



Pete Ricketts
Governor

STATE OF NEBRASKA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Jim Macy
Director

Suite 400, The Atrium
1200 'N' Street
P.O. Box 98922
Lincoln, Nebraska 68509-8922
Phone (402) 471-2186
FAX (402) 471-2909
website: <http://deq.ne.gov>

AIR QUALITY CONSTRUCTION PERMIT

PERMIT NUMBER: CP14-066

Facility Name: AltEn, LLC

NDEQ Facility ID#: 84069

Mailing Address:
1344 County Road 10
Mead, Nebraska 68041

Facility Location:
1344 County Road 10
Mead, Saunders County, Nebraska

Permit Description: SIGNIFICANT PERMIT REVISION to install a biogas turbine and make an as-built change at a 24.1 million gallon per year ethanol facility.

Standard Industrial Classification (SIC) Code: 2869, Industrial Organic Chemicals

Revised or Superseded Construction Permits: This construction permit supersedes Conditions III.(B) and III.(E), of construction permit CP13-010 (issued February 20, 2014). No other terms or conditions of the original construction permit are being revised or otherwise modified by this document. All other provisions of the original permit are still in effect, and in concert with this permit, constitute the effective construction permit.

Pursuant to Title 129 – Nebraska Air Quality Regulations, Chapter 14, the public has been notified by prominent advertisement of this proposed permit revision and the thirty (30) day period allowed for comments has elapsed. This construction permit approves the proposed revisions as identified in the air quality construction permit applications #14-066 received March 3, 2015, and #15-030 received July 29, 2015, including any supporting information received prior to issuance of this permit. Additional details of the proposed revisions, including estimated pollutant emission changes, 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 July 6, 2015.

Date

10/9/15

Shelley Schneider, Air Administrator
Air Quality Division

Shelley Schneider on behalf of
Shelley Schneider, Air Administrator
Air Quality Division



TABLE OF CONTENTS

Permit Signature Page i

Table of Contents ii

Permit Condition / Summary of Revision	Page
III.(B): Removes mash tank from emission units controlled by fermentation scrubber.	B-1
III.(E): Adds biogas turbine to existing emission units.	E-1

III.(B) Specific Conditions for Fermentation and Distillation Operations

- (1) Permitted Emission Points: The source is permitted to construct the emission points and associated emission units identified in the following table:

Emission Point ID#	Required Control Equipment ID# and Description	Emission Unit Description
EP-6	CE-06: Fermentation & Distillation Scrubber	EU-29a: Fermenter #1
		EU-29b: Fermenter #2
		EU-29c: Fermenter #3
		EU-29d: Fermenter #4
		EU-44: Beer Well
		EU-23: Liquefaction Tank
		EU-37: Yeast Slurry Tank
		EU-73: Stillage Tank #1
		EU-77: Stillage Tank #2
		EU-48: Beer Stripper
		EU-58: Rectifier
		EU-65a: Molecular Sieves #1
		EU-65b: Molecular Sieves #2

- (2) Emission Limitations and Testing Requirements:

- (a) Pollutant emission rates from each emission point identified in the table below shall not exceed the permitted limits.

Emission Point ID#	Pollutant	Permitted Limit	Averaging Period	Basis for Permit Limit	Performance Testing Required (Yes/No)
EP-6	VOC	12.0 lbs/hr	1-hour or test method average	Chapter 17	Yes
	Acetaldehyde	2.17 lbs/hr	1-hour or test method average	Chapter 17	Yes
	HAP	-	Speciation and Quantification of HAP composition at outlet	Chapters 27 and 28	Yes

- (b) The performance test shall be conducted while operating at maximum capacity during the first third quarter (July 1 - September 30) following the facility achieving startup of operations.
- (3) Operational and Monitoring Requirements and Limitations
- (a) Emissions from the emission units identified in Condition III.(B)(1) shall be controlled by pollution control equipment as specified in Condition III.(B)(1). {Chapters 19 and 27}

- (b) Operation and maintenance of the fermentation and distillation scrubber (CE-06) shall be in accordance with the following requirements until the issuance of an operating permit to the source (Chapters 17 and 27):
 - (i) The scrubber shall be operated and be controlling emissions at all times when the associated emission units are in operation.
 - (ii) The scrubber shall be properly designed, installed, operated and maintained. The manufacturer's operation and maintenance manual, or its equivalent, detailing proper operation, inspection and maintenance of the scrubber shall be kept on site and readily available to NDEQ representatives.
 - (iii) The scrubber shall be equipped with devices capable of monitoring the following operating parameters in the manner described below.
 - 1. Scrubbing liquid flow rate shall be monitored and recorded continuously;
 - 2. Chemical addition flow rate shall be monitored and recorded continuously if chemical addition is utilized;
 - 3. Scrubber pressure differential shall be monitored and recorded continuously; and,
 - 4. Scrubber liquid temperature shall be monitored by direct measurement and recorded at least once each day.
 - (iv) If chemical addition is utilized the total monthly amount of chemical, in gallons, added to the scrubber shall be monitored and recorded by the permittee.
 - (v) Chemical draw down checks shall be performed upon request by NDEQ personnel to verify that the flow meter is working correctly.
 - (vi) The scrubber operating parameters shall be maintained at the levels recorded during the most recent valid performance test conducted at the facility.
 - (vii) Observations at least once each day during daylight hours of scrubber operation shall be conducted to determine whether there are leaks, noise, or other indications that corrective action is necessary. If corrective action is necessary, it shall occur immediately.
 - (viii) Flow meters for recording scrubbing liquid and chemical addition flow rates shall be maintained and calibrated according to manufacturer's instructions.

(4) Applicable NSPS, NESHAP, and MACT Requirements:

The NDEQ has not identified any NSPS, NESHAP, or MACT requirements that apply to the emission points or emission units listed in Condition III.(B)(1).

(5) Reporting and Recordkeeping Requirements:

- (a) Records that document the operating parameter data for the scrubber, including the date and time of the readings. The records shall include:
 - (i) Scrubbing liquid flow rate;

-
- (ii) Chemical addition flow rate;
 - (iii) Scrubber pressure differential readings; and
 - (iv) Scrubbing liquid temperature readings.
- (b) Monthly records that document the amount, concentration, and type of chemical injected into the water supplied to the scrubber.
 - (c) Monthly records that document the purchase date, concentration, amount, and type of chemical purchased for chemical injection associated with the scrubber.
 - (d) Records that document the operating parameters developed during the most recent valid performance test conducted at the facility.
 - (e) Records documenting date and time of routine observations with a description, including operating parameters, atypical parameters observed, and any corrective actions taken, for each day the scrubber is in operation
 - (f) Each corrective action taken shall be documented upon occurrence, including the date, time, observations, and a description of the corrective action.
 - (g) Records documenting when routine maintenance and preventive actions were performed with a description of the maintenance and/or preventive action performed.
-

III.(E) Specific Conditions for Anaerobic Digestion and Steam Generation

- (1) Permitted Emission Points: The source is permitted to construct the emission points and associated emission units identified in the following table at the capacity and using the fuel types listed:

Emission Point ID#	Control Equipment ID# and Description	Emission Unit ID# and Description	Capacity (MMBtu/hr)	Permitted Fuel Type
EP-4	-	EU-89a: Boiler #1	54.0	Natural Gas and Biogas
	-	EU-89b: Boiler #2	49.59	Natural Gas and Biogas
EP-15	-	EU-94: Auxiliary Boiler	20	Natural Gas
EP-9	-	EU-95: Digester Flare	54.0	Natural Gas and Biogas
EP-17	-	EU-100: Turbine and Heat Recovery Steam Generator	58.57	Natural Gas and Biogas
EP-4, EP-9, and/or EP-17	EU-95: Digester Flare, EU-89a: Boiler #1, EU-89b: Boiler #2, and/or EU-100: Turbine	EU-90a: Anaerobic Digester #1	N/A	N/A
		EU-90b: Anaerobic Digester #2	N/A	N/A

- (2) Emission Limitations and Testing Requirements:

- (a) Pollutant emission rates from the emission points identified in the table below shall not exceed the permitted limits. 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	Performance Testing Required (Yes/No)
EP-4 and EP-9	SO ₂	22.10 lbs/hr (combined)	24-hour Block Average	Chapter 17	Yes

- (b) Emissions of TRS from digesters to EU-89a, EU-89b, EU-95, and EU-100 combined shall not exceed 11.6 lbs/hr (24-hour block average). {Chapters 4 and 17}
- (c) AltEn, LLC shall have a stack test performed on EP-4 while operating at maximum capacity during the first third quarter (July 1 - September 30) following the facility achieving startup of operations. Both EU-89a and EU-89b shall be operating at full capacity and shall be combusting biogas. Emission rates for NO_x and SO₂ shall be tested. {Chapter 34}
- (3) Operational and Monitoring Requirements and Limitations:
- (a) Emission units listed in Condition III.(E)(1) shall combust only the fuels specified in Condition III.(E)(1). {Chapters 17 and 20}

- (b) Biogas emissions from the anaerobic digesters shall be combusted by pollution control equipment as specified in Condition III.(E)(1). {Chapter 4}
- (c) EU-95 shall be operated with a flame present whenever biogas is flowing to the unit. A monitoring system, including a data recorder capable of continuously monitoring and recording the presence of a flame and biogas flow to EU-95, shall be installed to ensure that biogas flow to the flare cannot occur without the presence of a flame. The monitoring system shall be equipped with an alarm to notify plant personnel of biogas flow to the flare when no combustion is taking place. The monitoring device shall be properly installed, operated, calibrated and maintained. Manufacturer's instructions, or the equivalent, shall be kept on site and readily available to Department representatives. {Chapter 4}
- (d) SO₂ emissions from the boilers and enclosed flare shall be calculated for each 24-hour block period by using the following equation. The biogas emission factor of 173.3 lb/MMscf shall be revised based on the results of the most recent valid performance test: {Chapters 4 and 17}

$$E_{SO_2} = (F_{NG} * 0.6 \text{ lb/MMscf} + F_{BG} * 173.3 \text{ lbs/MMscf}) / 24 \text{ hours}$$

where,

E_{SO_2} = SO₂ Emission Rate (lb/hr)

F_{NG} = Natural Gas combusted in the boilers and enclosed flare (MMscf/24 hours)

F_{BG} = Biogas combusted in the boilers and enclosed flare (MMscf/24 hours)

- (e) The natural gas and biogas piping that supplies the turbine, boilers, and enclosed flare with fuel shall each be equipped with an operational flow meter to record the fuel flow rates to the turbine, boilers, and enclosed flare. The flow meters shall be installed, operated, and maintained in accordance with manufacturer's documentation, or the equivalent. The flow meters shall be calibrated at least once per year or more frequently per manufacturer's instructions. {Chapters 4 and 17}
- (f) The biogas piping from EU-90a and EU-90b outlets to the turbine, boilers, and enclosed flare shall be equipped with a continuous TRS and methane monitor which complies with the following requirements unless written approval is obtained from the Department. {Chapters 4, 17, and 34}
 - (i) 40 CFR 60.13.
 - (ii) 40 CFR 60 Appendix B Performance Specification 5.
 - 1. The span value of the continuous emissions monitoring system is two times the applicable emission limit, expressed as a concentration.
 - (iii) 40 CFR 60 Appendix F Procedure 1.
 - 1. All valid data shall be used in calculating emissions concentrations.
- (g) EU-89a, EU-89b, and EU-94 shall comply with all applicable operational and monitoring requirements and limitations of 40 CFR 60, Subparts A and Dc. {Chapter 18}

- (h) EU-100 shall comply with all applicable operational and monitoring requirements and limitations of 40 CFR 60, Subparts A and KKKK. {Chapter 18}
- (i) Biogas combusted in EU-100 shall not contain more than 459.65 MMscf of methane per any period of twelve (12) consecutive calendar months. At no time during the first eleven (11) calendar months after startup shall the total methane contained within biogas combusted in EU-100 exceed 459.65 MMscf. {Chapter 17}
- (j) The methane content within biogas directed to the EU-100 shall be measured by a continuous methane monitor. {Chapter 17}
 - (i) The continuous methane monitor shall comply with the requirements of 40 CFR 60 Appendix F Procedure 1.
 - 1. All valid data shall be used in calculating methane concentration.
 - (ii) The continuous methane monitor shall be installed, operated, and maintained in accordance with manufacturer's documentation, or the equivalent.
- (k) Volumetric flow rate of methane within biogas combusted in EU-100 shall be calculated for each hour by using the following equation: {Chapter 17}

$$V_{bg} = (C_{mol} * F_{tbg})$$

where,

V_{bg} = Volumetric flow rate of methane within biogas (scf/hour)

C_{mol} = Average concentration of methane for biogas in the period as measured by CEMS (molar %)

F_{tbg} = Biogas combusted in the turbine for the period as measured by flow meter (scf/hour)
- (l) EU-100 shall not combust more than 14.35 MMscf of natural gas per any period of twelve (12) consecutive calendar months. At no time during the first eleven (11) calendar months after startup shall the total hours of natural gas consumption in EU-100 exceed 14.35 MMscf. {Chapter 17}

(4) Applicable NSPS, NESHAP, and MACT Requirements:

The following standards apply to the EUs in the table below:

Applicable Standard	Emission Units	Title	Rule Citation
NSPS, Subpart A	EU-89a, EU-89b, EU-94, and EU-100	General Provisions	Chapter 18, Sec. 001.01 40 CFR 60.1
NSPS, Subpart Dc	EU-89a, EU-89b, and EU-94	Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units	Chapter 18, Sec. 001.52 40 CFR 60.40c
NSPS, Subpart KKKK	EU-100	Standards of Performance for Stationary Gas Turbines	Chapter 18, Sec. 001.77 40 CFR 60.4300

(5) Reporting and Recordkeeping Requirements:

- (a) Records of flame presence and biogas flow to demonstrate compliance with Condition III.(E)(3)(c).
- (b) Records documenting the pound per hour (lb/hr) sulfur dioxide emissions (24-hour block average) to demonstrate compliance with Condition III.(E)(2)(a).
- (c) Records of the amount of natural gas and biogas combusted in the boilers, and enclosed flare each day to demonstrate compliance with Condition III.(E)(3)(d).
- (d) Records of hourly averaged TRS concentration of the Anaerobic Digester unit outlets to the turbine, flare, and boilers. TRS quantities in the Anaerobic Digester unit outlets to the turbine, flare, and boilers shall be compiled within 15 days after the end of each calendar month and the calculations shall be kept on file to document compliance with Condition III.(E)(2)(b).
- (e) EU-89a, EU-89b, and EU-94 shall comply with applicable reporting and recordkeeping requirements of 40 CFR 60, Subparts A and Dc.
- (f) EU-100 shall comply with applicable reporting and recordkeeping requirements of 40 CFR 60, Subparts A and KKKK.
- (g) To demonstrate compliance with Condition III.(E)(3)(k) the facility must keep hourly records of:
 - (i) Molar percentage of methane within biogas combusted in the turbine,
 - (ii) Volumetric flow rate of biogas combusted in the turbine, and
 - (iii) Volumetric flow rate of methane within biogas combusted in the turbine.
- (h) Records of the total methane content of biogas, in MMscf, combusted in EU-100 each month and each consecutive 12-month period to demonstrate compliance with Condition III.(E)(3)(i).
- (i) Records of the total natural gas, in MMscf, combusted in EU-100 each month and each consecutive 12-month period to demonstrate compliance with Condition III.(E)(3)(l).