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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-1506C
Plant ID No.:	031-00005
Applicant:	Pilgrim's Pride Corporation (Pilgrim's)
Facility Name:	Moorefield Feed Mill
Location:	Moorefield, Hardy County, WV
SIC Code:	2048 - Prepared Feed and Feed Ingredients for Animals and Fowls, Except Dogs and Cats
NAICS Code:	311611 - Animal (except Poultry) Slaughtering
Application Type:	Modification
Received Date:	September 25, 2015
Engineer Assigned:	John Legg
Fee Amount:	$1,000.00
Date Received:	September 30, 2015
Applicant Ad Date:	November 4, 2015
Newspaper:	*Moorefield Examiner* (Hardy County Newspaper)
Complete Date:	November 13, 2015 (date company newspaper affidavit was received at the DAQ)
Due Date:	December 25, 2015 (estimated based on DAQ advertisement running 11/25/2015)
UTM's:	Easting: 674.2868 km Northing: 4,323.63 km Zone: 17
Description:	Double the facility's grain unloading rate (from train) to 1,120 ton/hr by replacing handling equipment (conveyors, elevator, and turn heads to existing silos) and building a silo. Increase truck activity for soybean mill, corn, and additives delivery, and truck product shipments.

SUMMARY

This modification application (R13-1506C) is concisely described in the paragraph immediately above.

Pilgram's legal advertisement (11/4/15) estimates the increase in potential-to -emit (PTE) at:

PM	+24.91 tons per year (tpy)
PM10	+ 6.81 tpy
PM2.5	+ 0.72 tpy

Of the total increase in PM, approximately 94.8% (23.63 tpy) of the increase can be attributed to fugitive dust emissions from vehicle activity. The remaining 5.2% (1.28 tpy) increase in PM can be attributed to process emissions.

DESCRIPTION OF PROCESS

This process description comes from the application, Attachment G. It is also summarized in Table 2 which is given below.

Pilgrim's is proposing to upgrade:

- the railroad grain receiving, handling, and storage operation at the Moorefield Feed Mill.

This upgrade is being proposed to:

- allow for a unit train to be unloaded in a set amount of time per a request from the railroad.

To accomplish the time requirement, Pilgrim's needs to:

- replace existing grain handling equipment and
- provide for more storage.

The proposed plan is to replace:

Grain Receiving - North Railcar Station:

- the existing railcar pit screw conveyor and hopper,
- the railcar receiving conveyor,
- the railcar receiving elevator (which also receives grain from railcars), and
- the receiving elevator

Headhouse and Grain Handling:

- the turnheads (headhouse) at the top of the two elevators,
- the drag conveyor for the existing large silos,

Additionally, a new silo is being constructed which will require:

- a grain transfer belt conveyor
  (classified as part of “Headhouse and Grain Handling” portion of the process - see above)

The new silo will be unloaded by/reclaimed by:

- a new reclaim drag which unloads to
- a new reclaim elevator/leg which unloads to
- a new reclaim transfer conveyor which can also unload existing silos 6&7 which in turn will feed into the existing reclaim system that feeds into the feed mill. (The new reclaim drag, elevator/leg and transfer conveyor are classified as part of “Headhouse and Grain Handling” portion of the process - see above)

The rate of grain receiving will increase:

- from 560 tons per hour (approximately 20,000 bushels per hour)
- to 1,120 tons per hour (approximately 40,000 bushels per hour).

The new storage silo will hold 7,700 tons (275,000 bushels).

The proposed changes are depicted on the drawing provided by “Top Bead Welding” which has been attached to this evaluation (from the permit application, Attachment F).

Additional, Prilgrim is:

- clarifying and adjusting the amount of:

  corn, soybean mill, and resulting feed product.

These numbers are presented in the Emission Units Table given below (and in Attachment I in the permit application). Vehicle activity (12S) is being added as a source for delivery of soybean mill, corn, and additives in trucks.

1.0 Emission Units Table.

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed/ Modified	Design Capacity		Control Device
1S	1E	Boiler 1	2002	21.0 mmBtu/hr		None
2AS	2AE	Grain Receiving (North Railcar Station)	2015	1,120 tph Corn	Combined Total 330,000 tpy Corn &	FE
		(South Railcar Station and Truck Station)	1992	200 tph Corn or soybean mill	120,000 tpy Soybean Mill	FE
2BS	2BE	Headhouse and Grain Handling	1992/2015	1,120 tph (Max)/330,000 tpy Corn North Railcar Receiving & 200 tph/120,000 tpy Corn or Soybean Mill		FE
3S	3E	All Grain Storage [1]	1992/2015	1,120 tph into corn storage 200 tph into corn or soybean mill storage South Railcar & Truck Receiving 56 tph out of Corn silos		FE
4S	4E	Pneumatic System (Truck Unloading)	1992	Variable [2]		4C Baghouse
5S	5E	Crusher (Hammermill)	1992	38 tph	330,000 tpy Corn	5C Baghouse
6S	6E	Crusher (Hammermill)	1992	38 tph		6C Baghouse
10S	10E	Crusher (Hammermill)	2005	38 tph		10C
7S	7E	Pellet System	1992	50 tph	478,000 tpy	7C Cyclone
9S	9E	Pellet System	2002	40 tph		9C Cyclone
8S	8E	Boiler 2	2002	21.0 mmBtu/hr		None
11S	11E	Feed Shipping	1992	60 tph/478,000 tpy		FE
12S	12E	Vehicle Activity	1992	24,883 trucks maximum		None
Control Equipment						
4C	4E	Baghouse (for Pneumatic Truck Unloading System)	1992	NA		None
5C	5E	Baghouse (for Crusher)	1992	NA		None
6C	6E	Baghouse (for Crusher)	1992	NA		None
7C	7E	Cyclone [for Pellet System (7S)]	1992	NA		None

1.0 Emission Units Table.

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed/ Modified	Design Capacity	Control Device
9C	9E	Cyclone [for Pellet System (9S)]	2002	NA	None
10C	10E	Pulse Jet Dust Collector (for Crusher)	2005	NA	None

(1) Grain Storage (Silos 1 thru 4, 6, 7 and new Silo) is listed herein because the hourly feed rate into the unit will be increased form 560 tons per hour to 1,120 tons per hour and a new corn silo is proposed to be installed.
(2) Pneumatic System is used to receive material from pneumatic trucks and the transfer rate depends on the trucks and the type of material being delivered. Average of 12 tph.

Table 2: New Equipment shown by Equipment Grouping.

Emission		Equipment Grouping	New Equipment to be Installed Under R13-1506C)
Unit ID	Point ID		
2AS	2AE	Grain Receiving - North Railcar Station	- Railcar Pit Screw Conveyor and Hopper - Railcar Receiving Conveyor - Railcar Receiving Elevator - Receiving Elevator
2BS	2BE	Headhouse and Grain Handling	- 5 hole positioning turnheads - Railcar Receiving Elevator - 5 hole positioning turnheads - Receiving Elevator - Replacement Drag for Existing 15,000 to 20,000 BPH Drag (feeds to existing silos: 1,2,3,4,6 and7) - Grain Transfer Belt Conveyor 40,000 BPH (feeds from new elevators to new silo) - 2000 BPH Reclaim Drag (feeds from new Silo) - 2000 BPH Reclaim Elevator Leg (feeds from new Silo Drag) - 2000 BPH Reclaim Transfer Conveyor (feeds from New Silo Elevator Leg and Silos 6&7 to existing reclaim system which in turn feeds to feed mills)
3S	3E	All Grain Storage	- Silos 1 thru 4 (existing) - Silos 6 and 7 - New 7,700 Ton (275,000 Bushel) Silo

SITE INSPECTION

Prigrim's facility is an existing source, permitted 23 years ago (September 17, 1992). Since construction, the facility has been modified (October 4, 2002 - boiler related) and updated (class II; October 12, 2005 - dust collector added).

The writer did not conduct a site inspection for this modification application. The facility's location is known to DAQ Enforcement Group who's inspectors/conducts periodic inspections (approximately every 3 years).

The last full, on-site inspection was conducted by Joseph A. Kreger (DAQ Enforcement) on October 30, 2013 at which time the facility was given the in-compliance status code of 30. (At least two previous on-site inspections spaced at three-year intervals apart have also been given the in-compliance status code of 30.)

Directions to the facility as given in the permit application (Section I. General, Item 12A, Page 2 of 4):

> Adjacent to WV Route 220 headed South out of Moorefield, WV, and is the Industrial Park.

ESTIMATE OF EMISSIONS

Company Discussion

The following discussion came from Attachment G of the permit application:

The existing/old permit application (R13-1506B):

- did not include emissions for grain receiving, headhouse and grain handling, storage, and feed loadout.
- stated that there were no emissions from these processes.

The emissions estimate for the facility has been:

- updated to reflect the emissions for grain receiving, headhouse and grain handling, storage and feed loadout based on:
- emission factors from AP-42, Section 9.9.1, Grain Elevators and Processes.
- revised for storage of grain based on:
    - the difference between the existing transfer rates into storage of 560 tons per hour and the new transfer rates of 1,120 tons per hour for grain receiving, headhouse and grain handling, storage, and feed loadout.
- expanded to included:
    - vehicle activity for delivering grain and liquid/solid additives by truck and removing the feed by truck.
    - This activity is an increase in emissions since it was not previously included.

The following sources do not have an emissions increase because the existing emission limits were based on operating the sources for 8,760 hours per year instead of being based on throughput:

Pneumatic System (Truck Unloading) (4S),
Crushers (5S, 6S and 10S) and
Pellet System (7S and 9S)

Company Legal Advertisement

According to their November 11, 2015 legal notice/newspaper advertisement, Prigrim's estimates the increased potential to emit to be:

24.91 tons per year (tpy)	Particulate Matter (PM)
6.81 tpy	PM_{10}
0.72 tpy	$PM_{2.5}$

Engineer Review

The writer reviewed Pilgrim's emission calculations and found them to be logical/understandable, complete and calculated correctly. The calculations are given in Attachment N to the permit application.

Given below in Table 3 is the increase in uncontrolled and controlled PM, PM10 and PM2.5 emissions resulting from implementing permit application R13-1506C.

Also, given below in Table 4 is the total uncontrolled and controlled PM, PM10 and PM2.5 emissions for Pilgram's entire facility after implementing permit application R13-1506C.

Table 3: Increase in Emissions Due to Increased Hourly Receiving, Headhouse and Storage.

Source Description	Pollutant	Proposed Emission Increase			
		Uncontrolled		Controlled	
		lb/hr	ton/yr	lb/hr	ton/yr
2AS - Grain Receiving	PM	12.92	1.02	2.59	0.21
	PM10	1.90	0.15	0.38	0.03
	PM2.5	0.30	0.02	0.07	0.01
2BS - Headhouse and Grain Handling	PM	46.36	3.66	9.27	0.74
	PM10	25.84	2.04	5.17	0.41
	PM2.5	4.41	0.35	0.88	0.07
3S - All Grain Storage	PM	19.00	1.50	3.80	0.30
	PM10	4.79	0.38	0.95	0.07
	PM2.5	0.84	0.07	0.17	0.01
11S - Feed Shipping	PM	0.00	0.21	0.00	0.04
	PM10	0.00	0.05	0.00	0.01
	PM2.5	0.00	0.01	0.00	0.00
12S - Vehicle Activity (1)	PM	9.49	23.62	9.49	23.62
	PM10	2.53	6.29	2.53	6.29
	PM2.5	0.25	0.63	0.25	0.63
Total	PM	87.77	30.01	25.15	24.91
	PM10	35.06	8.91	9.03	6.81
	PM2.5	5.80	1.07	1.37	0.72

(1) Vehicle activity was not included in the initial permit application and is being included here as an increase in emissions.

Table 4: Existing Facility Emissions as Permitted Under R13-1506B that Stay the Same/Do Not Increase Because of R13-1506C (see Attachment N, page N12 of Permit Application R13-1506C).

Source Description	Pollutant	Existing Emissions as Permitted Under R13-1506B			
		Uncontrolled		Controlled	
		lb/hr	ton/yr	lb/hr	ton/yr
1S - Boiler No. 1 (Fuel Oil - 6,000 hr/yr) (Natural Gas - 2, 760 hr/yr) (re-evaluated existing emissions)	PM	0.39	1.73	0.39	1.73
	PM10	0.39	1.73	0.39	1.73
	PM2.5	0.39	1.73	0.39	1.73
2AS - Grain Receiving (re-evaluated existing emissions) (page N3)	PM	9.52	2.81	1.90	0.56
	PM10	1.40	0.41	0.28	0.08
	PM2.5	0.22	0.07	0.04	0.01
2BS -Headhouse & Grain Handling (re-evaluated existing emissions) (page N3)	PM	34.16	10.07	6.83	2.01
	PM10	19.04	5.61	3.81	1.12
	PM2.5	3.25	0.96	0.65	0.19
3S - Storage (re-evaluated existing emissions) (page N3)	PM	14.00	4.13	2.80	0.83
	PM10	3.53	1.04	0.71	0.21
	PM2.5	0.62	0.18	0.12	0.04
4S - Pneumatic System (page N12)	PM	38.60	169.07	0.03	0.13
	PM10	5.02	21.98	0.01	0.02
	PM2.5	5.02	21.98	0.01	0.02
5S - Corn Only (page N12)	PM	463.00	2,027.94	0.51	2.23
	PM10	60.19	263.63	0.07	0.29
	PM2.5	60.19	263.63	0.07	0.29
6S - Corn Only (page N12)	PM	463.00	2,027.94	0.51	2.23
	PM10	60.19	263.63	0.07	0.29
	PM2.5	60.19	263.63	0.07	0.29
7S - Pellet System (page N12)	PM	385.0	1,686.30	3.96	17.34
	PM10	50.05	219.22	1.50	6.58
	PM2.5	50.05	219.22	1.50	6.58

Table 4: Existing Facility Emissions as Permitted Under R13-1506B that Stay the Same/Do Not Increase Because of R13-1506C (see Attachment N, page N12 of Permit Application R13-1506C).

Source Description	Pollutant	Existing Emissions as Permitted Under R13-1506B			
		Uncontrolled		Controlled	
		lb/hr	ton/yr	lb/hr	ton/yr
8S - Boiler No. 8 (Fuel Oil - 6,000 hr/yr) (Natural Gas - 2, 760 hr/yr) (re-evaluated existing emissions)	PM	0.39	1.73	0.39	1.73
	PM10	0.39	1.73	0.39	1.73
	PM2.5	0.39	1.73	0.39	1.73
9S - Pellet System (page N12)	PM	385.0	1,686.30	3.96	17.34
	PM10	50.05	219.22	1.50	6.58
	PM2.5	5.05	219.22	1.50	6.58
10S - Corn Only (page N12)	PM	463.00	2,027.94	0.51	2.23
	PM10	60.19	263.63	0.07	0.29
	PM2.5	60.19	263.63	0.07	0.29
11S - Feed Shipping (page N13)	PM	0.20	0.58	0.04	0.12
	PM10	0.05	0.14	0.01	0.03
	PM2.5	0.01	0.02	0.01	0.01
Total	PM	2256.26	9646.54	21.83	48.48
	PM10	310.49	1261.97	8.81	18.95
	PM2.5	290.57	1256	4.43	17.76

Table 5: Total Facility Potential To Emit (PTE) After Permit Modification R13-1506C (From Application, Attachment N, page N2).

Pollutant	Total Facility PTE after R13-1506C				[1] Delta Increases (Attributed to Changes Made under R13-1506C, Specifically 2SA; 2SB; 3S; 11S and 12S)	
	Uncontrolled		Controlled		Controlled	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
PM	2,344.57	9,677.47	47.52	74.35	+25.69	+25.87
PM10	345.78	1,270.92	18.07	25.79	+9.26	+6.84
PM2.5	296.38	1,256.41	6.20	17.81	+1.77	+0.05
VOC	0.34	1.34	0.34	1.34	No Emission Increases Resulting from Modifications Made Under R13-1506C	
SO2	21.32	64.96	21.32	64.96		
NOx	10.20	36.66	10.20	36.66		
CO	5.02	20.02	5.02	20.02		
Total HAPs	0.0902	0.3766	0.0902	0.3766		
Lead	0.0004	0.0014	0.0004	0.0014		

(1) Total Facility Controlled PM; PM10 and PM2.5 hourly and annual emissions (Table 5) minus Total Controlled PM; PM10 and PM2.5 hourly and annual emissions from Table 4 (for emission sources 1S, 2AS, 2BS, 3S, 4S, 5S, 6S, 7S, 9S, 10S and 11S) .

REGULATORY APPLICABILITY

State Regulations

45CSR2 - "To Prevent and Control Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers"

Sets emission limits on particulate matter mass and opacity from indirect heat exchanger(s).

No changes were made to the boilers due to this modification permit.

The modified facility must continue to meet Rule 2 emission requirements (specifically 45CSR2-3.1. and -4.4.b. in permit sections 4.1.6 and 7.).

45CSR4 - "To Prevent and Control the Discharge of Air Pollutants into the Open Air Which Causes or Contributes to an Objectable Odor or Oders"

The modified facility must continue to control objectionable odors.

45CSR7 - "To Prevent and Control Particulate Matter Air Pollution from Manufacturing Processes and Associated Operations"

Sets emission limits on PM mass and opacity from manufacturing processes.

Opacity restricted to 20% or less (45CSR7-3.1.) while the mass limit is a function of source type and process weight rate (45CSR7-4.1).

The modified facility must continue to meet Rule 7 emission requirements [specifically 45CSR7-3.1.; -4.1. and -5.1. (fugitive emissions) in permit sections 4.1.8; 9 and 10]. PM emissions resulting from the new grain handling equipment, new silo and increased truck traffic are subject to the same Rule 7 requirements.

45CSR10 - "To Prevent and Control Air Pollution from the emission of Sulfur Oxides"

Sets emission limits on SO_2 from fuel burning units, manufacturing processes and combustion of process gas streams.

The modified facility must continue to meet Rule 10 emission requirements (specifically 45CSR10-3.3. and -3.3.f in permit sections 4.1.11. and 12.).

45CSR13 - "Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permit, Gener Permits, and Procedures for Evaluation:

Prigrim's facility already has an existing Rule 13 construction permit (R13-1506B, approved on 10/12/2005).

The company wants to double the grain unloading rate (to 1,120 ton/hr) from train by installing new handling equipment, build a silo and increase truck deliveries (of raw ingredients/additives) and product truck shipments. The proposed changes are subject to the PM emissions standards of 45CSR7.

The company ran the required legal advertisement (11/05/15) as a modification to existing permit R13-1506B, submitted a permit application (9/25/15) which was deemed complete (11/04/15 - the date the affidavit of publication for the newspaper ad was received), and paid the required $1,000.00 application fee (9/30/15).

45CSR16 - "Standard of Performance for New Stationary Sources"

WV Rule 16 formally adopts NSPS/40 CFR 60 standards. See below for applicable 40 CFR 60 subparts.

No change resulting from this modification.

45CSR30 - "Requirements for Operating Permits"

Pilgrim's facility is classified as a non-major, deferred Title V source.

This modification does not change the facility's classification: it is still a non-major, deferred Title V source.

Federal Regulations

40 CFR 60, Subpart Dc "Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units"

Pilgrim's boilers are subject to this rule which includes requirements for fuel sulfur limits, fuel certification, and record-keeping and reporting.

No changes because of this modification (see permit sections 4.1.12. through 4.1.15).

40 CFR 60, Subpart DDDDDDD "National Emission Standards for Hazardous Air Pollutants for Area Sources: Prepared Feed Manufacturing"

Pilgrim's facility is subject to this rule since there is manganese in the trace minerals. The rule requires record-keeping for cyclone performance.

No changes because of this modification.

40 CFR 63,
Subpart JJJJJJ - "National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources"

Pilgrim's boilers are natural gas-fired boilers and only use fuel oil during curtailment, gas supply interruptions, startups, or periodic test on liquid fuel.

Periodic testing does not exceed 48 hours in a calendar year, therefore, the boilers are not subject to this standard.

No change because of this modification.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

Pilgrim's provided six (6) Material Safety Data Sheet (MSDS) in Attachment H to the permit application:

#1 - Betaine Solution

Supplier:	Michigan Sugar Company
Chemical Components -	Betaine (32.0%), Sucrose (7.0%), Non-Sucrose (23.0%) and Water (40.0%)
Chemical Formula -	Betaine (C5H11NO2), Sucrose (C12H22O11)
Description -	Dark brown syrup
Specific Gravity -	1.40
pH -	8.0 - 9.0
Reactivity:	Not a normal temperature and use. Can react exothermally at high temperatures.
Combustion Data:	Non-combustible
Decompostion Temp.:	>186 C

Internet - Betaine is found in microorganisms, plants, and animals and is a significant component of many foods, including wheat, shellfish, spinach, and sugar beets. Betaine is a zwitterionic quaternary ammonium compound that is also known as trimethylglycine, glycine betaine, lycine, and oxyneurine. It is a methyl derivative of the amino acid glycine with a formula of $(CH_3)_3N^+CH_2COO^-$ and a molecular weight of 117.2, and it has been characterized as a methylamine because of its 3 chemically reactive methyl groups. **Betaine was first discovered in the juice of sugar beets** (Beta vulgaris) in the 19th century and was subsequently found in several other organisms. The physiologic function of betaine is either as an organic osmolyte to protect cells under stress or as a catabolic source of methyl groups via transmethylation for use in many biochemical pathways.

The principle role for betaine in plants and microorganisms is to protect cells against osmotic inactivation (13). Exposure to drought, high salinity, or temperature stress triggers betaine synthesis in mitochondria, which results in its accumulation in the cells. Betaine is a compatible osmolyte that increases the water retention of cells, replaces inorganic salts, and protects intracellular enzymes against osmotically induced or temperature-induced inactivation. For example, spinach is grown in saline soil, and betaine can accumulate in amounts of up to 3% of fresh weight. This enables the chloroplasts to photosynthesize in the presence of high salinity.

Betaine has been used as a dietary feed supplement in animal nutrition for >50 years, and this use has provided useful insights into human nutrition. Betaine is added to farmed fish feed as an osmolyte to protect fish from the stress of moving from low to high salinity. Salmon liver mitochondria actively take up betaine when exposed to osmotic stress, and metabolic activity would be reduced to a much greater extent if betaine were not present. Betaine protects chick intestinal cells from coccidia infection, alleviates symptoms, and improves performance. Coccidiosis affects gut ionic balance and intestinal morphology, which leads to maldigestion, malabsorption, and dehydration. As a methyl donor, betaine provides the one-carbon units that can spare the amount of dietary methionine and choline required for optimal nutrition. For example, betaine improves growth and the efficiency of food utilization and reduces body fat in pigs and chicks.

Humans obtain betaine from foods that contain either betaine or choline-containing compounds. Betaine is present in foods in variable amounts that are generally related to growing and osmotic stress conditions. Some examples of food with high betaine content are shown in Table 1, and we estimate (SAS Craig, Danisco USA Inc, unpublished observations, 2004) that dietary intake of betaine ranges from an average of 1 g/d to a high of 2.5 g/d (for a diet high in whole wheat and seafood). The principle metabolic fate of choline is via irreversible oxidation to betaine in the liver and kidney via a two-step process (Figure 1). First, choline is oxidized to betaine aldehyde by the enzyme choline dehydrogenase. This enzyme can also convert betaine aldehyde to betaine in the presence of NAD^+. Choline dehydrogenase activity occurs in the mitochondria, on the matrix side of the inner membrane . Betaine aldehyde is then oxidized to betaine by the NAD^+-dependent enzyme betaine aldehyde dehydrogenase both in mitochondria and in the cytosol. The remainder of dietary choline is used to make acetylcholine and phospholipids such as phosphatidylcholine. A diet of normal foods is estimated to deliver 1 g choline/d.

#2 - Chicken Fat

Manufacturer's Name:	Pilgrim's Pride Corporation, Creeley, Colorado
Substance:	Rendered Poultry Fat
Chemical Family:	Triglyceride; Triacylglycerol
Boiling Point:	Decomposes
Specific Gravity:	0.84 (H2O=1)
Solubility in Water:	Insoluble
Appearance & Odor:	Light brown liquid to pale brown solid, bland odor
Reactivity:	Stable

#3 - Liquid Lysine [Feed Grade 50%]

Manufacturer's Name:	Ajinomoto Heartland Inc.
Product Name:	AjiLys
Chemical Name:	2, 6 Diaminohexanoic Acid
CAS:	56-87-1
Synonyms:	Aqueous solution of L-Lysine, Alpha, Epsilon-Diaminocaproic Acid; 2,6-Diaminohexanoic Acid; L-Lysine
Chemical Family:	Amino Acid
Chemical Formula:	C6H14N2O2 (L-Lysine) + H2O
Product Use:	To be used in the manufacture of animal feeds
Appearance & Odor:	Brown Liquid, slight odor
Specific Gravity:	1.12 to 1.119 kg/L (9.35 to 9.93 lbs/gallon)
pH as Supplied:	10 to 11
Molecular weight:	146.19
Stability:	6 months at 25 to 35 C
Conditions to avoid:	Temperature below less than 0 C - viscosity will increase at low temperatures

Lysine is an amino acid found in the protein of foods such as beans, cheese, yogurt, meat, milk, brewer's yeast, wheat germ, and other animal proteins. Proteins derived from grains such as wheat and corn tend to be low in lysine content. The bio-availability of lysine is reduced with food preparation methods, such as heating foods in the presence of a reducing sugar (ie, fructose or glucose); heating foods in the presence of sucrose or yeast; and cooking in the absence of moisture at high temperatures. The average 70 kg human requires 800 to 3,000 mg of lysine daily.

Lysine has been studied for the prevention and treatment of herpes infections and cold sores. It also increases the intestinal absorption of calcium and eliminates its excretion by the kidney, suggesting that it might be helpful in osteoporosis. Lysine has been investigated for its effects on increasing muscle mass, lowering glucose, and improving anxiety. Case reports suggest lysine may ameliorate angina. Lysine acetylsalicylate has been used to treat pain and to detoxify the body after heroin use. Lysine clonixinate has been used to treat migraine headaches and other painful conditions. However, limited clinical trials exist for these conditions.

#4 - Rhodimet AT 88

Supplier:	Adisseo USA Inc., Alpharetta, GA
Chemical:	2-Hydroxy-4-(Methylthio) Butanoic Acid (CAS 583-91-5) Water (CAS 7732-18-5)
Appearance & Odor:	Slightly brown viscous liquid, acrid odor
pH:	<1 at 100%
Specific Gravity:	1.21 - 1.23 at 25 C
Water Solubility:	Miscible
Viscosity:	105 centistokes at 25 C
Health Effects:	Corrosive.

Methionine is an essential amino acid for all animals, but they do not produce it themselves, meaning they have to get it from their feed. The methionine content of natural ingredients is generally low, so to meet the animals' requirements, additional methionine must be provided in their feed as a nutritional feed additive. Methionine deficiency in animals can cause muscle atrophy, slow growth, decreased bone strength, and fatty liver.

Adisseo is a major player on the methionine market, and seeks to fully meet all customers' needs by offering two different methionine products - one liquid, the other solid:

Rhodimet® AT88 A concentrated liquid source of hydroxy- methionine that is particularly well suited to large and medium-sized modern feed millers and integrators.

#5 - Choline Chloride

Manufacturer:	Balchem Corporation, New Hampton, NY 10958
Synonyms:	2-Hydroxy-N,N,N-trimethylethanaminium chloride
Typical Uses:	Nutritional Additive for Feed
Dry Products:	Light brown to white, free-flowing granules with little to slight grain odor. Poses little or no immediate hazards. Dust may be irritating to eyes, respiratory tract or skin. Combustion/decomposition may release toxic gases such as carbon dioxide, hydrogen chloride gas, nitrogen oxide and carbon monoxide. Deliquescent (absorbs moisture from air and becomes liquid) and may be slippery when spilled. Under appropriate conditions, dust explosion could occur.
Aqueous Product:	Colorless to light amber solution; slight amine (fish-like) odor; poses little or no immediate hazards.

From Wiki: Choline Chloride is an organic compound and a quaternary ammonium salt. It has a choline cation with chloride anion. Alternative names are hepacholine, biocolina and lipotril.

Choline chloride is mass-produced and is an important additive in feed especially for chickens where it accelerates growth. With urea it forms a deep eutectic solvent. Other commercial choline salts are choline hydroxide and choline bitartrate. In foodstuffs the compound is often present as phosphatidylcholine. It is also used as an additive in fluids used for hydraulic fracturing.

#6 - Ultra Low Sulfur Diesel Fuel 2 (S - 15 ppm) Dyed

From Wiki: Ultra Low Sulfur Fuel is diesel fuel with substantially lowered sulfur content. As of 2006, almost all of the petroleum-based diesel fuel available in UK, Europe and North America is of a ULSD type. There is not a single standard set of specifications and as the government mandated standard becomes progressively more strict so does the definition.

The move to lower sulfur content is expected to allow the application of newer emissions control technologies that should substantially lower emissions of particulate matter from diesel engines. This change occurred first in the European Union and is now happening in North America. New emissions standards, dependent on the cleaner fuel, have been in effect for automobiles in the United States since model year 2007.

ULSD has a lower energy content due to the heavy processing required to remove large amounts of sulfur from oil, leading to (1 to 2%) lower fuel economy. Using it requires more costly oil.

AIR QUALITY IMPACT ANALYSIS

Pilgrim's facility is consider to be an non-major source under State Rules 14, 19, and 30. The modification being reviewed here is a non-major modification to a non-major source. For this reason, no impact analysis study was conducted for the source.

MONITORING OF OPERATIONS

#2 Fuel Oil Supplier Certification

No change because of this modification. See permitting sections: 4.1.11.; 4.1.12;4.1.13; 4.1.14.; and 4.1.15.

Fuel Consumption

No change: Natural Gas and #2 Fuel Oil consumption records are to be kept per permit section 4.4.5.

Visible Emission Checks

The visible emission checks required under R13-1506B for the two existing boilers (1E; 8E) are still required (see Monitoring Requirement in permit section 4.2.1. and Reporting Requirement in permit section 4.4.4.).

Emission point 2E (formerly Whole Corn Silo) under R13-1506C becomes 2AE (Grain Receiving) and 2BE (Headhouse and Grain Handling). Emission point 11E (Feed Shipping) was added to the list of visible emission checks. See permit sections 4.2.1. (Monitoring Requirement) and 4.4.4. (Reporting Requirement).

PM Emission Limitations

Section 4.4.5. (Recordkeeping Requirements) was added to permit R13-1506C.

4.4.5. For determining compliance with the PM emission limitations established under permit condition 4.1.4., the permittee shall maintain accurate records for each truck/railcar shipment detailing the arrival/departure: date and time, specific load/unloading location, and amount of material(s) (corn, soybean mill, additives, product, etc.) entering or leaving the facility. These records shall be certified by the responsible official and maintained on site for a period of no less than five (5) years, and made available to the Director of the Division of Air Quality or his/her duly authorized representative upon request. (2AE, 4E, 11E and 12E)

CHANGES TO PERMIT R13-1506B

A compare file is attached to this evaluation. It details the changes made to permit R13-1506B to arrive at permit R13-1506C.

RECOMMENDATION TO DIRECTOR

Based on the information contained in permit application R13-1506C, the writer is convinced that Pilgrim's will operate the new grain handling equipment (which allows the facility to double its grain feeding rate to 1,120 ton/hr) in compliance with all applicable state and federal air pollution control rules and regulations. The writer recommends that the company be issued modification permit R13-1506C.

John Legg
Permit Writer

November 16, 2015