Note: Flint Hills Resources acquired Fairmont Plant on December 7, 2012 from Advanced BioEnergy

FACT SHEET

Date: **June 17, 2011**

Source Name: ABE Fairmont, LLC

NDEQ Facility ID#: 86026

Mailing Address:

10201 Wayzata, Suite 250
Minneapolis, MN 55305

Source Location:

1214 Road G
Fairmont, NE 68354

DESCRIPTION OF THE SOURCE OR ACTIVITY:

This Operating Permit Number OP08S2-021 approves the operation of an existing anhydrous ethanol production facility (SIC Code 2869). The source uses a dry-mill process with grain as the feedstock. The source produces approximately 119.7 MMgal of anhydrous ethanol per year. The source is permitted to produce approximately 126 MMgal per year of denatured ethanol (approximately 97.5 to 98 percent anhydrous ethanol and 2 to 2.5 percent gasoline).

The solids from the process are converted to animal feed in the form of wet distillers grains with solubles (WDGS), modified wet distillers grains with solubles (MWDGS), and dried distillers grain with solubles (DDGS). The difference between these types of animal feed is moisture content. WDGS contains approximately 65 percent moisture, MWDGS contains approximately 50 percent moisture, and DDGS contains approximately 10 percent moisture. This source has the capacity to produce 410,412 tons per year of DDGS and 950,751 tons per year of WDGS.

The following table details specific equipment/processes and associated emission points that are located at the source, as well as the specific permit conditions that apply to each piece of equipment, process, and/or emission point.

Equipment/Process	Emission Point ID#	Permit Conditions
Grain Receiving, Handling, Storage, and Hammermilling	S18, S20, and S30	Condition III.(A)
Fermentation	S40	Condition III.(B)
Prefermentation, Distillation, and DDGS Production (TO/HRSG)	S10	Condition III.(C)
DDGS Cooler	S70	Condition III.(D)
Solid Product Storage and Loadout	S90	Condition III.(E)
Storage Tanks	TK61, TK62, TK63, TK64, and TK65	Condition III.(F)
Ethanol Liquid Loading	S50 and FS130	Condition III.(G)
Equipment Leaks	FS140	Condition III.(H)
Haul Roads	FS100	Condition III.(I)
Cooling Tower	FS80	Condition III.(J)
Biomethanators (Flare)	S60	Condition III.(K)
Emergency Equipment	S100	Condition III.(L)
Insignificant Activities	N/A	Condition III.(M)

PERMIT HISTORY

ABE was originally issued a Construction Permit (CP05-0032) on February 24, 2006, to construct an ethanol production facility capable of producing 100 million gallons per year of denatured ethanol. This permit was superseded in its entirety on October 4, 2007, by permit CP07-0032. CP07-0032 incorporated numerous "as built" changes to the source, including increasing the maximum production of ethanol to 110 million gallons per year. On May 8, 2008, CP07-0032 was revised by permit CP08-018q in order to include requirements that the fermentation scrubber utilize chemical addition (if used during testing) in order to ensure compliance with the hazardous air pollutant (HAP) emissions limitation which keeps the source minor for HAPs.

Construction permit CP08-029, issued July 28, 2008, amended permit CP07-0032 and completely superseded permit CP08-018q. Specifically, this permit revised Conditions II.(D), III.(B), and III.(D) to allow for an increase in allowable particulate matter (PM) and particulate matter with an aerodynamic diameter equal to or less than ten microns (PM_{10}) from the fermentation scrubber (S40). Construction Permit CP08-029 also incorporated the July 8, 2008, minor permit revision (MPR) request (tracking #08-039) received from ABE. The MPR was requested to more accurately reflect the emission control configuration located at the DDGS coolers.

On April 6, 2009, NDEQ issued Construction Permit CP08-044 to amend CP07-0032. Specifically, CP08-044 superseded Conditions II.(E), III.(C), III.(I), and III.(L) of CP07-0032 and included potential to emit (PTE) calculations from the operation of a temporary open grain storage pile capable of storing 2.8 million bushels of corn. This permitting action updated several requirements for the source, including:

- Increase the haul road silt loading rate from 0.4 grams per meter squared (g/m^2) to 1.0 g/m^2.
- Increase NO_x emissions coming out of the recuperative thermal oxidizer/heat recovery steam generating units (TO/HRSGs, Emission Point S10) from 0.05 lb/MMBtu to 0.1 lb/MMBtu.
- Decrease the height of loadout flare to 26 feet
- Decrease height of biomethanator flare to 22.5 feet
- Increase the firewater engine pump horsepower rating from 300 to 460.
- Increase the maximum denatured ethanol production capability from 110 million gallons per year to 126 million gallons per year. While this permit did not include a specific limit on ethanol production, maximum anticipated emissions were based on the maximum production capacity of the plant.
- Revise the permit so the liquefaction tanks and cook water tank are no longer required to be controlled by the thermal oxidizers (C10A and C10B). The source only has two liquefaction tanks instead of the four tanks as originally permitted, so CP008-044 has removed EU17 and EU18. This permitting action brought the source into compliance for the December 17, 2008 Notice of Violation (NOV) issued to the source.

On October 27, 2008, NDEQ received the initial operating permit application (tracking #08S2-021) for ABE. In this application, the source requested to be classified as a Class II-Synthetic Minor source. While ABE was eligible to receive a Class II Synthetic Minor permit, it was ultimately determined that ABE wanted to be classified as a major (Class I) source in order to provide operational flexibility to the plant. The application form requesting a Class I permit was received by NDEQ on May 12, 2009. Therefore, the initial operating permit (#OP08S2-021) permits ABE as a major stationary source.

On October 15, 2010, NDEQ received an application to revise applicable CP requirements at ABE. When final action is taken on this CP application, ABE will need to revise the existing OP within twelve (12) months of the final CP action, if necessary.

SOURCE COMPLIANCE HISTORY

The following table summarizes the compliance history at ABE:

Date	Type of Violation	Description
July 30, 2010	Notice of Violation	Failure to meet VOC limit per Condition III.(B)(2)(a) of July 2008 Construction Permit
June 3, 2010	Notice of Violation	Failure to comply with July 2008 Construction Permit Condition III.(B)(3)(a). NDEQ staff observed uncontrolled emissions venting from fermentation tank #6 (EU31). According to the construction permit, all emissions from the fermentation process shall be controlled by the CO_2 scrubber.
December 2, 2009	Notice of Violation	Failure to comply with April 2009 Construction Permit Condition III.(C)(3)(a). NDEQ staff observed emissions from the dryers venting to the atmosphere from the dampers to each of the RTO/HSRG units. According to the construction permit, all dryer emissions shall be controlled by the RTO/HSRG system.

Review of NDEQ files for the source indicates that ABE has taken steps to resolve the compliance issues listed in the table above. One may contact the NDEQ Records Management section for more detailed information concerning the cause of the above compliance issues and ABE's response to the items addressed above.

TYPE AND QUANTITY OF AIR CONTAMINANT EMISSIONS ANTICIPATED:

Ethanol production at ABE generates several air pollutant emissions, including particulate matter (PM), particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (PM_{10}), nitrogen oxide (NO_x), sulfur oxides (SO_x), carbon monoxide (CO), volatile organic compounds (VOCs), and hazardous air pollutants (HAPs), specifically acetaldehyde. The primary emission sources at the source will be from the following equipment/processes:

Equipment/Process	**Expected Pollutants**
Grain Receiving, Handling, Storage, and Hammermilling	PM, PM_{10}, and $PM_{2.5}$
Fermentation	VOC and HAPs
Prefermentation, Distillation, DDGS Production (TO/HRSG)	PM, PM_{10}, $PM_{2.5}$, NO_x, SO_2, CO, VOC, and HAPs
DDGS Cooler	VOC and HAPs
Solid Product Storage and Loadout	PM, PM_{10}, and $PM_{2.5}$
Storage Tanks	VOC and HAPs
Ethanol Liquid Loading	VOC and HAPs
Equipment Leaks	VOC and HAPs

Equipment/Process	Expected Pollutants
Haul Roads	PM, PM_{10}, and $PM_{2.5}$
Cooling Tower	PM, PM_{10}, and $PM_{2.5}$
Biomethanators (Flare)	PM, PM_{10}, $PM_{2.5}$, NO_x, SO_2, CO, VOC, and HAPs
Emergency Equipment	PM, PM_{10}, $PM_{2.5}$, NO_x, SO_2, CO, VOC, and HAPs

Potential emissions of criteria pollutants and HAPs were estimated using a combination of vendor guarantees, testing from ABE and other operational ethanol plants, process design data, emission factors from EPA's Compilation of Air Pollutant Emission Factors, 5th Edition, Volume 1 (AP-42), EPA protocol and guidance documents, and EPA's TANKS software. Detailed emission calculations are in Factsheet Attachment A.

Equipment and emission estimation methodology are discussed below. In order to maintain naming consistencies with that used by the source in the Operating Permit Application, the following abbreviations are used: C = control equipment, EU = Emission Unit, S = emission point, FS = fugitive emission sources and TK = emissions from storage tanks.

Grain Receiving, Handling, Storage, and Hammermilling Operations

The outdoor grain storage pile and grain handling equipment (S18) will store 2.8 million bushels of corn. Emissions from this unit are considered fugitive. The October 4, 2007 CP allowed for the construction of a covered corn storage building (EU07) with a storage capacity of four million bushels, and the corn storage pile was to provide temporary storage until the permanent storage building was constructed. However, the corn storage building at ABE has not been built and the 18 month timeframe to begin construction under the October 4, 2007 CP has passed. Therefore, the permittee will be required to complete a new construction permit application should the source choose to build a new permanent corn storage building. The use of a temporary grain storage pile is still allowed at this time.

The outdoor grain storage pile and associated grain handling equipment is completely separate from permanent grain storage at the source. The grain is transferred from the tractor trailers to the outdoor grain storage pile by a mobile auger unit. The grain is then transported from the storage pile to the source grain receiving pits by either tractor trailer or front end loader. Emission factors from AP-42, Section 13.2.4, Equation 1 (11/06) and AP-42, Table 9.9.1-1 (03/03) were used to calculate potential emissions from the storage pile.

The other portions of the grain handling operations consist of unloading 1,265,000 tons of grain by truck or railcar, two 500,000-bushel capacity storage silos, one 5,000-bushel capacity corn day bin, grain elevators, and associated conveyors.

Grain is received at the plant by truck or railcar inside a partially enclosed building which contains the dump pits. The grain receiving system will be a choked flow system. An example of a partially enclosed building is a structure over the grain receiving pits (large enough to enclose a haul truck or railcar), but the overhead doors are open during the transfer of grain between the truck/railcar and pit. The partial enclosure is used to block the effects of wind. The dump pits are fitted with conveyor belts, which feed the elevator leg and grain-to-grain storage silos.

The dump pits and associated grain handling emission units are controlled by the grain receiving and handling baghouses (C20). The annual grain unloading rate is based upon data submitted in the Operating Permit Application.

The grain milling operations consist of a grain elevator, four (4) hammermills, and associated conveyors. The grain is fed by a grain transfer conveyor from the grain storage silos. Particulate emissions from the grain elevator and associated conveyors are controlled by the grain receiving baghouse (C20). The hammermills grind the grain to the required particle size. The grain milling operations are controlled by the milling baghouse (C30). The solids collected in the baghouses are returned to the process downstream of the hammermills.

Fermentation

The CO_2 scrubber (identified as C40) controls the fermentation process which consists of seven (7) fermenters and a beer well. The fermentation and distillation equipment will produce approximately 119.7 MMgal of anhydrous ethanol per year from grain (corn).

In the mixer, the ground grain is mixed with recycled process water from the cook water tank to form slurry. The slurry is cooked to liquefy and breakdown the starch to sugars. The slurry is cooled with non-contact cooling water and sent to a fermenter process vessel where the fermentation process, along with added yeast, converts the sugars to ethanol and carbon dioxide (CO_2). This process produces a fermented mash called beer. The beer or fermented slurry is pumped from the fermenters to the beer well. The beer well is a process tank that provides continuous flow of beer slurry to the distillation column. The CO_2 from the fermenters and the beer well passes through a water scrubber to remove residual amounts of ethanol before the CO_2 exits through scrubber stack C40. This CO_2 stream may be sold to a third-party as a by-product. The water from the scrubber is pumped to the cook water tank and recycled to the process.

The controlled emission factors from the CO_2 scrubber are based upon lb/hr permitted limits established in ABE's construction permit and this operating permit, as well as stack testing conducted at ABE. Performance testing of VOCs and HAPs is required for the CO_2 scrubber under the conditions of the operating permit. VOC tests are required to determine whether ABE is meeting the lb/hr VOC limit established in the permit. This testing is necessary because the lb/hr PTE of VOCs from the scrubber actually exceeds the permitted limit established in the construction permit. Testing is also required for HAPs from the CO_2 scrubber. While no lb/hr limits exist for individual or total HAPs, ABE is still subject to a source wide limit of 10 tons per year for each individual HAP and 25 tons per year for total HAPs. Stack testing data from the scrubber will be used to perform calculations determine that ABE is meeting the permitted limits for HAPs.

The emissions from the fermentation process are critical in meeting the minor source single Hazardous Air Pollutant (HAP) limitation. The emissions from the fermentation process can account for more than 90 percent of the single HAP emissions at an ethanol plant. As such, the fermentation process is classified as a significant process in regard to this limitation.

The NDEQ has allowed ABE to rely on parametric monitoring (monitoring of the scrubber operational parameters) to demonstrate compliance with the HAP limitations. When parametric monitoring is used to demonstrate compliance, the permit must require periodic testing to verify the operational parameters accurately demonstrate compliance. As explained below, the NDEQ has determined the periodic testing frequency for the fermentation scrubber will be based on ABE's previous testing results for the HAP emitted in the largest quantity, generally acetaldehyde. The frequencies are as follows:

- If the previous results show that the largest single HAP emissions are consistently between eight (8) and 10 tons per year (tpy), the frequency will be quarterly.
- If the results show that the largest single HAP emissions are consistently between five (5) and eight (8) tpy, the frequency will be semiannual.
- If the results show that the largest single HAP emissions are consistently between five (5) tpy and two and one half (2.5) tpy, the frequency will be annual.
- If the results show that the largest single HAP emissions are consistently below two and one half (2.5) tpy, the frequency will be twice per permit term.

To allow for improvements in emissions control by ABE, the permit will allow them to move to a lower frequency by demonstrating their largest single HAP emissions are within one of the lower ranges. On March 31st of each year ABE will compare their rolling 12-month total to the four tiers described above and adjust their testing frequency accordingly. Conversely, ABE will be required to move into a higher frequency if the March 31st evaluation shows the acetaldehyde emissions are within a higher range.

It should be noted that ABE is not necessarily required to test at the above frequencies. The permit includes a condition that allows sources to use a Continuous Emissions Monitor (CEM) or Predictive Emissions Monitor (PEM) to verify compliance. As discussed below, depending on the testing frequency ABE falls into, a CEM or PEM may be a more economical method of demonstrating compliance. With this permit action, we are giving ABE the option of demonstrating compliance through testing or the use of a CEM.

Monitoring and Testing Justification

When evaluating the testing frequencies for the scrubber, the following factors were considered:

- The relevant time period of the limitation;
- The likelihood of violating the applicable requirement;
- Whether add-on controls are necessary for the unit to meet the emission limit;
- The variability of emissions from the unit over time;
- The type of monitoring, process, maintenance, or control equipment data already available for the emission unit;
- The technical and economic considerations associated with the range of possible monitoring methods; and
- The kind of monitoring found on similar emission units.

Relevant time period – The NDEQ realizes that the above testing frequencies do not meet the relevant time period criteria. The relevant time period for a rolling 12-month total is one month. However, the NDEQ believes that requiring monthly testing would place an excessive cost burden on ABE (approximately $480,000 per year over the five year permit term).

The NDEQ can establish an alternative frequency provided the data are representative of the relevant time period. While the parametric monitoring being required may not yield consistent testing results (see "The variability of emissions from the unit over time" section below), the NDEQ believes that the combination of parametric monitoring and verification testing will provide sufficient data to determine compliance during the relevant time period.

The likelihood of violating the applicable requirement – Testing data for a fermentation scrubber at a batch ethanol plant have shown that meeting the minor source limitations may be challenging. At one point, seven of 13 ethanol plants tested had at least one test where they were emitting at a rate that would make them a major source. In addition, two sources have operated at a level where their actual emissions were above the major source thresholds.

Given the compliance history of the ethanol industry as a whole, the NDEQ believes that there is a greater likelihood that ABE may also experience compliance issues. Therefore, the monitoring and testing frequencies that are established in this operating permit are appropriate.

Whether add-on controls are necessary for the unit to meet the emission limit – Ethanol plants use wet scrubbers to control the fermentation emissions. In addition, ABE must use chemical addition as an additional control mechanism. However, as pointed out in the compliance discussion above, the ability of the wet scrubber to consistently control HAP emissions is suspect.

One issue impacting the ability of the wet scrubber to consistently control HAP emissions is the variability of the emissions (see Figure 1 below) during the fermentation cycle (The fermentation cycle is defined as the time between when one fermentation tank is emptied until the next fermentation tank is

emptied – generally from 12-20 hours). This variability causes problems in two areas: testing to demonstrate compliance; and, establishing operational parameters for the scrubber.

To address the testing issue, the NDEQ has allowed testing to be conducted over the entire cycle using the Fourier Transform Infrared Spectroscopy (FTIR) method, not just worst case (three one-hour tests at the highest emissions rate). Considering that the limitation is a rolling 12-month total, this approach provides an emission rate that is more representative of the "average" over the entire fermentation cycle and therefore the relevant period; rather than results that are representative of "worst case" conditions.

To address the operational parameter issue, the NDEQ has, in most cases, required that sources use constant operational parameters to demonstrate compliance. This means that adequate control should be provided at times when the emission rate is high. However, it also means that the emissions are being over-controlled when the emission rate is low. There are limited cases where the NDEQ has allowed variable parameters. In these cases, the source must demonstrate compliance under each operational scenario.

Given the above, this permit is requiring ABE to maintain the following operational parameters at the levels that were established during the most recent valid performance test that demonstrated compliance:

- Water flow rate;
- Chemical flow rate; and,
- Chemical concentration.

The variability of emissions from the unit over time – Over the years, the data from the testing of fermentation scrubbers has shown that there is variability from one fermentation cycle to another (see Figure 2 below). As shown in Figure 2, testing has shown that, while using the same operational parameters, the results can be different, sometimes by more than an order of magnitude. Because of this, compliance with the single HAP limit is suspect.

This variability is a concern when the testing results show the source is operating close to the single HAP limit. With this in mind, the NDEQ has developed the above testing frequency requiring more frequent testing the closer the results are to the limitation. As discussed above, the tiered frequency approach allows ABE to demonstrate that they have developed operational parameters that assure consistent testing results. When such demonstration has been made, ABE is allowed to test less frequently. However, if ABE fails to demonstrate consistent results, they will be required to perform verification testing at the appropriate frequency.

Given the variability of the emissions from the fermentation process and ABE past performance, the NDEQ has determined the initial testing frequency will be annually. This frequency is established by using the tiered testing approach in Condition III.(B)(4)(c) of this operating permit.

The type of monitoring, process, maintenance, or control equipment data already available for the emission unit – As discussed above, there is an abundance of data available on the operational parameters for, and emissions from, fermentation scrubbers. However, this data has not demonstrated consistent testing results. While this data can be used to establish operational parameters for use between tests, testing is still necessary to demonstrate compliance with the minor source HAP limitations.

Given the above, this permit requires ABE to develop operational parameters as discussed above, to maintain those operational parameters between tests, and to test at the above frequency.

The technical and economic considerations associated with the range of possible monitoring methods – In addition to parametric monitoring with verification testing, the NDEQ considered requiring the use of a Continuous Emissions Monitoring (CEM) device. A CEM in this application is technically feasible. The technology utilized in the CEM reviewed by the NDEQ for this application is proven in the area of organic HAP emissions testing and in demonstrating continuous compliance in the petroleum refinery industry. This CEM uses Fourier Transform Infrared Spectroscopy (FTIR) technology which is an approved and reliable testing method for organic HAP emissions. In addition, the use of a CEM would

be more economical and provide ABE with more flexibility than parametric monitoring with verification testing.

As discussed above, testing has shown that there is variability in the emission rate during a fermentation cycle. Under the parametric monitoring approach, sources must use constant operational parameters to demonstrate compliance. This means that adequate control is being provided at times when the emission rate is high. However, it can also mean that the emissions are being over-controlled when the emission rate is low. This can result in excess water being used and, since chemical is being added, excess chemical added at low emissions rates. If a CEM were used to monitor compliance, ABE would also be able to monitor the need for, and regulate the flow of, their chemical addition. By relying on the CEMS, they would be able to continuously demonstrate compliance with their permit and realize cost savings on the chemical by only adding it when needed and at the rate necessary to comply.

Regardless of the testing frequency ABE falls under, it appears as though a CEM is the least cost option for ABE. In addition to saving costs on chemical addition, if ABE is required to test on a quarterly basis they would realize a cost savings on verification testing of approximately $600,000[1] over the term of the permit. With semi-annual verification testing ABE would realize a cost savings of approximately $300,000 over the permit term. Under the annual testing category, the cost of testing would equal $200,000. This is equal to the cost of the CEM over the term of the operating permit. However, even under this scenario, a CEM presents cost savings to ABE through reductions in water usage and chemical addition when emission rates are low.

Given the above, the permit has been written so the costs of compliance can be minimized. In addition to the tiered approach (where the testing frequency is reduced based on the level of control), the permit includes an option to install a CEM in lieu of the testing. Based on conservative cost estimates to install and operate a CEM, the cost over the term of the first operating permit would be approximately $200,000. The costs over subsequent permits would be substantially less due to the one-time capital cost of the CEM incurred during the first permit term. In subsequent permits, the cost for the permit term will be approximately $40,000, making future costs savings significantly greater than those expressed above ($740,000 and $440,000 respectively). Finally, as discussed above, a CEM would provide ABE with additional operational flexibility, reduce the cost of chemical addition, and eliminate the costs associated with operational parameter monitoring for the scrubbers in question. In summary, the NDEQ is not dictating how ABE demonstrates compliance and therefore the cost of compliance. Instead, the NDEQ has provided two options for ABE to demonstrate compliance. The option chosen is ultimately a business decision to be made by ABE.

[1] Average annual cost of a CEM is $40,000, average annual cost of quarterly testing is $160,000, and average annual cost of semi-annual testing is $80,000. Assumptions: Cost of CEM = $150,000; Cost of annual CEM Relative Accuracy Test Audit (RATA) = $10,000; and, cost of one performance test = $40,000. NOTE: a RATA is less expensive than a performance test due to the length of time at the source (four hours vs. the fermentation cycle, approx. 18 hours) and the nature of the test (verifying accuracy of the instrumentation vs. compliance with permit).

Figure 1 – Variation Through a Typical Fermentation Cycle

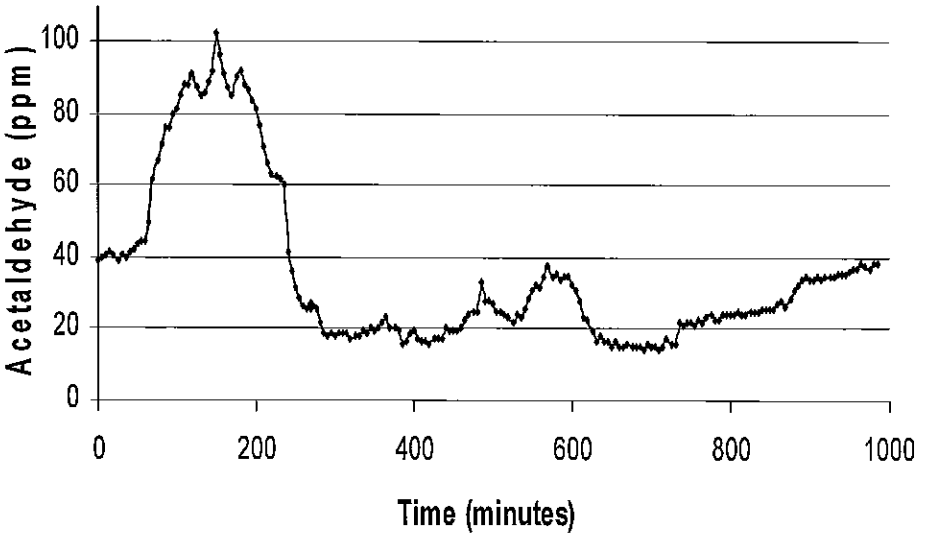


Figure 2- Variability on a Day to Day Basis

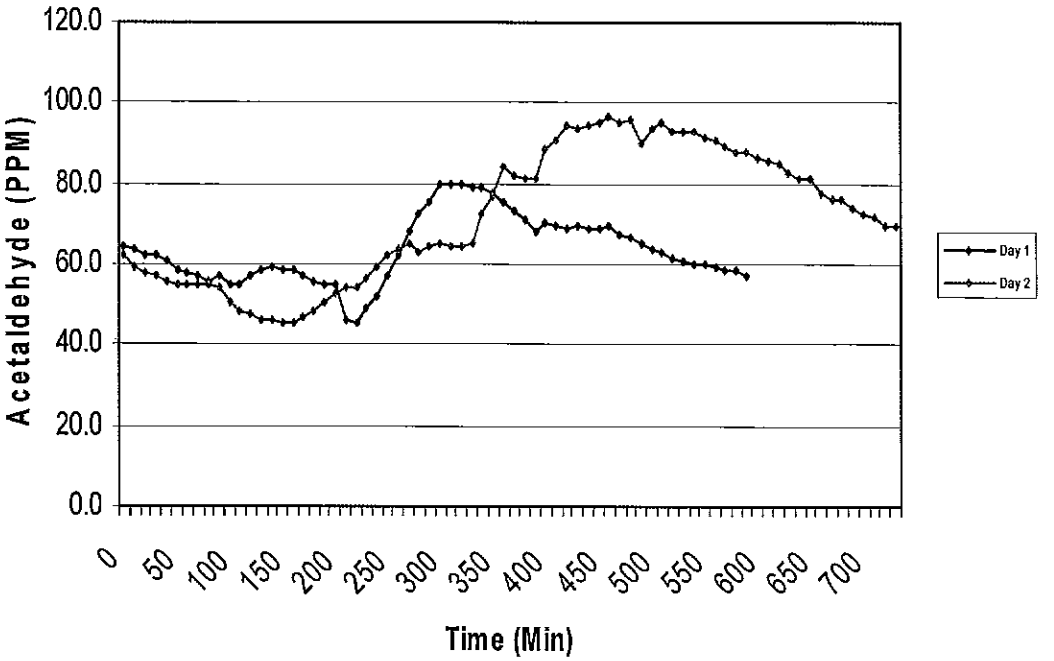
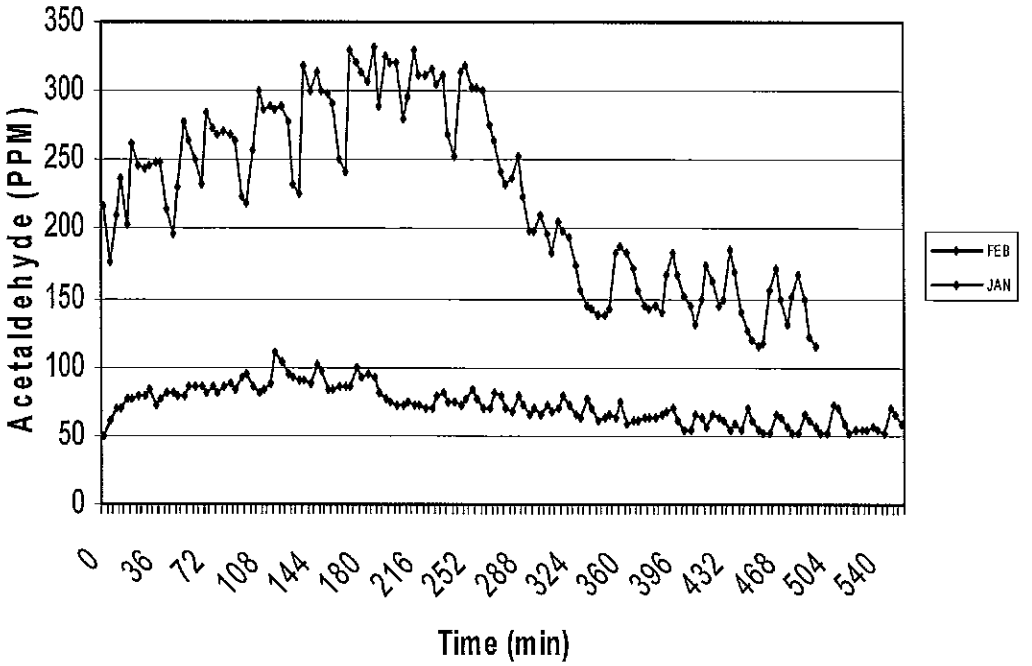


Figure 3 – Variability on a Month to Month Basis



Prefermentation, Distillation, DDGS Production (TO/HRSG)

The prefermentation emissions are vented to the distillation process vent. The prefermentation equipment consists of a mixer, two (2) slurry tanks, two (2) yeast tanks, a flash tank, a cook tube, and two (2) liquefaction tanks. The distillation equipment consists of a beer column, a side stripper, a molecular sieve, a 190-proof condenser, a 200-proof condenser, and a rectifier column. The DDGS/MWDGS drying operations consist of centrifuges, evaporators, four (4) 40 MMBtu/hr natural gas/methane fired dryers. The total drying capacity is 42 tons/hr DDGS. The above emission units are controlled by two (2) 120 MMBtu/hr TO/HRSGs (C10A and C10B) that exhaust through one common stack (S10).

The overflow from the centrifuge, called thin stillage, enters an evaporator to reduce the water content. The concentrated stream (called "syrup") is mixed with the centrifuge underflow stream before entering the dryer or is added to the WDGS.

Two TO/HRSGs exist downstream of the natural gas fired dryers. The TO/HRSGs are designed to remove 97% or more of the VOC in the waste gas stream. VOC reduction also generates significant reduction in condensable particulate matter emissions. In addition, the TO/HRSGs provide a reduction in carbon monoxide (CO) from DDGS processing.

The TO/HRSGs process emission factors for PM, PM_{10}, CO, SO_2, VOC, and HAPs are based on recent stack tests at other similar facilities plus an acceptable margin to allow for variation between source operations submitted by the source. The emission factors for PM, PM_{10}, CO, and VOC include emissions from natural gas/biogas combustion in the dryers and the TO/HRSGs. The emission factors include the control efficiency of the thermal oxidizer. The emissions are based upon the assumption that 100% of the material is dried to produce DDGS.

The thermal oxidizers also produce emissions from the combustion of natural gas and biogas (from the biomethanator) in the burners of the DDGS dryers and thermal oxidizer. The biogas combustion emissions are calculated under the flare for the biomethanator. The NO_x emissions from the burners of the thermal oxidizers and the dryers will be controlled by a low NO_x burner. The maximum potential

emissions are calculated assuming the dryers and the thermal oxidizer burn natural gas 100% of the time and the flare burns all biogas produced.

The April 6, 2009 CP determined that only two liquefaction tanks (EU15 and EU16) were constructed at the source and they are vented to the atmosphere. The CP action on April 6, 2009 allows for the liquefaction tanks to vent to the atmosphere, rather than to the TO/HRSGs as required in CP #07-0032. Liquefaction tank #2 (EU16) connects to liquefaction tank #1 (EU15), which vents directly to the atmosphere at emission point S11. The emissions from the tanks result when the temperature of the recycle water is raised releasing the VOCs concentrated in the water. Emission factors for the liquefaction tanks were derived from emission testing results for liquefaction tanks received by the NDEQ on September 8, 2008, from VeraSun Energy. The highest pollutant (in pounds) for a single test run in ratio to the maximum ethanol production was used to formulate the emission factors. The NDEQ believes that with the limited data available, this method helps to ensure that worst-case scenarios are anticipated and that emission thresholds are not exceeded.

The April 6, 2009 CP also stipulated that the water cook tank (EU12) was no longer required to be routed to the TO/HRSGs as required in CP07-0032. This unit is now permitted to vent directly to the atmosphere at emission point S12. The emissions from the tank result when the temperature of the recycled water is raised to approximately 180 degrees Fahrenheit, releasing the VOCs concentrated in the water. Since the emission release is similar to the liquefaction tanks, the emission factors derived from the VeraSun liquefaction tank testing were used to calculate the potential emissions.

DDGS Cooler

The DDGS from the dryers is routed to the DDGS cooling cyclone system. This system cools the DDGS prior to product storage and loadout. PM/PM_{10} emissions from the DDGS cooler will be controlled by the cooler baghouses (C70A and C70B). VOC and HAPs will also be emitted from the DDGS. The emission factors (lbs/ton PM, PM_{10}, VOC, and HAPs) are based on stack test results for similar coolers at similar facilities.

Solid Product Storage and Loading

The DDGS is routed to the DDGS storage and loadout area after the DDGS cooler. The DDGS storage and loading area has a baghouse (C90) to control particulate matter. The emissions from the DDGS loading baghouse include PM and PM_{10}.

WDGS Storage

Given the permitted increases in ethanol production specified in the April 6, 2009 CP, ABE now has the capacity to produce approximately 950,751 tons per year of WDGS. The emissions from the WDGS were estimated based on the emission factors derived from the November 2004 stack test at the DENCO ethanol plant located in Morris, Minnesota.

Storage Tanks

ABE has five (5) production storage tanks. 190-proof ethanol is stored in one (1) 200,000 gallon process storage tank (TK65). Denaturant (natural gasoline) is stored in one (1) 200,000 gallon storage tank (TK64) prior to the blending. Anhydrous ethanol is stored in one (1) 200,000 gallon storage tank (TK63) prior to the blending with 5% denaturant. After blending, the denatured ethanol is stored in one (1) of two (2) 1,500,000 gallon storage tanks (TK61, TK62).

Each tank in the storage area has been built on-site and utilizes an internal floating roof design. Meters, filters, pumps, and loadout equipment are provided for loadout into rail and truck tankers. The storage tanks are constructed on a "bermed" area to retain any spills that may occur.

All five tanks are sources of VOC emissions and will vent directly to the atmosphere. Emissions from these tanks have been estimated using TANKS software created by EPA.

Ethanol Loadout

Prior to shipping the denatured ethanol from the source, 2-2.5% natural gasoline is combined with the anhydrous ethanol. The gasoline is added to the final product to make the ethanol unfit for human consumption. Liquid product loading consists of submerged loading of denatured fuel ethanol into tanker trucks and tanker railcars. The emissions from the truck and railcar loadout will be collected by a vapor recovery system and then routed to a flare (S50).

Loading losses are estimated using the methods described in AP-42, Section 5.2: *Transportation and Marketing of Petroleum Liquids* (1/95). The VOC and HAPs emissions from product loadout were calculated from using the assumptions listed below. The estimated emissions, also called combustion products (PM, PM_{10}, NO_x, SO_x, and CO) are released from a flare. The flare emissions have been estimated using vendor guarantees (NO_x and CO) and AP-42, Section 13.5: *Industrial Flare*. Emission factors from AP-42, Section 1.4: *Natural Gas Combustion* (7/98) were used to estimate the emissions from the flare's pilot.

Loadout emissions were based on the following:

1. Only 27.5 million gallons of denatured ethanol shall be shipped out by tanker truck.
2. The tanker trucks are assumed to have previously contained conventional unleaded gasoline (RVP 13) and the gasoline vapors are displaced as the denatured ethanol is loaded. This is a worst-case assumption. Emissions will be less if the tanker trucks previously contained denatured ethanol.
3. Emissions from displacement of gasoline previously contained in the tanker trucks are estimated based on the difference between the saturation factors (SF) for normal dedicated and clean cargo provided in AP-42, Section 5.2.
4. HAP emissions are based on the HAP content of gasoline (RVP 13), anhydrous ethanol, and denatured ethanol.

The vapor control system for rail loadout has an overall efficiency of 98.0% (100% capture, 98% destruction). The control system for truck loadout also has an overall efficiency of 98.0% (99% capture, 98% destruction).

Equipment Leaks

Equipment leaks are leaks from valves and pumps in light service, gas valves, control valves, flanges, transmitters, and manholes. ABE will perform activities associated with the Leak Detection and Repair (LDAR) Program in accordance with NSPS Subpart VV. Fugitive emissions are calculated from *Protocol for Leak Emission Estimates*, EPA-453/R-95-017, November 1995. Emissions include fugitive VOC and HAP emissions.

The equipment leaks are assumed to be anhydrous ethanol process lines for determination of HAP emissions.

Haul Roads

All source haul roads are required to be paved. Fugitive dust emissions from traffic on these roads have been calculated using AP-42, Section 13.2.1: *Paved Roads* (01/11) emission factors and typical characteristics for paved roads.

A permitted silt load factor of 1.0 gram per square meter (g/m^2) was used to establish the pounds per vehicle mile traveled (lb/VMT) emission factor for PM and PM_{10}.

Cooling Towers

ABE uses a 4-celled cooling tower (F80) to cool non-contact process water back to a temperature that is useful for the ethanol production process. Potential PM/PM_{10} emissions from the cooling tower were calculated with a mass balance approach as presented in AP-42, Section 13.4: *Wet Cooling Towers* (1/95). This approach uses data regarding the total water circulation rate (3,000,000 gal/hr), total dissolved solids (TDS) concentration (2,500 ppm), and cooling tower drift losses (0.005%). This method assumes that the TDS present in water evaporated at the cooling tower produce PM/PM_{10} emissions.

Biomethanator Operation

The biomethanator operation consists of a biomethanator, a flare (S60) design-rated at 6.4 MMBtu/hr with a 0.1 MMBtu/hr pilot, and other associated equipment. The water stream from the evaporators goes to a biomethanator, which is an anaerobic biological water treatment system that converts organic matter to biogas (a fuel gas, mostly methane). This fuel is used as supplemental fuel in the dryers, or burned at a flare if the dryers are not operating.

The emissions from this operation can offset some of the emissions from the natural gas combustion in the dryer. The potential biogas combustion emissions in the flare and the dryers are equal to each other (if all of the biogas is burned in only one unit). The flare is expected to operate only when the DDGS dryer is not operating. Emissions of PM, PM_{10}, and SO_x from the flare are negligible due to the composition of the biogas.

Emergency Equipment

ABE has installed a 460 horsepower diesel-powered internal combustion engine emergency firewater pump. The emergency fire pump (S100) is limited to 300 hours of operation per year. This limitation is in place to keep the CO and NO_x source-wide emissions below the former 100 tpy PSD thresholds.

Since the emergency fire pump is diesel fired, a diesel storage tank was installed at the source. However, due to the small tank size, low volume throughput, and low vapor pressure diesel fuel, the VOC emissions associated with the diesel fuel storage tank are expected to be negligible.

Potential emissions for the emergency fire pump were estimated using AP-42, Section 3.3: *Gasoline and Diesel Industrial Engines* (10/96). The information presented in Section 3.3 is for industrial engines less than 600 horsepower.

Emission Summary

The following table summarizes the potential and actual emissions from ethanol production at ABE:

Regulated Pollutant	Potential Emissions as limited by permit (tons/year)	Actual Emissions* (tons/year)
Particulate Matter (PM)	87.15	47.13
Particulate Matter less than or equal to 10 microns (PM_{10})	62.76	30.92
Particulate Matter less than or equal to 2.5 microns ($PM_{2.5}$)	32.74	30.92
Sulfur Dioxide (SO_2)	81.41	3.28
Oxides of Nitrogen (NO_x)	177.39	122.19
Carbon Monoxide (CO)	98.61	47.54

Regulated Pollutant	Potential Emissions as limited by permit (tons/year)	Actual Emissions* (tons/year)
Volatile Organic Compounds (VOCs)	124.21	70.06
Hazardous Air Pollutants (HAPs):		
Acetaldehyde	9.03	4.31
Acrolein	4.06	4.48**
Hexane	3.17	3.14
Methanol	1.31	1.53
All Other HAPs	2.47	0.34
Total HAPs	20.04	13.80

*Actual Emissions are from 2010 air emissions inventory received by NDEQ on Feb. 23, 2011
**Actual emissions exceed PTE due to excess emissions events that are not accounted for in PTE calculations

APPLICABLE REQUIREMENTS AND VARIANCES OR ALTERNATIVES TO REQUIRED STANDARDS:

Title 129, Chapter 5 – Operating Permit Program

As described in Title 129, Chapter 5, any source with PTE above major source thresholds (100 tons/yr of each criteria pollutant (particulates, SO_x, NO_x,, CO, VOCs), 10 tons/yr of any single HAP, 25 tons/yr of all listed HAPs, and 5 tons/yr of lead) must apply for an operating permit as a Class I (major) source, unless the source agrees to limit the potential to emit below the threshold values. In the case of ABE, no limits on PTE of criteria pollutants have been established through either construction permit or operating permit actions. Therefore, ABE is classified as a Class I source for purposes of the operating permit program because PTE of both NO_x and VOCs are above the 100 tons per year major source threshold.

While ABE is receiving a Class I Operating Permit because PTE of both NO_x and VOCs exceed the 100 tons/yr major source threshold, the source is considered a minor (area) source of HAPs. ABE accepted limits on HAPs in the October 4, 2007 Construction Permit issued to the source. This construction permit limited emissions below the 10/25 tons/yr major source threshold for HAPs.

On July 1, 2011, greenhouse gases (GHGs) will become a regulated air pollutant under 40 CFR Part 70 and Title 129, Chapter 1. Because GHGs is not a regulated air pollutant at this time, neither ABE nor the NDEQ are obligated to provide emissions estimates for this pollutant. Although GHGs is not a regulated air pollutant, the NDEQ would be obligated to include any applicable requirement concerning GHGs, should they exist. After careful research, the NDEQ has determined that, at the time of permit issuance, ABE is not subject to applicable requirements concerning GHGs.

Title 129, Chapter 18 - New Source Performance Standards (NSPS)

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, and 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. EPA has determined that a thermal oxidizer with a waste heat recovery boiler is considered a steam generating unit, per EPA's January 8, 2003, memorandum from Michael S. Alushin, Director of the Compliance Assessment and

Media Programs Division of the Office of Compliance to George T. Czerniak, Chief of the Air Enforcement and Compliance Assurance Branch of USEPA Region 5's Air and Radiation Division, concerning applicability of NSPS Subpart Db to a thermal oxidizer/waste heat-recovery boiler at an ethanol production facility. Therefore, the TO/HRSG system for this plant is subject to this NSPS. Because the VOC-containing streams from the pre-fermentation and distillation equipment and the dryers are not considered as fuels for the TO/HRSG system pursuant to the definition of "steam generating unit" specified in NSPS Subpart Db, the fuel recordkeeping requirements of NSPS Subpart Db do not apply to these streams.

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

REQUIREMENT	CITATION
Applicability	§ 60.40b(a)
Definitions	§ 60.41b
Standard for Nitrogen Oxides	§ 60.44b(a), (h), (i), (j), (l)(1) and (l)(2)
Emission Monitoring for Particulate Matter and Nitrogen Oxides	§ 60.48b(b), (c), (d), (e)(2) and (e)(3), (f), (g)
Reporting and Recordkeeping	§ 60.49b(d), (g), (h)(2), (i), (o)

Please note that in Title 129, the requirements of NSPS Subpart Db are those that were published in the Federal Register on June 13, 2007. NSPS Subpart Db has since been amended at the Federal level on January 28, 2009, but the amendments did not change the requirements applicable to the TO/HRSG units at ABE.

Subpart DD—Standards of Performance for Grain Elevators: This subpart, adopted by reference in Title 129, Chapter 18, Section 001.19, applies to each truck unloading and/or loading station, barge and ship unloading and/or loading station, railcar unloading and/or loading station, grain dryer, and grain handling operations that are located at any grain terminal or storage elevator that commenced construction, modification, or reconstruction after August 3, 1978. The grain handling operations located at this source are not subject to this subpart because the source does not have the storage capacity to permanently store more than 2.5 million bushels of grain.

If ABE had constructed the permanent grain storage facility as permitted in the October 4, 2007 CP, the source would be subject to NSPS Subpart DD as described in Condition III.(A)(4) of the CP. However, without the permanent storage facility, the grain storage capacity at ABE falls below the 2.5 million bushel permanent storage threshold established by the NSPS rule. Additionally, with the source now needing a new CP in order to build a permanent grain storage building, the source is currently permitted in such a way that it cannot exceed 2.5 million bushels of grain storage unless the temporary grain storage pile is constructed with a permanent foundation and side walls. In this case, the storage pile would no longer be considered temporary and Subpart DD would apply to the source.

Subpart Kb—Standards of Performance for Volatile Organic Liquid Storage Vessels for which Construction, Reconstruction, or Modification Commenced After July 23, 1984: This subpart, adopted by reference in Title 129, Chapter 18, Section 001.62, applies to 3 tanks at this source (TK61, TK62, and TK64). These tanks store denatured ethanol (TK61 and TK62) and denaturant (TK64). Subpart Kb applies because each of these tanks has a storage capacity that exceeds 75 cubic meters (approximately 19,813 gallons). Each of the tanks has an internal floating roof as its control device.

The remaining tanks at the source (TK63 and TK65) are not subject to Subpart Kb. These tanks store anhydrous ethanol (TK63) and 190 proof ethanol (TK65), and are considered process tanks as defined in Subpart Kb. However, in order to comply with State HAP BACT rules, the Construction Permit issued

on October 4, 2007 requires both process tanks to use an internal floating roof that meets the standards of Subpart Kb. These standards are found in 40 CFR 60.112b(a)1.

The applicable requirements of Subpart Kb include, but are not limited to, the following:

REQUIREMENT	CITATION
Applicability	§ 60.110b(a)
Definitions	§ 60.111b
Standard for Volatile Organic Compounds	§ 60.112b(a)(1)
Reporting and Recordkeeping	§ 60.115b(a)
Monitoring of Operations	§ 60.116b(a), (b), (c), (d), (e)
Delegation of Authority	§ 60.117b

The diesel storage tank for the emergency equipment and the corrosion inhibitor storage tank are not subject to this NSPS because these tanks each have a maximum capacity less than 75 cubic meters.

Subpart NNN—Standards of Performance for Volatile Organic Compound (VOC) Emissions from Synthetic Organic Chemicals Manufacturing Industry (SOCMI) Distillation Operations: This subpart, adopted by reference in Title 129, Chapter 18, Section 001.61, does not apply to the distillation operation, per EPA's January 24, 2000 letter from Richard Tripp, EPA Region VII to Randy Griffin, Nebraska Air Quality Compliance Supervisor, concerning applicability of 40 CFR 60 to biomass ethanol production. The letter stated that Subpart NNN does not apply to ethanol derived from biomass such as corn. Subpart NNN applies to synthetic (chemical reaction of petroleum refining products) processes to produce organic chemicals (including ethanol).

Subpart RRR—Standards of Performance for Volatile Organic Compound (VOC) Emissions from Synthetic Organic Chemicals Manufacturing Industry (SOCMI) Reactor Processes: This subpart, adopted by reference in Title 129, Chapter 18, Section 001.70, does not apply to the fermentation tanks, per EPA's January 24, 2000, letter from Richard Tripp, EPA Region VII to Randy Griffin, Nebraska Air Quality Compliance Supervisor, concerning applicability of 40 CFR 60 to biomass ethanol production. The letter stated that Subpart RRR does not apply to ethanol derived from biomass such as corn. Subpart RRR applies to synthetic (chemical reaction of petroleum refining products) processes to produce organic chemicals (including ethanol).

Subpart VV—Standards of Performance for Equipment Leaks of VOC in Synthetic Organic Chemicals Manufacturing Industry for which Construction, Reconstruction, or Modification Commenced After January 5, 1981, and on or Before November 7, 2006: This subpart, adopted by reference in Title 129, Chapter 18, Section 001.14, applies to the VOC equipment leaks associated with this plant (a Synthetic Organic Chemical Manufacturing Industry). This subpart is associated with subpart NNN and RRR, but NNN and RRR are based on how the chemical is produced (biomass versus synthetic), while VV is based on the chemicals produced. Since new organic chemicals are synthesized (process doesn't matter), then all of the associated equipment leaks are subject to this subpart. Associated equipment includes light liquid valves, light liquid pumps, gas valves, control valves, flanges, transmitters, and manholes.

The requirements of NSPS Subpart VV in Title 129, Chapter 18, are those that were published in the Federal Register on July 1, 2006. NSPS Subpart VV was then amended on November 16, 2007. The amendments have not been adopted into Title 129, Chapter 18. Therefore, ABE must comply with the requirements of both versions of the rule. The requirements from July 1, 2006 are enforceable by NDEQ and USEPA, whereas the requirements from the amendments on November 16, 2007 are enforceable by USEPA only.

The requirements of Subpart VV on July 1, 2006, include, but are not limited to, the following:

REQUIREMENT	CITATION
Definitions	§ 60.481
Standards: General	§ 60.482-1(e), (f), (g)
Standards: Pumps in Light Liquid Service	§ 60.482-2(a)(1), (a)(2), (b)(2), (c)(2), (d)(4), (d)(5), (d)(6),
Standards: Sampling Connection Systems	§ 60.482-5(a), (b)
Standards: Valves in Gas/Vapor Service and in Light Liquid Service	§ 60.482-7(a), (c)
Standards: Pumps and Valves in Heavy Liquid Service, Pressure Relief Devices in Light Liquid or Heavy Liquid Service, and Connectors	§ 60.482-8(a)(2), (d)
Standards: Delay of Repair	§ 60.482-9(a), (f)
Alternative Standards for Valves—Allowable Percentage of Valves Leaking	§ 60.483-1(d)
Alternative Standards for Valves—Skip Period Leak Detection and Repair	§ 60.483-2(b)(5)
Test Methods and Procedures	§ 60.485(g)(4), (g)(5), (h)
Recordkeeping	§ 60.486(e)(6)
Reporting	§ 60.487(c)(2)

The following requirements have been added or changed as a result of NSPS Subpart VV amendments on November 16, 2007. These requirements are only enforceable by USEPA until the amendments are adopted into Title 129

REQUIREMENT	CITATION
Definitions	§ 60.481
Standards: General	§ 60.482-1(e), (f), (g)
Standards: Pumps in Light Liquid Service	§ 60.482-2(a)(1), (a)(2), (b)(2), (c)(2), (d)(4), (d)(5), (d)(6),
Standards: Sampling Connection Systems	§ 60.482-5(a), (b)
Standards: Valves in Gas/Vapor Service and in Light Liquid Service	§ 60.482-7(a), (c)
Standards: Pumps and Valves in Heavy Liquid Service, Pressure Relief Devices in Light Liquid or Heavy Liquid Service, and Connectors	§ 60.482-8(a)(2), (d)
Standards: Delay of Repair	§ 60.482-9(a), (f)
Alternative Standards for Valves—Allowable Percentage of Valves Leaking	§ 60.483-1(d)
Alternative Standards for Valves—Skip Period Leak Detection and Repair	§ 60.483-2(b)(5)
Test Methods and Procedures	§ 60.485(g)(4), (g)(5), (h)
Recordkeeping	§ 60.486(e)(6)
Reporting	§ 60.487(c)(2)

Subpart VVa—Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for which Construction, Reconstruction, or Modification Commenced After November 7, 2006: This subpart, not yet adopted into Title 129, Chapter 18, applies to the VOC equipment leaks associated at a Synthetic Organic Chemical Manufacturing facility that was constructed, reconstructed, or modified after November 7, 2006. This new subpart includes all the requirements of 40 CFR Part 60, Subpart VV, as amended, along with new provisions. Differences between Subparts VVa and VV include, but are not limited to, lower leak definitions for pumps and valves, requiring monitoring of connectors, and additional recordkeeping requirements and quality assurance measures. Subpart VVa is currently not applicable to ABE. However, if ABE physically modifies its process line in the future, this subpart may become applicable.

Subpart IIII—Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (ICE): This subpart, adopted by reference in Title 129, Chapter 18, Section 001.76, applies to stationary compression ignition internal combustion engines with a displacement of less than 30 liters per cylinder that commence construction or have been modified or reconstructed after July 11, 2005. The emergency firewater pump engine at ABE was constructed after July 11, 2005 and, thus, is subject to this subpart.

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

Requirement	Citation
Emission Standards for Emergency Engines	§ 60.4205(c), including Table 4 of this subpart
Length of Time Emission Standards Must be Met	§ 60.4206
Fuel Requirements	§ 60.4207(a), (b), (c)
Monitoring Requirements	§ 60.4209(a)
Compliance Requirements	§ 60.4211(a), (b), (e)
Test Methods and Procedures	§ 60.4212
Notification, Reporting, and Recordkeeping	§ 60.4214(b)
General Provisions	§ 60.4218, including Table 8
Definitions	§ 60.4219

Title 129, Chapter 19 - Prevention of Significant Deterioration (PSD)

ABE is considered a minor source with regard to the PSD program because the potential emissions of each regulated New Source Review (NSR) pollutant is below the major source threshold of 250 tons/year for the entire source. At this time, ethanol plants do not fall into one of the 28 source categories that are subject to a 100 tons/year threshold as listed in Chapter 2, Section 008.01, for each regulated NSR pollutant. In addition, there are no "nested" sources within the ethanol plant that may otherwise be subject to a 100 tons/year major source threshold.

Title 129, Chapter 20 - Particulate Limitations

Title 129, Chapter 20, Section 001 – Process Weight Rate

Each of the permitted emission rate limitations ensures that the process weight rate limits will not be exceeded. The following formulas were used to determine compliance:

For process weight rates up to 60,000 lbs/hr: $E= 4.10p^{0.67}$; where E=emissions rate in lbs/hr and p=process weight in tons

For process weight rates in excess of 60,000 lbs/hr: $E= 55.0p^{0.11}-40$; where E=emissions rate in lbs/hr and p=process weight in tons

The source is expected to be in compliance with the process weight rate limitations. The process weight rate limitations are calculated in the Fact Sheet Attachment.

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

This permittee is expected to be in compliance with this regulation because the fuels combusted at this source are natural gas, diesel fuel, and methane. The allowable emission rates per Title 129, Chapter 20, Section 002 are calculated in the Fact Sheet Attachment.

Title 129, Chapter 20, Section 004 – Opacity

All of the equipment at the source is subject to the opacity standard (20 percent opacity limit) specified in Title 129, Chapter 20, Section 004. It is unlikely the fuel burning equipment would exceed the opacity standard due to the use of natural gas and distillate fuel oil (diesel) as fuel. These fuels are considered "clean" fuels with regard to visible emissions. In addition, control equipment used throughout the source will help the source comply with the opacity standard.

Title 129, Chapter 24 - Sulfur Compound Emissions

According to Title 129, Chapter 24, no fossil fuel burning equipment at a source may emit sulfur oxides greater than two and one half (2.5) pounds per million BTU input. Recent interpretation of this regulation by NDEQ legal staff states that "…it [Chapter 24] imposes a sulfur emissions standard on sources that existed prior to February 26, 1974, and none other." In other words, Title 129, Chapter 24 only applies to fossil fuel burning equipment that was in existence prior to February 26, 1974, the original effective date of the rule. No fossil fuel burning equipment at ABE Fairmont was in existence prior to this date. Therefore, Title 129, Chapter 24 does not apply to any emission units at the source.

Title 129, Chapter 27 - Best Available Control Technology (BACT)

This source is subject to State BACT since the controlled individual HAP emissions exceed 2.5 tons/year and combined HAP emissions exceed 10 tons/year. BACT requirements, as established in the October 4, 2007 Construction Permit, include the following:

Process	BACT Equipment/Activities
Fermentation	Scrubber with a minimum 65% control efficiency for total combined HAPs
Distillation/Pre-fermentation	RTO
DDGS/MWDGS Drying	RTO
Equipment Leaks	LDAR program
Storage Tanks	Internal floating roof
Loading of Liquid Product	Submerged filling, loadout vapor recovery system and flare
Biomethanator	Flare and/or fuel for thermal oxidizers/DDGS dryers

Title 129, Chapter 28 - National Emission Standards for Hazardous Air Pollutants (NESHAP, MACT)

Subpart ZZZZ—National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines: Changes to this rule were published in the Federal Register on August 20, 2010. The rule extends coverage to stationary reciprocating internal combustion engines (RICE) that are less than 500 bhp and to RICEs of all sizes that are located at area sources of HAPs. Pursuant to 40 CFR 63.6590(c), the emergency firewater pump engine must meet the requirements of this subpart because it is located at an area source of HAPs. Furthermore, 40 CFR 63.6590(c) also states that the requirements for subpart ZZZZ are met by meeting the requirements of 40 CFR Part 60 Subpart IIII.

There are no other NESHAPs applicable to this source because the PTE has been limited to less than 10 tons/yr of a single HAP and less than 25 tons/yr for all combined HAPs, and there are no other NESHAPs that apply to area sources of HAPs. If emissions were to exceed these thresholds in the future, the following NESHAPs would potentially be applicable to the source:

Subpart F—National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry: This subpart, adopted by reference in Title 129, Chapter 28, Section 001.20, applies to manufacturing facilities which produce a hazardous air pollutant as the primary chemical, and use the chemical as a reactant or manufacture the chemical as a product or co-product, and are located at a plant site that is a major source of HAPs. This plant produces ethanol, which contains acetaldehyde and methanol, as well as the HAPs in the denaturant. This source is not subject to this subpart because the primary product (ethanol) is not on the HAP list for this subpart. Also, the source is limited to below major HAP source thresholds.

Subpart G—National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater: This subpart, adopted by reference in Title 129, Chapter28, Section 001.21, applies to the same manufacturing facilities as subpart F, but only for all of the process vents, storage vessels, transfer racks and wastewater streams. Since this plant is exempt from subpart F, it is also exempt from subpart G.

Subpart H—National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry for Equipment Leaks: This subpart, adopted by reference in Title 19, Chapter 28, Section 001.22, applies to the same manufacturing facilities as subpart F, but only for the following equipment: pumps, compressors, agitators, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, surge control vessels, bottoms receivers, instrumentation systems, and control devices or closed vent systems that are intended to operate in organic hazardous air pollutant service for 300 hours or more during the calendar year. Since this plant is exempt from Subpart F, it is also exempt from subpart H.

Subpart Q—National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers: This subpart, adopted by reference in Title 129, Chapter 28, Section 001.04, applies to industrial process cooling towers that are operated with chromium-based water treatment chemicals and are located at major facilities for HAPs. This source is exempt from this subpart because the source is limited to below the HAP major source thresholds. Also, no chromium-based water treatment chemicals are used in the cooling tower.

Subpart EEEE—National Emission Standards for Hazardous Air Pollutants for Organic Liquids Distribution (Non-Gasoline): This subpart, adopted by reference in Title 129, Chapter 28, Section 001.83, applies to major HAP facilities that have organic liquids distribution. The organic liquids distribution operation must have 7.29 million gallons per year or more either into or out of the operation to be subject to this subpart. Organic liquids are all crude oils other than black oil, and those liquids or liquid mixtures, except gasoline, that contain a total of 5 percent by weight or more of the organic HAP listed in the

subpart (including acetaldehyde, methanol, benzene, and others). Fuels used on-site (i.e. fuels used for fleet refueling) are exempt from this subpart. If the source-wide HAP emissions exceed the major source threshold, then an analysis will need to be conducted on the organic liquid distribution operations to determine if this subpart is applicable.

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 that 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 of isolated intermediate), that produce an organic chemical(s) in the specified SIC (includes SIC code 2869) and its processes, uses, or produces HAP. If the source-wide HAP emissions exceed the major source threshold, the miscellaneous organic chemical manufacturing units and operations would be subject this NESHAP.

Subpart JJJJJJ—National Emission Standards for Hazardous Air Pollutants for Area Sources: Industrial, Commercial, and Institutional Boilers: This subpart, finalized on February 21, 2011 but not yet published in the Federal Register or in Title 129, applies to boilers at area sources of HAPs. According to the NESHAP JJJJJJ Fact Sheet published by USEPA, boilers that burn only gaseous fuels or solid waste are not subject to the rule. The TO/HRSG system qualifies as a boiler under the subpart, but the system is restricted to burning natural gas only. Therefore, it appears that the TO/HRSG at ABE is not subject to this NESHAP. However, it is up to the permittee to evaluate the applicability of this rule to the TO/HRSG once the Subpart is official and published in the Federal Register.

Subpart VVVVVV—National Emission Standards for Hazardous Air Pollutants for Chemical Manufacturing Area Sources: This subpart, not yet adopted into Title 129, applies to area sources of HAPs that own or operate miscellaneous organic manufacturing process units (MCPU). This subpart applies to each chemical manufacturing process unit (CMPU) at an area source that uses as feedstock, generates as a byproduct, or produces as a product any of the HAPs listed in the rule. A CMPU includes all process equipment and activities involved in the production of a material described by NAICS code 325. Additionally, a CMPU includes each surge control vessel, bottoms receiver, pump, compressor, agitator, pressure relief device, sampling connection system, open-ended valve or line, valve, connector, storage tank, transfer rack, and instrumentation system associated with production.

NESHAP Subpart VVVVVV applicability for ethanol plants is currently under review by the USEPA. Information concerning this decision will be distributed as soon as it is available.

Title 129, Chapter 31 – Compliance Assurance Monitoring (CAM)

CAM applies to pollutant-specific emissions units (PSEU) at major sources required to obtain a Class I air operating permit if the unit satisfies all three of the following criteria: the PSEU is subject to an emission limitation or standard; the PSEU uses a control device to comply with the emission limitation or standard; and potential pre-control device emissions from the PSEU are greater than or equal to the amount required to be a major source under the Title V program (40 CFR 64.2). Applicable requirements that contain emission limitations or standards include BACT, NSPS, the Acid Rain program, CP requirements, and requirements under Title 129 such as Chapter 20 for PM emissions.

While ABE is subject to CAM, the requirements of the CAM regulation do not need to be implemented until the renewal of this Title V operating permit. As stated in 40 CFR 64.5(b), the owner or operator of "other PSEUs" must submit the required CAM information as part of an application for renewal of a Part 70 (Title V) permit. The PSEUs at ABE are considered "other PSEUs" because they all have post-control emissions that are less than the amount required to be a major source. Therefore, ABE will need to

submit the CAM information required by 40 CFR 64.4 with the renewal application to this operating permit. The CAM requirements will be incorporated at the time the operating permit is renewed.

40 CFR Part 68 – Chemical Accident Prevention Provisions (Risk Management Plans)

Title 129, Chapter 8, Section 011 states that an operating permit must contain conditions pertaining to the Prevention of Accidental Releases program [Section 112(r)] when a Class I source is subject to this program. ABE is not subject to this section of the Federal Clean Air Act because the source does not produce, process, handle, or store threshold quantities of substances regulated under Section 112(r). Therefore, the operating permit does not contain conditions for the Prevention of Accidental Releases program. (§68.10 and §68.115)

Operating Parameters of Control Equipment

The monitoring requirements for the control equipment are to ensure the equipment is operated in the same condition as during the stack testing. The monitored operating parameters for each piece of control equipment are not limited to the parameters listed in the permit (i.e. pressure differential, temperature). The operating parameters are those that the source normally monitors to ensure that the control equipment is operating properly.

In the case of fermentation scrubber C40, NDEQ has defined four (4) operating parameters. These parameters are the chemical addition rate, the type of chemical used, the chemical concentration, and the liquid flow rate. While there may be several other operating parameters associated with the scrubber, the four (4) parameters currently listed for the scrubber are considered most important. A change in any one listed scrubber operating parameter would require a new performance test to be conducted by the source.

Maintenance of equipment

The maintenance requirements in this operating permit for both the emissions unit and the control equipment ensure that all equipment is operated in the same condition as during the stack testing. This is required because proper maintenance is critical in assuring compliance with the operating permit.

At a minimum, all equipment at the source is to be maintained as specified in the manufacturer's documentation. The source may develop site specific maintenance manuals provided they are equivalent to one produced by the manufacturer of the equipment. The maintenance procedures should include procedures developed over time that the source uses for prevention of poor performance requiring corrective action (atypical operating parameters, leaks, noise, etc). For example, during scrubber shutdowns, the internal conditions (confined entry area) should be checked for things such as:

- Solids build-up in the demister, packing, and/or tray orifices
- Sagging scrubber trays
- Plugged nozzles
- Excessive corrosion in downcomers, trays or other areas
- Broken downcomers

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. These requirements establish several things, including a date for when records must be completed, the length of time records must be maintained, and the identification of specific types of records that must be maintained by the permittee. Records are required to be maintained to ensure compliance with all applicable requirements. Specific

recordkeeping requirements for permitted emission units can be found in the respective section covering the unit.

II.(B) This condition specifies general submittal and reporting requirements. The reports required by this condition include semi-annual deviation reports, reports of all deviations from permit requirements, the annual emissions inventory report, a submission of emissions fees, annual certification of compliance, and excess emissions reports. Unit specific reporting requirements are provided in Condition III of the permit.

II.(C) The condition requires notification be sent to NDEQ regarding changes to a source that do not require a construction permit.

II.(D) This condition includes the requirements associated with testing, as required in the permit. All performance tests required throughout this permit are required to be conducted in accordance with these conditions. The permittee is required to provide the NDEQ 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 NDEQ has the opportunity to witness the emissions testing and/or approve 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. Note that testing must take place when the source is operating at full capacity.

II.(E) A permit shield is granted. The permittee also requested and received a permit shield for requirements that appear to be applicable to ABE but are not.

II.(F) This condition requires all emission units, control equipment, and monitoring equipment to be properly installed, operated, and maintained.

II.(G) This condition requires the permittee to comply, in a timely matter, with requirements that become effective during the permit term.

II.(H)(1) This condition identifies the source-wide emission limitations at ABE. In order to comply with Condition II.(F) of the October 4, 2007 CP and to remain a minor source for HAPs, there are two source-wide HAP limits that apply to ABE. No individual HAP is allowed to exceed 10 tons per year, and all combined HAPs are not allowed to exceed 25 tons per year. Both limits are measured on a 12 month rolling total [Condition II.(F), October 4, 2007 CP; Title 129, Chapters 27 and 28].

Compliance with the emission limits in this condition must be demonstrated by performing emissions calculations every month using the calculation methodology presented in attachment A to calculate the single and total HAPs emissions. Since testing has been required under the construction permit and by this operating permit, the source must use the emission factor, in pounds per hour, derived through testing when performing the calculations. In addition, the source must use data from the most recent valid emission test conducted in accordance with Condition II.(D). Once the monthly emissions are calculated, the source is required to add the current monthly total and subtract the the total from 13 months ago to determine their rolling twelve (12) month total emissions [Condition II.(F), October 4, 2007 CP; Title 129, Chapter 8, Section 004].

II.(H)(2)(a) The permittee is required to monitor daily production/throughput rates in order to demonstrate compliance with the requirements in Condition II.(D)(3)(d). This requirement applies to emission units that have had a performance test [Title 129, Chapter 34, Section 006].

II.(H)(3)(a) To demonstrate compliance with Condition II.(H)(2)(a), ABE must keep records of daily production/throughput rates for all units that have had a performance test. These records include daily production/throughput rates and production/throughput rates on a 30 day rolling average basis [Title 129, Chapter 34, Section 006; Title 129, Chapter 8, Section 004].

II.(H)(3)(b) To demonstrate compliance with Condition II.(D)(3)(d), for emissions units that have had a performance test, ABE must notify the NDEQ of any ten (10) percent increase in daily production/throughput rate over the rate recorded during the most recent valid performance test. NDEQ must also be notified of each cumulative five (5) percent increase in daily production/throughput rate, based on a 30 day rolling average, over the rate recorded during the most recent valid performance test. Emissions units that have been tested and use a CEMS or PEMS device to demonstrate compliance are exempt from these reporting requirements [Title 129, Chapter 34, Section 006].

II.(H)(3)(c) This condition clarifies which production/throughput rates must be recorded by specifying the source track the rate used to document "maximum" capacity in their most recent performance test and as submitted to the NDEQ in their stack test report. While a source is required to test at "maximum" capacity, there are times when they cannot reach this rate at the time of a performance test. In addition, a source can make efficienty changes that increase the "maximum" capacity of an emissions unit and/or a process. These conditions, II.(H)(3)(a) through (c), are included in the operating permit to assure performance testing has been conducted at a level that is representative of the source maximum capacity.

II.(H)(3)(d) The source is required to keep a site survey or similar documentation that verifies equipment stack heights. This documentation is to be readily available to NDEQ representatives [Condition II.(E), April 6, 2009 CP].

II.(H)(3)(e) The source is required to keep a site diagram or similar documentation that demonstrates compliance with the ambient air restriction plan. This documentation is to be readily available to NDEQ representatives [Condition II.(E), April 6, 2009 CP].

III.(A) Grain Receiving, Storage, Handling, and Hammermilling

(1) This condition permits the source to operate the emission points and associated emission units listed in the table of the operating permit. With the exception of the grain storage pile, all grain receiving, storage, handling, and hammermilling are to be controlled by baghouses.

(2) This condition identifies NSPS and NESHAP requirements applicable to the grain receiving, storage, handling, and hammermilling operations at the source. As stated in the permit, no NSPS or NESHAP requirements have been identified as applicable to these operations at the source.

(3) This condition identifies the emission limitations that are applicable to the grain receiving, storage, handling, and hammermilling operations at the source. Specific PM and PM_{10} limitations have been implemented to ensure that the provisions of Title 129, Chapter 20 are not violated and to keep source-wide PM/PM_{10} emissions below the former PSD threshold of 100 tons/year. A limitation on opacity has also been included to ensure compliance with Title 129, Chapter 20.

Performance testing is required for emission points S20 and S30. Previous testing for EP# S20 conducted on April 17, 2008 demonstrated compliance with the permitted emission limit for S20. Likewise, previous testing for EP# S30 conducted on March 25-27, 2008 demonstrated compliance with the permitted limit for S30. However, given the length of time that will pass between performance tests during this permit

term, NDEQ has found it appropriate to conduct a performance test for both S20 and S30. Therefore, testing is required near the end of the permit term to verify that the emission points continue to demonstrate compliance with the PM/PM_{10} limitations.

Emission Point ID#	Pollutant	Permitted Limit	Averaging Period	Basis for Permit Limit	Performance Testing Required (Yes/No)
S20	PM/PM_{10}	1.79 lb/hr	3-hr or test method average	Title 129, Chapter 19; Condition III.(A)(2), October 4, 2007 CP	Yes
S30	PM/PM_{10}	1.18 lb/hr	3-hr or test method average	Title 129, Chapter 19; Condition III.(A)(2), October 4, 2007 CP	Yes
S18	PM	18.7 lb/hr[1]	1 Hour	Title 129, Chapter 20, Section 001	No
S20, S30	PM	55 lb/hr [2] (each)	1 Hour	Title 129, Chapter 20, Section 001	No
S18	Opacity	< 20% each[1]	6 Minutes	Title 129, Chapter 20, Section 004	No
S20, S30	Opacity	< 20% each[2]	6 Minutes	Title 129, Chapter 20, Section 004	No

[1] Testing and monitoring requirements are satisfied through compliance with Condition III.(A)(4)(d)
[2] Testing and monitoring requirements are satisfied through compliance with Condition III.(A)(4)(a), (b), and (d)

(4)(a) PM/PM_{10} emissions generated by the grain receiving, storage, handling, and hammermilling processes, with the exception of the grain storage pile (S18), are required to be controlled by baghouses [Title 129, Chapters 19 and 20; Condition III.(A)(3)(a), October 4, 2007 CP]. PM/PM_{10} emissions from the temporary grain storage pile are uncontrolled.

(4)(b) In order to control particulate emissions, each baghouse must be properly operated whenever the associated emission units are in operation [Condition III.(A)(3)(b)(i), October 4, 2007 CP]. Each baghouse is required to be properly installed, operated, and maintained. The manufacturer's operation manual, or its equivalent, must be kept on site and readily available to NDEQ representatives [Title 129, Chapter 8, Section 004]. One indication of baghouse malfunction is an atypical pressure drop across the baghouse. Therefore, each baghouse is required to be equipped with an operational pressure differential indicator [Condition III.(A)(3(b)(ii), October 4, 2007 CP; Title 129, Chapter 8, Section 004]. Baghouse bags are to be inspected and replaced according to the operations manual or more frequently based upon pressure differential readings or other indications of bag failure [Condition III.(A)(3)(b)(iii), October 4, 2007 CP; Title 129, Chapter 8, Section 004]. The source must conduct daily observations, during the daylight hours of baghouse operation, to ensure that there are not visible emissions from the stack, leaks, noise from the unit, or atypical pressure differential readings [Condition III.(A)(3)(b)(iv), October 4, 2007 CP; Title 129, Chapter 8, Section 004]. By requiring daily observations, baghouse malfunctions will be detected quickly and should be corrected. The source is required to keep an on-site inventory of spare bags of each type used [Condition III.(A)(3)(b)(iv), October 4, 2007 CP]. If a baghouse is not operating properly (i.e. has a blown bag), it is expected that there will be excess emissions emitted from the unit. Keeping spare bags and installing the bags when necessary will minimize the

duration of excess emissions events. Finally, any waste material from the baghouses must be collected, transported, and stored in a way that ensures compliance with Condition II.(Q) [Title 129, Chapter 8, Section 004].

(4)(c) This condition requires that daily observations be conducted on the grain storage pile to determine whether visible emissions are leaving the boundaries of the property. If corrective action is required to prevent the escape of visible emissions from plant property, it shall occur immediately. The results of the daily observations and any corrective actions must be kept in a log book. If no visible emissions are documented in the logbook for 45 consecutive days of grain storage, ABE may reduce the survey frequency to once per week. If visible emissions are observed at any time after the visible emissions survey frequency has been reduced, ABE must revert back to daily observations [Title 129, Chapter 8, Section 004.01A and Title 129, Chapter 20].

(4)(d) The grain receiving operations are required to be conducted within a partially enclosed building for purposes of capturing the emissions generated via the unloading process. The source must also use choke feed practices during the receipt of grain [Title 129, Chapters 19 and 20; Condition III.(A)(3)(c), October 4, 2007 CP].

(5) This condition requires specific records to be kept by the permittee to demonstrate compliance with the requirements of Condition III.(A)(4). These records include the following: documenting pressure differential indicator readings and visual emission surveys [Condition III.(A)(5)(a), October 4, 2007 CP; Title 129, Chapter 8, Section 004.02]; filter bag replacement records [Condition III.(A)(5)(b), October 4, 2007 CP]; records of daily observations and any corrective actions taken [Condition III.(A)(5)(c), October 4, 2007 CP]; documents of routine maintenance conducted [Title 129, Chapter 8, Section 004.02]; and records of the visible emissions surveys conducted on the grain storage pile [Title 129, Chapter 8, Section 004.02].

III.(B) Fermentation Operations

(1) This condition permits the source to operate the emission points and associated emission units listed in the table in III.(B)(1) of the operating permit. Emissions from fermentation operations are required to be controlled by a CO_2 scrubber.

(2) This condition identifies NSPS and NESHAP requirements applicable to the fermentation operations at the source. As stated in the permit, no NSPS or NESHAP requirements have been identified as applicable to the fermentation operations at the source.

(3) This condition identifies the emission limitations that are applicable to the fermentation operations at the source. VOC and HAP emission limitations have been established to ensure the source demonstrates compliance with Title 129, Chapter 27 (for HAP). PM/PM_{10} and VOC emission limitations have been established in order to protect construction permit requirements.

Performance testing and monitoring requirements for PM/PM_{10} are satisfied through compliance with Condition III.(B)(4)(a) and (b). Previous testing for EP# S40 conducted on January 30-February 1, 2008 demonstrated compliance with the permitted PM/PM_{10} limit for S40. So, if ABE complies with Condition III.(B)(4), NDEQ can reasonably expect the source to maintain compliance with the permitted PM/PM_{10} limit for the fermentation process at ABE.

While testing is not required for PM/PM_{10} for EP# S40, performance testing is required for both VOC and HAP emissions in order to demonstrate on-going

compliance with permitted limits. The testing requirements are explained in greater detail in the discussion of Condition III.(B)(4)(c).

Emission Point ID#	Pollutant	Permitted Limit	Averaging Period	Basis for Permit Limit	Performance Testing Required (Yes/No)
S40	PM/PM_{10}	0.25 lb/hr[1]	3-hour or test method average	Title 129, Chapter 17; Condition III.(B)(2)(a), July 28, 2008 CP.	No
	VOC	10.67 lb/hr[2]	3-hour or test method average	Title 129, Chapter 17; Condition III.(B)(2)(a), July 28, 2008 CP	Yes
	HAP	65% Control Efficiency or 20.0 ppmvd for combined HAPs	Speciation and Quantification of HAP composition at inlet and outlet	Title 129, Chapter 27; Condition III.(B)(2)(a), July 28, 2008 CP	Yes

[1] Testing and monitoring requirements are satisfied through compliance with Condition III.(B)(4)(a) and (b).
[2] Expressed as weight of VOC.

(4)(a) Emissions from emissions units EU25 through EU29 and EU31 through EU33 must be controlled by CO_2 scrubber with chemical injection (C40) [Title 129, Chapters 17 and 27; Condition III.(B)(3)(a), July 28, 2008 CP].

(4)(b) In order to control emissions, the scrubber must be properly operated whenever the associated emission units are in operation [Condition III.(B)(3)(b)(i), July 28, 2008 CP]. The scrubber is required to be properly installed, operated, and maintained. The manufacturer's operation manual, or its equivalent, must be kept on site and readily available to NDEQ representatives [Title 129, chapter 8, Section 004.01]. The permittee is also required to install a device that is capable of continuously monitoring the operating parameters of the scrubber. The parameters to be monitored include, at a minimum, the scrubbing liquid flow rate, the chemical addition flow rate, and the pressure differential. It is also required that scrubber liquid temperature be monitored daily by direct measurement [Condition III.(B)(3)(b)(ii), July 28, 2008 CP; Title 129, Chapter 8, Section 004.01].

In addition to the requirements listed above, ABE must also monitor and record the total monthly amount and type of chemical injected into scrubber S40 [Title 129, Chapter 8, Section 004.01]. These monitoring requirements, in conjunction with the recordkeeping requirements of III.(B)(5), provide NDEQ staff a way to verify whether the monitoring devices on the scrubber are properly calibrated.

The permittee is required to maintain all operating parameters of the scrubber (scrubbing liquid must be well water, scrubbing liquid flow rate, flow rate of chemical additions, and concentration of the chemical injected into the scrubber) at the levels of the most recent valid performance test conducted at the source. However, scrubber operating parameters do not need to be adhered to if the source decides to use a CEMs or PEMs device to demonstrate compliance with permitted emission limits [Condition III.(B)(3)(b)(iii), July 28, 2008 CP; Title 129, Chapter 8, Section 004].

The source must conduct daily observations, during the daylight hours of scrubber operation, to ensure that there are not visible emissions from the stack, leaks, noise from the unit, or atypical parameter readings [Title 129, Chapter 8, Section 004.01C; Condition III.(B)(3)(b), July 28, 2008 CP].

The source must properly maintain and calibrate the scrubbing liquid flow meter and the chemical addition flow meter in accordance with manufacturer's instructions [Title 129, Chapter 8, Section 004].

(4)(c) Condition III.(B)(4)(c) establishes testing requirements applicable to the scrubber (C40). By March 31 of each year, the permittee is required to calculate source-wide rolling 12-month total emissions of the largest single HAP. In order to calculate these emissions, the source must use emission factors derived from the most recent testing as required in III.(B)(4)(c)(ii). The permittee must also use the methodology required in Condition II.(H)(1)(a) to calculate emissions. Essentially, NDEQ is requiring the source to use the methodology found in Attachment A of the permit. Finally, the permittee must submit to the air division the 12-month rolling total emissions, including all supporting calculations used to calculate the emissions, by April 30 of each year [Title 129, Chapter 8, Section 004].

The testing frequency for the scrubber is determined by the source-wide rolling 12 month total emissions of the single largest HAP at the source. The testing frequency is determined on March 31 of each year, and is based on the following Tiers:

Tier	Rolling 12-Month Total Emissions of Largest Single HAP	Testing Frequency
1	<2.5 tons per year	Twice per permit term
2	≥2.5 tons per year and <5 tons per year	Annual
3	≥ 5 tons per year and < 8 tons per year	Semi-Annual
4	≥ 8 tons per year	Quarterly

At time of permit issuance, ABE is required to conduct performance testing in accordance with Tier 2. However, the testing frequency may be adjusted, if applicable, on March 31 of each year. It is required that the source conduct at least one (1) test during the third quarter (July through September) of each year. Additionally, the emissions testing protocol required in Condition II.(D)(3)(b) must identify all operating ranges at the source that testing will cover. Also, only one valid performance test may be conducted at each operating range when conducting performance tests on scrubber C10 [Title 129, Chapter 8, Section 015.03 and Chapter 34].

(4)(d) This condition establishes requirements that must be followed if ABE chooses to install a CEMS or PEMS system on the fermentation scrubber. If a qualifying CEMS or PEMS is used, the monitoring and testing requirements of Conditions III.(B)(4)(b)(iii) through III.(B)(4)(b)(v) and Condition III.(B)(4)(c) are no longer in effect [Title 129, Chapter 8, Section 004]. A CEMS or PEMS device provides adequate monitoring to ensure continuous compliance with applicable requirements, so these conditions would no longer be necessary in situations where a CEMS or PEMS is used.

If ABE chooses to install a CEMS or PEMS, they must notify the NDEQ at least sixty (60) days prior to installation of the system. ABE must comply with Performance Specifications and other regulations, as appropriate, once the CEMS or PEMS device is installed and operational.

Note: Condition III.(B)(4)(d) differs from Condition III.(B)(3)(b)(iii) of the July 28, 2008 CP. This difference must be noted due to the provisions of Title 129, Chapter 8, Section 002.01. The original CP condition stated that alternate scrubber operating parameters could be used if test results or operation of a CEMs device demonstrated that the source was achieving better emissions control. However, NDEQ has determined that there is no need to adhere to scrubber operating parameters when a CEMs device is used to demonstrate compliance. Condition III.(B)(4)(d) has been altered to reflect this fact.

(5) This condition requires specific records to be kept by the permittee. These records include the following: the readings of continuous monitoring of operating parameters, including readings of scrubbing liquid flow rate, chemical addition flow rate, and scrubber pressure differential readings [Conditions III.(B)(5)(a) and (c), July 28, 2008 CP; Title 129, Chapter 8, Section 004.02]; monthly records that document the total amount and type of the chemical injected into the scrubber [Title 129, Chapter 8, Section 004.02]; monthly purchase records that document the date and amount of chemical purchased for the scrubber [Title 129, Chapter 8, Section 004.02]; records that document the operating parameters developed during the most recent valid performance test conducted at the source [Title 129, Chapter 8, Section 004.02]; records documenting the date, time, observations, and corrective actions taken for each day the associated scrubber is in operation [Condition III.(B)(5)(b), July 28, 2008 CP; Title 129, Chapter 8, Section 004.02]; records documenting equipment failures, malfunctions, or other variations [Title 129, Chapter 8, Section 004.02]; records documenting when routine maintenance and preventive actions were performed with a description of the maintenance and/or preventive action performed [Title 129, Chapter 8, Section 004.02]; and records that document source-wide emissions of individual HAPs and total HAPs [Title 129, Chapter 8, Section 004.02]. Maintaining these records helps ABE demonstrate compliance with the requirements of Condition III.(B)(4)(b), (c), and (d).

III.(C) TO/HRSG Operations

(1) This condition permits the source to operate the emission points and associated emission units listed in the table in III.(C)(1) of the operating permit. The distillation vent emissions and dryer process emissions are required to be controlled by the TO/HRSG.

(2)(a) NSPS Subparts A and Db [Title 129, Chapter 18, Sections 001.01 and 001.22] apply to both TO/HRSG units at ABE [Condition III.(C)(4), April 6, 2009 CP].

(2)(b) No NESHAP requirements are applicable to ABE.

(3)(a) This condition identifies the emission limitations that are applicable to the TO/HRSG operations at the source. Limitations have been established to ensure the source demonstrates compliance with Title 129, Chapter 27 (for HAPs). PM and VOC emission limitations have been established in order to protect construction permit requirements. Emission limitations for PM_{10}, SO_x, and CO have been established to ensure that the information submitted in the construction permit application and emissions used in the air dispersion modeling analysis that demonstrated compliance with the NAAQS is valid. NO_x limitations have been put in place to ensure compliance with NSPS Subpart Db. PM, Opacity, and SO_x requirements have also been included to ensure compliance with Title 129, Chapters 20 and 24.

Testing and monitoring requirements are not required for NO_x emissions from EP# S10. Since a CEMS devices is required by both NSPS Subpart Db and Condition III.(C)(4)(b)(iv), testing and monitoring requirements for NO_x are unnecessary.

Emission Point ID#	Pollutant	Permitted Limit	Averaging Period	Basis for Permit Limit	Performance Testing Required (Yes/No)
S10	PM/PM_{10}	4.074 lb/hr	3-hour or test method average	Title 129, Chapter 17; Condition III.(C)(2), April 6, 2009 CP.	Yes
	NO_x	0.1 lb/MMBtu[1]	30 day rolling average	40 CFR 60.40b; Title 129, Chapter 18; Condition III.(C)(2), April 6, 2009 CP	No
	SO_2	18.33 lb/hr	3-hour or test method average	Title 129, Chapter 17; Condition III.(C)(2), April 6, 2009 CP	Yes
	CO	20.78 lb/hr	3-hour or test method average	Title 129, Chapter 17; Condition III.(C)(2), April 6, 2009 CP	Yes
	VOC	4.07 lb/hr	3-hour or test method average	Title 129, Chapter 17; Condition III.(C)(2), April 6, 2009 CP	Yes
S10	HAP	N/A	Speciation and Quantification of HAP composition	Title 129, Chapter 27; Condition III.(C)(2), April 6, 2009 CP	Yes
	PM	43.97 lb/hr[2]	1 Hour	Title 129, Chapter 20, Section 001	No
	PM	101.61 lbs/hr[2]	1 Hour	Title 129, Chapter 20, Section 002	No
	Opacity	< 20 percent[2]	6 minutes	Title 129, Chapter 20, Section 004	No

[1] Testing is not required because a CEMS unit is required by NSPS Subpart Db and Condition III.(C)(4)(b)(iv).
[2] Monitoring and testing requirements are satisfied through compliance with Condition III.(C)(4).

(3)(b) ABE is required to conduct performance testing for EP# S10 twice during the permit term. The first test must be conducted within one (1) year of permit issuance. The second test must be conducted no more than twenty-four (24) months and no less than twelve (12) months before permit expiration. Recent experience with similar units has shown changes in the air to fuel ratio of the system can cause large fluctuations in emissions. Therefore, NDEQ has determined that periodic testing is required to ensure all emission limits are being met. Testing data also provides useful information that can be used when ABE renews this operating permit.

(4)(a) In order to control PM/PM_{10}, VOC, and HAP emissions, thermal oxidizer systems must be properly operated whenever the associated emission units are in operation. The source has constructed two 122.0 MMBtu/hr recuperative thermal oxidizers with heat recovery steam generators (TO/HRSG) to control emissions. The two TO/HRSG systems are routed to a common stack [Condition III.(C)(3)(a), April 6, 2009 CP].

(4)(b) In order to control emissions, the TO/HRSG systems must be properly operated whenever the associated emission units are in operation [Condition III.(C)(3)(b)(i), April 6, 2009 CP]. The TO/HRSG systems are required to be properly installed, operated, and maintained. The manufacturer's operation manual, or its equivalent, must be kept on site and readily available to NDEQ representatives [Condition III.(C)(3)(b)(ii), April 6, 2009 CP].

The combustion chamber temperature is important in determining whether the thermal oxidation system is providing appropriate emissions control. Therefore, each system is required to be equipped with a thermocouple or equivalent device that continuously monitors the temperature in the combustion chamber [Condition III.(C)(3)(b)(iii), April 6, 2009 CP]. The TO/HRSG system must also be equipped with an operational NO_x CEMS device that is properly installed, operated, calibrated, and maintained in accordance with NSPS, Subpart Db [Condition III.(C)(3)(b)(iv), April 6, 2009 CP]. Additionally, all monitored operating parameters for the TO/HRSG system are to be maintained at levels recorded during the most recent performance test that demonstrated compliance with the permitted emission limits [Condition III.(C)(3)(b)(v), April 6, 2009 CP]. Finally, the source must conduct daily observations, during the daylight hours of operation, to ensure that there are not visible emissions from the stack, leaks, or noise from the unit. By requiring daily observations, malfunctions will be detected quickly and should be corrected [Condition III.(C)(3)(b)(vi), April 6, 2009 CP].

(4)(c) This condition requires the permittee to combust only natural gas or biogas in the DDGS Dryers (EU10A, EU10B, EU10C, and EU10D). Combustion of natural gas and/or biogas ensures that the dryer operations are consistent with emissions calculations and keeps the source a minor source with regards to the PSD program [Title 129, Chapter 8, Section 004.01; Condition III.(C)(1), April 6, 2009 CP].

(4)(d) This condition requires the permittee to combust only natural gas in the TO/HRSG system (C10A and C10B). Combustion of natural gas ensures that TO/HRSG system operation is consistent with emissions calculations and keeps the source a minor source with regards to the PSD program [Title 129, Chapter 8, Section 004.01, Condition III.(C)(1), April 6, 2009 CP].

(5) This condition specifies recordkeeping requirements applicable to the TO/HRSG operations at the source. Records to be kept include the following: the date, time, and hourly temperature averages of the TO/HRSG burners [Condition III.(C)(5)(d), April 6, 2009 CP]; documentation of routine observations and records of any corrective taken [April 6, 2009 CP]; all records of routine maintenance and preventative actions [Title 129, Chapter 8, Section 004.02]; fuel records that show the type of fuel combusted in the DDGS dryers and TO/HRSG system [Title 129, Chapter 8, Section 004.02]; and reporting and records as required by NSPS Subpart A and Subpart Db [Condition III.(C)(5)(a) through (c), April 6, 2009 CP].

III.(D) DDGS Coolers

(1) This condition allows the permittee to operate the emission points and associated emission units listed in the table in III.(D)(1) of the operating permit. Emissions from DDGS cooling units are required to be controlled by baghouses.

(2) This condition identifies NSPS and NESHAP requirements applicable to the DDGS Cooling operations at the source. As stated in the permit, no NSPS or NESHAP

requirements have been identified as applicable to the DDGS Cooling operations at the source.

(3) This condition identifies the emission limitations that are applicable to the DDGS Cooling, Storage, and Loadout operations at the source. VOC emission limitations were established in the July 28, 2008 CP to ensure that the source remained below the former 100 tpy PSD threshold. Limitations for PM/PM_{10} also keep source-wide emissions below 100 tons/year, as well as keep the source in compliance with Title 129, Chapter 20. The Opacity limitation ensures compliance with Title 129, Chapter 20.

Testing and monitoring requirements for EP# S70 are satisfied through compliance with Condition III.(D)(4). Previous testing conducted on January 30-February 1, 2008 for EP# S70 demonstrated compliance with VOC permitted limits. Likewise, testing conducted on March 25-27, 2008 for EP# S70 demonstrated compliance with the PM/PM_{10} permitted limit. So, if ABE complies with Condition III.(D)(4), NDEQ can reasonably expect the source to maintain compliance with the permitted limits for the fermentation process at ABE

Emission Point ID#	Pollutant	Permitted Limit	Averaging Period	Basis for Permit Limit	Performance Testing Required (Yes/No)
S70	PM/PM_{10}	0.86 lb/hr[1]	3-hour or test method average	Title 129, Chapter 19; Condition III.(D)(2), July 28, 2008 CP	No
	VOC	4.07 lb/hr[1]	3-hour or test method average	Title 129, Chapter 19; Condition III.(D)(2), July 28, 2008 CP	No
	PM	44.0 lb/hr[1]	1 Hour	Title 129, Chapter 20, Section 001	No
	Opacity	< 20 percent[1]	6 minutes	Title 129, Chapter 20, Section 004	No

[1] Testing and monitoring requirements satisfied through compliance with Condition III.(D)(4).

(4)(a) Emissions generated by the DDGS cooling process are required to be controlled by baghouses (C70a and C70b) [Condition III.(D)(3)(a), July 28, 2008 CP].

(4)(b) In order to control particulate emissions, the baghouses must be properly operated whenever the associated emission units are in operation [Condition III.(D)(3)(b)(i), July 2008 CP]. The baghouses are required to be properly installed, operated, and maintained. The manufacturer's operation manual, or its equivalent, must be kept on site and readily available to NDEQ representatives [Title 129, Chapter 8, Section 004.01]. One indication of baghouse malfunction is an atypical pressure drop across the baghouse. Therefore, the baghouses are required to be equipped with an operational pressure differential indicator [Condition III.(D)(3)(b)(ii), July 28, 2008 CP; Title 129, Chapter 8, Section 004.01]. Baghouse bags are to be inspected and replaced according to the operations manual or more frequently based upon pressure differential readings or other indications of bag failure [Condition III.(D)(3)(b)(iii), July 28, 2008 CP]. The source must conduct daily observations, during the daylight

hours of baghouse operation, to ensure that there are not visible emissions from the stack, leaks, noise from the unit, or atypical pressure differential readings [Condition III.(D)(3)(b)(iv), July 28, 2008 CP]. By requiring daily observations, baghouse malfunctions will be detected quickly and should be corrected. The source is required to keep an on-site inventory of spare bags of each type used [Condition III.(D)(3)(b)(v), July 2008 CP]. If a baghouse is not operating properly (i.e. has a blown bag), it is expected that there will be excess emissions emitted from the unit. Keeping spare bags and installing the bags when necessary will minimize the duration of excess emissions events. Finally, any waste material from the baghouses must be collected, transported, and stored in a way that ensures compliance with Condition I.(Q) [Title 129, Chapter 8, Section 004.01C].

(5) This condition requires specific records to be kept by the permittee. These records include the following: documenting pressure differential indicator readings [Condition III.(D)(5)(a), July 28, 2008 CP]; filter bag replacement records [Condition III.(D)(5)(b), July 28, 2008 CP]; indicators that corrective action is needed, daily observations, and any corrective actions taken [Condition III.(D)(5)(c), July 28, 2008 CP]; and records of routine maintenance and preventive actions taken [Title 129, Chapter 8, Section 004.02].

III.(E) Solid Product Storage and Loadout

(1) This condition allows the permittee to operate the emission points and associated emission units listed in the table in III.(E)(1) of the operating permit. Emissions from solid product storage and loadout are required to be controlled by baghouses.

(2) This condition identifies NSPS and NESHAP requirements applicable to the solid product storage and loadout operations at the source. As stated in the permit, no NSPS or NESHAP requirements have been identified as applicable to the DDGS Cooling operations at the source.

(3) This condition identifies the emission limitations that are applicable to the solid product storage and loadout operations at the source. Limitations for PM/PM_{10} keep source-wide emissions below the former 100 tpy major PSD threshold, as well as keep the source in compliance with Title 129, Chapter 20. The Opacity limitation ensures compliance with Title 129, Chapter 20.

Testing and monitoring requirements for EP# S90 are satisfied through compliance with Condition III.(E)(4). Previous testing conducted on March 25-27, 2008 for EP# S90 demonstrated compliance with permitted limits. So, if ABE complies with Condition III.(D)(4), NDEQ can reasonably expect the source to maintain compliance with the permitted limits for solid product storage and loadout operations at ABE.

Emission Point ID#	Pollutant	Permitted Limit	Averaging Period	Basis for Permit Limit	Performance Testing Required (Yes/No)
S90	PM/PM_{10}	0.39 lb/hr[1]	3-hour or test method average	Title 129, Chapter 19; Condition III.(E)(2), October 4, 2007 CP	No
S90	PM	44.0 lb/hr[1]	1 Hour	Title 129, Chapter 20,	No

Emission Point ID#	Pollutant	Permitted Limit	Averaging Period	Basis for Permit Limit	Performance Testing Required (Yes/No)
				Section 001	
	Opacity	< 20 percent[1]	6 minutes	Title 129, Chapter 20, Section 004	No

[1] Testing and monitoring requirements satisfied through compliance with Condition III.(E)(4).

(4)(a) Emissions generated by solid product storage and loadout operations are required to be controlled by a baghouse (C90) [Condition III.(E)(3)(a), October 4, 2007 CP].

(4)(b) In order to control particulate emissions, the baghouse must be properly operated whenever the associated emission units are in operation (III.(E)(3)(b)(i), October 4, 2007 CP). The baghouse is required to be properly installed, operated, and maintained. The manufacturer's operation manual, or its equivalent, must be kept on site and readily available to NDEQ representatives [Title 129, Chapter 8, Section 004.01]. One indication of baghouse malfunction is an atypical pressure drop across the baghouse. Therefore, the baghouse is required to be equipped with an operational pressure differential indicator [Condition III.(E)(3)(b)(ii), October 4, 2007 CP; Title 129, Chapter 8, Section 004.01]. Baghouse bags are to be inspected and replaced as often as necessary to ensure proper operation or more frequently based upon pressure differential readings or other indications of bag failure [Condition III.(E)(3)(b)(iii), October 4, 2007 CP]. The source must conduct daily observations, during the daylight hours of baghouse operation, to ensure that there are not visible emissions from the stack, leaks, noise from the unit, or atypical pressure differential readings [Condition III.(E)(3)(b)(iv), October 4, 2007 CP]. By requiring daily observations, baghouse malfunctions will be detected quickly and should be corrected. The source is required to keep an on-site inventory of spare bags of each type used [Condition III.(E)(3)(b)(v), October 4, 2007 CP]. If a baghouse is not operating properly (i.e. has a blown bag), it is expected that there will be excess emissions emitted from the unit. Keeping spare bags and installing the bags when necessary will minimize the duration of excess emissions events. Finally, any waste material from the baghouses must be collected, transported, and stored in a way that ensures compliance with Condition I.(Q) [Title 129, Chapter 8, Section 004.01].

(5) This condition requires specific records to be kept by the permittee. These records include the following: documenting pressure differential indicator readings [Condition III.(E)(5)(a), October 4, 2007 CP]; filter bag replacement records [Condition III.(E)(5)(b), October 4, 2007 CP]; indicators that corrective action is needed, daily observations, and any corrective actions taken [Condition III.(E)(5)(c), October 4, 2007 CP]; documentation of routine maintenance and preventive actions performed [Title 129, Chapter 8, Section 004.02].

III.(F) Tanks

(1) The condition states that the permittee is permitted to operate the storage and process tanks, at the capacity and for the products specified, as listed in the table in the operating permit.

(2)(a) NSPS Subparts A and Kb [Title 129, Chapter 18, Sections 001.01 and 001.62] apply to the storage tanks (Tanks TK61, TK62, and TK64) at ABE [Condition III.(F)(3)(c) and Condition III.(F)(4), October 4, 2007 CP].

(2)(b) The NDEQ has not identified any NESHAPs that are applicable to the tanks at the source.

(3) For tanks TK61, TK62, and TK64, emission limitations and testing requirements are as established by 40 CFR 60 Subpart Kb [Condition III.(F)(2), October 4, 2007 CP].

(4)(a) All of the anhydrous ethanol, denaturant, and denatured ethanol tanks located at the source are required to be equipped with an internal floating roof to comply with State HAP BACT requirements [Title 129, Chapter 27; Condition III.(F)(3)(a), October 4, 2007 CP].

(4)(b) Process tanks TK 63 and TK65 must not have direct product loadout capabilities. All process tanks must loadout to additional processing equipment, other process tanks, or to the storage tanks at the source [Condition III.(F)(3)(b), October 4, 2007 CP].

(4)(c) Tanks TK61, TK62, and TK64 are subject to all applicable requirements of NSPS Subpart Kb [Title 129, Chapter 18; Condition III.(F)(3)(c), October 4, 2007 CP].

(5) This condition specifies the recordkeeping requirements applicable to the tanks at the source. Records for tanks TK61, TK62, and TK64 are to be kept in accordance with NSPS Subpart Kb. Also, operation and maintenance records for the internal floating roofs on Tanks TK 63 and TK65 that demonstrate compliance with Specific Condition III.(F)(4)(a) are to be maintained by the permittee. Additional recordkeeping requirements in accordance with Specific Condition II.(A) are also required to be maintained [Condition III.(E)(5), May 16, 2008 CP].

III.(G) Ethanol Liquid Loading

(1) This condition permits the permittee to operate the emission points and associated emission units listed in the table in III.(G)(1) of the operating permit. VOC and HAP emissions from truck and rail loadout are required to be captured and controlled by a vapor recovery system and loadout flare.

(2) This condition identifies NSPS and NESHAP requirements applicable to the Ethanol Loadout operations at the source. As stated in the permit, no NSPS or NESHAP requirements have been identified as applicable to the ethanol loadout operations.

(3) This condition identifies the emission limitations that are applicable to the ethanol loadout operations at the source. PM and Opacity limits have been implemented to ensure compliance with Title 129, Chapter 20.

Testing and monitoring requirements are not specified for EP# S50. Potential to emit (PTE) calculations for EP# S50 show that maximum emissions of PM and SO_x are well below the permitted limit as specified in Title 129, Chapters 20 and 24. ABE also satisfies opacity monitoring and testing requirements through the proper use of the vapor recovery system and the combustion of natural gas in the flare. Therefore, NDEQ can expect ABE to be in compliance with these limits.

Emission Point ID#	Pollutant	Permitted Limit	Averaging Period	Basis for Permit Limit	Performance Testing Required (Yes/No)
S50	PM	7.07 lb/hr[1]	Hourly	Title 129, Chapter 20, Section 002	No
	Opacity	< 20 percent[2]	6 minutes	Title 129, Chapter 20, Section 004	No

[1] Emission factor for PM is below the permitted limit from Chapter 20 (See Fact Sheet Attachment A-11). Therefore, no monitoring or testing is required for this emission point.
[2] Compliance with Condition III.(G)(4)(c) and (e) satisfies the testing and monitoring requirements for opacity.

(4)(a) This condition specifies that during any period of twelve (12) consecutive calendar months, ethanol loadout by truck must not exceed 27,500,000 gallons. This requirement ensures that source emissions remain below the former 100 tpy major PSD threshold for haul road emissions [Title 129, Chapter 19; Condition III.(G)(3), October 4, 2007 CP].

(4)(b) Truck loadout operations are to be equipped with a flow meter to record the amount of ethanol loaded out. This meter must be properly operated, calibrated, and maintained. The manufacturer's operation and maintenance manual, or its equivalent, detailing proper operation, inspection, and maintenance of the flow meter must be kept on site and readily available to NDEQ representatives. Requiring a flow meter, in conjunction with the flow meter recordkeeping requirements in Condition III.(G)(5), assures that ABE will not exceed the ethanol loadout limitations found in Condition III.(G)(4)(a) [Condition III.(G)(3)(a), October 4, 2007 CP].

(4)(c) VOC and HAP emissions from the truck and rail ethanol loadout operations are required to be captured and controlled by a vapor recovery system. This system is to be operational at all times ethanol loading is occurring at the source [Title 129, Chapters 19 and 27; Condition III.(G)(3)(b), October 4, 2007 CP].

The closed vapor recovery system is required to 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 vapor recovery system and flare shall be kept on site and readily available to NDEQ representatives. Also, when ethanol loadout is occurring, a flame shall be present at the flare. The source must install an appropriate safety device or flame monitoring system to ensure that truck and rail loadout cannot occur without the presence of a flame. The safety device or flame monitoring system shall be properly installed, operated, calibrated, and maintained. The manufacturer's operation and maintenance manual, or its equivalent, detailing proper operation, inspection, and maintenance of the flare monitoring device/system shall be kept on site and readily available to NDEQ representatives [Title 129, Chapters 19 and 27; Condition III.(G)(3)(e), October 4, 2007 CP].

(4)(d) The liquid loadout flare (C50) must not exceed 3,000 hours of operating time per any period of twelve (12) consecutive calendar months. The pilot light for the flare is permitted to operate on a continuous basis. The flare must also be equipped with a non-resettable hour meter. This requirement, in conjunction with the recordkeeping requirements for the flare found in Condition III.(G)(5) assures that ABE will not

exceed the 3,000 hour operating limit imposed on flare operations [Title 129, Chapter 19; Condition III.(G)(3)(c), October 4, 2007 CP].

(4)(e) The liquid loadout flare is required to combust only liquid loadout vapors and natural gas. Combustion of these fuels ensures that flare operation is consistent with emissions calculations and keeps the source a minor source with regards to the PSD program [Title 129, Chapter 8, Section 004.01; Condition III.(G)(1), October 4, 2007 CP].

(4)(f) Submerged or bottom loading is required when transferring liquid to limit the amount of VOCs and HAPs emitted during the transfer process [Title 129, Chapters 19 and 27; Condition III.(G)(3)(d), October 4, 2007 CP].

(5) This condition specifies the recordkeeping requirements applicable to the ethanol loadout operations at the source. Records required to be maintained include the following: the gallons of ethanol loaded out for each calendar month and each period of twelve (12) consecutive calendar months [Condition III.(G)(5)(a), October 4, 2007 CP; Title 129, Chapter 8, Section 004.02]; documentation of routine maintenance and preventive actions that were performed on the vapor recovery system [Condition III.(G)(5)(b), October 4, 2007 CP]; documentation of equipment failures, malfunctions, or other variations, including the time of occurrence, remedial action taken, and when corrections were made on the vapor recovery system with flare [Condition III.(G)(5)(d), October 4, 2007 CP]; records of hours of operation for the flare for each calendar month and each period of twelve (12) consecutive calendar months [Condition III.(G)(5)(d), October 4, 2007 CP]; and records documenting fuels combusted by the flare [Title 129, Chapter 8, Section 004.02].

III.(H) Equipment Leaks

(1) Each valve, pump, compressor, pressure relief device, sampling connection system open-ended valve or line, flange, or other connector in VOC service and any device or system required by NSPS, Subpart VV located throughout the ethanol plant is considered a permitted emission point.

(2)(a) NSPS Subparts A and VV [Title 129, Chapter 18, Sections 001.01 and 001.14] apply to all components listed in Condition III.(H)(1) at ABE Fairmont, LLC [Condition III.(H)(4), October 4, 2007 CP].

(2)(b) The NDEQ has not identified any NESHAPs that are applicable to equipment leaks at the source.

(3) The emission limitations for equipment leaks at the source are specified by NSPS Subpart VV [Condition III.(H)(2), October 4, 2007 CP].

(4) The operational and monitoring requirements for equipment leaks at the source are specified by NSPS Subpart VV [Condition III.(H)(3), October 4, 2007 CP].

(5) This condition specifies recordkeeping requirements that apply to equipment leaks at the source. The records that must be maintained include the following: notifications, recordkeeping, and reporting as required by NSPS Subparts A and VV [Conditions III.(H)(5)(a) and (b), October 4, 2007 CP]; records that include the date that leak detection testing occurred; which valves, pumps, seals, open-ended lines, flanges, connectors, etc. were tested; and who conducted the testing [Condition III.(H)(5)(c), October 4, 2007 CP]; and submission of a semi-annual leak detection and repair report every six (6) calendar months to the NDEQ. The reports shall be submitted

within 45 days following June 30 and December 31 of each year. Each report must be certified by a responsible official and include the date and time testing occurred, who conducted the testing, and additional information required to be reported to the NDEQ in accordance with Subpart VV [Condition III.(H)(5)(d), October 4, 2007 CP].

III.(I) Haul Roads

(1) This condition specifies that all on-site haul roads are to be paved [Title 129, Chapters 17 and 32; Condition III.(I)(1), April 6, 2009 CP].

(2) This condition identifies NSPS and NESHAP requirements applicable to the haul roads located at the source. As stated in the permit, no NSPS or NESHAP requirements have been identified as applicable to the haul roads.

(3) This condition requires the permittee to comply with a 1.0 g/m^2 silt load limitation [Title 129, Chapter 17; Condition III.(I)(2)(a), April 6, 2009 CP].

(4) The source is required to develop a fugitive dust control plan (FDCP) to control emissions from haul roads. The FDCP shall outline the control methods, frequencies, and triggers for when implementation of fugitive dust controls will be utilized based on daily surveys [Condition III.(I)(3)(a), April 6, 2009 CP].

This condition also requires that the owner or operator conduct a survey of the plant property and haul roads to determine if visible fugitive emissions are being generated and leaving plant property. Implementation of fugitive dust control shall be taken upon observation of visible fugitive emissions leaving plant property or more frequently in accordance with the FDCP. Documentation of all corrective actions and daily surveys must be maintained in a log that shall accompany the FDCP [Condition III.(I)(3)(b), April 6, 2009 CP].

(5) This condition requires that the permittee maintain the following records: the FDCP must be maintained on site and readily available to NDEQ representatives [Condition III.(I)(5)(a), April 6, 2009 CP]; documents that show the use of fugitive dust control measures [Condition III.(I)(5)(b), April 6, 2009 CP]; documents that show haul road visible emission checks are conducted daily during plant operation and a description of any corrective action taken [Condition III.(I)(5)(c), April 6, 2009 CP].

III.(J) Cooling Tower

(1) This condition permits the permittee to operate the emission points and associated emission units listed in the table in III.(J)(1) of the operating permit.

(2) This condition identifies NSPS and NESHAP requirements applicable to the cooling tower located at the source. As stated in the permit, no NSPS or NESHAP requirements have been identified as applicable to the cooling tower operations.

(3) This condition identifies the emission limitations applicable to the cooling tower at the source. A PM limit has been implemented to ensure compliance with Title 129, Chapter 20.

Testing and monitoring requirements are not specified for the cooling tower. Drift loss and TDS limitations are written into the operating permit. When using these limitations, PTE calculations for PM from the cooling tower are well below the permitted limit. Therefore, compliance with Condition III.(J)(4) gives NDEQ reasonable assurance that ABE is complying with the permitted PM limit.

Emission Point ID#	Pollutant	Permitted Limit	Averaging Period	Basis for Permit Limit	Performance Testing Required (Yes/No)
F80	PM	115 lb/hr[1]	Hourly	Title 129, Chapter 20, Section 001	No

[1] Testing and monitoring requirements satisfied through compliance with Condition III.(J)(4).

(4) A limitation on the drift loss percentage from the cooling tower has been established based on the manufacturer's drift loss specification. If the cooling tower is properly maintained and operated, it is expected that the permittee would be in compliance with the drift loss percent limitation [Title 129, Chapter 19; Condition III.(J)(3)(a), October 4, 2007 CP].

The total dissolved solids (TDS) concentration in the cooling tower water has been limited to 2,500 ppm to ensure PM/PM_{10} emissions from the cooling tower are consistent with the emission calculations performed. A representative TDS sample shall be collected and tested from each cooling tower a minimum of once per calendar month. The test method used to determine TDS concentration shall be in accordance with an EPA approved method and be documented [Title 129, Chapter 19; Condition III.(J)(3)(b), October 4, 2007 CP].

(5) This condition specifies the recordkeeping requirements applicable to the cooling tower at the source. Records to be maintained by the permittee include the TDS concentration from testing results [Title 129, Chapter 8, Section 004.02; Condition III.(J)(5), October 4, 2007 CP]. The manufacturer's drift loss specification must also be kept on site and be readily available to NDEQ representatives for the life of the unit [Condition III.(J)(3)(a), October 4, 2007 CP].

III.(K) Biomethanator Operations

(1) This condition permits the permittee to operate the emission points and associated emission units listed in the table in III.(K)(1) of the operating permit. Methane emissions from the biomethanator are required to be captured and controlled by a flare if the gas is not burned in the TO/HRSG units.

(2) This condition identifies NSPS and NESHAP requirements applicable to the biomethanator operations located at the source. As stated in the permit, no NSPS or NESHAP requirements have been identified as applicable to the biomethanator operations.

(3) This condition identifies the emission limitations that are applicable to the biomethanator operations at the source. PM and Opacity requirements have been implemented to ensure compliance with Title 129, Chapter 20.

Testing and monitoring requirements are not specified for EP# S60. PTE calculations for EP# S50 show that maximum emissions of PM and SO_x are well below the permitted limit as specified in Title 129, Chapters 20 and 24. Monitoring and testing requirements for opacity are satisfied through using a vapor recovery system and combusting natural gas in the flare. Therefore, NDEQ can expect ABE to be in compliance with these limits.

Emission Point ID#	Pollutant	Permitted Limit	Averaging Period	Basis for Permit Limit	Performance Testing Required (Yes/No)
S60	PM	3.9 lb/hr[1]	Hourly	Title 129, Chapter 20, Section 002	No
	Opacity	< 20 percent[2]	6 minutes	Title 129, Chapter 20, Section 004	No

[1] Emission factor for PM is below the permitted limit from Chapter 20 (See Fact Sheet Attachment A-17). Therefore, no monitoring or testing is required for this emission point.
[2] Compliance with Condition III.(K)(4) satisfies the testing and monitoring requirements for opacity.

(4)(a) Emissions from the biomethanators are required to be controlled by the biomethanator flare. Alternatively, biogas generated from the biomethanators may be burned in the dryers associated with the thermal oxidizer [Condition III.(K)(3)(1), October 4, 2007 CP].

(4)(b) The biomethanator flare (excluding the pilot) is limited to combusting the biogas generated for a maximum of 500 hours per any period of twelve (12) consecutive calendar months. In order to determine hours of operation, the biomethanator flare is required to be equipped with a non-resettable hour meter to record operating hours [Title 129, Chapters 4 and 19; Condition III.(K)(3)(b), October 4, 2007 CP]. These conditions were implemented in order to limit source-wide emissions below the former 100 tpy major PSD threshold.

(4)(c) This condition stipulates that a flame must be present at the flare when emissions are being routed to the biomethanator flare. The source must install an appropriate safety device or flare monitoring system to ensure that emissions cannot be sent to the flare without the presence of a flame [Title 129, Chapters 19 and 27; Condition III.(K)(3)(c), October 4, 2007 CP].

(4)(d) This condition specifies that the four biomethanators, the biomethanator flare, the flare safety device, and the non-resettable hour meter, are to be properly designed, installed, operated, and maintained. The manufacturer's manual, or its equivalent, must be kept on site and readily available to NDEQ representatives for all the pieces of equipment listed in Condition III.(K)(4)(d) [Title 129, Chapter 8, Section 002].

(5) This condition specifies that the permittee must maintain the following records to demonstrate compliance with Condition III.(K)(4): all records that document the operating hours of the flare for each calendar month and each period of twelve (12) consecutive calendar months [Condition III.(K)(5), October 4, 2007 CP; Title 129, Chapter 8, Section 004.02]; documentation of the fuel type combusted in the biomethanator flare [Title 129, Chapter 8, Section 004.02]; and records documenting routine maintenance and preventive actions, as well as records documenting equipment failures, malfuctions, and other variations, for the biomethanators, biomethanator flare, and the equipment associated with the flare [Title 129, Chapter 8, Section 004.02].

III.(L) Emergency Equipment

(1) This condition permits the permittee to operate the emission points and associated emission units listed in the table in III.(L)(1) of the operating permit.

(2)(a) This condition identifies NSPS and NESHAP requirements applicable to the emergency equipment located at the source. NSPS Subparts A and IIII [Title 129, Chapter 18, Sections 001.01 and 001.76] apply to the Emergency Fire Pump Engine [Condition III.(L)(4), April 6, 2009 CP].

Note: The April 6, 2009 construction permit correctly identifies that the emergency equipment at ABE Fairmont, LLC is subject to NSPS Subpart IIII, and correctly identifies the appropriate Federal regulatory citation. Thus, this construction permit requirement provides the regulatory basis for the operating permit condition that identifies Subpart IIII as applicable to this source. However, the title of the NSPS and the Nebraska Title 129 regulatory citation found in the construction permit is incorrect. Therefore, under the provisions of Title 129, Chapter 8, Section 002.01, this operating permit identifies the difference between the operating permit condition and the applicable requirement (construction permit condition) and uses the appropriate NSPS Subpart IIII title and Title 129 rule citation.

(2)(b) NESHAP Subpart ZZZZ is applicable to the emergency equipment [Title 129, Chapter 28, Section 001.88]. However, the applicable requirements of NESHAP Subpart ZZZZ are met through compliance with the applicable requirements of NSPS Subpart IIII [§63.6590b(3)].

(3)(a) This condition identifies the emission limitations that are applicable to the emergency equipment at the source. NMHC + NO_x, CO, and PM limitations have been incorporated to ensure that permittee complies with NSPS Subpart IIII. These limits have been converted to units of lbs/hr, as opposed to g/hp-hr as written in the subpart, in order to provide consistency in reporting units throughout the permit. Also, opacity limitations have been implemented to ensure that the permittee maintains compliance with Title 129, Chapter 20.

No monitoring or record keeping requirements for the emergency engine are currently required by the permit. Given that the source is limited by the permit to burn low-sulfur diesel fuel (sulfur content in diesel must be ≤ 0.05 percent by weight), which is a relatively clean burning fuel, and has no historic opacity violations, it is unlikely that EP# S100 will exceed the permitted limits. Therefore, NDEQ has determined that testing and monitoring requirements can be satisfied through compliance with Condition III.(L)(4). However, if any of the circumstances listed above change over the course of the permit term, the NDEQ may reinstate monitoring and recordkeeping requirements in a subsequent permit renewal.

Emission Point ID#	Pollutant	Permitted Limit	Averaging Period	Basis for Permit Limit	Performance Testing Required (Yes/No)
S100	NMHC + NO_x	7.8 g/hp-hr[1]	Test Method Average	40 CFR 60.4205(c): Table 4 to Subpart IIII	No
	PM	0.40 g/hp-hr[1]	Test Method Average	40 CFR 60.4205(c): Table 4 to Subpart IIII	No

Emission Point ID#	Pollutant	Permitted Limit	Averaging Period	Basis for Permit Limit	Performance Testing Required (Yes/No)
S100	CO	2.6 g/hp-hr[1]	Test Method Average	40 CFR 60.4205(c): Table 4 to Subpart IIII	No
	PM	1.93 lb/hr[1]	1 Hour	Title 129, Chapter 20, Section 002	No
	Opacity	< 20 percent[1]	6 minutes	Title 129, Chapter 20, Section 004	No

[1] Testing and monitoring requirements satisfied through compliance with Condition III.(L)(4)(c).

(3)(b) This condition refers the permittee to NSPS IIII for additional emission limitations and testing requirements that apply to the emergency fire pump engine [Condition III.(L)(2), April 6, 2009 CP].

(4)(a) The emergency fire pump engine is limited to operating 300 hours per any period of twelve (12) consecutive calendar months in order to limit source-wide potential emissions below the former 100 tpy major source PSD threshold [Title 129, Chapter 19; Condition III.(L)(3)(a), April 6, 2009 CP].

(4)(b) In order to determine hours of operation, the emergency fire pump engine is required to be equipped with a non-resettable hour meter to record operating hours [Condition III.(L)(3)(b), April 6, 2009 CP].

(4)(c) This condition stipulates that only diesel fuel can be used as a fuel source for the emergency fire pump engine [Condition III.(L)(1), April 6, 2009 CP].

(4)(d) This condition stipulates that the sulfur content of diesel fuel used in the emergency fire pump engine shall not exceed 15 ppm [40 CFR 60.4207(b)]. This fuel sulfur content is approximately equal to 0.0015 percent by weight.

Note: Condition III.(L)(4)(d) differs from Condition III.(L)(3)(c) of the April 6, 2009 Construction Permit. The Construction Permit required that sulfur content of the diesel fuel not exceed 0.05% by weight. However, beginning October 1, 2010, NSPS Subpart IIII requires that the sulfur content of diesel fuel used by the engines not exceed 15 ppm. The more stringent limit from the NSPS is included in the Operating permit.

(5) This condition specifies the recordkeeping requirements applicable to the emergency equipment at the source. Records to be maintained by the permittee include the following: fuel receipts that show diesel fuel with a maximum sulfur content of 0.05% by weight is the only fuel being combusted in the engine [Condition III.(L)(5)(a), April 6, 2009 CP]; records showing engine operating hours for each calendar month and each period of twelve (12) consecutive calendar months [Condition III.(L)(5)(b), April 6, 2009 CP]; and appropriate records and notifications in accordance with the NSPS Subparts A and IIII requirements [Conditions III.(L)(5)(c) and (d), April 6, 2009 CP].

III.(M) Insignificant Activities

(1) This condition identifies the fuel storage tank located at the source as an insignificant activity.

Unit Description	Insignificance Criteria
Diesel Fuel Storage Tank, Installed 2007, Storage Capacity of 500 Gallons (Approx. 1.89 m^3)	Annual Fuel Throughput for Entire Source < 1,000,000 Gallons

(2) This condition specifies that no emission limitations or testing requirements are applicable to the fuel storage tank located at the source.

(3) This condition specifies that no operational or monitoring requirements are applicable to the fuel storage tank located at the source.

(4) This condition requires written notification for additions or changes that are made to the list of insignificant activities at the source. The written notification is only necessary for those insignificant activities that must be included in an application, and must be in accordance with Specific Condition II.(B)(6).

The following terms and conditions from various construction permits were not incorporated into this Class I operating permit, or have been modified as discussed below:

Specific Condition	Reason Modified or Not Included In Operating Permit
II.(E)(2)(a) April 6, 2009 CP	This condition required the source to submit an ambient air restriction plan to the NDEQ 90 days prior to initial startup of the plant. The permittee has already submitted this plan, as initial startup of the source occurred in 2007.
Various Conditions Under III.(A) Applicable to Emission Point S21 October 4, 2007 CP	Emission Point S21 (Grain Storage Building and associated baghouse) has not been built by the source. While the October 4, 2007 CP allowed for the construction of the storage building, the 18 month timeframe for commencing construction on this building has passed. If the permittee wishes to construct a grain storage building, they will need to apply for a new CP. So, all applicable requirements for EP 21 are no longer required.
III.(A)(4) October 4, 2007 CP	Emission Point S21 (Grain Storage Building and associated baghouse) has not been built by the permittee. Without the storage building in place, the source does not exceed the 2.5MM bushel permanent grain storage threshold under NSPS Subpart DD. Therefore, Subpart DD is no longer applicable to ABE Fairmont.
III.(B)(3)(c) July 28, 2008 CP	Source testing shows chemical addition is necessary.
III.(I)(5)(a) April 6, 2009 CP	Initial startup has occurred at this source and the Fugitive Dust Control Plan (FDCP) has been submitted to NDEQ. However, the FDCP must still be kept onsite.

STATUTORY OR REGULATORY PROVISIONS ON WHICH PERMIT REQUIREMENTS ARE BASED:

Applicable regulations: Title 129 - Nebraska Air Quality Regulations as amended January 9, 2011.

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

The public notice, as required under NAQR Chapter 14, shall be published on Wednesday, March 16, 2011, in the Nebraska Signal, Inc newspaper. Persons or groups shall have 30 days from that issuance of public notice, April 15, 2011, 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:

Robert Sheeder - Programs Specialist
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.

Within 60 days after the US Environmental Protection Agency Administrator review, persons may petition the Administrator to object to the issuance of the proposed permit. Any such petition shall be based only on objections to the permit that were raised with reasonable specificity during the 30-day public comment period, unless the petitioner demonstrates that it was impracticable to raise such objection within such period. For specific dates for which the 60-day petition period is open, contact Robert Sheeder at (402) 471-2189. Petitions should be mailed to:

Karl Brooks-Regional Administrator
US EPA Region VII
Attn: Air Permitting & Compliance Branch
901 N. 5th Street
Kansas City, KS 66101

Compliance with this permit shall not be a defense to any enforcement action for violation of an ambient air quality standard.