is considered to satisfy initial performance testing requirements.

- (3) Operational and Monitoring Requirements and Limitations: Any boiler installed under the authority of this permit shall permanently cease operations within two and one half (2 ½) years after startup or until the startup of the coal-fired CFB boiler (EP 5B) approved by permit CP06-0008, whichever occurs first. {Chapter 19}
- (4) Applicable NSPS, NESHAP, and MACT Requirements: The following standards apply to each boiler based on their maximum heat input rates.

Applicable Standard	Title	Rule Citation	Boiler Size (MMBtu/hr)
NSPS, Subpart A	General Provisions	Chapter 18, Sec. <u>001.01</u> 40 CFR 60.1	--
NSPS, Subpart Db	Industrial, Commercial, and Institutional Steam Generating Units	Chapter 18, Sec. <u>001.22</u> 40 CFR 60.40b	>100
NSPS, Subpart Dc	Small Industrial, Commercial, Institutional Steam Generation Units	Chapter 18, Sec. <u>001.52</u> 40 CFR 60.40c	10-100

- (5) Reporting and Recordkeeping Requirements:
  - (a) Records documenting the date and size of each boiler installed.
  - (b) Notifications and record keeping as required by 40 CFR 60.7.
  - (c) Depending on the heat input rate for each boiler: Reporting and recordkeeping as required by 40 CFR 60.49b **or** Reporting and recordkeeping as required by 40 CFR 60.49c.

# **D R A F T**

## **FACT SHEET**

Cargill, Inc.  
650 Industrial Road  
Blair, Washington County, Nebraska 68008

June 10, 2008

### **DESCRIPTION OF THE FACILITY OR ACTIVITY:**

Cargill, Inc. (Cargill) operates a corn wet milling facility in Washington County near Blair, Nebraska. The facility produces fructose, ethanol, and corn oil as primary products; corn germ gluten meal, and fiber feed materials as secondary products. In addition to the corn wet milling facility, the Cargill Blair Complex also includes the following facilities:

- PGLA-1 Company, which is a Cargill joint venture
- NatureWorks, LLC, which was originally a Cargill joint venture (Cargill Dow, LLC) but is now a joint venture between Cargill and Teijin Holdings USA Inc.
- Cargill Polyols, which was originally a Cargill joint venture (M & C Sweeteners) but is now wholly owned by Cargill
- Evonik, which was originally a Cargill joint venture (Midwest Lysine) but is now wholly owned by Degussa
- Cargill Lactic Acid, which was originally part of the Natureworks facility as a joint venture but is now wholly owned by Cargill
- Purac, which is a separate company

The wet mill at the Cargill facility operates under SIC code 2046, Wet Corn Milling (NAICS# 311221). The joint ventures listed above are considered a separate PSD source from the wet mill and are not part of this permitting action. The natural gas fired boilers installed as part of this permitting action will be part of the wet mill facility.

On September 8, 2006, Cargill received a permit (CP06-0008) that authorized the construction of a coal-fired circulating fluidized bed (CFB) boiler with a heat input of 1,500 Million Btu per hour (MMBtu/hr). In this permitting action Cargill proposes the construction of up to four natural gas fired boilers with a combined maximum heat input rate of 200 million btu per hour that will operate for no more than two and one half years or until startup of the CFB boiler. The CFB boiler and the natural gas boiler(s) will never be operated at the same time.

Cargill originally proposed the installation of a single 200 MMBtu/hr boiler, however Cargill plans on renting the equipment from another company and have found that renting multiple boilers with smaller capacities will be easier to find, accomplish their goals and be more cost effective. Cargill has requested that NDEQ take this into account and allow for up to four (4) boilers to be selected for installation.

### **TYPE AND QUANTITY OF AIR CONTAMINANT EMISSIONS ANTICIPATED:**

The primary pollutants emitted from the temporary boilers are particulate matter (PM), particulate matter with an aerodynamic diameter of less than or equal to ten (10) micrometers (PM<sub>10</sub>), sulfur oxides (SO<sub>x</sub>), oxides of nitrogen (NO<sub>x</sub>), carbon monoxide (CO), volatile organic compounds (VOCs), and hazardous air pollutants (HAP).

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Emission Factors for PM, PM<sub>10</sub>, SO<sub>x</sub>, VOC's and HAP have been estimated using the USEPA AP-42 Chapter 1 tables 1.4-2, 1.4-3, and 1.4-4. NO<sub>x</sub> and CO emissions have been estimated using the proposed Best Available Control Technology (BACT) limitations.

Regulated Pollutant	Emissions (tons/year)
Particulate Matter (PM)	6.57
PM smaller than or equal to 10 microns (PM <sub>10</sub> )	6.57
Sulfur Dioxide (SO <sub>2</sub> )	0.53
Oxides of Nitrogen (NO <sub>x</sub> )	35.04
Carbon Monoxide (CO)	63.07
Volatile Organic Compounds (VOC)	4.73
Hazardous Air Pollutants (HAPs):	
Hexane	1.55
Total HAPs	1.62

## **APPLICABLE REQUIREMENTS AND VARIANCES OR ALTERNATIVES TO REQUIRED STANDARDS:**

**Chapter 4 – Ambient Air Quality Standards:** In 2006 Cargill was permitted to construct a 1,500 MMBtu/hr CFB boiler. The emissions from the CFB are not expected to exceed any National Ambient Air Quality Standards (NAAQS). Since the temporary boilers will have a combined maximum heat input of 200 MMBtu/hr, only combust natural gas (lower emissions are expected from the use of natural gas), and will only operate while the CFB boiler is not operational, it is reasonable to conclude that this project will not exceed any NAAQS. Modeling conducted for the CFB boiler project is considered a “worst-case” scenario.

Air dispersion modeling that is normally required for a Prevention of Significant Deterioration (PSD) project is not applicable to projects whose emissions can be considered temporary (Title 129 Chapter 19 section 016.05). For the purposes of air dispersion modeling it can be reasonably concluded that the natural gas fired boilers are temporary emission units for the following reasons:

- Emissions from the CFB boiler will be significantly greater than the emissions from this project and the emissions from these boilers are considered temporary for PSD purposes.
- Natural gas fired boilers will only operate for a period of 2½ years or until the CFB boiler is operational.
- Emissions from the CFB were modeled as part of the PSD analysis of the 2006 permit and it was determined that the CFB will not exceed any NAAQS.

Therefore no air dispersion modeling was required as part of the permit application.

**Chapter 17 – Construction Permit Requirements:** A construction permit is required for this source because this construction project has a net increase in potential emissions at the site greater than one or more of the threshold levels identified in Title 129, Chapter 17, Section 001.01 for PM<sub>10</sub>, SO<sub>x</sub> (SO<sub>2</sub> and/or SO<sub>3</sub>), NO<sub>x</sub>, CO, VOC and HAPs. The thresholds are as follows:

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Pollutant	Threshold
PM <sub>10</sub>	15 tons/yr
SO <sub>x</sub> (SO <sub>2</sub> and/or SO <sub>3</sub> )	40 tons/yr
NO <sub>x</sub>	40 tons/yr
CO	50 tons/yr
VOC	40 tons/yr
Individual HAP	2.5 tons/yr
Total combined HAPs	10 tons/yr

The source-wide potential emissions from the source after the issuance of this permit falls into the following category:

- 100 tons or more per year of any air pollutant; or
- 10 tons or more per year of any single HAP; or
- 25 tons or more per year of any combination of HAPs

Therefore, the facility submitted a \$3,000.00 fee when submitting their Air Quality Construction Permit Application, in accordance with Title 129, Chapter 17, Section 003.01.

## **Chapter 18 – New Source Performance Standards (NSPS), and 40 CFR Part 60:**

Subpart A – General Provisions: NSPS Subpart A, adopted by reference in Title 129, Chapter 18, Section 001.01, applies to those units covered by the specific NSPS as discussed below. The permittee is required to submit notification of the date construction commenced postmarked no later than 30 days after such date (40 CFR 60.7(a)(1)), notification of the anticipated date of initial startup of the equipment postmarked not more than 60 days nor less than 30 days prior to such date (40 CFR 60.7(a)(2)), and notification of the actual date of initial start up of the equipment postmarked within 15 days after such date (40 CFR 60.7(a)(3)).

Subpart Db – Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units: This subpart, adopted by reference in Title 129, Chapter 18, Section 001.22, applies to steam generating units with a design rate greater than 100 MMBtu/hr, installed after June 19, 1984. The temporary boilers located at this facility may be subject to Subpart Db if the temporary boiler(s) has/have a heat input rating greater than 100 MMBtu/hr.

The NSPS, Subpart Db requirements include, but are not limited to, the following:

- (A) NO<sub>x</sub> emissions shall not exceed 0.1 lbs/MMBtu (30-day rolling average) for each stack. This emission limit applies at all times including periods of startup, shutdown or malfunction.
- (B) The permittee shall install, calibrate, maintain, and operate a CEMS in accordance with Subpart Db for measuring the NO<sub>x</sub> emissions.
- (C) Performance and compliance testing shall be conducted in accordance with Title 129, Chapter 18, NSPS, Section 001.01 General Provisions, and as required by 40 CFR 60.46b(e).
- (D) The Requirements for Performance Specifications 2 found in 40 CFR 60 Appendix B shall be followed for the CEMS required.
- (E) Quality assurance for the CEMS required shall be conducted according to the requirements of 40 CFR 60 Appendix F. The report of the Relative Accuracy Test Audit required by the 40 CFR 60 Appendix F or a similar procedure shall be submitted to the Department within 45 days of completion of the test.

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- (F) The source shall record and maintain records of the amount of natural gas combusted during each day unless EPA Region VII approves an alternative record-keeping frequency. {40 CFR 60.48b(d)}

The source shall submit notification of the date of construction, anticipated startup, and actual startup, as provided by Title 40 CFR 60.7. {40 CFR 60.49b(a)}

Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units: This subpart, adopted by reference in Title 129, Chapter 18, Section 001.52, is for steam generating units with a design rate between 10 MMBtu/hr and 100 MMBtu/hr, installed after June 9, 1989. Any temporary boiler installed as part of this project and has a design rate of 100 MMBtu/hr or less will be subject to this subpart.

**Chapter 19 – Prevention of Significant Deterioration (PSD):** The existing facility operates under the primary SIC code 2046, Wet Corn Milling. At this time Cargill has a potential to emit individual pollutants at a rate greater than 250 tons per year and is considered a major stationary source. This facility also operates fossil fuel fired boilers with a heat input greater than 250 million Btu per hour which is also listed as a 100 ton per year PSD major source category und 52.21 (b)(i)(a).

The net emissions increase proposed in this application are considered minor to the PSD program however, Cargill has indicated that one or more of the temporary boilers could supply steam to the equipment permitted in the September 8, 2006 construction permit which could link this project to the 2006 project which is major for PSD. Cargill has provided a PSD BACT analysis for the boilers for all pollutants expected to be emitted by the boilers that underwent PSD review during the 2006 project. This includes PM/PM<sub>10</sub>, NO<sub>x</sub>, SO<sub>x</sub>, VOC, and CO. Air dispersion modeling was not required for this project since all emission units permitted in this action are considered temporary and exempt from PSD modeling requirements under Section 16.05.

## PSD Best Available Control Technology (BACT)

Pursuant to Chapter 19, section 017.03, [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. 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.

*The first step in a BACT analysis is to determine, for the pollutant in question, the most stringent control technology and emission limit available for a similar source or source category. These technologies represent the top control alternative under the BACT analysis. If it can be shown that this level of control is infeasible on the basis of technical, economic, energy, and environmental impacts for the source in question, then the next most stringent level of control is identified and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any technical, economic, energy or environmental consideration.*

*A “Top-Down” BACT analysis basically consists of the following steps:*

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- *Identify All Control Technologies. All control technologies for similar processes, as well as Lowest Achievable Emission Rate (LAER) technologies are included.*
- *Eliminate Technically Infeasible Options. Technologies demonstrated to be infeasible based on physical, chemical, and engineering principles are excluded from further consideration.*
- *Rank Technologies By Control Effectiveness. Technically feasible control technologies are ranked in the order of highest expected emission reduction to lowest expected emission reduction. The ranking also includes expected emission rate, control effectiveness, energy impacts, environmental impacts (including toxic and hazardous air emissions), and economic impacts.*
- *Control Technology Evaluation. The technology ranking is evaluated and case-by-case consideration is given to energy, environmental, and economic impacts. The most effective option not rejected is chosen as BACT and is used to express an enforceable emission limitation for the affected emission unit.*

The BACT analysis process is summarized below for each applicable pollutant emitted from the natural gas-fired temporary boilers. Refer to the permit application and supplemental information, as indicated in the BACT analysis, for the detailed BACT analysis performed for each pollutant emitted from each emission unit. A BACT analysis was provided for all pollutants that were considered major for the CFB boiler project.

## BACT for Temporary Boiler(s) (20Temp)

The temporary boiler(s) BACT analysis addresses pollutant emissions of NO<sub>x</sub>, SO<sub>2</sub>, CO, PM/PM<sub>10</sub>, VOC, H<sub>2</sub>SO<sub>4</sub> mist and fluorides (as HF). Particulate matter limitations for utility boilers are generally expressed as total PM. PM<sub>10</sub> is a subset of PM, and therefore cannot exceed PM. In order to present a conservative analysis, the two components of particulate matter (PM/PM<sub>10</sub>) are treated together and considered equal for the purposes of this analysis. The following table summarizes BACT for the temporary boiler(s).

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<b>Temporary Boiler(s) BACT Emission Limitations</b>		
<b>Pollutant</b>	<b>Emission Limit</b>	<b>Control Type</b>
SO <sub>2</sub>	0.0006 lb/MMBtu <sup>[1]</sup>	Use of Natural Gas (NG)
NO <sub>x</sub>	0.04 lb/MMBtu (test method average, 30-day rolling average)	Low -NO <sub>x</sub> burners and Induced Flue Gas Recirculation
CO	0.072 lb/MMBtu (test method average)	Good Combustion Practices (GCP)
PM/PM <sub>10</sub>	0.0075 lb/MMBtu <sup>[1]</sup>	NG
VOC	0.0054 lb/MMBtu (test method average)	GCP
H <sub>2</sub> SO <sub>4</sub> mist	No H <sub>2</sub> SO <sub>4</sub> mist is expected to be emitted as part of this project	-
HF	No HF is expected to be emitted as part of this project	-

<sup>[1]</sup>The department has determined that these limits are based on work practice standards, not by the addition of supplemental control technologies; therefore restricting the fuel combusted in the boilers to natural gas will fulfill BACT requirements for SO<sub>2</sub> and PM/PM<sub>10</sub>.

The BACT analysis has been divided into sections that address each applicable pollutant individually.

### SO<sub>2</sub> BACT Analysis

The following paragraphs identify and the SO<sub>2</sub> control technologies presented in the permit application as potentially available for use. Further details concerning the operations and theoretical process of the various control technologies is contained in the permit application dated December 2007.

Fuel Desulphurization/Low Sulfur Content Fuel  
Wet Flue Gas Desulphurization (FGD)  
Dry FGD

### Control Technology Evaluation

A detailed control technology evaluation was not provided in the permit application as the combined uncontrolled SO<sub>2</sub> emissions expected from the temporary boilers are less than 1 ton per year. The cost of installing control technology to reduce emissions becomes economically infeasible at such low levels.

### SO<sub>2</sub> BACT Selection

The December 2007 permit application proposed a SO<sub>2</sub> BACT limit of 0.0006 lb/MMBtu. This BACT limit was based on the USEPA AP-42 Chapter 1 Table 1.4-2 emission factor for SO<sub>x</sub>. The proposed BACT limit was supported by information contained in the EPA's RACT/BACT/LAER clearinghouse.

### NO<sub>x</sub> BACT Analysis

The following paragraphs identify the NO<sub>x</sub> control technologies presented in the permit application as potentially available for use. Further details concerning the operations and theoretical process of the various control technologies is contained in the permit application dated December 2007.

Selective Catalytic Reduction (SCR)  
Selective Non-Catalytic Reduction (SNCR)  
Forced Flue gas Recirculation (FFGR)  
Low-NO<sub>x</sub> Multistage Combustion Burners and Induced Flue gas Recirculation (IFGR)

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## Top-Down Ranking

The NO<sub>x</sub> control technologies that are considered technically feasible for implementation on the proposed natural gas fired Boiler(s) have been ranked from most to least effective in terms of emission reduction potential. The following table summarizes the control technology ranking.

<b>Top-Down Ranking of NO<sub>x</sub> Control Technologies</b>	
<b>Control Technology</b>	<b>Percent SO<sub>2</sub> Reduction</b>
SCR	72.5 (0.011 lb/MMBtu)
Low NO <sub>x</sub> burners with IFGR (Baseline)	0 (0.04 lb/MMBtu)

## Control Technology Evaluation

Cargill provided an evaluation of the feasible NO<sub>x</sub> control technologies listed above. The primary obstacle to using SCR as a BACT control technology for the temporary boiler project is the cost per ton to remove the NO<sub>x</sub> versus the total achievable NO<sub>x</sub> reduction. Cargill provided an economic analysis which determined the cost effectiveness of SCR to be approximately \$22,700 per ton of pollutant removed. The overall cost of removing 25.4 tons of NO<sub>x</sub> per year has been determined to be excessive. SCR has been determined to be economically infeasible for this project.

## NO<sub>x</sub> BACT Selection

The December 2007 permit application proposed a NO<sub>x</sub> BACT limit of 0.04 lb/MMBtu. This BACT limit was based on emission factors provided by the boiler manufacturer and was supported by information contained in the EPA's RACT/BACT/LAER clearinghouse.

## CO BACT Analysis

The following paragraphs identify the CO control technologies presented in the permit application as potentially available for use. Further details concerning the operations and theoretical process of the various control technologies is contained in the permit application dated December 2007.

Thermal Oxidation  
Catalytic Oxidation  
Combustion Controls

Both Catalytic and Thermal Oxidation utilize a combustion process to reduce CO and VOC emissions. Since a natural gas boiler is a combustion process itself adding a second combustion source would be redundant and no additional benefit will be received by adding either control. Both Catalytic and thermal oxidation are considered technically infeasible for this reason.

## Control Technology Evaluation

A detailed control technology evaluation was not provided in the permit application as Cargill proposes to use the only feasible method of CO control for the natural gas boilers—Combustion Controls.

## CO BACT Selection

The December 2007 permit application proposed a CO BACT limit of 0.072 lb/MMBtu. The proposed BACT limit was supported by information contained in the EPA's RACT/BACT/LAER clearinghouse.

## PM/PM<sub>10</sub> Filterable and Condensable BACT Analysis

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The following paragraphs identify and summarize the particulate matter control technologies presented in the permit application as potentially available for use. Discussion is included as to the feasibility of the particulate matter control technologies as applied to the operation of the proposed natural gas fired Boiler(s). Further details concerning the operations and theoretical process of the various control technologies is contained in the permit application dated December 2007.

HEPA Filters  
Fabric Filter  
Electrostatic Precipitator  
Wet Scrubber  
Mechanical Collectors

## Control Technology Evaluation

A detailed control technology evaluation was not provided in the permit application as the combined uncontrolled PM/PM<sub>10</sub> emissions expected from the temporary boilers are less than 7 tons per year. The cost of installing control technology to reduce emissions becomes economically infeasible at such low levels.

## Particulate Matter BACT Selection

The December 2007 permit application proposed a particulate matter BACT limit of 0.075 lb/MMBtu. This BACT limit was based on the USEPA AP-42 Chapter 1 Table 1.4-2 emission factor for PM/PM<sub>10</sub>. The proposed limit was supported by information contained in the EPA's RACT/BACT/LAER clearinghouse.

## VOC BACT Analysis

The same control technologies discussed for CO control apply to VOC control. Therefore, the only technically feasible option for control of VOC emissions is combustion controls. Further details concerning the operations and theoretical process of the various control technologies is contained in the permit application dated December 2007.

## VOC BACT Selection

The December 2007 permit application proposed a VOC BACT limit of 0.0054 lb/MMBtu. This BACT limit was based on the USEPA AP-42 Chapter 1 Table 1.4-2 emission factor for VOC. The proposed limit was supported by information contained in the EPA's RACT/BACT/LAER clearinghouse.

## **Chapter 20 – Particulate Matter Emissions:**

*Title 129, Chapter 20, Section 002 - Particulate Emissions from Combustion Sources*

This facility is expected to be in compliance with this regulation because natural gas is the only fuel combusted by the temporary boilers. The allowable emission rates per Title 129, Chapter 20, Section 002 are presented in Attachment A.

*Title 129, Chapter 20, Section 004 - Opacity*

The temporary boilers are subject to the opacity standard (20% opacity limit) specified in Title 129, Chapter 20, Section 004. It is very unlikely the fuel burning equipment would exceed the opacity standard due to the use of natural gas. Natural gas is considered a "clean fuel" with regard to particulate emissions

**Chapter 24 – Sulfur Compound Emissions:** Fossil fuel burning equipment at the facility may not emit sulfur oxides at a rate greater than two and one half (2.5) pounds per million BTU input. This limit is not

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expected to be exceeded since natural gas is the only fossil fuel combusted by the temporary boilers. The exclusive use of natural gas in all combustion units will ensure compliance with Section 001.

**Chapter 27 – Hazardous Air Pollutants:** The source is subject to the requirements of this chapter because the facility-wide PTE of any single HAP and total HAPs is greater than the 2.5/10 tons per year thresholds listed in Section 002. Best Available Control Technology is required for this project. The potential HAP emission increase from the temporary boilers will be primarily organic HAPs and are therefore considered VOC emissions as well. The VOC emissions for the temporary boiler were analyzed under the PSD BACT. The evaluation of this HAP source under PSD BACT for VOCs is considered to satisfy the Chapter 27 Requirements.

**Chapter 28 – Hazardous Air Pollutant Emission Standards (MACT):** The source, for purposes of MACT applicability, is the entire Cargill-Blair complex, which includes the joint ventures, the corn milling plant, and the ethanol plant. As such, the source is a major source of HAPs, and Cargill must comply with any applicable MACT. No additional MACT standards have been identified as applicable to this project.

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

- II.(A) This condition contains general recordkeeping and reporting requirements that apply to all permitted emission units, control equipment, and monitoring devices. These requirements establish several things including, a completion date when records must be completed, how long records need to be maintained, and identifying specific types of records that must be maintained. Records are required to be maintained to ensure compliance with all applicable requirements, specifically those required in this permit. However, additional recordkeeping requirements may be established in the future to better ensure compliance. Documentation detailing operation, inspection, and maintenance can be operational and maintenance manuals provided by the manufacturer. If manufacturer manuals are not available, the owner or operator must develop a document containing operation, inspection, and maintenance requirement for each permitted emission unit and piece of required control equipment.
- II.(B) This condition requires all permitted emission units, required control equipment, and required monitoring equipment to be properly installed, operated, and maintained. It is expected that the installation, operation, and maintenance conducted will be similar to the items contained in the documents detailing proper operation, inspection, and maintenance of the equipment (required in Specific Condition II.(A)(5)). It is very important that permitted and required equipment is operating properly and maintained since un-maintained equipment has the potential to emit greater amounts of pollution into the atmosphere or monitor items incorrectly or inaccurately. Emission estimates for this permitting action assume that all equipment is operating properly and being properly maintained.
- II.(C) This condition requires any emissions resulting from equipment failures, malfunctions, or other variations in control or process equipment performance that are, or may be, in excess of the applicable emission control regulations to be reported to the Department in accordance with Title 129, Chapter 35, Section 005. The Department must be notified when excess emissions have, or may have occurred along with the cause of the emissions in order to determine the appropriate enforcement action. These reports also assist with verifying proper operation and maintenance of process and control equipment.
- II.(D) General initial performance testing requirements. All performance tests required throughout this permit are required to be conducted in accordance with these conditions. The owner or operator

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is required to provide the Department at least thirty (30) days written (i.e. hard copy, not electronic or verbal) notice prior to testing. The notification should include the emissions testing protocol. This is to ensure that the Department has the opportunity to witness the emissions testing and/or agree with the testing plan proposed. The owner or operator must also submit the final test results within forty-five (45) days after the test has occurred. A meeting has been required prior to emissions testing in order for the Department and source to discuss the operating scenario(s) that will be employed during the emissions testing.

There are several reasons why emissions' testing is being required in this construction permit. One reason is to obtain site-specific emission factors for VOC emissions from the raw mill heaters and the kilns while coal is being combusted and when GBB is used as supplemental fuel. These emission factors will verify the emissions calculations performed to justify not requiring a construction permit for VOC emissions associated with the modification. Due to the "SIP Gap" that currently exists, it is important for Ash Grove to verify that a PSD permit is not needed to be obtained under the rules currently in Title 129 and in the approved SIP. The justification is required to be completed and submitted with the final testing report.

### III(A) Natural Gas Fired Temporary Boilers

- (1) The source is permitted to construct and operate the emissions units and associated control devices as presented in this section.
- (2) Emission limitations have been established for this emission point in accordance with Chapter 19. Testing for NO<sub>x</sub> and CO is required to verify these limits.
- (3) Specifies when the temporary boiler(s) must be permanently shutdown.
- (4) NSPS subparts A and Db or Dc apply to these emissions units. Db will apply if the heat input rating for the boiler is between 10 and 100 MMBtu/hr. Dc applies to boilers with a heat input rating greater than 100 MMBtu/hr.
- (5) The source is required to keep records documenting: the size and date of each boiler installed, receipts for fuel combusted in each boiler and records required by NSPS subparts A and Db or Dc (as appropriate).

### **STATUTORY OR REGULATORY PROVISIONS ON WHICH PERMIT REQUIREMENTS ARE BASED:**

Applicable regulations: Title 129 - Nebraska Air Quality Regulations as amended February 16, 2008.

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

The public notice, as required under NAQR Chapter 14, shall be published on June 17, 2008, in the Enterprise Publishing Company newspaper in Blair. Persons or groups shall have 30 days from that issuance of public notice (July 16, 2008) 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

# **D R A F T**

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-Environmental Engineer  
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.**

**Appendix A: Potential to Emit- Temporary Boiler**

**Allowable Particulate Matter Emissions- Chapter 20**

Fuel	Natural Gas
Heat Input	200.00 MMBtu/hr
Heating Value	1,020.00 Btu/scf
Operating Hours	8,760.00 hr/yr

E=1.026/(I^0.233)	
E= Particulate Emissions (lb/hr)	
I= Heat Input rate (lb/MMBtu)	
E=	0.30 lb/MMBtu

Pollutant	Emission Factor <sup>[1]</sup>		Emission Rate	
	lb/MMBtu	lb/MMscf	lb/hr	tpy
PM	0.01	7.60	1.50	6.57
PM <sub>10</sub>	0.01	7.60	1.50	6.57
NO <sub>x</sub> <sup>[2]</sup>	0.04		8.00	35.04
SO <sub>2</sub>	6.00E-04	0.60	0.12	0.53
CO <sup>[2]</sup>	0.07		14.40	63.07
VOC	0.01	5.50	1.08	4.73
Lead	4.90E-07	5.00E-04	9.80E-05	4.29E-04
2-Methylnaphthalene		2.40E-05	4.71E-06	2.06E-05
3-Methylchloranthrene		1.80E-06	3.53E-07	1.55E-06
7,12-Dimethylbenz(a)anthracene		1.60E-05	3.14E-06	1.37E-05
Acenaphthene		1.80E-06	3.53E-07	1.55E-06
Acenaphthylene		1.80E-06	3.53E-07	1.55E-06
Anthracene		2.40E-06	4.71E-07	2.06E-06
Benz(a)anthracene		1.80E-06	3.53E-07	1.55E-06
Benzene		2.10E-03	4.12E-04	1.80E-03
Benzo(a)pyrene		1.20E-06	2.35E-07	1.03E-06
Benzo(b)fluoranthene		1.80E-06	3.53E-07	1.55E-06
Benzo(g,h,i)perylene		1.20E-06	2.35E-07	1.03E-06
Benzo(k)lluoranthene		1.80E-06	3.53E-07	1.55E-06
Chrysene		1.80E-06	3.53E-07	1.55E-06
Dibenzo(a,h)anthracene		1.20E-06	2.35E-07	1.03E-06
Dichlorobenzene		1.20E-03	2.35E-04	1.03E-03
Fluoranthene		3.00E-06	5.88E-07	2.58E-06
Fluorine		2.80E-06	5.49E-07	2.40E-06
Formaldehyde		7.50E-02	1.47E-02	6.44E-02
Hexane		1.80E+00	3.53E-01	1.55E+00
Indeno(1,2,3-cd)pyrene		1.80E-06	3.53E-07	1.55E-06
Naphthalene		6.10E-04	1.20E-04	5.24E-04
Phenanthrene		1.70E-05	3.33E-06	1.46E-05
Pyrene		5.00E-06	9.80E-07	4.29E-06
Toluene		3.40E-03	6.67E-04	2.92E-03
Arsenic		2.00E-04	3.92E-05	1.72E-04
Beryllium		1.20E-05	2.35E-06	1.03E-05
Cadmium		1.10E-03	2.16E-04	9.45E-04
Chromium		1.40E-03	2.75E-04	1.20E-03
Cobalt		8.40E-05	1.65E-05	7.21E-05
Manganese		3.80E-04	7.45E-05	3.26E-04
Mercury		2.60E-04	5.10E-05	2.23E-04
Nickel		2.10E-03	4.12E-04	1.80E-03
Selenium		2.40E-05	4.71E-06	2.06E-05
Total HAP			0.37	1.62
Single Greatest HAP- Hexane			0.35	1.55

[1]-Emission Factors are from AP-42, Chapter 1 (07/98) Tables 1.4-2,1.4-3, and 1.4-4

[2]-NO<sub>x</sub> and CO emission factors are the proposed emission limitations and not from AP-42

**PUBLIC NOTICE**

**Nebraska Department of Environmental Quality**

**Air Quality Division**

Notice is given to the public, according to Chapter 14 of Title 129 - Nebraska Air Quality Regulations, of the application of Cargill, Inc. for a Prevention of Significant Deterioration (PSD) permit to construct up to four temporary natural gas-fired boilers with a maximum combined heat input of 200 MMBtu/hr located at 650 Industrial Road in Blair, Nebraska.

The increase in emissions of air contaminants anticipated due to the proposed construction is estimated in the following table:

Regulated Pollutant	Emissions (tons/year)
Particulate Matter (PM)	6.57
PM smaller than or equal to 10 microns (PM10)	6.57
Sulfur Dioxide (SO2)	0.53
Oxides of Nitrogen (NOx)	35.04
Carbon Monoxide (CO)	63.07
Volatile Organic Compounds (VOC)	4.73
Hazardous Air Pollutants (HAPs):	
Hexane	1.55
Total HAPs	1.62

Washington County is in attainment with the National Ambient Air Quality Standards (NAAQS) for all regulated pollutants and is expected to continue to be in attainment. Washington County is in compliance with the state Total Reduced Sulfur (TRS) standards and no increase in TRS emissions is expected from this project. No impact is anticipated on habitat for any rare or threatened species.

The Department proposes to issue a PSD construction permit with specific conditions, based on Title 129 - Nebraska Air Quality Regulations, which:

- Limit the operation of the boilers to a period of no more than 2.5 years
- Identify emission limitations and testing requirements; and
- Specify recordkeeping and reporting requirements.

The proposed permit and supporting materials are available for inspection at the office of the Nebraska Department of Environmental Quality, Suite 400, 1200 "N" Street, Lincoln, Nebraska 68508. These materials were also forwarded to the Blair Public Library. Telephone inquiries may be made at (402) 471-2189. Please notify the Department of Environmental Quality if alternate formats of materials are needed. Contact phone number is (402) 471-2186. TDD users please call 711 and ask the relay operator to call us at (402) 471-2186. Persons requiring further information should contact:

Dan LeMaistre-Environmental Engineer

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

Within 30 days after the initial publication of this notice, persons may request or petition the Director for public hearing, or submit comments relative to the issuance of the proposed permit. Comments received during the 30 day public notice period, ending July 16, 2008, will be considered prior to the final decision to issue or to deny the proposed permit. A request or petition for hearing must state the nature of the issues to be raised and all arguments and factual grounds supporting such position. If a public hearing is granted by the Director, the hearing will be advertised by public notice at least 30 days prior to its occurrence. Comments and requests should be mailed to:

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