

STATE OF MISSOURI



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: 012016-005

Project Number: 2015-10-026  
Installation Number: 217-0051

Parent Company: Kay Dee, LLC

Parent Company Address: 1919 Grand Avenue, Sioux City, IA 51106

Installation Name: NF Protein, LLC

Installation Address: 3000 Industrial Parkway, Nevada, MO 64772

Location Information: Vernon County (S27, T36N, R31W)

Application for Authority to Construct was made for:

The installation of a 60-foot stack and the addition of ozone to the exhaust gas stream to control odorous emissions. This review was conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

Standard Conditions (on reverse) are applicable to this permit.

Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

Prepared by  
Ryan Schott  
New Source Review Unit

Director of Designee  
Department of Natural Resources

JAN 11 2016

Effective Date

## STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Department's Air Pollution Control Program of the anticipated date of startup of these air contaminant sources. The information must be made available within 30 days of actual startup. Also, you must notify the Department of Natural Resources' regional office responsible for the area within which you are located within 15 days after the actual startup of these air contaminant sources.

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant sources(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

**SPECIAL CONDITIONS:**

The permittee is authorized to construct and operate subject to the following special conditions:

*The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."*

NF Protein, LLC

Vernon County (S27, T36N, R31W)

1. Ozone Usage Restriction
  - A. NF Protein, LLC shall add less than 66 pounds of ozone (O<sub>3</sub>) per day to the exhaust gas stream in order to control odorous emissions from the three double drum dryers (EP-01).
  - B. NF Protein, LLC shall demonstrate compliance with Special Condition 1.A. using Attachment A or another equivalent form that has been approved by the Air Pollution Control Program, including an electronic form.
2. Record Keeping and Reporting Requirements
  - A. NF Protein, LLC shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request. These records shall include SDS for all materials used.
  - B. NF Protein, LLC shall report to the Air Pollution Control Program's Compliance/Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than 10 days after the end of the month during which any record required by this permit show an exceedance of a limitation imposed by this permit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE  
SECTION (5) REVIEW

Project Number: 2015-10-026  
Installation ID Number: 217-0051  
Permit Number:

Installation Address:

NF Protein, LLC  
3000 Industrial Parkway  
Nevada, MO 64772  
Vernon County (S27, T36N, R31W)

Parent Company:

Kay Dee, LLC  
1919 Grand Avenue  
Sioux City, IA 51106

REVIEW SUMMARY

- NF Protein, LLC has applied for authority to install a 60-foot stack and add ozone to the exhaust gas stream to control odorous emissions.
- The application was deemed complete on October 14, 2015.
- HAP emissions are not expected from the proposed equipment.
- None of the NSPS, NESHAPs, or currently promulgated MACT regulations apply to the proposed equipment.
- This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.
- This installation is located in Vernon County, an attainment area for all criteria pollutants.
- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.
- Emissions testing is not required for the equipment.
- No Operating Permit is required for this installation.
- Approval of this permit is recommended with special conditions.

## INSTALLATION DESCRIPTION

NF Protein, LLC (formerly Nutra-Flo) operates an animal feed ingredient processing plant in Nevada, Missouri. The facility processes condensed porcine solubles (CPS), soy oil, and soy flour to produce dried porcine solubles (DPS). The maximum production rate of the plant is 13,632 tons of DPS per year. The following New Source Review permits have been issued to NF Protein, LLC from the Air Pollution Control Program.

Table 1: Permit History

Permit Number	Description
112014-004	Animal feed ingredient processing plant
112014-004A	Update baghouses

## PROJECT DESCRIPTION

When the animal feed ingredient processing plant was first constructed, a biofilter was installed to help control the odor associated with the animal by-product processing operation; however, odor buildup near ground level has frequently occurred, especially on days when the wind direction and wind speed are unfavorable for odor dispersion. To mitigate the issue with the odor, NF Protein, LLC has proposed to install a 60-foot stack that would allow sufficient odor dispersal away from ground level. The existing biofilter will continue to be used, and the exhaust gas will be vented to the stack after passing through the biofilter.

To further reduce odorous emissions and remove odor-causing pollutants from the exhaust gas, NF Protein, LLC has proposed to add ozone (O<sub>3</sub>) to the exhaust gas stream between the existing scrubber and biofilter. Ozone added to the exhaust stream will react with the remaining odor-causing pollutants, producing mostly inert compounds. With the inclusion of the new equipment and methods proposed in this project, all emissions from the three double drum dryers (EP-01) will now pass through a cross-flow packed scrubber, an ozone destruction zone, a biofilter, and will exit from a 60-foot stack, in that order.

## EMISSIONS/ CONTROLS EVALUATION

Potential ozone emissions are difficult to calculate because of the incredibly short half-life of ozone at ambient conditions. Ozone is an extremely reactive molecule that is able to rapidly oxidize most airborne molecules, including air pollutants, bacteria, and even normal air constituents. The ozone molecule donates an oxygen atom to the airborne contaminant, neutralizing it through oxidation, and converting ozone to diatomic oxygen. Even when released into clean, open air at ground level, ozone quickly decomposes back to diatomic oxygen without the need for a presence of air contaminants. Therefore, all ozone added to the exhaust stream is expected to be fully consumed by oxidation reactions, and any residual ozone that may be exhausted from the 60-foot stack is expected to rapidly decompose into inert compounds. Although the oxidation reactions have the possibility of producing SO<sub>x</sub>, only infinitesimal quantities are expected.

The following table provides an emissions summary for this project. Existing potential emissions were taken from the previous construction permit 112014-004. No emissions information has yet to be entered into MoEIS; therefore, actual emissions are unknown. Potential emissions of the application represent the potential of the new equipment, assuming 100% of all added ozone (at rates specified in Special Condition 1) is emitted. Conditioned potential emissions account for an estimated 99% destruction efficiency of the rapid, ozone-consuming reactions that will occur between the added ozone and the odor-causing air pollutants in the exhaust stream. This is a conservative value, because all added ozone is expected to be fully consumed before being exhausted from the stack.

Table 2: Emissions Summary (tons per year)

Pollutant	Regulatory <i>De Minimis</i> Levels	Existing Potential Emissions	Existing Actual Emissions	Potential Emissions of the Application	New Installation Conditioned Potential
PM	25.0	16.25	N/D	N/A	16.25
PM <sub>10</sub>	15.0	13.52	N/D	N/A	13.52
PM <sub>2.5</sub>	10.0	9.18	N/D	N/A	9.18
SO <sub>x</sub>	40.0	0.40	N/D	N/A	0.40
NO <sub>x</sub>	40.0	7.21	N/D	N/A	7.21
VOCs	40.0	2.59	N/D	N/A	2.59
Total Ozone*	40.0*	9.80*	N/D	12.05*	9.92*
CO	100.0	6.06	N/D	N/A	6.06
Total HAPs	25.0	0.61	N/D	N/A	0.61

N/A = Not Applicable; N/D = Not Determined

\*Because ozone is formed from the precursors NO<sub>x</sub> and VOCs, an equivalent de minimis level of 40.0 tons per year was given to the pollutant category "Total Ozone," which is the sum of all NO<sub>x</sub>, VOCs, and Ozone emissions

## PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below de minimis levels.

## APPLICABLE REQUIREMENTS

NF Protein, LLC shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved.

## GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information, 10 CSR 10-6.110*
  - Per 10 CSR 10-6.110(4)(B)2.B(II) and (4)(B)2.C(II) a full EIQ is required for the first full calendar year the equipment (or modifications) approved by this permit are in operation.
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin, 10 CSR 10-6.170*
- *Restriction of Emission of Visible Air Contaminants, 10 CSR 10-6.220*
- *Restriction of Emission of Odors, 10 CSR 10-6.165*

## STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (5), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, it is recommended that this permit be granted with special conditions.

## PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated August 27, 2015, received October 9, 2015, designating Kay Dee, LLC as the owner and operator of the installation.

## Attachment A – Ozone Usage Compliance Worksheet

NF Protein, LLC  
 Vernon County (S27, T36N, R31W)  
 Project Number: 2015-10-026  
 Installation ID Number: 217-0051  
 Permit Number: \_\_\_\_\_

This sheet covers the period of \_\_\_\_\_ .  
 (month, year)

Day	<sup>1</sup> Ozone Added to Exhaust Gas Stream (lbs)	Day	<sup>1</sup> Ozone Added to Exhaust Gas Stream (lbs)
1		17	
2		18	
3		19	
4		20	
5		21	
6		22	
7		23	
8		24	
9		25	
10		26	
11		27	
12		28	
13		29	
14		30	
15		31	
16			

<sup>1</sup> Record the total amount of ozone added to the exhaust gas stream in the given day.

**A value less than 66 pounds per day is necessary for compliance.**



## APPENDIX A

### Abbreviations and Acronyms

<b>%</b> .....	percent	<b>m/s</b> .....	meters per second
<b>°F</b> .....	degrees Fahrenheit	<b>Mgal</b> .....	1,000 gallons
<b>acfm</b> .....	actual cubic feet per minute	<b>MW</b> .....	megawatt
<b>BACT</b> .....	Best Available Control Technology	<b>MHDR</b> .....	maximum hourly design rate
<b>BMPs</b> .....	Best Management Practices	<b>MMBtu</b> ....	Million British thermal units
<b>Btu</b> .....	British thermal unit	<b>MMCF</b> .....	million cubic feet
<b>CAM</b> .....	Compliance Assurance Monitoring	<b>MSDS</b> .....	Material Safety Data Sheet
<b>CAS</b> .....	Chemical Abstracts Service	<b>NAAQS</b> ...	National Ambient Air Quality Standards
<b>CEMS</b> .....	Continuous Emission Monitor System	<b>NESHAPs</b>	National Emissions Standards for Hazardous Air Pollutants
<b>CFR</b> .....	Code of Federal Regulations	<b>NO<sub>x</sub></b> .....	nitrogen oxides
<b>CO</b> .....	carbon monoxide	<b>NSPS</b> .....	New Source Performance Standards
<b>CO<sub>2</sub></b> .....	carbon dioxide	<b>NSR</b> .....	New Source Review
<b>CO<sub>2e</sub></b> .....	carbon dioxide equivalent	<b>PM</b> .....	particulate matter
<b>COMS</b> .....	Continuous Opacity Monitoring System	<b>PM<sub>2.5</sub></b> .....	particulate matter less than 2.5 microns in aerodynamic diameter
<b>CSR</b> .....	Code of State Regulations	<b>PM<sub>10</sub></b> .....	particulate matter less than 10 microns in aerodynamic diameter
<b>dscf</b> .....	dry standard cubic feet	<b>ppm</b> .....	parts per million
<b>EQ</b> .....	Emission Inventory Questionnaire	<b>PSD</b> .....	Prevention of Significant Deterioration
<b>EP</b> .....	Emission Point	<b>PTE</b> .....	potential to emit
<b>EPA</b> .....	Environmental Protection Agency	<b>RACT</b> .....	Reasonable Available Control Technology
<b>EU</b> .....	Emission Unit	<b>RAL</b> .....	Risk Assessment Level
<b>fps</b> .....	feet per second	<b>SCC</b> .....	Source Classification Code
<b>ft</b> .....	feet	<b>scfm</b> .....	standard cubic feet per minute
<b>GACT</b> .....	Generally Available Control Technology	<b>SDS</b> .....	Safety Data Sheet
<b>GHG</b> .....	Greenhouse Gas	<b>SIC</b> .....	Standard Industrial Classification
<b>gpm</b> .....	gallons per minute	<b>SIP</b> .....	State Implementation Plan
<b>gr</b> .....	grains	<b>SMAL</b> .....	Screening Model Action Levels
<b>GWP</b> .....	Global Warming Potential	<b>SO<sub>x</sub></b> .....	sulfur oxides
<b>HAP</b> .....	Hazardous Air Pollutant	<b>SO<sub>2</sub></b> .....	sulfur dioxide
<b>hr</b> .....	hour	<b>tph</b> .....	tons per hour
<b>hp</b> .....	horsepower	<b>tpy</b> .....	tons per year
<b>lb</b> .....	pound	<b>VMT</b> .....	vehicle miles traveled
<b>lbs/hr</b> .....	pounds per hour	<b>VOC</b> .....	Volatile Organic Compound
<b>MACT</b> .....	Maximum Achievable Control Technology		
<b>µg/m<sup>3</sup></b> .....	micrograms per cubic meter		

Mr. Dan Scannell  
Facility Operator  
NF Protein, LLC  
3000 Industrial Parkway  
Nevada, MO 64772

RE: New Source Review Permit - Project Number: 2015-10-026

Dear Mr. Scannell:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. Also, note the special conditions on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files. Operation in accordance with these conditions and your new source review permit application is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

If you were adversely affected by this permit decision, you may be entitled to pursue an appeal before the administrative hearing commission pursuant to Sections 621.250 and 643.075.6 RSMo. To appeal, you must file a petition with the administrative hearing commission within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the administrative hearing commission, whose contact information is: Administrative Hearing Commission, Truman State Office Building, Room 640, 301 W. High Street, P.O. Box 1557, Jefferson City, Missouri 65102, phone: 573-751-2422, fax: 573-751-5018, website: [www.oa.mo.gov/ahc](http://www.oa.mo.gov/ahc).

If you have any questions regarding this permit, please do not hesitate to contact Ryan Schott at the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or by phone at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp  
New Source Review Unit Chief

SH:rsf

Enclosures

c: Southwest Regional Office  
PAMS File: 2015-10-026

Permit Number: