



APPLICATION FOR A COASTAL ZONE ACT PERMIT

**State of Delaware
Department of Natural Resources & Environmental Control
Office of the Secretary**

November 2015
Pellet Cooler Upgrade
Mountaire Farms of Delaware, Inc.

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Permit Application Instructions

1. Complete all parts of the application. For sections which are not applicable to your project, do not leave blank; present a statement that clearly states why the section is not applicable to your project.
2. Because all applicants' projects are different, this word document template will provide you flexibility for needed space to answer the questions. Please insert additional lines for text where needed for your application. If appropriate, attach extra pages referencing each answer by the corresponding section and question number.
3. Submit eight complete hard copies of the permit application to:

Office of the Secretary
Department of Natural Resources & Environmental Control
State of Delaware
89 Kings Highway
Dover, DE 19901

In addition to the eight hard copies, submit a complete electronic "pdf" copy of the permit application and a copy of the Offset Matrix in Microsoft Word format on cd-rom.

4. Comply, if required, or as requested by the DNREC Secretary, with [7 Delaware Code, Chapter 79, Section 7902](#). If requested, but not completed, your application will not be considered administratively complete until this form is reviewed.
5. Be sure to include your permit application fee of \$3,000; otherwise the application will not be considered administratively complete. Make checks payable to the "State of Delaware."
6. Be advised that the application for a Delaware Coastal Zone Act Permit is a public document, which may be displayed at DNREC offices, public libraries, and the web, among others. If this application requires you to place confidential information or data in the application to make it administratively complete, note the Delaware Freedom of Information Act ([29 Delaware Code, Chapter 100](#)) and [DNREC's Freedom of Information Act Regulation](#), Section 6 (Requests for Confidentiality), for the proper procedure in requesting confidentiality.

Note: This application template was last revised by DNREC on January 30, 2008. Please discard any previous versions.

PART 1

CERTIFICATION BY APPLICANT

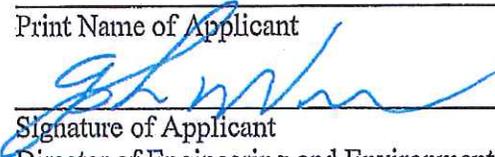
Under the penalty of perjury pursuant to 11 Delaware Code §1221-1235, I hereby certify that all the information contained in this Delaware Coastal Zone Act Permit Application and in any attachments is true and complete to the best of my belief.

I hereby acknowledge that any falsification or withholding of information will be grounds for denial of a Coastal Zone Permit.

I also hereby acknowledge that all information in this application will be public information subject to the Delaware Freedom of Information Act, except for clearly identified proprietary information agreed to by the Secretary of the Department of Natural Resources & Environmental Control.

John Wren

Print Name of Applicant



Signature of Applicant

Director of Engineering and Environmental Services

Title



Date

PART 2

APPLICANT INFORMATION AND SITE IDENTIFICATION

2.1 Identification of the applicant:

Company Name: Mountaire Farms of Delaware, Inc.
Address: 29106 John J. Williams Hwy, Millsboro DE 19966
Telephone: 302-934-1100
Fax: 302-934-3081

2.2 Primary contact: Please list the name, phone number and email of a preferred contact within your company in case the DNREC needs to contact you regarding this permit application.

Beth Sise, Env. Mgr. 302-934-3094 bsise@mountaire.com

2.3 Authorized agent (if any):

Name: Lee J. Beetschen, P.E., DEE
Address: 144 S. Governors Ave. Dover DE 19904
Telephone: 302-674-9280
Fax: 302-674-1099

If you have an authorized agent for this permit application process, provide written authorization from client for being the authorized agent. Attachment A

2.4 Project property location (street address):

Same as above

2.5 In a separate attachment, provide a general map of appropriate scale to clearly show the project site.

See Attachment B

2.6 Is the applicant claiming confidentiality in any section of their application?

NO

If yes, see instructions on page 3.

PART 3

PROJECT SUMMARY

Provide a one-page summary describing the proposed project. Include a brief quantitative description of the anticipated environmental impacts, and how the Environmental Offset Proposal will “clearly and demonstrably” more than offset any negative impacts.

The installation of a new pellet cooler in the existing feed mill will increase the pellet cooler capacity from 50 T/hr to 85 T/hr. A 35 T/hr increase equates to a PM10 emission rate increase of 11.5 T/year.

The increase in pellet mill capacity will also require replacement of the existing Boone Bag House on the Hammermill to 95 TPH from the current permit limit of 70 TPH. This will increase the PM10 emissions by 1.3 T/year. The total increase in PM10 emissions resulting from the feed mill expessor will be $11.5 + 1.3 = 12.8$ T/year requiring an offset of 1.3×12.8 T/year = 16.64 T/year.

The application for a Coastal Zone Act permit for the resource recovery plant filed by Mountaire on July 22, 2009 provided evidence of past voluntary environmental improvements and investments made prior to the time of that application. The environmental improvements were created by converting two (2) complex boilers from oil to natural gas. The resulting reduction in complex air emissions was 71 T/year. Mountaire requested that 13.4 tons of the annual 71 ton reduction in emissions be used as an offset for that resource recovery Coastal Zone Act permit. As stated in the cited application, “the balance of available offset due to change of boiler fuel for two (2) of the three (3) complex boilers described above is being held in reserve should additional projects subject to Delaware’s Regulations Governing Coastal Zone be necessary. This balance is quantified at approximately 58 tons.”

We intend to apply 17 T/year of air emissions from the 58 T/year reserve balance to satisfy the offset requirement for the feed mill expansion, thereby leaving a balance of 41 T/year to be held in reserve should additional projects subject to Delaware Regulations Governing Coastal Zone be necessary.

The offset for this project occurred in August of 2010 when two (2) complex boilers were voluntarily replaced with boilers that would combust natural gas only. The two (2) boilers that were replaced could also combust No. 6 fuel oil. The change in fuels resulted in a 71 ton reduction of total emissions of the fuel combustion products. The previous coastal zone application which was approved by the Secretary used 13 tons per year of these emission reductions as the offset for that project. Mountaire indicated in the application that the balance of available offset due to the change of boiler fuel quantified that approximately 58 tons was being held in reserve should additional projects subject to Delaware's Regulations Governing Coastal Zone be necessary. This pellet cooler upgrade project taps into that reserve for 17 T/year to provide the offset. This beneficial reduction in air emissions is and will be continuous as long as these boilers are in operation and providing steam to the complex should be equivalent to the operating life of the feed mill in which the cooler upgrade is occurring.

The success of the offset project is measured in both the short and long term and reported to the Department with air quality reports on an annual basis. The conversion to natural gas has been made an enforceable condition in the current DNREC air permit. In our opinion, there are no negative impacts associated with the offset project which has been in place for the resource recovery plant since August, 2010.

PART 4

**PROJECT PROPERTY RECORD AND
EVIDENCE OF LOCAL ZONING AND PLANNING APPROVAL**

PROJECT PROPERTY RECORD

4.1 Name and address of project premises owner(s) of record:

Ronnie Cameron
Mountaire Corporation
PO Box 21440
N. Little Rock, AR 72221

4.2 Name and address of project premises equitable owner(s):

N/A

4.3 Name and address of lessee(s):

N/A

4.4 Is the project premises under option by permit applicant?

No

4.5 What is the present zoning of the land for this entire project site?

Heavy Industrial

EVIDENCE OF LOCAL ZONING AND PLANNING APPROVAL

I, Lawrence B. Lank, Director for Sussex County Planning and Zoning

do hereby affirm that the project proposed by Mountaire Farms of Delaware, Inc.

located at 29106 John J. Williams Highway in Millsboro DE 19966.

The HI-1 Heavy Industrial zoning district is in full compliance with the zoning code as it applies to this project.

The above named applicant's project is in compliance with the adopted comprehensive development plan for the geographic area within which the project will be located.

Lawrence B. Lank
(Signature)

Director of Planning and Zoning
(Title)

7.16.15
(Date)

This part is essential for a complete Coastal Zone Act Permit Application. No application will be considered administratively complete without it. While the applicant is strongly advised to use this form, the local zoning jurisdiction may utilize a different form or document to demonstrate "evidence of local zoning approval," provided such documents are signed and dated by the proper official.

PART 5

PROJECT OPERATIONS

5.1 Describe the characteristics of the manufactured product and all the process and/or assembly operations utilized by the proposed project. Include in the description (use attachments if necessary):

- a. the raw materials, intermediate products, by-products and final products and characteristics of each. Review any materials' risk of carcinogenicity, toxicity, mutagenicity and/or the potential to contribute to the formation of smog. Provide material safety data sheets (MSDS) if available;

The raw materials used to create chicken feed are: corn, soybeans, protein meals, fat, vitamins, minerals, and feed additives. There are no intermediate products or by-products generated in this process.

Manganese, zinc and copper are feed ingredients that are toxic and when handled, personal protection is required. The remaining raw materials pose no risk of carcinogenicity, toxicity, mutagenicity and/or the potential to contribute to the formation of smog.

Safety Data Sheets (SDS) are located in Attachment C.

- b. the step-by-step procedures or processes for manufacturing and/or assembling the product(s). Provide a flow diagram to illustrate procedures;
The corn is crushed in the hammermill and then all additional ingredients are blended in. Steam is added to this feed mixture so that the feed can be pressed into small pellets by the pellet mill. The pellets are then cooled using forced air, and stored in bins prior to shipment to poultry farms.
- c. the nature of the materials mentioned above in 4.1(a) as to whether or not the materials require special means of storage or handling;

The dry bulk raw materials are stored in bins. The fat is stored in two heated insulated tanks.

- d. list the machinery (new and/or existing) to be utilized by this project;

A new pellet cooler cyclone and a replacement bag house will be installed

- e. list any new buildings or other facilities to be utilized;

No new buildings or other facilities

- f. list the size and contents of any anticipated aboveground or underground storage tank systems that may be constructed or utilized in support of facility operations;
N/A
- g. if this project represents an increase or decrease in production at an already existing facility, what will be the new rate of maximum production?
The new pellet cooler cyclone will allow the production rate to be increased from 50 TPH to 85 TPH
- h. if this project represents a totally new facility at a new or existing site, what will be the maximum production rate?

N/A

5.2 Describe daily hours of plant operations and the number of operating shifts.

The feed mill typically operates three shifts (24 hrs), six days/week.

5.3 Provide a site plan of this project with: See Attachment D

- a. a north arrow;
- b. a scale of not less than one inch to 200 feet;
- c. identity of the person responsible for the plan, including any licenses and their numbers;
- d. the acreage of the applicant's entire property and acreage of the proposed project;
- e. property lines of entire property;
- f. lines designating the proposed project area for which application is being made, clearly distinguished from present facilities and operating areas (if any);
- g. existing and proposed roads, railroads, parking and loading areas, piers, wharfs, and other transportation facilities;
- h. existing water bodies and wetlands and proposed dredge and fill areas, and;
- i. existing and proposed drainage ways, gas, electric, sewer, water, roads, and other rights-of-way.

5.4 How many acres of land in total are required for this proposed project?

Existing/ currently utilized/ developed land: 0 acres.

New land: 0 acres. No change

5.5 Has the property been involved with a state or federal site cleanup program such as Superfund, Brownfields, HSCA Voluntary Cleanup Program, RCRA Corrective Action, Aboveground or Underground Storage Tank Cleanup Programs? If so please specify which program.

Yes, State Drinking Water Act Program

5.6 With regards to environmental cleanup actions, has a Uniform Environmental Covenant, Final Plan of Remedial Action, or no further action letter been issued by the Department? If so are the planned construction activities consistent with the requirements or conditions stated in these documents? NO

PART 6A

ENVIRONMENTAL IMPACTS

Air Quality

6.1 Describe project emissions (new, as well as any increase or decrease over current emissions) by type and amount under maximum operating conditions:

| Pollutant | Existing Emissions | | Net Increase/Decrease | | New Total Emissions | | Percent Change (compare tons/year) |
|-----------|--------------------|-----------|-----------------------|-----------|---------------------|-----------|------------------------------------|
| | Lbs/day | Tons/year | Lbs/day | Tons/year | Lbs/day | Tons/year | |
| PM10 | 117 | 21 | 70 | 13 | 187 | 34 | 62 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

6.2 Describe how the above emissions change in the event of a mechanical malfunction or human error.

The cyclone captures 95% of the particulate matter under normal operating conditions. Should a mechanical malfunction occur, excess dust (particulate) would be emitted causing an increase in visible emissions.

- 6.3 Describe any pollution control measures to be utilized to control emissions to the levels cited above in 5.1.

The pellet mill and pellet cooler are interlocked.

- 6.4 Show evidence that applicant has, or will have, the ability to maintain and utilize this equipment listed in 5.3 in a consistently proper and efficient manner. (For example, provide college transcripts and/or records of training courses and summary of experience with this pollution control equipment of person(s) responsible for pollution control equipment, and/or provide copies of contracts with pollution control firms to be responsible for maintaining and utilizing this equipment.)

Current management staffing has a total of 23 years feed mill experience. This includes the operation of the existing pellet mills and pellet cooler cyclones at the facility.

Water Quality

6.5 Describe wastewater discharge (new, as well as any increase or decrease over current discharge levels) due to project operations: No change due to this project.

| Pollutant | Current Discharge Concentration (ppm) | New or Changed Discharge Concentration (ppm) | Current Discharge | | Net Increase/Decrease | | New Total Emissions | |
|-----------|---------------------------------------|--|-------------------|-----------|-----------------------|-----------|---------------------|-----------|
| | | | Lbs/day | Tons/year | Lbs/day | Tons/year | Lbs/day | Tons/year |
| | | | | | | | | |
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| | | | | | | | | |

6.6 Describe the current method of employee sanitary wastewater disposal and any proposed changes to that system due to this proposed project.

Sanitary waste remains the same – pumped to existing complex sanitary system.

6.7 Identify the number, location, and name of receiving water outfall(s) of any and all process wastewater discharge (new or current) affected by this proposed project. Provide NPDES Permit Numbers for each discharge affected.

Treated process wastewater is land applied pursuant to Permit #LTS 5011-87-04

6.8 If any effluent is discharged into a public sewer system, is there any pretreatment program? If so, describe the program.
N/A

6.9 Stormwater:

a. Identify the number, location, and name of receiving waters of stormwater discharges. Provide permit number for each discharge.
There will be no stormwater discharges to surface waters as a result of this project.

b. Describe the sources of stormwater run-off (roofs, storage piles, parking lots, etc).
Roof and parking lot

c. Describe the amount of stormwater run-off increase over current levels that will result from the proposed project.
None

- d. Describe any pollutants likely to be in the stormwater. N/A
- e. Describe any pollution control device(s) or management technique(s) to be used to reduce the amount of stormwater generated, and devices to improve the quality of the stormwater run-off prior to discharge. N/A
- f. Describe any new or improved stormwater drainage system required to safely carry off stormwater without flooding project site or neighboring areas down gradient. Existing facility – stormwater infrastructure in place

6.10 Will this project use a new water intake device, or increase the use (flow) from an existing intake device?

NO

If yes, state:

- a. the volume of water to be withdrawn, and;
- b. describe what will be done to prevent entrainment and/or entrapment of aquatic life by the intake device.

6.11 Will this proposed project result in a thermal discharge of water, or an increase in the flow or temperature of a current thermal discharge?

NO

If yes, state:

- a. the volume of the new flow or increase from the existing thermal discharge, both in flow and amount of heat;
- b. how warm will the water be when it is discharged into a receiving waterway, discharge canal, or ditch, and what will be the difference in discharge temperature and ambient temperature (delta T) at various seasons of the year after all cooling water mechanisms have been applied to the hot water?
- c. the equipment and/or management techniques that will be used to reduce the thermal load of the discharge water.

6.12 Will any proposed new discharge or change in existing discharge cause, or have potential to cause, or contribute to, the exceedence of applicable criteria appearing in the [“State of Delaware Surface Water Quality Standards”](#)?

NO

If yes, explain:

6.13 Describe any oils discharged to surface waters due to this proposed project. None

6.14 Describe any settleable or floating solid wastes discharged to surface waters due to this project.

None

6.15 Show evidence that the applicant has, or will have, the ability to maintain and utilize any water pollution control equipment listed in questions 5.5 through 5.14 in a consistently proper and efficient manner. (For example, provide operator license numbers, college transcripts and/or training courses and summary of prior experience with this pollution control equipment of person(s) responsible for pollution control equipment, and/or provide copies of contracts with pollution control firms.)

No wastewater is produced by this process.

6.16 Estimate the amount of water to be used for each specified purpose including cooling water. State daily and maximum water use in the unit of gallons per day for each purpose and source of water. State if water use will vary with the seasons, time of day, or other factors.

| | <u>Average Daily</u> | <u>Maximum Daily</u> |
|----------------|----------------------|----------------------|
| Boiler – Steam | 36,900 GPD | Same as Average |

Water usage may vary slightly in proportion to raw material input that has a limited seasonality reflecting market demand for poultry products.

6.17 Identify the source of water needed for the proposed project, including potable water supplies.

Groundwater from the Columbia Aquifer.

6.18 Are wells going to be used?

YES

If yes:

- a. Identify the aquifer to be pumped and the depth, size and pumping capacity of the wells.

| <u>Well</u> | <u>Location</u> | <u>Capacity (GPM)</u> |
|-------------|-----------------|-----------------------|
| Boiler Room | Columbia | 200 |
| SP-H1 | Columbia | 1500 (Backup) |

- b. Has a permit been applied for to do this?

Current allocation is sufficient.

- c. How close is the proposed well(s) to any well(s) on adjacent lands?

Sufficiently distant to preclude interference with cone of influence of off-site wells.

Solid Waste

6.19 Will this project result in the generation of any solid waste?

NO

If yes, describe each type and volume of any solid waste (including biowastes) generated by this project, and the means used to transport, store, and dispose of the waste(s).

6.20 Will there be any on-site recycling, re-use, or reclamation of solid wastes generated by this project?

NO

If yes, describe:

6.21 Will any waste material generated by this project be destroyed on-site?

NO

If yes, how will that be done?

Hazardous Waste

6.22 Will this proposed project result in the generation of any hazardous waste as defined by the [“Delaware Regulations Governing Hazardous Waste”](#)?

NO

If yes, identify each hazardous waste, its amount, and how it is generated:

6.23 Describe the transport of any hazardous waste and list the permitted hazardous waste haulers that will be utilized.

N/A

6.24 Will the proposed project cause the applicant to store, treat, and/or dispose of hazardous waste?

NO

If yes, describe:

6.25 Does the applicant currently generate any hazardous waste at this site?

YES

If yes, describe: Octanes/chloroform (laboratory waste)

Habitat Protection

6.26 What is the current use of the land that is to be used for the proposed project?

Agribusiness Complex

6.27 Will the proposed project result in the loss of any wetland habitat?

NO

If yes, describe:

6.28 Will any wastewater and/or stormwater be discharged into a wetland?

NO

If yes, will the discharge water be of the same salinity as the receiving wetlands?

6.29 Will the proposed project result in the loss of any undisturbed natural habitat or public use of tidal waters?

NO

If yes, how many acres?

6.30 Do threatened or endangered species (as defined by the DNREC and/or the Federal Endangered Species Act) exist at the site of the proposed project, or immediately adjacent to it?

NO

If yes, list each species:

6.31 Will this proposed project have any effect on these threatened or endangered species (as defined by the DNREC and/or the Federal Endangered Species Act).

NO

If yes, explain:

6.32 What assurances can be made that no threatened or endangered species exist on the proposed project site?

No vegetative growth or suitable habitat to support threatened or endangered species.

6.33 Describe any filling, dredging, or draining that may affect nearby wetlands or waterways.

N/A

6.34 If dredging is proposed, how much will occur and where will the dredged materials go for disposal?

N/A

Other Environmental Effects

- 6.35 Describe any noticeable effects of the proposed project site including: heat, glare, noise, vibration, radiation, electromagnetic interference, odors, and other effects.

There will be no noticeable effects as the result of the installation of this pellet cooler in regards to; heat, glare, noise, vibration, radiation, electromagnetic interference, odors and other effects.

- 6.36 Describe what will be done to minimize and monitor such effects.

N/A

- 6.37 Describe any effect this proposed project will have on public access to tidal waters.

None

- 6.38 Provide a thorough scenario of the proposed project's potential to pollute should a major equipment malfunction or human error occur, including a description of backup controls, backup power, and safety provisions planned for this project to minimize any such accidents.

The pellet mill and pellet cooler are interlocked. The cyclone can clog in freezing temperatures in conjunction with moist air, which will result in a release. This malfunction can be avoided with increased monitoring of differential pressure and increased preventative maintenance.

- 6.39 Describe how the air, water, solid and hazardous waste streams, emissions, or discharge change in the event of a major mechanical malfunction or human error.

During a release of visible emissions (malfunction), dust is released in the immediate area of the pellet cooler.

PART 6B

ENVIRONMENTAL OFFSET PROPOSAL REDUCTION CLAIM

Is applicant claiming the right to have a reduced offset proposal due to past voluntary improvements as defined in the “Regulations Governing Delaware’s Coastal Zone”?

YES

If yes, provide an attachment to the application presenting sufficient tangible documentation to support your claim.

See Attachment E

PART 6C

ENVIRONMENTAL OFFSET PROPOSAL

If the applicant or the Department finds that an Environmental Offset Proposal is required, the proposed offset project shall include all the information needed to clearly establish:

- A. A qualitative and quantitative description of how the offset project will “*clearly and demonstrably*” more than offset the negative impacts from the proposed project.
- B. How and in what period of time the offset project will be carried out.
- C. What the environmental benefits will be and when they will be achieved.
- D. What scientific evidence there is concerning the efficacy of the offset project in producing its intended results.
- E. How the success or failure of the offset project will be measured in both the short and long term.
- F. What, if any, negative impacts are associated with the offset project.
- G. How the offset will impact the attainment of the Department’s environmental goals for the Coastal Zone and the environmental indicators used to assess long-term environmental quality within the Coastal Zone.

See Attachment E

Additional Offset Proposal Information for the Applicant

1. The offset proposals must “*clearly and demonstrably*”¹ more than offset any new pollution from the applicant’s proposed project. The applicant can claim (with documentation) evidence of past voluntary environmental investments (as defined in the Regulations) implemented prior to the time of application. Where the Department concurs with the applicant that such has occurred, the positive environmental improvement of the offset proposal against the new negative impact can be somewhat reduced.
2. The applicant must complete the Coastal Zone Environmental Impact Offset Matrix. This matrix can be found on the CZA web page (<http://www.dnrec.delaware.gov/Admin/CZA/CZAHome.htm>), or by clicking on [this link](#). On page one, the applicant must list all environmental impacts in the column labeled “Describe Environmental Impacts.” In the column to the immediate right, the applicant should reference the page number of the application or attachment which documents each impact listed. In the “Describe Environmental Offset Proposal” column, applicant must state what action is offsetting the impact. The offset action shall be referenced by page number in the column to the right to show how the offset will work. The applicant shall not utilize the far right column. *Please ensure the matrix is complete, detailed, and as specific as possible, given the allotted space. Also, thoroughly proof-read to ensure there are no spelling or grammatical errors.* The applicant must submit a completed matrix both in hardcopy and electronic form.
3. Please note: the entire offset proposal, including the matrix, shall be available to the public, as well as the evidence of past voluntary environmental enhancements.

¹ For purposes of this requirement, the DNREC will interpret the phrase “clearly and demonstrably” to mean an offset proposal that is obviously so beneficial without detailed technical argument or debate. The positive environmental benefits must be obviously more beneficial to the environment than the new pollution that minimal technical review is required by the Department and the public to confirm such. The total project must have a positive environmental impact. The burden of proof is on the applicant.

PART 7

ECONOMIC EFFECTS

Construction

- 7.1 Estimate the total number of workers for project construction and the number to be hired in Delaware.

Four construction workers should complete the installation in two days.

- 7.2 Estimate the weekly construction payroll.

Total estimated payroll - \$5000

- 7.3 Estimate the value of construction supplies and services to be purchased in Delaware.

Construction services (payroll) - \$5000

- 7.4 State the expected dates of construction initiation and completion.

December 5-6, 2015

- 7.5 Estimate the economic impact from the loss of natural habitat, or any adverse economic effects from degraded water or air quality from the project on individuals who are directly or indirectly dependent on that habitat or air or water quality (e.g. commercial fishermen, waterfowl guides, trappers, fishing guides, charter or head boat operators, and bait and tackle dealers).

None

Operations

7.6 State the number of new employees to be hired as a direct result of this proposed project and how many of them will be existing Delaware residents and how many will be transferred in from other states.

No change

7.7 If employment attributable to the proposed project will vary on a seasonal or periodic basis, explain the variation and estimate the number of employees involved.

No change

7.8 Estimate the percent distribution of annual wages and salaries (based on regular working hours) for employees attributable to this project:

| <u>Wage/salary</u> | <u>Percent of employees</u> |
|--------------------|-----------------------------|
| <\$10,000 | |
| \$10,000-14,999 | |
| \$15,000-24,999 | |
| \$25,000-34,999 | No change |
| \$35,000-49,999 | |
| \$50,000-64,999 | |
| \$65,000-74,999 | |
| \$75,000-99,999 | |
| >\$100,000 | |

7.9 Estimate the annual taxes to be paid in Delaware attributable to this proposed project:

| | | |
|-----------------------------------|----|-----------|
| State personal income taxes: | \$ | |
| State corporate income taxes | \$ | |
| County and school district taxes: | \$ | No change |
| Municipal taxes: | \$ | |

PART 8

SUPPORTING FACILITIES REQUIREMENTS

Describe the number and type of new supporting facilities and services that will be required as a result of the proposed project, including, but not limited to: None

- a. Roads
- b. Bridges
- c. Piers and/or docks
- d. Railroads
- e. Microwave towers
- f. Special fire protection services not now available
- g. Traffic signals
- h. Sewer expansion
- i. Energy related facilities expansion
- j. Pipelines

PART 9

AESTHETIC EFFECTS

- 9.1 Describe whether the proposed project will be located on a site readily visible from a public road, residential area, public park, or other public meeting place (such as schools or cultural centers).

The installation of the cyclone will be completed at the Millsboro Feed Mill which is situated on Mountaire's Complex along John J. Williams Highway. The new cyclone will be added to the existing three cyclones at the Feed Mill. It is difficult to view from the road. The Mountaire complex consists of over 1000 acres. There is no residential property, public parks or public meeting places at the complex.

- 9.2 Is the project site location within a half mile of a place of historic or scenic value?

No

- 9.3 Describe any planned attempt to make the proposed facility aesthetically compatible with its neighboring land uses. Include schematic plans and/or drawings of the proposed project after it is complete, including any landscaping and screening.

This property is zoned heavy industrial. The cyclone is consistent with existing features.

PART 10

EFFECTS ON NEIGHBORING LAND USES

10.1 How close is the nearest year-round residence to the site of this proposed project?

0.3 miles

10.2 Will this proposed project interfere with the public's use of existing public or private recreational facilities or resources?

No

10.3 Will the proposed project utilize or interfere with agricultural areas?

No

10.4 Is there any possibility that the proposed project could interfere with a nearby existing business, commercial or manufacturing use?

No

END OF APPLICATION

ATTACHMENTS TO FOLLOW

ATTACHMENTS

| | |
|---|--------------|
| A. AUTHORIZED AGENT | 2.3 |
| B. GENERAL MAP | 2.5 |
| C. SAFETY DATA SHEETS | 5.1.a |
| D. SITE PLAN OF THIS PROJECT | 5.3 |
| E. ENVIRONMENTAL OFFSET PROPOSAL | 6C |

Attachment A



October 30, 2015

Office of the Secretary
Department of Natural Resources & Environmental Control
State of Delaware
89 Kings Highway
Dover, DE 19901

To Whom It May Concern:

This is to advise that Lee J. Beetschem, P.E., DEE of CABE Associates, Inc. is Mountaire's Authorized Agent for Coastal Zone Act permit application process for the Feed Mill Expansion project to be constructed and operated within our existing Millsboro Mountaire Farms of Delaware, Inc. complex.

Sincerely,

A handwritten signature in blue ink, appearing to read "John R. Wren".

John R. Wren
Director of Engineering & Environmental Services

dds



Mountaire Farms

"We measure quality by how well we service our internal and external customers"

Attachment B



Google earth

feet
meters

2000

700



Attachment C

Safety Data Sheet for Whole Grain

| SECTION 1: IDENTIFICATION | |
|--|--|
| PRODUCT NAME: | WHOLE GRAIN |
| SDS NUMBER: | GRAIN |
| SYNONYMS/OTHER MEANS OF IDENTIFICATION: | Barley, Soft Red Winter Wheat, Soybeans & Corn |
| INTENDED USE: | FOOD |
| MANUFACTURER: (company name) | Mountaire Farms |
| EMERGENCY HEALTH AND SAFETY NUMBER: | 302-934-3424 |
| SDS INFORMATION: | PHONE: 302-934-3424 |
| | E-MAIL: jward@mountaire.com |
| | URL: www.mountaire.com |
| SDS DATE OF PREPARATION: | 06/01/2015 |

| SECTION 2: HAZARD(S) IDENTIFICATION |
|---|
| <p>CLASSIFICATION: COMBUSTIBLE DUST/RESPIRATORY HAZARD IF SMALL PARTICLES ARE GENERATED DURING FURTHER PROCESSING, HANDLING OR BY OTHER MEANS.</p> |
| <p>LABEL ELEMENTS: SIGNAL WORD: WARNING</p> |
| <p>HAZARD STATEMENT(S): CLASS 2B EYE IRRITANT. MAY CAUSE BREATHING DIFFICULTIES IF INHALED. IF SMALL PARTICLES ARE GENERATED DURING FURTHER PROCESSING, HANDLING OR BY OTHER MEANS, MAY FORM COMBUSTIBLE DUST CONCENTRATIONS IN AIR.</p> |
| <p>PRECAUTIONARY STATEMENT(S): DUST FROM PARTICULATES MAY BE A MECHANICAL EYE IRRITANT. RINSE EYES WITH WATER FOR SEVERAL MINUTES.</p> |
| <p>AVOID BREATHING DUST. EXCESSIVE INHALATION MAY AFFECT NOSE, THROAT AND LUNGS. AVOID IGNITION SOURCES: GRAIN DUST MAY BURN IF SUSPENDED IN AIR AND MAY CREATE A FLASH FIRE/EXPLOSION HAZARD.</p> |
| <p>EMERGENCY OVERVIEW: DUST FROM PARTICULATES MAY BE MECHANICAL IRRITANT TO EYES. EXCESSIVE INHALATION OF GRAIN DUSTS MAY AFFECT NOSE THROAT, AND LUNGS. MAY FORM COMBUSTIBLE DUST CONCENTRATION IN AIR; SEE "EXPLOSION HAZARD" BELOW.</p> |
| <p>EXPLOSION HAZARD: GRAIN IS GENERALLY CONSIDERED NOT HAZARDOUS BUT DUST GENERATED THROUGH DOWNSTREAM ACTIVITIES THAT MAY REDUCE ITS PARTICLE SIZE (E.G., SHIPPING, HANDLING, TRANSFER TO BINS, ETC.) MAY CREATE A HAZARDOUS CONDITION.</p> |
| <p>IF EXPOSED TO AN IGNITION SOURCE, DUST MAY BURN. AIRBORNE DUST IN SUFFICIENT CONCENTRATIONS WHEN EXPOSED TO AN IGNITION SOURCE MAY FLASH OR, IN A CONFINED SITUATION, MAY FUEL AN EXPLOSION.</p> |

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

| COMPONENT | CASRN | CONCENTRATION |
|---|-------|---------------|
| WHOLE GRAINS | | UP TO 100% |
| FOREIGN MATERIAL (SUCH AS ORGANIC PLANT MATERIAL) | | 0-5% |
| GRAIN DUST | | 0-5% |

SECTION 4: FIRST AID MEASURES

INHALATION:

REMOVE PERSON FROM EXPOSURE. SEEK MEDICAL ATTENTION FOR ANY BREATHING DIFFICULTY.

INGESTION:

IF SWALLOWED, GIVE SEVERAL GLASSES OF WATER TO DILUTE. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

SKIN CONTACT:

WASH AFFECTED SKIN WITH SOAP AND WATER.

EYE CONTACT:

FLUSH EYES WITH WATER. SEEK MEDICAL ATTENTION AS NEEDED.

SECTION 5: FIREFIGHTING MEASURES

FLASH POINT (METHOD): N/A

FLAMMABLE LIMITS: LEL: UNKNOWN UEL: UNKNOWN

AUTOIGNITION TEMPERATURE: UNKNOWN

HAZARDOUS COMBUSTION PRODUCTS: OXIDES OF CARBON

SPECIAL FIREFIGHTING PROCEDURES: EXTINGUISH WITH WATER FOG, DRY CHEMICAL POWDERS OR FOAM. DO NOT USE STRONG STREAMS OF WATER OR DRY CHEMICAL IF DUST CAN BE DISPERSED INTO THE AIR. DUST PLACED IN SUSPENSION WITH AN IGNITION SOURCE PRESENT MAY FLASH OR EXPLODE.

UNUSUAL FIRE AND EXPLOSION HAZARDS: WHOLE GRAIN IS NOT EXPLOSIVE. FINE DUST DISPERSED IN AIR AT A SUFFICIENT CONCENTRATION MAY IGNITE IF EXPOSED TO AN IGNITION SOURCE.

SECTION 6: ACCIDENTAL RELEASE MEASURES

CLEAN UP WITH SOFT BRISTLE BROOM(S) OR A VACUUM APPROVED FOR A CLASS II HAZARDOUS LOCATION. DUST DEPOSITS SHOULD BE MAINTAINED TO A MINIMUM ON SURFACES, AS THESE COULD FORM AN EXPLOSIVE MIXTURE IF THEY ARE RELEASED INTO THE ATMOSPHERE IN SUFFICIENT CONCENTRATION. AVOID DISPERSAL OF DUST IN THE AIR (I.E. CLEANING DUST SURFACES WITH COMPRESSED AIR IN THE PRESENCE OF IGNITION SOURCE SHOULD NOT BE ALLOWED.)

SECTION 7: HANDLING AND STORAGE

FINE DUST DISPERSED IN AIR AT A SUFFICIENT CONCENTRATION MAY IGNITE IF EXPOSED TO AN IGNITION SOURCE. REMOVE GRAIN DUST FROM AREA/PROCESSING EQUIPMENT PRIOR TO USING ANY HEAT PRODUCING EQUIPMENT SUCH AS ARC WELDERS, CUTTING TORCHES AND SPARK/HEAT PRODUCING TOOLS SUCH AS PORTABLE SURFACE GRINDERS. ACCORDING TO 29 CFR 1910.272(F) A HOT WORK PERMIT IS REQUIRED.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

RESPIRATORY PROTECTION: WEAR AN APPROVED NIOSH DUST RESPIRATOR WHENEVER DUST CONCENTRATIONS IN THE WORK AREA ARE ABOVE ACGIH TLV/OSHA PELS

GRAIN DUST (WHEAT, OAK AND BARLEY)

| | |
|-----------------|------------------|
| <u>OSHA PEL</u> | <u>ACGIH TLV</u> |
| 10 MG/M3 | RMG/M3* |

OTHER GRAINS

| | |
|----------------------|------------------|
| <u>OSHA PEL</u> | <u>ACGIH TLV</u> |
| 15 MG/M3 (TOTAL) | 10 MG/M3* |
| 5 MG/M3 (RESPIRABLE) | |

* THIS TLV APPLIES TO NUISANCE PARTICULATES.
THE GRAIN INDUSTRY BELIEVES THERE IS CURRENTLY INADEQUATE DATA TO SUPPORT THIS TLV.

VENTILATION: LOCAL EXHAUST: IF NEEDED
MECHANICAL (GENERAL): IF NEEDED

ENSURE THAT DUST HANDLING SYSTEMS (SUCH AS EXHAUST DUCTS, DUST COLLECTORS, VESSELS, AND PROCESSING EQUIPMENT) ARE DESIGNED IN A MANNER TO PREVENT THE ESCAPE OF DUST INTO THE WORK AREAS. USE ONLY APPROPRIATELY CLASSIFIED ELECTRICAL EQUIPMENT AND POWERED INDUSTRIAL TRUCKS.

PROTECTIVE GLOVES: N/A

EYE PROTECTION: SAFETY GLASSES / GOGGLES SUGGESTED IN DUSTY CONDITIONS

WORK/HYGIENIC PRACTICES: GOOD PERSONAL HYGIENE PRACTICES SHOULD BE FOLLOWED. AVOID EXCESSIVE DUST ACCUMULATION AND CONTROL IGNITION SOURCES. WHERE APPROPRIATE, EMPLOY GROUNDING, VENTING, AND EXPLOSION RELIEF PROVISIONS IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICES IN PROCESSES CAPABLE OF GENERATING DUST AND/OR STATIC ELECTRICITY.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

FLASH POINT (METHOD): N/A

FLAMMABLE LIMITS: LEL: UNKNOWN UEL: UNKNOWN

AUTOIGNITION TEMPERATURE: UNKNOWN

APPEARANCE:

NATURAL GRAIN COLOR - WHOLE GRAIN
GRAIN DUST - LIGHT, GRAYISH OR BROWN POWDER

UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS: WHEN DISPERSED INTO THE AIR IN SUFFICIENT CONCENTRATIONS GRAIN DUST CAN EXPLODE IN THE PRESENCE OF AN IGNITION SOURCE. DO NOT ALLOW DUST TO BECOME DISPERSED INTO THE AIR, EVEN BY THE EXTINGUISHING AGENT. MINIMUM EXPLOSIVE CONCENTRATION IS 55 G/M3. HOWEVER, MOISTURE CONTENT, PARTICLE SIZE, CALORIC PROPERTIES, AND SPECIFIC INGREDIENTS ALSO AFFECT THE EXPLOSIVENESS OF GRAIN DUST.

THE FLASH POINT AND FLAMMABLE LIMITS ARE ACCURATE BECAUSE GRAIN DUST HAS NO FLASH POINT, LEL, OR UEL DUE TO ITS PROPERTIES. THE FIREFIGHTING MEASURES LISTED ARE IN ACCORD WITH OTHER SIMILAR SDS.

FOR AN EXPLOSION TO OCCUR, FOUR CONDITIONS MUST EXIST: FIRST, OXYGEN MUST BE PRESENT. SECOND, THERE MUST BE AN IGNITION SOURCE (E.G. ELECTRICAL SHORT, SPARKS, ETC.). THIRD, THERE MUST BE FUEL (E.G. GRAIN DUST IN SUSPENSION). FOURTH, THERE MUST BE CONTAINMENT OF SUSPENDED GRAIN DUST (I.E. SILO, VESSEL, ETC.). ALTHOUGH AN EXPLOSION WILL NOT OCCUR IF THERE IS NO CONTAINMENT, THE DUST CAN STILL IGNITE, RESULTING IN A FIRE.

AS NOTED, EXPLOSIONS ARE DEPENDENT UPON THE CONCENTRATION OF THE FUEL (E.G. GRAIN DUST) SUSPENDED IN THE AIR. THE MINIMUM EXPLOSIVE CONCENTRATION (MEC) FOR GRAIN DUST IS AROUND 55G/M3. THE MEC VARIES ACCORDING TO THE PARTICLE SIZE AND CALORIC PROPERTIES OF THE PRODUCT. IN ADDITION, THE SPECIFIC INGREDIENTS OF THE GRAIN DUST WILL AFFECT THE MEC. THEREFORE, THE LISTED MEC RANGE WOULD BE APPROPRIATE.

THE FOLLOWING INSERT TAKEN FROM "PREVENTING GRAIN DUST EXPLOSIONS" EXPLAINS EXPLOSIVE LIMITS FOR GRAIN DUST:

"A TEXAS A&M UNIVERSITY DUST CONTROL SCIENTIST SUGGESTS THAT THE MEC RANGE IS ABOUT 50 TO 150 GRAMS PER CUBIC METER, DEPENDING ON THE TYPE OF DUST AND THE SIZE OF PARTICLES (PARNELL, 1998). THIS EQUATES TO THE SAME MEC LEVEL USED BY THE NATIONAL GRAIN AND FEED ASSOCIATION (NGFA). NGFA STATES THAT THE BROAD, GENERALLY ACCEPTED MEC FOR GRAIN DUST EXPLOSIONS IS ABOUT 0.05 OUNCES PER CUBIC FOOT OF VOLUME. IT SAYS THAT THE OPTIMUM EXPLOSIVE CONCENTRATION (DEC) IS ABOUT 0.5 TO 1.0 OUNCES PER CUBIC FOOT - ABOUT 10 TIMES THE MEC (GILLIS, 1985, P. 43)."

ODOR: NO DISTINCT ODOR (OUT-OF-CONDITION PRODUCTS MAY BE SOUR OR MUSTY)

VAPOR PRESSURE: N/A **ODOR THRESHHOLD:** N/A **VAPOR DENSITY:** N/A

PH: N/A **MELTING POINT/FREEZING POINT:** N/A

SOLUBILITY (IES): N/A **INITIAL BOILING POINT AND BOILING RANGE:** N/A

PARTITION COEFFICIENT N-OCTANOL/WATER: N/A

FLASH POINT: N/A **AUTO-IGNITION TEMPERATURE:** N/A

EVAPORATION RATE: N/A **DECOMPOSITION TEMPERATURE:** N/A

SECTION 10: STABILITY AND REACTIVITY

STABILITY: **CONDITION TO AVOID:** DISPERSING DUST IN AIR, ABOVE MEC, AND EXPOSURE TO POTENTIAL IGNITION SOURCES **STABLE:** X

INCOMPATIBILITY (MATERIALS TO AVOID): NONE KNOWN

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: CO₂ H₂S AND OXYGEN DEFICIENT ATMOSPHERE UNDER IMPROPER STORAGE CONDITIONS

HAZARDOUS POLYMERIZATION: **CONDITION TO AVOID:** N/A
WILL NOT OCCUR: X

REACTIVITY:

SECTION 11: TOXICOLOGICAL INFORMATION

ROUTES OF EXPOSURE: INHALATION: X SKIN: X EYES: X INGESTION: UNLIKELY
CARCINOGENICITY: NTP: NO ARC MONOGRAPHS: NO OSHA REGULATED: NO

ACUTE: MAY BE MECHANICAL IRRITANT TO SKIN AND EYES. EXCESSIVE INHALATION OF GRAIN DUSTS MAY AFFECT THE NOSE, THROAT, AND LUNGS.

CHRONIC: REPEATED AND PROLONGED EXPOSURE TO GRAIN DUSTS MAY AFFECT THE RESPIRATORY SYSTEM OR CAUSE SENSITIZATION. SMOKERS HAVE AN INCREASED RISK OF REPIRATORY EFFECTS.

SIGNS AND SYMPTOMS OF EXPOSURE: IRRITATION TO THE SKIN, EYES, NOSE OR THROAT MAY OCCUR. SOME PEOPLE MAY OCCASIONALLY EXPERIENCE COUGHING.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: ALLERGIES AND RESPIRATORY AILMENTS.

SECTION 12: ECOLOGICAL INFORMATION: (NON-MANDATORY)

SECTION 13: DISPOSAL CONSIDERATIONS: (NON-MANDATORY)

SECTION 14: TRANSPORT INFORMATION: (NON-MANDATORY)

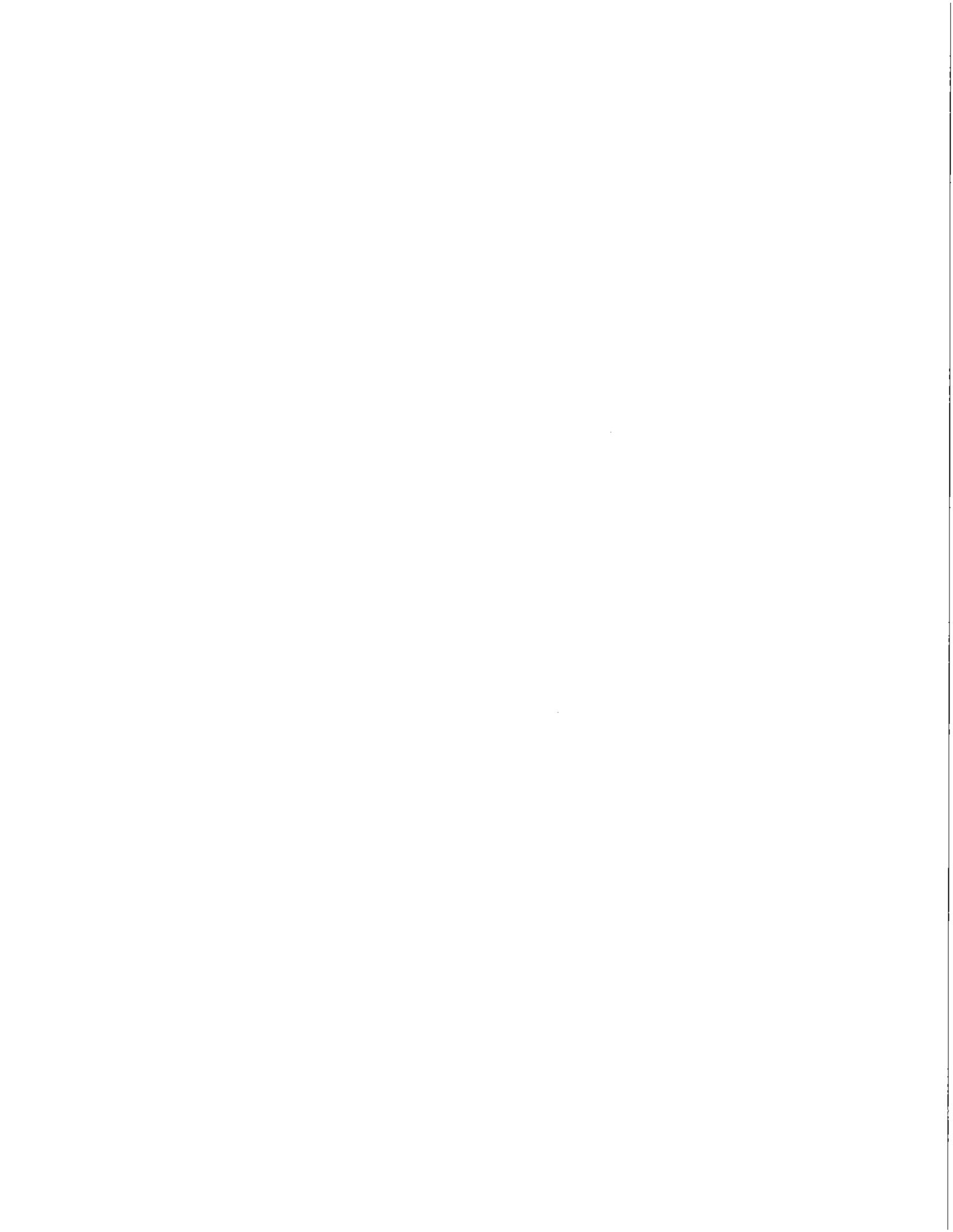
SECTION 15: REGULATORY INFORMATION: (NON-MANDATORY)

ALL ELECTRICAL EQUIPMENT MUST BE SUITABLE FOR USE IN HAZARDOUS ATMOSPHERES INVOLVING COMBUSTIBLE DUST IN ACCORDANCE WITH 29 CFR 1910.307. THE NATIONAL ELECTRICAL CODE, NFPA 70, CONTAINS GUIDELINES FOR DETERMINING THE TYPE AND DESIGN OF EQUIPMENT AND INSTALLATION, WHICH WILL MEET THIS REQUIREMENT.

COMBUSTIBLE DUST IS A "HAZARD, OTHER THAN CHEMICAL" AS DEFINED BY THE OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200.

SECTION 16: OTHER INFORMATION

THIS SAFETY DATA SHEET COVERS GRAIN IN ITS NATURAL STATE AND DOES NOT INCLUDE CHEMICALS THAT MAY BE APPLIED BY SUBSEQUENT HANDLERS AND/OR DISTRIBUTORS OF THIS PRODUCT. THE INFORMATION IN THIS SDS WAS OBTAINED FROM SOURCES THAT WE BELIEVE ARE RELIABLE; HOWEVER, THE INFORMATION IS PROVIDED WITHOUT ANY REPRESENTATION OR WARRANTY, EXPRESSED OR IMPLIED, REGARDING THE ACCURACY OR CORRECTNESS. THE CONDITIONS OR METHODS OF HANDLING, STORAGE, USE AND DISPOSAL OF THE PRODUCT ARE BEYOND OUR CONTROL AND MAY BE BEYOND OUR KNOWLEDGE. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE, OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE, OR DISPOSAL OF THIS PRODUCT.





SAFETY DATA SHEET

(According to 91/155/EFC)

ADM Safety Data Sheet

Date / Revised: May 18, 2001

Product: ADM Liquid L-Lysine 50% (Feed Grade)

1. Substance/preparation and company name

LIQUID L-LYSINE 50% FEED GRADE

Description of Product: Dark brown liquid

Company:

U.S.A. Agent/Agent U.S.A
ADM BioProducts Division
4666 Faries Parkway
P.O. Box 1470
Decatur, Illinois 62525 USA
TEL: 1-217-424-5200

European Union Agent
ADM Ölmühlen
Beteiligungsgesellschaft mbH
P.O. Box 11 29
55001 Mainz
GERMANY
TEL: (49)-6131 80120

Emergency information:

TEL: 1-217-451-2675

2. Composition/information on ingredients

Chemical nature: $C_6H_{13}N_2O_2$

Preparation contains: L-lysine free base and water

EINECS No. 200-29-42

CAS No.: 56-87-1

Symbols: L-Lys-Free Base

IFN: 5-08-022

Hazardous Ingredients: N/A

3. Possible hazards

Not DOT regulated

Not EPA regulated

No extraordinary risks for humans and environment

4. First aid measures

General recommendation: avoid contact

After inhalation: remove individual to fresh air

After skin contact: wash area thoroughly with soap and water

After eye contact: wash eye with water for 15 minutes

After swallowing: drink large amounts of water

5. Fire fighting measures

Suitable extinguishing media: water, carbon dioxide, dry chemical

Special protective equipment: in case of fire, wear self-contained breathing apparatus

Further information: may form NO_x fumes when burned

6. Accidental release measures

Personal precautions: Class P1 particle filter recommended

Methods for cleaning up: wash area with water, avoid high pressure rinsing. Material is biodegradable--avoid washing into drainage ditches

7. Handling and storage

Handling: rubber gloves and protective eyewear recommended

Storage: store in stainless steel, fiber reinforced plastic, rubber-lined steel tanks, or carbon steel tanks

8. Exposure controls and personal protection

Additional information for design of technical equipment: N/A

Components with maximum tolerance levels for workplaces: N/A

Personal protection equipment:

Protection from inhalation: dust mask - optional

Hand protection: rubber gloves

Eye protection: goggles

Body protection: N/A

General protection and hygienic measures:

9. Physical and chemical properties

Form: liquid, pumpable

Color: dark brown

Smell: fermentation

Boiling point: 230°F-250°F (110°C-120°C)

Explosion limits: N/A Lower: N/A Upper: N/A

Ignition temperature: N/A

Vapor pressure: N/A

Density: (25°C) 9.8 lb/gal (1.17 g/cm³)

Solubility in water: freely soluble

Viscosity: (25°C) 30-40 cps

pH: 9.5-10.5

10. Stability and reactivity

Conditions to avoid: heating to decomposition

Substances to avoid: strong oxidizers

Hazardous reactions: may generate heat when neutralized with acid

Hazardous decomposition products: none

11. Toxicology

Acute toxicity

LD₅₀ oral rat: 10,000 mg/kg

LD₅₀ ipr rat: 4,019 mg/kg

Sensitization

Not a skin sensitizer

12. Ecology

Elimination information:

Behavior and environmental fate: biodegradable

Ecotoxic effects: none

Further ecological information: biodegradable, not highly toxic to fish

13. Advice for disposal

Contained material may be transported to an approved landfill, incinerated, or aerobically digested

14. Transportation guidelines

Not considered to be hazardous

15. Regulatory information

Complies with applicable European Union, Canadian, United States, FDA and Japanese regulations governing animal feed ingredients

MATERIAL SAFETY DATA SHEET

Date: February 15, 2007

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**ALIMET[®] Feed Supplement
METHIONINE HYDROXY ANALOGUE**

1. PRODUCT IDENTIFICATION

Synonyms: 2-hydroxy-4-(methylthio) butanoic acid, methionine hydroxy analogue
Chemical Formula: CH₃S(CH₂)₂CHOHCOOH
CAS Reg. No.: 583-91-5
Product Use: Liquid Animal Feed Supplement

NOVUS INTERNATIONAL, INC.
 530 Maryville Centre Drive
 St. Louis, MO 63141-5862
 Telephone: 314-576-8886
 For Emergencies: 800-568-0088
 CHEMTREC: 800-424-9300

NOVUS International (Canada) Inc.
 2910 South Sheridan Way
 Oakville, Ontario, Canada L6J 7J8
 Telephone: 905-845-1878
 For Emergencies: 800-568-0088
 CANUTEC: 613-996-6666

NOVUS International de Mexico
 Bosque de Ciruelos, 194 PH
 Col. Bosques de las Lomas
 Mexico, D.F. 11700
 Telephone: 01-55-5251-5433
 For Emergencies: 800-568-0088
 SETIQ (in Mex): 01-800-002-1400

2. COMPOSITION / INFORMATION ON INGREDIENTS

| <u>Chemical Ingredients:</u> | <u>CAS Number</u> | <u>% by weight</u> | <u>OSHA PEL</u> | <u>ACGIH TLV</u> |
|------------------------------|-------------------|--------------------|-----------------|------------------|
| Methionine Hydroxy Analogue | 583-91-5 | >88% | N.E. | N.E. |
| Water | 7732-18-5 | <12% | N.E. | N.E. |

N.E. = Not Established

3. HAZARDS IDENTIFICATION

Emergency Overview

Light brown to brown liquid with sulfur odor.

DANGER!

CAUSES EYE BURNS

CAUSES SKIN IRRITATION

Potential Health Effects

EYE CONTACT: Corrosive. Causes severe eye burns.
SKIN CONTACT: Causes skin irritation.
INHALATION: Vapors have strong offensive odor, which may cause nausea, especially when exposures occur in situations without adequate ventilation or breathing protection.
INGESTION: May be harmful if swallowed. Irritating to mouth, throat and stomach.

4. FIRST AID PROCEDURES

IF IN EYES: Immediately flush eyes with plenty of water for at least 15 minutes. Get immediate medical attention

IF ON SKIN: Immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse.

IF INHALED: Remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Seek immediate medical attention.

IF SWALLOWED: Do NOT induce vomiting. Give victim a glass of water or milk. Get immediate medical attention. Careful evacuation of stomach by medical personnel imperative. Never give anything by mouth to an unconscious person.

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5. FIRE FIGHTING MEASURES**FLAMMABLE
PROPERTIES:**

Methionine hydroxy analogue contains approximately 12% water and presents no fire hazard until the water is driven off and only a mild or non-violent fire hazard potential after water content has evaporated. Product meets NFPA-30 Code (1996 Edition), Section 1-2, definition of Class IIIB combustible liquid after water content driven off. Combustion generates toxic fumes of sulfur oxides and carbon monoxide.

FLASH POINT:

No flash point observed using **Pensky-Martens Closed Cup Method** up to boil-over temperature of ~116°C (240°F). Simultaneous flash/fire point observed using **Cleveland Open Cup Method** at ~202°C (395°F). Boiling first observed at ~121°C (250°F) and continued until moisture driven off before temperature rise to fire point.

EXTINGUISHING MEDIA:

Water spray, foam, dry chemical, CO₂ or Class B extinguishing agent. Do not flush to drain.

**FIREFIGHTING
INSTRUCTIONS:**

As in any fire, wear self-contained breathing apparatus (pressure-demand, MSHA/NIOSH approved or equivalent) and full protective gear. Equipment should be thoroughly decontaminated after use.

6. ACCIDENTAL RELEASE MEASURES

Observe all protection and safety precautions when cleaning up spills. Refer to Section 3, Hazards Identification and Section 8, Exposure Controls/Personal Protection.

Avoid contamination of any material remaining in original product containers. Use only hoses and equipment known to be clean and suitable for food-grade product service in handling any product for potential salvage.

SMALL SPILL:

Keep people away. Absorb spills on floor or other impervious surfaces with lime, clays or other non-biodegradable materials. Collect contaminated sorbent and place in a plastic-lined drum. After removing all possible material, wash contaminated surface with industrial detergent solution and rinse with water. Deodorize cleaned surface with 5% sodium hypochlorite solution. **DO NOT** mix sodium hypochlorite solutions with undiluted methionine hydroxy analogue.

LARGE SPILL:

Keep people away. Contain where possible to prevent runoff from entering storm sewers and ditches which lead to waterways. Pick up by suction or vacuum truck using clean, suitable equipment. Avoid contamination of any material remaining in original product containers. Use only hoses and equipment known to be clean and suitable for food-grade product service in handling any product for potential salvage. Neutralize spills on ground with lime if possible. Dig up all contaminated soil and product and isolate from uncontaminated materials in a plastic lined drum or other suitable container.

WATER SPILL:

Keep people away. Methionine hydroxy analogue readily mixes with water. If containment and clean up is not possible, natural dilution will reduce acidity. Do not intentionally dilute.

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7. HANDLING AND STORAGE

- HANDLING:** Do not get in eyes. Avoid contact with skin and clothing. Avoid breathing vapor or mist. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling. Emptied container retains vapor and product residue. Follow all MSDS and label precautions until container is cleaned, reconditioned or destroyed as container may retain product residues.
- STORAGE:** Store under sanitary conditions with other feed ingredients. Do not store near combustible materials. Keep container closed when not in use. Keep from freezing.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

- EYE PROTECTION:** Wear chemical safety goggles. Facilities storing or using product should be equipped with an immediately available eye wash facility.
- SKIN PROTECTION:** Wear appropriate protective clothing, chemical-resistant gloves and shoes to prevent skin contact. Safety shower should be located in area where product is handled. Clean equipment after handling product. Wash thoroughly after handling product.
- RESPIRATORY PROTECTION:** Methionine hydroxy analogue does not have established airborne exposure limits. Use MSHA/NIOSH-approved full-face respiratory protection equipment when airborne exposure causes discomfort. Consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by MSHA/NIOSH or the manufacturer. Respiratory protection programs must be in compliance with 29 CFR 1910.134. For confined space entry, comply with 29 CFR 1910.146.
- VENTILATION:** Good general ventilation should be sufficient to control airborne levels. If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.

9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance: Light brown to brown liquid
- Odor: Sulfur
- Density: 1.22 gm/cm³ (10.16 lbs/gal) @ 25° C
1.24 gm/cm³ (10.33 lbs/gal) @ 0° C
- Vapor Pressure: 16mm Hg at 25° C
- Solubility in Water: Completely soluble
- Viscosity: 105 cs @ 20° C:
500 cs @ 0° C:
- Boiling Point: 121° C (250° F)
- pH: <1
- Freezing Point: Product should be protected from exposure to temperatures below 0° C (32° F).

NOTE: These physical data are typical values based on material tested, but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

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10. STABILITY AND REACTIVITY

STABILITY: Stable under expected and reasonable conditions of storage and use.

INCOMPATIBILITIES: Avoid contact with strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCT: Product decomposition with gas evolution can occur on exposure to temperatures exceeding 160°C. No uniquely hazardous decomposition products are expected. If the product is burned, as with any sulfur-containing organic material, sulfur dioxide, carbon dioxide, and carbon monoxide can be produced.

HAZARDOUS POLYMERIZATION: Does not occur.

11. TOXICOLOGICAL INFORMATION

Single exposure (acute) studies indicate:

Methionine Hydroxy

Analogue:

(CAS # 583-91-5)

Oral - Rat LD₅₀ : 2501 mg/kg
 Oral - Mouse LD₅₀ : male-3196 mg/kg, Female- >3125 mg/kg
 Dermal - Rabbit LD₅₀ : >2,000 mg/kg, Mouse- > 5000 mg/kg
 Eye Irritation - Corrosive (Rabbit)
 Skin Irritation - Slightly Irritating (Rabbit, 4-hr exposure)
 Skin Irritation - Moderately Irritating (Rabbit, 24-hr exposure, 4.1/8.0)

Product has produced no genetic changes in standard tests using bacterial cells.

12. ECOLOGICAL INFORMATION

ASSESSMENT: Slightly toxic for Selenastrum and Scenedesmus (algae).
 Practically nontoxic for water flea and fish.
 Biodegradable.

TEST RESULTS: 96 hr LC₅₀ Fish (Brachydanania rerio): 386 mg/l
 72 hr EC₅₀ Algae (Scenedesmus subspicatus): 82 mg/l
 72 hr EC₅₀ Algae (Selenastrum capricornutum): 87 mg/l
 48 hr LC₅₀ Water flea (Daphnia magna): 222 mg/l

Biodegradation (% after 28 days): 50 mg/l: 88%
 100 mg/l: 91%

Activated sludge respiration inhibition test: 3 hr EC₅₀ ≥ 1 g/l

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13. DISPOSAL CONSIDERATIONS

Dispose of all contaminated product, soil, debris, sorbents and other spill clean-up materials in accordance with applicable Federal, state or local procedures.

Contaminated materials, including contaminated or unwanted product may be classified as hazardous under the Federal Resource and Conservation Act (RCRA) and related state laws. Disposal of these materials may be subject to the RCRA Land Disposal Restriction requirements including the Universal Treatment Standards.

14. TRANSPORTATION INFORMATION

**TRANSPORTATION AND
HAZARDOUS MATERIALS
DESCRIPTION:**

Not regulated under U.S. DOT or Canadian TDG regulations

15. REGULATORY INFORMATION

SARA Hazard Notification: Physical & Health Hazard Categories, 40 CFR Part 370:

- Immediate (acute):
- Delayed (chronic):
- Fire hazard:
- Reactive hazard:
- Sudden Release of Pressure:

Section 313 Toxic Chemical(s): Not applicable.

OSHA Hazard Communication Standard: Hazardous under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200).

US Food and Drug Approval: Generally recognized as safe (GRAS) when used in animal feeds in accordance with good manufacturing or feeding practice. (21 CFR 582.5477).

NFPA Hazard Identification Label: **Health-3** (corrosive to eyes); **Fire Hazard-1** (flash point >200° F); **Reactivity-0** (stable); **Specific Hazard-None**

HMIS® Rating **Health-3; Flammability-1 ; Reactivity-0**

WHMIS Classification: Class D – Poisonous and Infectious Material, Division 2
This product has been classified according to the hazard criteria of the Canadian Consumer Products Regulation (CPR) and the MSDS contains all the information required by the CPR.

MATERIAL SAFETY DATA SHEET

Date: February 15, 2007

ALIMET® Feed Supplement
METHIONINE HYDROXY ANALOGUE

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Chemical Inventory Status

| | <u>TSCA</u> | <u>EU</u> | <u>AUS</u> | <u>CAN-DSL</u> | <u>Japan</u> | <u>Korea</u> | <u>Philippines</u> | <u>Swiss</u> |
|---------------------------|-------------|-----------|------------|----------------|--------------|--------------|--------------------|--------------|
| Methionine hydroxy analog | √ | √ | √ | √ | √ | √ | √ | - |

European Information:

| | |
|-----------|--|
| R38 | Irritating to skin |
| R41 | Risk of serious damage to eyes |
| S20 | When using do not eat or drink |
| S24/25 | Avoid contact with skin and eyes |
| S36/37/39 | Wear suitable protective clothing, gloves and eye/face protection. |

16. OTHER INFORMATION

Label Text:

DANGER!

CAUSES EYE BURNS

CAUSES SKIN IRRITATION

Do not get in eyes, on skin or on clothing.
Avoid breathing vapor or mist.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

Prepared By:

Samuel Beverly

Title:

Manager, Regulatory Affairs & Quality Assurance

Supersedes:

AL001.3, issue date March 8, 2005

Revision Information:

Review and minor corrections to Canada address

FOR ADDITIONAL NON-EMERGENCY INFORMATION, CONTACT:

GOVERNMENT AFFAIRS

NOVUS INTERNATIONAL, INC.

TELEPHONE: 314-576-8421

FAX: 314-576-2148



MSDS No. AL001.4

MATERIAL SAFETY DATA SHEET

Date: February 15, 2007

ALIMET® Feed Supplement
METHIONINE HYDROXY ANALOGUE

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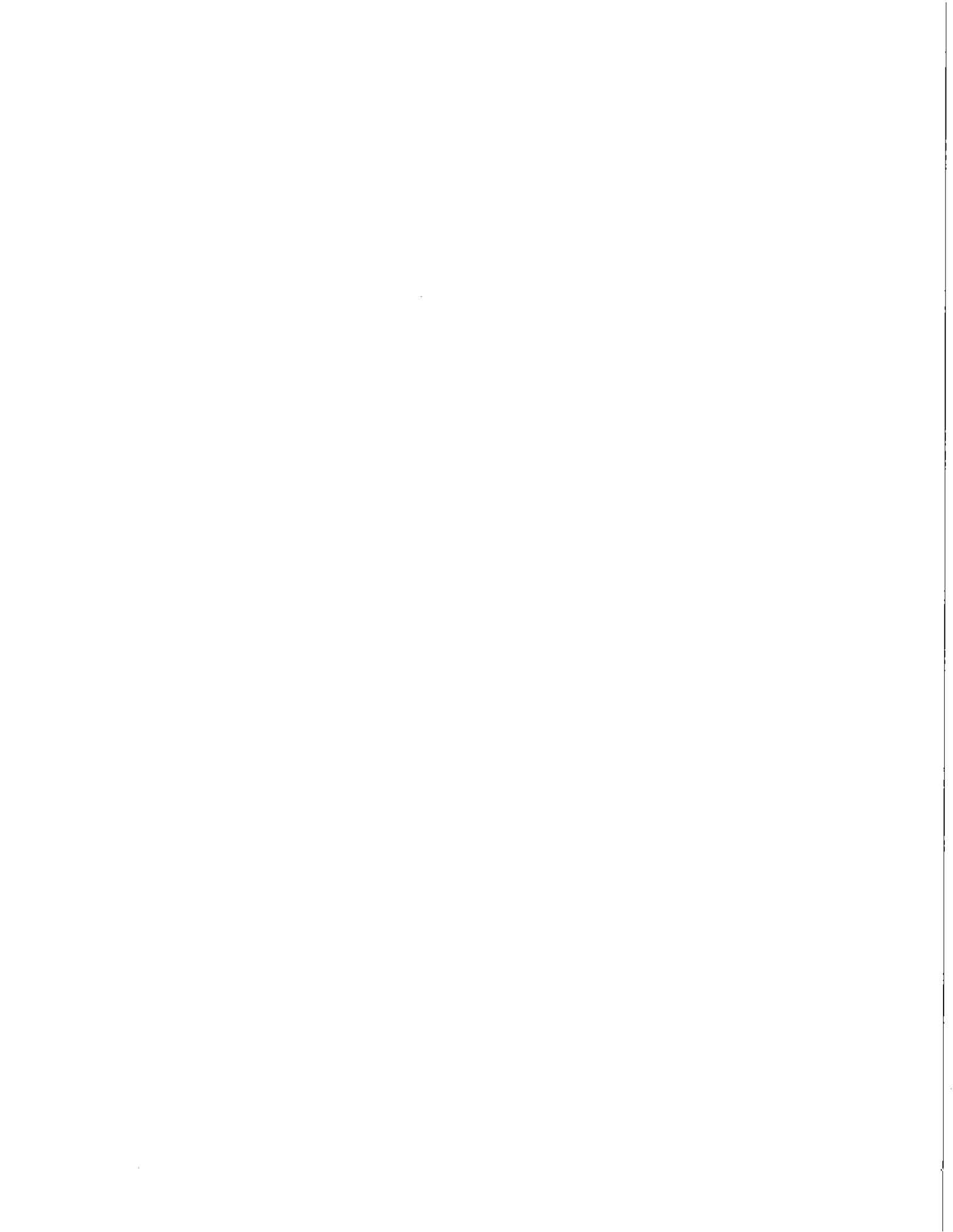
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PERFORMANCE MINERALS®

MATERIAL SAFETY DATA SHEET

MSDS DATE: 08/13/12

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Availa® Zn 120

Zinc-amino acid complex – Livestock nutritional feed additive

Zinpro Corporation
10400 Viking Drive, Suite 240
Eden Prairie, MN 55344-7265

CHEMTREC PHONE: 800-424-9300
INFO PHONE: 952-944-2736

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

| PRODUCT | INGREDIENT | CAS NO. | % WT | SARA 313 REPORTABLE | OSHA PEL-TWA | ACGIH TLV-TWS |
|-----------------|-------------------------|---------|-------------|---------------------|--------------|---------------|
| Availa® Zn 120: | Zinc amino acid complex | None | 12% (as Zn) | Yes | None | None |

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Avoid exposure to all workplace chemicals. Obtain manufacturer's instructions before use. In case of accident or if you feel unwell, seek medical advice immediately and show the product label where possible.

ROUTES OF ENTRY: Ingestion, inhalation.

POTENTIAL HEALTH EFFECTS

- EYES:** May irritate eyes.
- SKIN:** May irritate skin.
- INGESTION:** May irritate mucous membranes.
- INHALATION:** Irritation of nose, mouth, and throat may occur.

ACUTE HEALTH HAZARDS: None

CHRONIC HEALTH HAZARDS: Breathing high levels of zinc can cause irritation of your nose and throat. Ingesting high levels of zinc can cause stomach cramps, nausea, and vomiting. Very-high doses of zinc can cause anemia and affect cholesterol levels.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Respiratory problems, existing dermatitis

CARCINOGENICITY: None known at this time.

SECTION 4: FIRST AID MEASURES

- EYES:** Wash eyes with copious amounts of water. Consult a physician.
- SKIN:** After contact with skin, wash immediately with plenty of water.
- INGESTION:** Wash mouth and throat repeatedly without swallowing. Do not induce vomiting without medical advice. Consult a physician if you feel unwell.
- INHALATION:** Move to fresh air. Provide oxygen or artificial respiration if needed. Consult a physician without delay.

MATERIAL SAFETY DATA SHEET

MSDS DATE: 08/13/12

SECTION 5: FIRE-FIGHTING MEASURES

FLAMMABLE LIMITS IN AIR, UPPER: NA
(% BY VOLUME) LOWER: NA

FLASH POINT: >200 °C

AUTOIGNITION TEMPERATURE: >200 °C

NFPA HAZARD CLASSIFICATION

HEALTH: 0 FLAMMABILITY: 1 REACTIVITY: 0

HMIS HAZARD CLASSIFICATION

HEALTH: 0 FLAMMABILITY: 1 REACTIVITY: 0 PHYSICAL: 0

EXTINGUISHING MEDIA: Dry chemical, CO₂, water spray, or foam as appropriate for surrounding materials.

SPECIAL FIRE FIGHTING PROCEDURES: Self-contained breathing apparatus always recommended for fire-fighting.

UNUSUAL FIRE AND EXPLOSION HAZARDS: All granular materials have the potential to create a fire hazard if dust is generated during handling.

HAZARDOUS DECOMPOSITION PRODUCTS: Burning may produce irritant fumes such as metal oxides, or toxic gases such as carbon monoxide.

SECTION 6: ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS: Use personal protective equipment including gloves, safety glasses, and dust mask when handling this product. When handling, do not eat, drink, or smoke.

ENVIRONMENTAL PRECAUTIONS: Prevent product from entering drains.

METHODS FOR CLEANING: Carefully sweep up and recover uncontaminated material for re-use. Scoop remaining waste into suitable, labeled container for disposal.

SECTION 7: HANDLING AND STORAGE

HANDLING AND STORAGE: Use only in an area provided with adequate ventilation.
Use personal protective equipment when handling this product.
Remove and wash contaminated clothing before re-use.
Store in tightly closed container at room temperature in a dry location.

OTHER PRECAUTIONS: ALWAYS minimize the generation of dust when handling.
This product contains metal compounds. Do not mix with acids or oxidizers except under controlled conditions.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE GUIDELINES:

| Source | Substance | Permissible Exposure Level |
|---|-------------------------------------|------------------------------|
| Occupational Safety & Health Administration | Zinc complex of amino acids hydrate | None listed |
| Occupational Safety & Health Administration | Zinc dust | None listed |
| Occupational Safety & Health Administration | Nuisance dust (total) | 15.0 mg/m ³ (TWA) |
| Occupational Safety & Health Administration | Nuisance dust (respirable fraction) | 5.0 mg/m ³ (TWA) |

ENGINEERING CONTROLS: Use only in a well-ventilated area to prevent exposure from exceeding regulatory levels.

MATERIAL SAFETY DATA SHEET

MSDS DATE: 08/13/12

RESPIRATORY PROTECTION: Breathing apparatus is needed only when dust is formed. Use a mask suitable for dust. Proper handling to minimize dust is required. Do not smoke when handling this product.

EYE PROTECTION: Safety glasses with side-shields.

SKIN PROTECTION: Gloves

WORK HYGIENIC PRACTICES: Do not eat or drink when handling this product.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Brown, granular

ODOR: Sweet, organic

PHYSICAL STATE: Solid

pH: NA

MELTING POINT: >200 °C

SPECIFIC GRAVITY (H₂O = 1): 0.620 at 20°C

SOLUBILITY IN WATER: Active product is water soluble; Carrier is insoluble

PERCENT SOLIDS BY WEIGHT: 100%

PERCENT VOLATILE: 0%

VOLATILE ORGANIC COMPOUNDS (VOC): 0%

SECTION 10: STABILITY AND REACTIVITY

STABILITY: This product is stable under recommended storage conditions and in normal use.

CONDITIONS TO AVOID (STABILITY): Avoid generation of dust while handling. As with all dusts, particularly those containing metals, finely divided airborne material may explode or burn when exposed to source of ignition.

INCOMPATIBILITY (MATERIAL TO AVOID): Organic and metallic compounds are incompatible with acids and strong oxidizers. Potentially violent reactions may occur on mixing with these materials.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: Thermal decomposition may release irritating gases, such as metal oxides, or toxic gases, such as carbon monoxide.

HAZARDOUS POLYMERIZATION: None

SECTION 11: TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION:

Essential trace minerals are not a health hazard at low concentrations. However, the toxicology of this mixture of mineral-amino acid complexes at the stated concentrations has not been specifically studied. The following information pertains to the individual mineral components of this product.

Acute toxicity: Zinc (salts) lowest LD₅₀ (oral, rat) = 1000 mg/kg

Excessive exposure may affect human health as follows:

Prolonged contact may cause mild pain and redness of skin, eyes, and mucous membranes.

Prolonged inhalation may cause pain and redness in the nose, mouth, & throat.

Excessive inhalation or ingestion of this or other trace minerals may lead to nausea, drowsiness, muscle weakness, emotional disturbances, headache, dizziness, confusion, or paralysis.

MATERIAL SAFETY DATA SHEET

MSDS DATE: 08/13/12

SECTION 12: ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION:

This product contains zinc, a metal that occurs naturally throughout the environment, in rocks, soil, and water and is an essential element in plants and animals. Inorganic zinc and zinc compounds are used as pesticides, most commonly as fungicides and microbiocides, illustrating that targeted ecological effects of such materials do occur. There is no data regarding the actual eco-toxicity of the metal-amino acid complex in this product, which is formulated and approved for ingestion by livestock.

SECTION 13: DISPOSAL CONSIDERATIONS

This product is not a hazardous waste when disposed. As with all waste materials, it is recommended that residuals of this product and the container be disposed in a responsible manner at a licensed landfill or recycling center.

SECTION 14: TRANSPORT INFORMATION

This product is not listed or categorized as a hazardous material for transport in the U.S. at 49 CFR 172.101.

SECTION 15: REGULATORY INFORMATION

Mineral-amino acid complexes are not regulated under any of the listed programs. The metallic component as a free metal is regulated as follows:

U.S. FEDERAL REGULATIONS

TSCA (TOXIC SUBSTANCE CONTROL ACT) listed: Zinc and zinc compounds

CERCLA (COMPREHENSIVE RESPONSE COMPENSATION, AND LIABILITY ACT): No RQ is assigned, although the class is a CERCLA hazardous substance.

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT):

302 EXTREMELY HAZARDOUS SUBSTANCE TPQ: Not EHS

304 EXTREMELY HAZARDOUS SUBSTANCE RQ: Not EHS

311/312 HAZARD CATEGORIES: Acute: No Chronic: Yes Fire: No Pressure: No Reactivity: No

313 REPORTABLE INGREDIENTS: Availa® Zn-120 Zinc cmpds as dust or fume N987 (36% by weight; 12% Zn by weight)

STATE REGULATIONS: Refer to individual state agency for information.

INTERNATIONAL REGULATIONS: Refer to European Chemical Substance Information System (ESIS)
Refer to Australian Hazardous Substance Information System (HSIS)

SECTION 16: OTHER INFORMATION

OTHER INFORMATION: None

PREPARATION INFORMATION:

Centers for Disease Control (CDC) Agency for Toxic Substances and Disease Registry (ATSDR)
National Fire Protection Association (NFPA)
Hazardous Materials Information System (HMIS)
U.S. EPA Chemical Emergency Preparedness and Prevention Office (CEPPO) List of Lists
Pesticide Network Database
U.S. EPA Substance Registry Service (TSCA)
U.S. Dept of Labor Occupational Safety & Health Administration (OSHA) 29 CFR 1910.1000
U.S. Dept of Transportation (DOT) 49 CFR 172.101

DISCLAIMER: The information expressed in this document regarding this product is believed to be reliable. However, no guarantee or warranty of any kind, express or implied, concerning the use of this product is intended.

material safety data sheet

BETAFIN LQD

1. IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY / UNDERTAKING

Commercial product name: BETAFIN LQD
Product code: L080L
Description: Feed Additive
Manufacturer: Manufactured for Finnfeeds by
Finnugar Bioproducts Inc.
411 East Gano
St. Louis, MO 63147
USA
Tel +1-913-764-8100

Emergency phone number: +358-2-4393 300 Finnfeeds Finland Oy, Naantali plant

2. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical characterization: Betaine solution, contains no hazardous ingredients
Synonyms: 1-Carboxy-N,N,N-trimethylmethanaminium hydroxide inner salt, Trimethylglycine
CAS number: 107-43-7
EINECS number: 203-490-6

3. HAZARDS IDENTIFICATION

The data available does not indicate any hazards to human health.

4. FIRST-AID MEASURES

Inhalation: Remove from exposure
Skin contact: Rinse with water
Eye contact: Rinse with water
Ingestion: Rinse mouth and throat with water

5. FIRE-FIGHTING MEASURES

Suitable fire extinguishing media: Water, CO₂, foam, dry powder (extinguisher), sand
Non-suitable media: Not known
Special exposure hazards: Not known
Special protective equipment for firefighters: None

6. ACCIDENTAL RELEASE MEASURES

Wash with lots of water.

7. HANDLING AND STORAGE

Storage undiluted in unopened packages. If diluted, the product is not microbiologically stable.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Recommended personal protective equipment:

Respiratory protection: None
Hand protection: Impermeable gloves recommended
Eye protection: Protecting glasses or eye shield recommended

9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|-------------|----------------------|
| Appearance: | Brown liquid |
| Odour: | Faint molasses odour |
| pH: | 9-12 |

10. STABILITY AND REACTIVITY

The product is stable under normal conditions of use.

| | |
|----------------------|--|
| Conditions to avoid: | Avoid cold conditions to protect from precipitation. |
|----------------------|--|

| | |
|---------------------|-----------|
| Materials to avoid: | Not known |
|---------------------|-----------|

| | |
|-----------------------------------|-----------|
| Hazardous decomposition products: | Not known |
|-----------------------------------|-----------|

11. TOXICOLOGICAL INFORMATION

The product is not classified as toxic for acute health hazards.

12. ECOLOGICAL INFORMATION

Product is believed not to be dangerous to the environment with respect to mobility, persistency and degradability, bioaccumulative potential, aquatic toxicity and other data relating to ecotoxicity.

13. DISPOSAL CONSIDERATIONS

No special disposal methods required, except that it be in accordance with current local authority regulations.

14. TRANSPORT INFORMATION

No special requirements. Avoid damage to packaging.

15. REGULATORY INFORMATION

The product is not subject to mandatory labelling.

16. OTHER INFORMATION

The information contained in this Safety Data Sheet, as of the issue date, is believed to be true and correct. However, the accuracy or completeness of this information and any recommendations or suggestions are made without warranty or guarantee. Since the conditions of use are beyond the control of our company, it is the responsibility of the user to determine the conditions of safe use of this product. The information in this sheet does not represent analytical specifications, for which please refer to our technical data sheet.

The format of this Material Safety Data Sheet complies with the directive 91/155/EEC (as amended) and the standard ISO 11014-1.

MATERIAL SAFETY DATA SHEET

| | |
|---------------------|--|
| Common Name | COPPER SULFATE |
| Manufacturer | Old Bridge Chemicals, Inc. P.O. Box 194 Old Bridge, New Jersey 08857 |
| Telephone | (732) 727-2225 |
| Emergency Telephone | 1(800) 275-3924 |

This document is prepared pursuant to the OSHA Hazard Communication Standard (29 CFR 1910.1200).

SECTION I. MATERIAL IDENTIFICATION

| | |
|-------------------|---|
| Common Name | Copper Sulfate |
| Synonyms | Blue Vitrol, Bluestone, Cupric Sulfate |
| Molecular Formula | $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ |
| EPA Reg. Number | 46923-4 |
| CAS Number | 7758-99-8 |
| SIC Number | 28199 C 29 |

SECTION II. PHYSICAL DATA

| | |
|--------------------------------|---|
| Physical State | Blue crystals or powder |
| Boiling Point | -5 H ₂ O @ 150° F |
| Melting Point | -4 H ₂ O @ 110° F |
| Specific Gravity | 2.284 |
| Solubility in H ₂ O | 22.37% @ 0° C 117.95% @ 100° C |
| Solubility in other solvents | Soluble in methanol, glycerol and slightly soluble in ethanol |
| Appearance | Blue crystals or powder |
| Odor | Odorless |

SECTION III. FIRE AND EXPLOSION DATA

| | |
|------------------------------------|--|
| Flash Point | Not applicable |
| Flammable Limits | Not flammable. If heated above 400° C it can decompose to emit toxic fumes of oxide and sulfur. |
| Extinguishing Media | Copper Sulfate does not burn nor will it support combustion. If stored with other combustible products use water, CO ₂ or dry chemical. |
| Special Fire Fighting Instructions | If dry heated above 600° C, SO ₂ is evolved. If water is used it will solubilize the Copper Sulfate and care should be taken to keep such water out of streams or other water bodies. |
| Fire and Explosion Hazards | None |

SECTION IV. REACTIVITY DATA

| | |
|----------------------------------|---|
| Stability | Stable |
| Conditions to Avoid | Product is highly soluble, but does not react with water. |
| Incompatibility | None known when product remains dry. Product readily dissolves in water. Solutions are mildly corrosive to steel. Store solutions in plastic or rubber or 304, 316 or 317 stainless steel. Iron and moisture should be avoided. Store in a dry area. With exposure to air it will oxidize and turn whitish. |
| Hazardous Decomposition Products | None at normal production temperatures and pressures. If dry heated above 600° C toxic sulfur may evolve. |
| Polymerization | Will not occur. |

SECTION V. HEALTH AND HAZARD INFORMATION

| | |
|-----------------|--|
| Swallowing | Toxic orally in accordance with FHSLA regulations. Acute oral LD50 (male rats) = 472 mg/kg. |
| Skin | Non-toxic. Skin irritation index is zero in accordance with FHSLA regulations. |
| Eyes | Corrosive in accordance with FHSLA regulations. Eye irritation score: 24 hours = 41.67; 48 hours = corrosive |
| Inhalation | Inhalation of dust may cause irritation to the upper respiratory tract. |
| Carcinogenicity | None as per NTP, OSHA, and IARC. |

This product contains Copper Sulfate subject to the reporting requirements of Section 13 of the Emergency Planning and Community-right-to-Know-Act of 1986 (40 CFR 372).

SECTION VI. FIRST AID PROCEDURES

| | |
|-----------------|---|
| Swallowing | Give large amounts of milk or water. Induce vomiting. Call Poison Control Center or a physician. |
| Skin | Wash thoroughly with soap and water. Remove and wash contaminated clothing before reuse. |
| Eyes | Immediately flush eyes with plenty of water for 15 minutes. Hold eyelids apart during irrigation. Call a physician. |
| Inhalation | Remove person to fresh air and call a physician. |
| Carcinogenicity | None |

SECTION VII. HANDLING PRECAUTIONS

| | |
|-------------------------------|--|
| Personal Protective Equipment | Chemical safety goggles. Rubber gloves and rubber apron may be worn. |
| Ventilation | TWA = 1 mg/l for Copper Sulfate. When TWA exceeds this limit in the workplace, provide appropriate ventilation. Wear an approved respirator for dusts or mists: MSHA/NIOSH approved number prefix TC-21C, or a NIOSH approved respirator with any R, P or HE filter. |

Alternatively, provide respiratory protection equipment in accordance with Paragraph 1910.134 of Title 29 of the Code of Federal Regulations.

SECTION VIII. ENVIRONMENTAL AND DISPOSAL INFORMATION

| | |
|-----------------------|---|
| Aquatic Toxicity | LC50, 24 hours, Daphnia magna equals 0.182 mg/l. Rainbow Trout equals 0.17 mg/l. Blue Gill equals 1.5 mg/l. All values are expressed as Copper Sulfate Pentahydrate. Test water was soft. |
| Spills and Leaks | Comply with Federal, State and local regulations on reporting spills. Do not wash away crystals or powder. Recover dry if possible. If product is in a confined solution, react with soda ash to form an insoluble Copper Carbonate solid that can be scooped up. |
| Waste Disposal | Do not reuse container. Comply with Federal, State and local regulations. Sweep up crystals, powder or insoluble Copper Carbonate and dispose of in an approved landfill. |
| Environmental Effects | May be dangerous if it enters the public water systems. Follow local regulation. Toxic to fish and plants. Fish toxicity critical concentration is 235 mg/l and plant toxicity is 25 mg/l. |

SECTION IX. SPECIAL PRECAUTIONS

| | |
|-------------------|---|
| Storage | Store in a dry place. |
| Other Precautions | None other than those stated in the MSDS or on the package. |

SECTION XI. REGULATORY INFORMATION

NOTICE: The information herein is presented in good faith and believed to be accurate. However, no warranty, expressed or implied, is given. Regulatory requirements are subject to change and may differ from one location to another. It is the buyer's responsibility to ensure that its activities comply with Federal, State and local laws.

U.S. REGULATIONS: SARA 313 Information. This product contain the following substance subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372: **COPPER COMPOUND 63.3%**.

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendments and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following category: **AN IMMEDIATE HEALTH HAZARD.**

SECTION XII. SHIPPING INFORMATION

DOT Shipping Name: RQ, Environmentally Hazardous Substance, Solid, N.O.S., (CUPRIC SULFATE), 9, UN3077, PGIII, Marine Pollutant, ERG 171.

SECTION XIII. MSDS PREPARATION INFORMATION

| | |
|-------------|-------------------------------------|
| Prepared by | Joel L. Goldschmidt, Vice President |
| Updated | March 16, 1999 |

Copyright © 1999



Material Safety Data Sheet

| NFPA | WHMIS | Personal Protective Equipment | Transport Symbol |
|------|-------|-------------------------------|------------------|
| | | | |

Preparation Date: 26-Apr-2011

Revision Date: 26-Apr-2011

Revision Number: 0

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name:
CitriStim®

Emergency response telephone number:
Chemtrec 1-800-424-9300 (CCN 1635)

Product Code:
030101

Contact Manufacturer / Distributor:
ADM Alliance Nutrition, Inc.
1000 North 30th St.
Quincy, IL 62301
(217) 222-7100

Use of the Substance / Preparation:
Animal feed ingredient

2. HAZARDS IDENTIFICATION

Emergency Overview

Fine dust dispersed in air may ignite. Product dust may be irritating to eyes, skin and respiratory system.

Appearance
Tan

Physical State
Powder

Odor
Mild.

Potential Health Effects

Principle Routes of Exposure

No information available

Acute Effects

Eyes
Skin
Inhalation
Ingestion

Contact with eyes may cause mechanical irritation.
Product dust may cause mild, mechanical irritation.
May cause irritation of respiratory tract. May cause irritation of the mucous membranes.
Not for human consumption. Oral exposure is not anticipated under normal working conditions.
Consumption of this product in any manner other than it's intended use may result in toxicity

Chronic Effects

Repeated contact may cause allergic reactions in very susceptible persons

Aggravated Medical Conditions

Respiratory disorders . Skin disorders.

Potential Environmental Effects

See Section 12 for additional ecological information.

Toxicological Information

See Section 11 for additional toxicological information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature of the preparation Substance

Non-hazardous Components

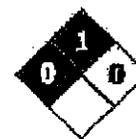
| Chemical Name | CAS-No | Weight % | North American Hazard Indicator |
|---------------------------------|--------|----------|---------------------------------|
| Extracted Citric Acid Presscake | no CAS | 100 | - |

4. FIRST AID MEASURES

| | |
|--------------------|---|
| Eye Contact | Rinse thoroughly with plenty of water, also under the eyelids. |
| Skin Contact | Wash off with warm water and soap. If skin irritation persists, call a physician. |
| Inhalation | Move to fresh air. If symptoms persist, call a physician. |
| Ingestion | When symptoms persist or in all cases of doubt seek medical advice. |
| Notes to Physician | Treat symptomatically |

5. FIRE-FIGHTING MEASURES

| | |
|---|---|
| Flammable Properties | Fine dust dispersed in air may ignite. Risks of ignition followed by flame propagation or secondary explosions should be prevented by avoiding accumulation of dust, e.g. on floors and ledges. |
| Suitable Extinguishing Media | Dry chemical. Foam. Water spray. Carbon dioxide (CO ₂). Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. |
| Unsuitable Extinguishing Media | No information available. |
| Hazardous Combustion Products | Carbon dioxide (CO ₂) , Carbon monoxide (CO). |
| Explosion Data | |
| Sensitivity to mechanical impact | No information available. |
| Sensitivity to static discharge | Yes (as dust). |
| Specific Hazards Arising from the Chemical | None known. |
| Protective Equipment and Precautions for Firefighters | As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Use personal protective equipment. |
| Further information | Fine dust dispersed in air may ignite |
| NFPA | |
| Health 0 | Stability and Reactivity 0 |
| Flammability 1 | Physical hazard - |

**6. ACCIDENTAL RELEASE MEASURES**

| | |
|---------------------------|---|
| Personal Precautions | Avoid dust formation. Use personal protective equipment. For personal protection see section 8. |
| Environmental Precautions | Prevent further leakage or spillage if safe to do so. |
| Methods for Clean-up | Shovel or sweep up. For disposal information see section 13. |

7. HANDLING AND STORAGE

| | |
|-----------------|--|
| Handling | Avoid dust formation in confined areas. Provide appropriate exhaust ventilation at places where dust is formed. Ensure adequate ventilation. Fine dust dispersed in air may ignite. Refer to NFPA 61, "Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities". |
| Storage | Keep containers dry and tightly closed to avoid moisture absorption and contamination. Containers should remain sealed until the time of use. In order to reduce the possibility of product contamination, it is recommended to use the entire container once opened. |

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits

This product is not known to contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies. However, as an airborne dust, exposure limits pertaining to "particulates not otherwise regulated" have been provided below.

| Chemical Name | ACGIH TLV | OSHA PEL | MEXICO | NIOSH | OSHA |
|--------------------------------------|--|--|--------|-------|--|
| Particulates not otherwise regulated | TWA: 10 mg/m ³ inhalable particles, recommended TWA: 3 mg/m ³ respirable particles, recommended | TWA: 15 mg/m ³ total dust TWA: 5 mg/m ³ respirable fraction | | | TWA: 10 mg/m ³ inhalable particulate TWA: 3 mg/m ³ respirable particulate |

| | |
|---------------------------------------|---|
| Engineering Measures | Ensure adequate ventilation, especially in confined areas. Apply technical measures to comply with the occupational exposure limits. However it is the duty of the user to verify this and follow given exposure limits at the workplace. |
| Personal Protective Equipment | |
| Eyeface Protection. | Safety glasses with side-shields. |
| Skin and Body Protection | Protective gloves. |
| Respiratory Protection | No personal respiratory protective equipment normally required. In the case of dust or aerosol formation use respirator with an approved filter. |
| General Hygiene Considerations | Handle in accordance with good industrial hygiene and safety practice |

9. PHYSICAL AND CHEMICAL PROPERTIES

| | | | |
|-----------------------------------|--------------------------|---------------------------------|--------------------------|
| Appearance | Tan | Odor | Mild |
| Physical State | Powder | Odor Threshold | No information available |
| Flash Point | Not applicable | Autoignition Temperature | No information available |
| Boiling point | Not applicable | Melting/Freezing Point | No information available |
| Flammability Limits in Air | No information available | Explosion Limits | No information available |
| pH | No information available | Vapor Pressure | Not applicable |
| Solubility(ies) | | Water Solubility | Insoluble |
| Evaporation Rate | Not applicable | Vapor Density | Not applicable |
| Specific Gravity | No information available | | |

10. STABILITY AND REACTIVITY

| | |
|---|--|
| Chemical Stability | Stable under normal conditions |
| Conditions to Avoid | Avoid dust formation. |
| Incompatible Materials | No materials to be especially mentioned |
| Hazardous Decomposition Products | Carbon dioxide (CO ₂), Carbon monoxide (CO). |
| Possibility of Hazardous Reactions | Hazardous polymerization does not occur. |

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Product Information

LD50 Oral: > 5g/kg (rat)
LD50 Dermal: No information available
LC50 Inhalation: No information available

Chronic Effects

Carcinogenicity

There are no known carcinogenic chemicals in this product
OSHA: (Occupational Safety & Health Administration)
Not Listed
ACGIH: (American Conference of Governmental Industrial Hygienists)
Not Listed
NTP: (National Toxicity Program)
Not Listed
Mexico: (Official Mexican Norm NOM-010-STPS-1999)
Not Listed
IARC: (International Agency for Research on Cancer)
Not Listed

Irritation

No information available.

Sensitization

No information available.

Mutagenic Effects

No information available.

Developmental Effects

No information available.

Corrosivity

No information available.

Neurological Effects

No information available.

Reproductive Effects

No information available.

Target Organ Effects

Respiratory system. Eyes. Skin.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Contains no substances known to be hazardous to the environment. Contains no substances known to be not degradable in waste water treatment plants..

Persistence/Degradability

No information available.

Bioaccumulation/ Accumulation

Not applicable.

Mobility

Insoluble in water.

13. DISPOSAL CONSIDERATIONS

Whenever possible, as rules and regulations allow, please recycle or manage materials to minimize waste.

Waste Disposal Methods

Dispose of in compliance with the laws and regulations pertaining to this product in your jurisdiction

Contaminated Packaging

Empty containers should be decontaminated and taken for local recycling, recovery or waste disposal

14. TRANSPORT INFORMATION**Domestic transport regulations (USA)**

DOT Not regulated

Domestic transport regulations (Canada)

TDG Not regulated

Domestic transport regulations (Mexico)

MEX Not regulated

International transport regulations

ICAO Not regulated

IATA Not regulated

IMDG/IMO Not regulated

15. REGULATORY INFORMATION**International Inventories**

The components of this product are reported in the following inventories:

| Chemical Name | TSCA | DSL | NDSL | EINECS | ELINCS | AICS | ENCS ISHL | CHINA | PICCS | KECL | NZLoC |
|------------------------------------|------|-----|------|--------|--------|------|--------------|-------|-------|------|-------|
| Extracted Citric Acid Presscake | No | No | No | No | No | No | No | No | No | No | No |

Legend

TSCA - Toxic Substances Control Act, Section 8(b) Inventory (USA). DSL - Domestic Substance List (Canada). NDSL - Non Domestic Substances List (Canada). EINECS - European Inventory of Existing Commercial Chemical Substances (EU). ELINCS - European List of Notified Chemical Substances (EU). AICS - Australian Inventory of Chemical Substances (Australia). ENCS - Existing and New Chemical Substances (Japan). ISHL - Industrial Health and Safety Law (Japan). CHINA - Chinese Inventory of Existing Chemical Substances (China). PICCS - Inventory of Chemicals and Chemical Substances (Philippines). KECL - Korean Existing and Evaluated Chemical Substances (Korea). NZLoC - New Zealand Inventory of Chemicals (New Zealand).

USA**Federal Regulations****Ozone Depleting Substances:**

No Class I or Class II material is known to be used in the manufacture of, or contained in, this product.

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product is not known to contain any chemicals which are subject to the reporting requirements of the Act or regulations contained in 40 CFR 372.

SARA 302

This product is not known to contain any chemicals which are subject to the reporting requirements of the Act or regulations contained in 40 CFR 302.

SARA 311/312 Hazardous Categorization

| | |
|-----------------------------------|----|
| Acute Health Hazard | No |
| Chronic Health Hazard | No |
| Fire Hazard | No |
| Sudden Release of Pressure Hazard | No |
| Reactive Hazard | No |

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)

This product is not known to contain any HAPs.

State Regulations**California Proposition 65**

Proposition 65 chemicals are not expected to be found in this product above those naturally present in their agricultural source. Proposition 65 exempts naturally occurring listed chemicals from an obligation to label.

State Right-to-Know

No known components subject to "Right-To-Know" legislation in the following States: Massachusetts, Minnesota, New Jersey, Pennsylvania, Rhode Island.

Canada

WHMIS Product Classification

Not a WHMIS controlled product.

WHMIS Ingredient Disclosure List IDL

Component Information

(NPRI) Canadian National Pollutant Release Inventory

No known component is listed on NPRI.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all the information required by the CPR.

Mexico

Mexico - Grade

Slight risk, Grade 1

16. OTHER INFORMATION

| | |
|-------------------|--------------------------------------|
| Prepared By: | ADM Alliance Nutrition |
| Preparation Date: | 26-Apr-2011 |
| Revision Date: | 26-Apr-2011 |
| Revision Number: | 0 |
| Revision Summary | Implementation into software system. |

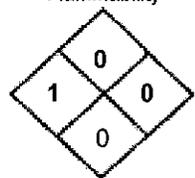
The information provided on this sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text

End of (M)SDS

Material Safety Data Sheet

| | | |
|-----------------------------|------------------------|--------------------------|
| Revision Issued: 04/01/2013 | Supersedes: 03/01/2013 | First Issued: 12/31/1989 |
|-----------------------------|------------------------|--------------------------|

Section I – Product and Company Identification

| | |
|---|---|
| Product Name: Defluorinated Phosphate (18.0% P) | PotashCorp MSDS No.: 8 ERG No.: N/A |
|  <p>1101 Skokie Blvd., Northbrook, IL 60062 Phone (800) 241-6908 / (847) 849-4200</p> <p>Suite 500, 122 – 1st Avenue South Saskatoon, Saskatchewan Canada S7K7G3 Phone (800) 667-0403 from Canada (800) 667-3930 from USA</p> <p>Emergencies (800) 424-9300 (CHEMTREC) Web Site www.potashcorp.com Health Emergencies, Contact Your Local Poison Center</p> | <p>Flammability</p> <p>Health  Reactivity</p> <p>Specific Hazard</p> <p>NFPA Code</p> |

| | | | | | | | |
|---------------------|---|-----------------|--|-----------------|------------------|--------------|--------------------------|
| Common Name: | Tricalcium Phosphate or Defluorinated Phosphate (DFP) | Formula: | Mixture of Ca ₃ (PO ₄) ₂ primarily & NaCaPO ₄ | Synonym: | DFP and ULTRADFP | Uses: | Animal and Poultry feeds |
|---------------------|---|-----------------|--|-----------------|------------------|--------------|--------------------------|

Section II – Composition / Information On Ingredients

| Chemical Name | CAS No. | Exposure Limits | | | | | | | | % by Weight |
|--|-----------|-------------------|-----|-------------------|-----|-------------------|-----|-------------------|-----|-------------|
| | | OSHA PEL | | TLV – TWA | | STEL | | CEIL | | |
| | | mg/m ³ | ppm | |
| Tricalcium phosphate, as Ca ₃ (PO ₄) ₂ | 1306-06-5 | 15/5* | | 10/3** | | | | | | 57 |
| Rhenanite, as NaCaPO ₄ | 1555-25-6 | | | | | | | | | 35 |
| Calcium silicate, as Ca ₂ SiO ₄ | 1344-95-2 | | | | | | | | | 6 |
| Other metallic impurities | | | | | | | | | | 2 |

*For particulates not otherwise regulated, standard is 15 mg/m³ total dust and 5 mg/m³ for respirable fraction.

**For particulates (insoluble) not otherwise specified, adopted value is 10 mg/m³ for inhalable fraction and 3 mg/m³ for respirable fractions.

Section III – Hazard Identification

| | |
|--|--|
| Potential Acute Health Effects: | |
| Eyes and Skin: | May cause slight irritation to the eyes, skin, nose or throat. Direct contact with the eyes can cause corneal burns. |
| Inhalation: | May cause slight discomfort. |
| Ingestion: | Swallowing a large amount is very unlikely, but could cause gastrointestinal irritation, nausea, vomiting, and diarrhea. |
| Potential Chronic Health Effects: | No other potential health effects known. |
| CARCINOGENICITY LISTS | IARC Monograph: No NTP: No OSHA: No |

Section IV – First Aid Measures

| | |
|--------------|---|
| Eyes: | Immediately flush eyes (holding eyelids apart) with plenty of water for at least 15 minutes. Get medical attention if irritation continues, develops or persists. |
| Skin: | Wash skin thoroughly with soap and water. |

| | |
|--------------------|---|
| Ingestion: | Do not induce vomiting. If conscious and large amount is ingested give several glasses of water to dilute stomach contents. Call a physician if a large amount of Defluorinated Phosphate is swallowed. |
| Inhalation: | Remove to fresh air. Keep warm. Get medical attention if discomfort continues. |

| | | | |
|---|--|-----------------------------------|----------------|
| Section V – Fire Fighting Measures | | | |
| Flash Point: | Non-flammable | Auto Ignition Temperature: | Not Applicable |
| Lower Explosive Limit: | Not Applicable | Upper Explosive Limit: | Not Applicable |
| Unusual Fire and Explosion Hazards: | Not Applicable | | |
| Extinguishing Media: | Tricalcium phosphate is a non-flammable inorganic salt. Use any extinguishing media required for surrounding fire, such as water spray, dry chemical, carbon dioxide, or foam. | | |
| Special Firefighting Procedures and Equipment: | Keep personnel removed from and upwind of fire. Wear full fire-fighting turn-out gear (full Bunker gear) and respiratory protection (SCBA). | | |

| | |
|---|---|
| Section VI – Accidental Release Measures | |
| Small Spill: | Defluorinated phosphate is used as a feed ingredient. If uncontaminated, recover and reuse product. If contaminated with other materials, collect in suitable containers. |
| Large Spill: | Defluorinated phosphate is used as a feed ingredient. Prevent large quantities from contacting waterways. If uncontaminated, recover and reuse product. If contaminated with other materials, collect in suitable containers. |
| Release Notes: | If spill could potentially enter any waterway, including intermittent dry creeks, contact the local authorities. If in the U.S., contact the US COAST GUARD NATIONAL RESPONSE CENTER toll free number 800-424-8802. In case of accident or road spill notify: CHEMTREC IN USA at 800-424-9300; CANUTEC in Canada at 613-996-6666 CHEMTREC in other countries at (International code) +1-703-527-3887. |
| Comments: | See Section XIII for disposal information and Section XV for regulatory requirements. Large and small spills may have a broad definition depending on the user's handling system. Therefore, the spill category must be defined at the point of release by technically qualified personnel. |

| | |
|---|---|
| Section VII – Handling and Storage | |
| Ventilation: | Local exhaust or other ventilation that will reduce dust concentrations to less than the recommended Permissible Exposure Limit |
| Handling: | Use appropriate personal protective equipment as specified in Section VIII. Avoid contact with skin and eyes. Avoid inhalation and ingestion. |
| Storage: | Store in ventilated area, away from fire hazards. |

| | |
|--|---|
| Section VIII – Exposure Controls/ Personal Protection | |
| Engineering Controls: | Local exhaust or other ventilation that will reduce dust concentrations to less than the recommended Permissible Exposure Limit |
| Personal Protection: | |
| Eye Protection: | Tight fitting goggles should be worn in dusty areas to reduce dust exposure to the eyes. |
| Protective Clothing: | If irritation occurs, long sleeves and impervious gloves should be worn. |
| Respiratory Protection: | A NIOSH-approved dust respirator should be used when exposure exceeds the OSHA nuisance dust standard of 15 mg/m ³ . |
| Other Protective Clothing or Equipment: | Optional |

| | | | |
|--|---------------------------------------|-------------------------------|--|
| Section IX – Physical and Chemical Properties | | | |
| Appearance/Color/Odor: | Odorless tan granular solid | Boiling Point: | Not Applicable |
| Melting Point/Range: | 1670°C (3038°F) | Boiling Point Range: | Not Applicable |
| Solubility in Water: | Negligible | Vapor Pressure (mmHg): | Not Applicable |
| Specific Gravity: | 2.2 | Molecular Weight: | 310 for tricalcium phosphate and 158 for rhenanite |
| Vapor Density: | Not Applicable | % Volatiles: | Not Applicable |
| Bulk Density: | 85 to 100 lbs/ft ³ (loose) | Evaporation Rate: | Not Applicable |
| pH: | 7 (10% slurry) | Freezing Point: | Not Applicable |

| | | | |
|------------|----------------|----------|----------------|
| Viscosity: | Not Applicable | Density: | Not Applicable |
|------------|----------------|----------|----------------|

| Section X – Stability and Reactivity | |
|--------------------------------------|----------------|
| Stability: | Stable |
| Hazardous Polymerization: | Will not occur |
| Conditions to Avoid: | None known |
| Materials to Avoid (Incompatibles): | None known |
| Hazardous Decomposition Products: | None known |

| Section XI – Toxicological Information | | |
|---|--|-------------------|
| Significant Routes of Exposure: | Eyes, skin, respiratory system, digestive tract. | |
| Toxicity to Animals: | Acute Oral Toxicity: | No data available |
| | Acute Inhalation Toxicity: | No data available |
| | Acute Toxicity: Other Routes: | No data available |
| | Acute Dermal Toxicity: | No data available |
| | Repeated Dose Toxicity: | No data available |
| | Eye & Skin Irritation/Corrosion: | No data available |
| Special Remarks on Toxicity to Animals: | No data available | |
| Other Effects on Humans: | No data available | |
| Special Remarks on Chronic Effects on Humans: | No data available | |
| Special Remarks on Other Effects on Humans: | No data available | |

| Section XII – Ecological Information | | |
|--------------------------------------|---|---|
| Ecotoxicity: | EPA Ecological Toxicity rating : | No data available |
| | Acute Toxicity to Fish: | No data available |
| | Chronic Toxicity to Fish: | No data available |
| | Acute Toxicity to Aquatic Invertebrates: | No data available |
| | Toxicity to Aquatic Plants: | No data available |
| | Toxicity to Bacteria: (activated sludge): | No data available |
| | Toxicity to Soil Dwelling Organisms: | No data available |
| Environmental Fate: | Toxicity to Terrestrial Plants: | No data available |
| | Stability in Water: | Defluorinated Phosphate has negligible solubility in water. |
| | Stability in Soil: | No data available |
| Toxicity: | Transport and Distribution: | No data available |
| | | No data available |
| Degradation Products: | Biodegradation: | No data available |
| | Photodegradation: | No data available |

| Section XIII – Disposal Considerations | |
|--|--|
| Product Disposal: | Dispose of waste at an appropriate waste disposal facility according to applicable laws and regulations. Collect in appropriate containers. Dispose of at an appropriate waste disposal facility in accordance with current applicable laws and regulations and product characteristics at time of disposal. |
| General Comments: | None |

| Section XIV – Transportation Information | | |
|--|---------------|---------------|
| | USDOT | TDG - Canada |
| Proper Shipping Name: | Not regulated | Not regulated |
| Hazard Class: | | |
| Identification Number: | | |

| | |
|--|--|
| Packing Group (Technical Name): | |
| Labeling / Placarding: | |
| Authorized Packaging: | |
| Notes: | |

| Section XV – Regulatory Information | | | | | | | | | | |
|---|---|----------------|-----------------------------|------------------------|--|-----|----------------|-----|-----------------|----|
| UNITED STATES: SARA Hazard Category: | This product has been reviewed according to the EPA Hazard Categories promulgated under Section 311 and 312 of the Superfund Amendment and reauthorization Act of 1986 (SARA title III) and is considered, under applicable definitions, to meet the following categories: | | | | | | | | | |
| | Fire: | No | Pressure Generating: | No | Reactivity: | No | Acute: | Yes | Chronic: | No |
| | 40 CFR Part 355 - Extremely Hazardous Substances: | | | | | | None | | | |
| | 40 CFR Part 370 - Hazardous Chemical Reporting: | | | | | | Not Applicable | | | |
| | All intentional ingredients listed on the TSCA inventory. | | | | | | | | | |
| SARA Title III Information: | This product contains the following substances subject to the reporting requirements of Title III (EPCRA) of the Superfund amendments and Reauthorization Act of 1986 and 40 CFR Part 372: | | | | | | | | | |
| | Chemical | CAS NO. | Percent by Weight | CERCLA RQ (lbs) | SARA (1986) Reporting | | | | | |
| | Tricalcium phosphate | 1306-06-5 | 57 | | 311 | 312 | 313 | | | |
| | Note: * Exempt from reporting in accordance with 40CFR370.2(5) | | | | | | | | | |
| CERCLA/Superfund, 40 CFR Parts 117, 302: | If this product contains components subject to substances designated as CERCLA reportable Quantity (RQ) Substances, it will be designated in the above table with the RQ value in pounds. If there is a release of RQ Substance to the environment, notification to the National response Center, Washington D.C. (1-800-424-8802) is required. | | | | | | | | | |
| CANADA: | WHMIS Hazard Symbol and classification: | | | | This product is not WHMIS controlled. | | | | | |
| | Ingredient Disclosure List | | | | This product does not contain ingredient(s) on this list. | | | | | |
| | Environmental Protection: | | | | All intentional ingredients are listed on the DSL (Domestic Substance List). | | | | | |
| EINECS#: | (Tricalcium phosphate) 215-145-7 | | | | | | | | | |
| California: Prop 65: | This is not a chemical known to cause cancer, nor is it listed. | | | | | | | | | |

| Section XVI – Other Information | | | | |
|---|--|----------------|----------------------|-------------------------|
| NFPA Hazard Ratings: | Health: 1 | Fire: 0 | Reactivity: 0 | Special Hazards: |
| | 0 = Insignificant | 1 = Slight | 2 = Moderate | 3 = High 4 = Extreme |
| COMMENTS: | This product is TSE/BSE (Transmissible Spongiform Encephalopathy/Bovine Spongiform Encephalopathy) free. There are no animal constituents used in the manufacture of Defluorinated Phosphate for PCS Sales (USA) Inc. Our product is created through a chemical process. | | | |
| Section(s) changed since last revision: | II | | | |
| Although the information contained is offered in good faith, SUCH INFORMATION IS EXPRESSLY GIVEN WITHOUT ANY WARRANTY (EXPRESS OR IMPLIED) OR ANY GUARANTEE OF ITS ACCURACY OR SUFFICIENCY and is taken at the user's sole risk. User is solely responsible for determining the suitability of use in each particular situation. PCS Sales specifically DISCLAIMS ANY LIABILITY WHATSOEVER FOR THE USE OF SUCH INFORMATION, including without limitation any recommendation which user may construe and attempt to apply which may infringe or violate valid patents, licenses, and/or copyright. | | | | |

MATERIAL SAFETY DATA SHEET

Santoquin® Liquid
Feed and Forage Antioxidant

1. PRODUCT IDENTIFICATION

Synonyms: 1,2-Dihydro-6-Ethoxy-2,2,4-Trimethylquinoline
Chemical Formula: C₁₄H₁₉NO
CAS Reg. No.: 91-53-2
Product Use: Feed and Forage Antioxidant

For Emergencies: CHEMTREC: 800-424-9300: Outside the US: 703-527-3887

NOVUS INTERNATIONAL, INC.
 20 Research Park Drive
 St. Charles, MO 63304
 Telephone: 314-576-8886
 800-568-0088

NOVUS INT'L (CANADA) INC.
 2910 South Sheridan Way
 Oakville, ON, CAN L6J 7J8
 Telephone: 905-845-1878
 CANUTEC: 613-996-6666

NOVUS Internacional de Mexico
 Bosque de Ciruelos, 194 Oficina 001-A
 Planta Jardín
 Col. Bosques de las Lomas
 Mexico, D.F. 11700
 Telephone: 01-55-5251-5433

NOVUS INTERNATIONAL, Pte, Ltd.
 51 Goldhill Plaza, #12-08
 Singapore 308900
 Telephone: 01-65-6252-0688

2. COMPOSITION / INFORMATION ON INGREDIENTS

| <u>Chemical Ingredients:</u> | <u>CAS Number</u> | <u>% by weight</u> | <u>OSHA PEL</u> | <u>ACGIH TLV</u> |
|---|-------------------|--------------------|-----------------|------------------|
| Ethoxyquin (1,2-dihydro-6-ethoxy-2,2,4-trimethylquinoline) | 91-53-2 | 91 - 100 | N.E. | N.E. |
| Paraphenetidine (p-ethoxyaniline) | 156-43-4 | 0 - 3 | N.E. | N.E. |

N.E. = Not Established

3. HAZARDS IDENTIFICATION

Emergency Overview

WARNING: MAY BE HARMFUL IF SWALLOWED. CAUSES IRRITATION TO SKIN AND EYES. MAY CAUSE ALLERGIC SKIN REACTION.

MATERIAL SAFETY DATA SHEET
Santoquin® Liquid

MSDS No. SQ001.4

Date: April 27, 2010

Page 2 of 5

Potential Health Effects

- EYE CONTACT:** Causes irritation, redness and pain.
- SKIN CONTACT:** Causes irritation to skin. Symptoms include redness, itching and pain. May produce skin sensitization or allergic skin reaction.
- INHALATION:** No information
- INGESTION:** May cause irritation to gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea.
-

4. FIRST AID PROCEDURES

- IF IN EYES:** Immediately flush with plenty of water for at least 15 minutes. Remove contact lenses when possible. If irritation persists, get medical attention.
- IF ON SKIN:** Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. If irritation persists, get medical attention. Wash clothing before reuse.
- IF INHALED:** Immediate first aid not likely to be required. If symptoms occur, remove to fresh air.
- IF SWALLOWED:** Wash out mouth with water, provided person is conscious. Get medical attention. If large quantities of this product are swallowed, call a physician. Do NOT induce vomiting unless directed to do so by a physician. Never give anything by mouth to an unconscious person.
-

5. FIRE FIGHTING MEASURES

- FLASH POINT:** 107°C (224°F) Closed Cup
140 - 143°C (284-289°F) Cleveland Open Cup
- EXTINGUISHING MEDIA:** Carbon dioxide, dry chemical or appropriate foam.
- SPECIAL INSTRUCTIONS:** As in any fire, wear self-contained breathing apparatus (pressure-demand, MSHA/NIOSH approved or equivalent) and full protective gear.
-

6. ACCIDENTAL RELEASE MEASURES

- SPILLS:** Wear appropriate personal protective equipment as specified in section 8. Contain and recover liquid when possible. Collect liquid in an appropriate container or absorb with an inert material (vermiculite, dry sand, earth), and place in a chemical waste container. Do not flush to sewer. Dispose in accordance with federal, state, and local procedures.
-

MATERIAL SAFETY DATA SHEET
Santoquin® Liquid

Date: April 27, 2010

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7. HANDLING AND STORAGE

Keep in a tightly closed container, stored in a cool, dry ventilated area. Recommended temperature = 10-50° C (50-122°F). Protect against physical damage. Product causes staining. Store away from materials where staining would be a concern.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EYE PROTECTION: Wear appropriate chemical safety glasses or goggles as described by OSHA's eye and face regulation in 29 CFR 1910.133. Facilities storing or using product should be equipped with an eye wash facility.

SKIN PROTECTION: Wear appropriate protective clothing and chemical-resistant gloves to prevent skin contact. Wash thoroughly after handling product.

PERSONAL RESPIRATORY: Avoid breathing vapor. Use MSHA/NIOSH-approved respiratory protection equipment when airborne exposure limits are exceeded (see Section 2, Exposure Limits). Respiratory protection programs must be in compliance with 29 CFR 1910.134.

VENTILATION: Good general ventilation should be sufficient to control airborne levels. If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment. Consult NFPA Standard 91 for design of exhaust systems.

9. PHYSICAL AND CHEMICAL PROPERTIES

| | | | |
|----------------------|--------------------------------|-------------------|---|
| Appearance: | Yellow to red to brown liquid. | Odor: | Sweet odor. |
| Solubility in Water: | 75 mg/l @ 25°C (77°F). | pH: | Not available. |
| Boiling Point: | 123 – 125 °C @ 2 mm Hg. | Vapor Pressure: | 1.82x10 ⁻⁴ mm @ 0°C (32 °F) |
| Vapor Density: | Not available. | | 2.56x10 ⁻⁴ mm @ 25°C (77 °F) |
| Evaporation Rate: | Not available. | Specific Gravity: | 1.029 @ 25°C (77 °F) |

10. STABILITY AND REACTIVITY

STABILITY: Stable under expected and reasonable conditions of storage and use.

INCOMPATIBILITIES: Strong acids, oxidizing materials and high temperatures.

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS: Carbon dioxide, carbon monoxide and nitrogen oxides can be produced.

HAZARDOUS POLYMERIZATION: Will not occur.

MATERIAL SAFETY DATA SHEET
Santoquin[®] Liquid

11. TOXICOLOGICAL INFORMATION

Product Data:

Oral rat LD50: 2,040 mg/kg
 Dermal rabbit LD50: >3,160 mg/kg
 Eye irritation: Slightly irritating to eyes (rabbit)
 Skin irritation: Slightly irritating to skin (rabbit), 24 hrs.
 No genetic effects observed in standard tests using bacterial cells and whole animals
 Repeated dose oral administration caused kidney and liver effects only at very high dose levels
 Developmental toxicity: No birth defects noted (rat-oral)
 Reproductive toxicity: No effect on fertility or reproduction noted in rat and rabbit studies
 Carcinogenicity: Ethoxyquin is not listed as a carcinogen.

12. ECOLOGICAL INFORMATION

Fish toxicity: 96hr. LC50 (Fathead Minnow) 7.1 mg/L
 Invertebrate toxicity: 48hr. EC50 (Daphnia Magna) 2.2 mg/L

13. DISPOSAL CONSIDERATIONS

Dispose of all empty containers, contaminated products, debris, sorbents and other spill clean-up materials in accordance with applicable Federal, state or local procedures. Do not reuse containers.

14. TRANSPORTATION INFORMATION

U.S. DOT – Not regulated
 Canada TDG – Not regulated

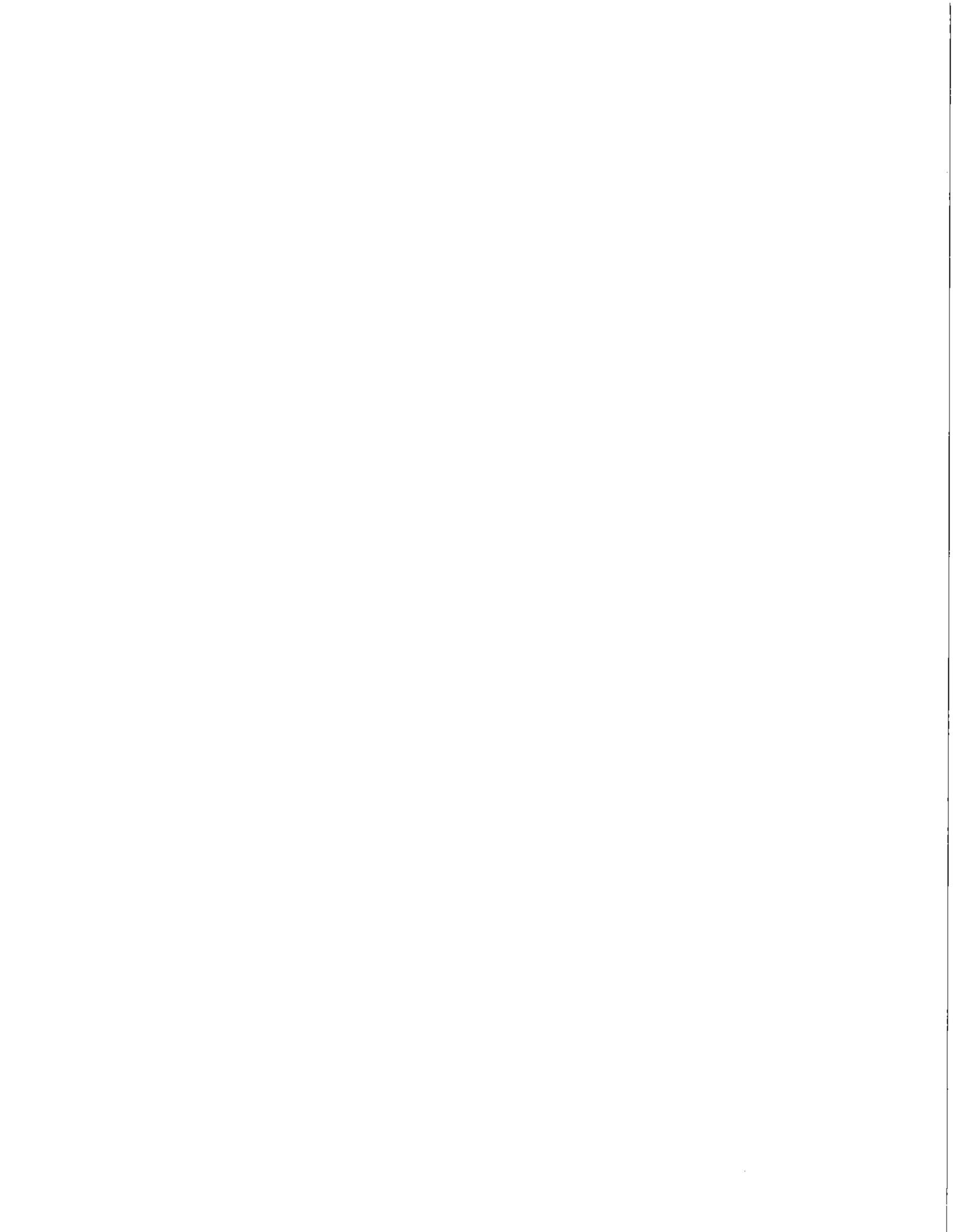
15. REGULATORY INFORMATION

SARA Hazard Notification: Physical & Health Hazard Categories, 40 CFR Part 370:

- Immediate (acute): Effects occur rapidly and are of short duration.
- Delayed (chronic):
- Fire hazard:
- Reactive hazard:
- Sudden Release of Pressure

Section 313 Toxic Chemical(s): Not applicable

Section 302 Extremely Hazardous Substances: Not applicable



Material Safety Data Sheet

S-Carb® Feed Additive

MSDS #: 533-96-0-2
Revision Date: 2013-10-28
Version 1.01



This MSDS has been prepared to meet U.S. OSHA Hazard Communication Standard 29 CFR 1910.1200
And Canadian Workplace Hazardous Materials Information System (WHMIS) requirements.

1. PRODUCT AND COMPANY IDENTIFICATION

Product name S-Carb® Feed Additive

Synonyms Sodium Sesquicarbonate; Trisodium Hydrogencarbonate, Sesqui

Recommended use: Ruminant Feed Buffer and Sodium Source for Livestock

Manufacturer **Emergency telephone number**

FMC Wyoming Corporation 1 307 / 872 2452 (Plant - Green River, WY)
Alkali Chemicals Division 1 303 / 595 9048 (Medical - U.S. - Call Collect)
1735 Market Street
Philadelphia, PA 19103 For leak, fire, spill or accident emergencies, call:
Tel: +1 215 / 299 6000 1 800 / 424 9300 (CHEMTREC - U.S.A.)
E-Mail: msdsinfo@fmc.com 1 703 / 527 3887 (CHEMTREC - Collect - All Other Countries)

2. HAZARDS IDENTIFICATION

Emergency Overview

White, odorless, needle-shaped particles
Reacts with acids to release carbon dioxide and heat

Potential health effects

Acute Toxicity

Eyes May cause irritation.
Skin Prolonged or repeated contact may dry skin and cause irritation.
Inhalation May cause irritation of respiratory tract.

Chronic Toxicity

No known effect.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

| Chemical Name | CAS-No | Weight % |
|------------------------|----------|----------|
| Sodium Sesquicarbonate | 533-96-0 | 100 |

4. FIRST AID MEASURES

Eye contact Rinse thoroughly with plenty of water, also under the eyelids. Keep eye wide open while rinsing.

Skin contact Wash skin with soap and water. Get medical attention if irritation develops and persists.

Inhalation Remove person to fresh air. If signs/symptoms continue, get medical attention.

Ingestion Rinse mouth with water and afterwards drink plenty of water or milk. Get medical attention if symptoms occur. Never give anything by mouth to an unconscious person.

5. FIRE-FIGHTING MEASURES

Flammable properties Not combustible.

Flash Point Not combustible

Suitable extinguishing media Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Hazardous combustion products Fumes of sodium oxide.

Explosion Data

Sensitivity to Mechanical Impact Not sensitive.

Sensitivity to Static Discharge Not sensitive.

Specific hazards arising from the chemical None in particular.

| | | | | |
|------|-----------------|----------------|-------------|-------------------|
| NFPA | Health Hazard 1 | Flammability 0 | Stability 0 | Special Hazards - |
|------|-----------------|----------------|-------------|-------------------|

6. ACCIDENTAL RELEASE MEASURES

Personal precautions Sweep up to prevent slipping hazard. For personal protection see section 8.

Methods for containment Vacuum or shovel waste into a drum and label contents for disposal. Avoid dust formation.

Methods for cleaning up Pick up and transfer to properly labeled containers. Keep in suitable and closed containers for disposal. Dispose of waste as indicated in Section 13.

7. HANDLING AND STORAGE

Handling Keep away from incompatible products (acids). Avoid dust formation. Provide appropriate exhaust ventilation at places where dust is formed. Reference to other sections.

Storage Store in original container. Keep in a dry place. Keep in properly labeled containers. Keep container tightly closed.

8. Exposure controls/personal protection

Exposure guidelines This product does not contain any hazardous materials with occupational exposure limits established by the region specific regulatory bodies. Local nuisance dust standards apply.

Occupational exposure controls

Engineering measures Where reasonably practicable this should be achieved by the use of local exhaust ventilation and good general extraction.

Respiratory protection If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

| | |
|---------------------------------|--|
| Eye/face protection | Safety glasses with side-shields |
| Skin and body protection | Wear suitable protective clothing. Protective shoes or boots. |
| Hand protection | Protective gloves Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the EC approved gloves |
| Hygiene measures | Handle in accordance with good industrial hygiene and safety practice Do not eat, drink or smoke when using this product. Wash hands before breaks and at the end of workday. |

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

| | |
|---------------------------------|--|
| Appearance | White, odorless, needle-shaped particles |
| Color | white to off white |
| Physical state | solid |
| Odor | odorless |
| Odor Threshold | Not applicable |
| pH | 9.9 (1% solution) |
| Melting Point/Range | Decomposes on heating. |
| Freezing point | No information available |
| Boiling Point/Range | Not applicable |
| Flash Point | Not combustible |
| Evaporation rate | Not applicable |
| Flammable properties | Not combustible |
| Oxidizing properties | Non-oxidizing |
| Vapor pressure | No information available |
| Vapor density | Not applicable |
| Specific Gravity | 2.12 |
| Bulk density | 0.74 g/cm ³ |
| Water solubility | (% by weight) 12% maximum |
| Percent volatile | No information available |
| Partition coefficient: | Not applicable |
| Viscosity | No information available |
| Autoignition Temperature | 135 °C |
| | Not combustible |

10. STABILITY AND REACTIVITY

| | |
|---|--|
| Stability | Stable. |
| Conditions to avoid | Avoid contact with acids |
| Materials to avoid | Acids |
| Hazardous decomposition products | Carbon dioxide (CO ₂). |
| Hazardous polymerization | Hazardous polymerization does not occur. |
| Hazardous reactions | None under normal processing. |

11. TOXICOLOGICAL INFORMATION

Acute effects

| | |
|------------------------|-------------------------|
| Eye irritation | Non-irritating (rabbit) |
| Skin irritation | Non-irritating (rabbit) |

LD50 Oral > 2800 mg/kg (Rat)
LD50 Dermal No information available
LC50 Inhalation: > 5.03 mg/L 4 hr (Rat)

Sensitization Non-sensitizing, guinea pig

Chronic Toxicity

Chronic Toxicity No known effect.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Not expected to have significant environmental effects

Persistence and degradability Biodegradability does not pertain to inorganic substances.

Bioaccumulation Does not bioaccumulate.

Mobility Dissociates into ions.

13. DISPOSAL CONSIDERATIONS

Waste disposal methods This material, as supplied, is not a hazardous waste according to Federal regulations (40 CFR 261). This material could become a hazardous waste if it is mixed with or otherwise comes in contact with a hazardous waste, if chemical additions are made to this material, or if the material is processed or otherwise altered. Consult 40 CFR 261 to determine whether the altered material is a hazardous waste. Consult the appropriate state, regional, or local regulations for additional requirements.

Contaminated packaging Dispose of in accordance with local regulations.

14. TRANSPORT INFORMATION

DOT not regulated

TDG not regulated

ICAO/IATA not regulated

IMDG/IMO not regulated

15. REGULATORY INFORMATION

International Inventories

| | |
|---|----------|
| TSCA Inventory (United States of America) | Complies |
| DSL (Canada) | Complies |
| NDSL (Canada) | Complies |
| EINECS/ELINCS (Europe) | Complies |
| ENCS (Japan) | Complies |
| IECSC (China) | Complies |
| KECL (Korea) | Complies |
| PICCS (Philippines) | Complies |
| AICS (Australia) | Complies |

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NZIoC (New Zealand)

Complies

U.S. Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories

| | |
|--|----|
| Acute Health Hazard | no |
| Chronic Health Hazard | no |
| Fire Hazard | no |
| Sudden Release of Pressure Hazard | no |
| Reactive Hazard | no |

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

International Regulations

Mexico - Grade

No information available

Canada

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class

Non-controlled

16. OTHER INFORMATION

| | | | | |
|------|-----------------|----------------|-------------|-----------------------|
| HMIS | Health Hazard 1 | Flammability 0 | Stability 0 | Special precautions - |
|------|-----------------|----------------|-------------|-----------------------|

NFPA/HMIS Ratings Legend

Severe = 4; Serious = 3; Moderate = 2; Slight = 1; Minimal = 0

Product Certifications

This product meets the chemical testing specifications defined in the Food Chemicals Codex (FCC), 8th Edition.

This product is certified to NSF/ANSI Standard 60 for use in drinking water treatment at the specified maximum use limit. The MUL (maximum use level) for sodium sesquicarbonate is 100 mg/L under NSF/ANSI Standard 60.



Revision Date: 2013-10-28
Reason for revision: (M)SDS sections updated. 16.

Disclaimer

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Prepared By

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End of Material Safety Data Sheet

RONOZYME® P-(CT)

1. Product and Company Identification

| | | |
|---------------------|--|-----------------------|
| Product name | RONOZYME® P-(CT) | |
| Product code | 50 0820 4 | |
| Company information | Enquiries: DSM Nutritional Products AG Wurmisweg 576 CH-4303 Kaiseraugst Switzerland | Local representation: |
| | Phone | +41-62 866 23 14 |
| | Fax | +41-62 866 25 10 |

2. Composition/Information on ingredients

Characterization granulated standardized enzyme preparation of biotechnological origin for feed admixture

| Ingredient | Concentration | EU-Classification (pure ingredient) |
|--|---------------|---|
| 6-Phytase CAS: 9001-77-8 EINECS: 232 630 9 | ~ 2 % |  Xn R42 S22, S24, S36/37 |

3. Hazards identification

Most important hazards - May cause sensitization by inhalation.

4. First-aid measures

| | |
|-------------------|--|
| Eye contact | - rinse immediately with tap water for 10 minutes - open eyelids forcibly |
| Skin contact | - remove contaminated clothes, wash affected skin with water and soap - do not use any solvents |
| Inhalation | - remove the casualty to fresh air and keep him/her calm - in the event of symptoms get medical treatment |
| Note to physician | - treat symptomatically |

RONOZYME® P-(CT)

5. Fire-fighting measures

- Suitable extinguishing media - water spray jet, dry powder, foam, carbon dioxide
- Protection of fire-fighters - precipitate gases/vapours/mists with water spray

6. Accidental release measures

- Methods for cleaning up - collect solids (avoid dust formation) and hand over to waste removal
- rinse with plenty of water
- avoid formation of aerosols

7. Handling and storage

Handling

- Technical measures - avoid dust formation
- use only in well ventilated areas
- local exhaust ventilation necessary
- transfer and handle in enclosed systems, if possible
- Suitable materials - stainless steel, aluminium, polyethylene
- Note - due to the granulated formulation of this product there is a low hazard of dust explosion; however, avoid any dust-generating mechanical processing

Storage

- Storage conditions - below 25 °C
- store in a dry place
- Packaging materials - tightly closing; material: polyethylene, food-approved plastic

8. Exposure controls/Personal protection

- Engineering Measures - see 7.

Personal protective equipment

- Respiratory protection - In case of open handling or accidental release: particle mask (P3) or respirator with independent air supply
- Hand protection - protective gloves (eg made of NR Natural Rubber, NBR Acrylnitril-Butadien-Rubber)
- Eye protection - safety glasses

RONOZYME® P-(CT)

9. Physical and chemical properties

| | |
|---------------|----------------------------|
| Colour | beige |
| Form | granules |
| Odour | slight, fermentation odour |
| Particle size | Ø 600 µm |

10. Stability and reactivity

| | |
|---------------------|--|
| Stability | - stable under the conditions mentioned in chapter 7 |
| Conditions to avoid | - temperatures above 30 °C |
| Materials to avoid | - strong acids, strong bases |

11. Toxicological information

| | |
|----------------|---|
| Acute toxicity | - LD ₅₀ > 2'000 mg/kg (oral, rat) |
| Local effects | - some enzymes may cause irritation of eyes, mucous membranes or skin on longer contact |
| Sensitization | - may cause allergic rhino-conjunctivitis and asthma (man) |

12. Ecological information

| | |
|------------------------|--|
| Ready biodegradability | - biodegradable |
| Ecotoxicity | - fish, unspecified LC ₅₀ > 100 mg/l - Daphnia sp. EC ₅₀ > 100 mg/l - algae IC ₅₀ > 100 mg/l |
| Air pollution | - observe local/national regulations |

13. Disposal considerations

| | |
|---------------------|--|
| Waste from residues | - observe local/national regulations regarding waste disposal - large amounts: incinerate in qualified installation with flue gas scrubbing |
|---------------------|--|

14. Transport information

| | |
|------|---|
| Note | - not classified by transport regulations |
|------|---|

RONOZYME® P-(CT)

15. Regulatory information

Classification and labelling according to EU directives



Xn

R42
S22
S24
S36/37

May cause sensitization by inhalation.
Do not breathe dust.
Avoid contact with skin.
Wear suitable protective clothing and gloves.

Water hazard class (Germany)

1: weakly hazardous for water (according to annex 4 of directive VwVwS of 17.05.1999)

16. Other information

Use - feed additive

R phrases (chapter 2 ingredients)

R42

May cause sensitization by inhalation.

Edition documentation

- first edition

The information in this safety data sheet is based on current scientific knowledge. It should not be taken as expressing or implying any warranty concerning product characteristics.

EASTERN MINERALS, INC.
P.O. Box 1310
Bainbridge, GA 39818
(229) 246-3396

MATERIAL NAME
Trace Mineral Animal Premixes
containing hazardous ingredients
exceeding 1% of the total mixture

Date issued: December 12, 1998

Date revised: June 1, 2012

MATERIAL IDENTIFICATION - INGREDIENTS (Note: See the product label for specific ingredients.)

TRACE MINERAL and/or MINERAL ANIMAL FEED PREMIXES - Contain hazardous ingredients that exceed one percent of the total mixture.

These premixes may contain any or all of the following ingredients:

Trace Mineral and Mineral Salts - Calcium, Cobalt, Copper, Iron, Iodine, Magnesium, Manganese, Potassium, Selenium, Sodium, Zinc, Salt and Sulfur.

These products are animal feed ingredients accepted by the FDA and produced under the requirements of 21 U.S.C. 301 et seq.

HEALTH HAZARD INFORMATION

OSHA PEL - 8 hr. time weighted average of 15 mg/m³ total dust - 5 mg/m³ respirable dust (From Table Z-3, 29 CFR 1919.1000).

One or more of the mineral ingredients in this premix exceed one percent of the total mixture, and the entire mixture must be classified as toxic according to 29 CFR 1910.1200(d)(5)(11). The reference texts indicate that cobalt, copper, zinc and selenium salts may have oral human lethal doses in the range of 50 to 500 mg/kg. Ingestion of large doses of mineral salts usually causes vomiting, but the acute effects are described as nausea, chills and diarrhea. Eye or skin irritation may occur following ingredient contact, and respiratory irritation could be expected from the inhalation of premix dusts. For employee training purposes, we have assigned the cautionary keyword "**WARNING**" to these premixes due to the presence of hazardous ingredients in the mixture, and employees using premixes should be instructed to use respiratory protection if dust is anticipated during premix use, and to use other protective equipment as required by the users' process to minimize exposures. Employees should be instructed to wash thoroughly after handling chemicals or chemical mixtures.

| | | | |
|-------------|--------------|---|---|
| First Aid - | Ingestion | - | Dilute with water or milk. Get medical attention. (Take the product label for identification.) |
| | Inhalation | - | Remove to fresh air. Restore breathing. Get medical attention. |
| | Skin Contact | - | Wash from skin with soap and water. Get medical attention for reddened or irritated skin. |
| | Eye Contact | - | Flush eyes with water for at least 15 minutes. Get medical attention for irritation. |

PHYSICAL DATA (Note: See product label for specific information.)

Premixes are mixtures of trace minerals and minerals in carriers such as calcium carbonate and salt.

FIRE, EXPLOSION AND REACTIVITY DATA (Note: Temperature and limit data supplied are for grain and grain mixtures.)

Autoignition Temperature - 350 - 500 ° F. Flammable limits - LEL - appx. 50 gr/m³ (0.050 oz/ft³) VEL - unknown.

Premixes are combustible but not flammable (i.e., combustion generally requires the continuous application of ignition to support flames). The dispersal of organic material into the atmosphere of a confined space in high density (i.e., over 50 grams per cubic meter) could produce dust mixtures that are ignitable or explosive.

Extinguishing media. Determined by surrounding fire. Use water, fog, foam, CO₂ or dry chemical for extinguishment.

Premixes are stable and will not polymerize.

Premixes should be relatively unreactive with normal feed plant process chemicals or products.

Premixes may produce irritating or toxic combustion products when heated to decomposition.

Firefighters should wear self-contained breathing apparatus and full protective equipment in fire situations.

SPECIAL PROTECTIVE INFORMATION

Use a NIOSH approved particulate respirator if dust generation occurs or is anticipated during product use.

Use other protective equipment as required by process or special conditions.

CAUTIONARY STATEMENTS FOR PERSONS HANDLING THESE PRODUCTS

WARNING - MAY BE HARMFUL IF SWALLOWED. DO NOT TAKE THIS PRODUCT INTERNALLY. DO NOT BREATHE PRODUCT DUST.

Avoid contact with eyes, skin and clothing. Use with adequate ventilation.

Wash thoroughly after handling. Keep away from children. Keep container closed.

These products are manufactured as animal feed additives. They are not produced for human consumption.

MATERIAL STORAGE INFORMATION

Store animal feed premixes in a cool, dry place away from sources of high heat.

Protect containers from damage.

Keep containers closed when not in use.

SPECIAL USE INFORMATION

Eastern Minerals, Inc. cannot predict the ultimate use of these products, and can offer no special use information beyond the need for respiratory protection in dusty atmospheres, cautioning about the fire or explosive hazards that are created by the production of dense dust atmospheres when ignited in confined spaces, and warning users against entry into confined spaces such as mixers, storage bins or tanks without the proper equipment, a watchman, and permission of the user's management.

Dust conditions in the user's plant or process may require the installation of Class II, Division I (dust ignition proof) or Class II, Division 2 (dust tight) electrical equipment to minimize the hazards of dust fires or explosions. Articles 500 and 502 of the National Electrical Code (NFPA 70) should be consulted for specific requirements.

SPILL, LEAK AND DISPOSAL PROCEDURES

Notify management of material spills.

Product spills should be placed in recovery systems, or be shoveled into closed containers for disposal.

DISPOSAL: Place spills in recovery systems, or place spilled material in an approved landfill or incinerator. Follow federal, state and local regulations for disposal.

HYGIENIC PRECAUTIONS, EMPLOYEE INSTRUCTION AND TRAINING

All employees who handle chemicals must follow good hygienic practices (i.e., wash frequently, and wear clean clothing).

All employees should be instructed to use protective equipment whenever atmospheric dust or chemical vapors are present.

All employees who may have occasion to use protective equipment should be trained in the use of that equipment.

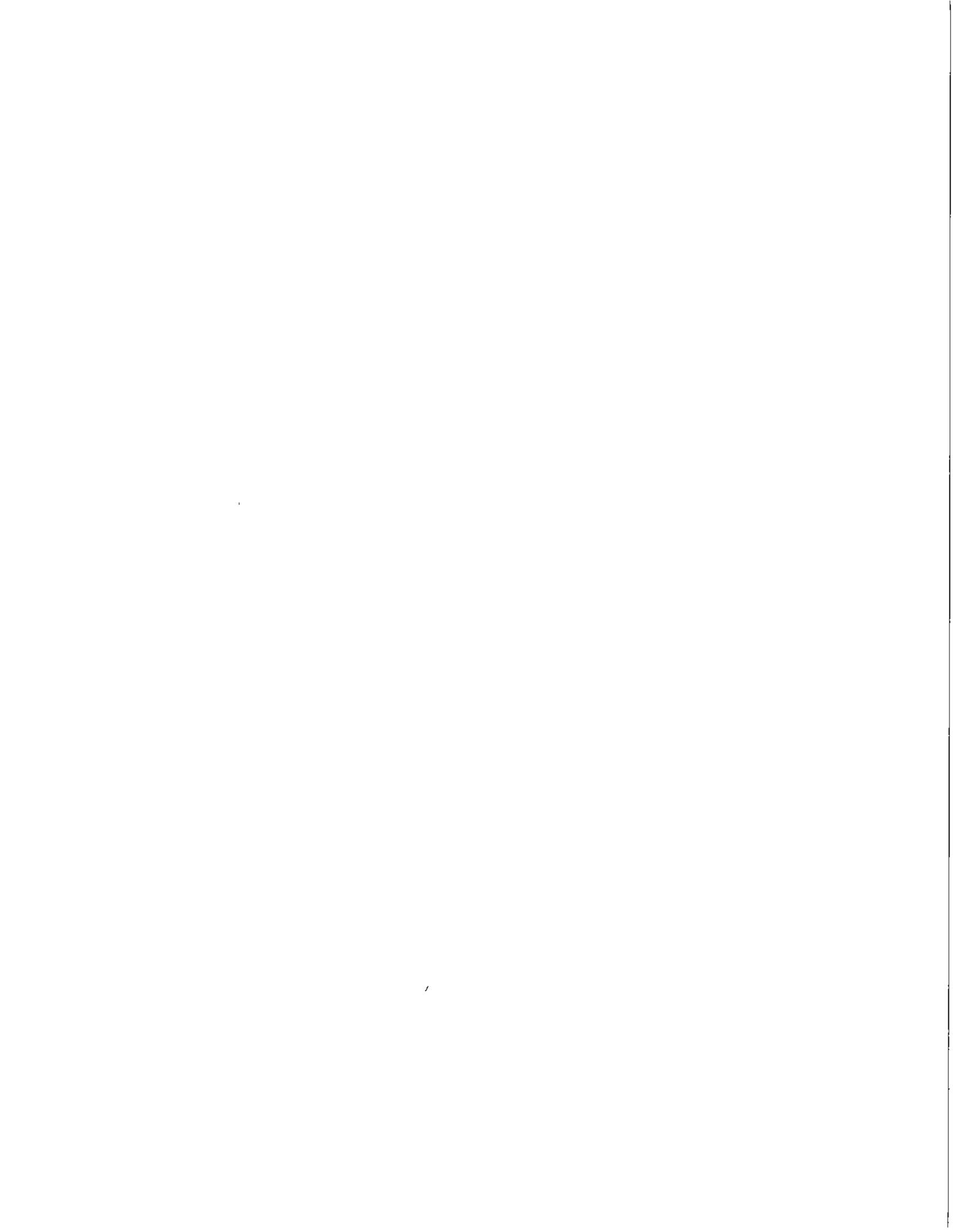
All employees who may have occasion to enter confined spaces should be trained in confined space entry procedures.

INFORMATION PERTINENT TO THESE PRODUCTS

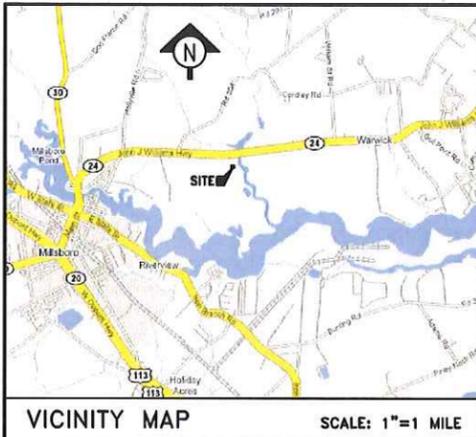
Trace minerals and minerals are essential for health and growth, and the lack of certain trace minerals and minerals in mammalian diets may produce deficiency diseases. These premixes are a dietary supplement containing the trace minerals and minerals necessary for the growth and health of specific animal species that are added to animal feed during mixing and production by feed manufacturers. In form, these premixes are analogous to the multiple vitamin and mineral supplements that are often taken by adults, or are prescribed by physicians for their children. Like similar human preparations, abuse is possible through overdose, or by using a specific preparation for another purpose, such as using an adult preparation for children, or in the case of animal preparations, using a product that was prepared for dogs on chickens. Users of animal feed premixes are cautioned to read the product label for specie, dosage and withdrawal information, and to consult product literature, their veterinarian, or a feed professional to resolve any questions about product usage.

SUPPLEMENTAL SOURCES OF DATA SHEET INFORMATION - DISCLAIMER OF LIABILITY

Eastern Minerals, Inc. has supplemented manufacturer's data with information from other sources in order to provide our managers, employees and customers with adequate information on chemical hazards. The duty to inform users of all of the hazards of a chemical is properly that of the manufacturer or distributor, and **Eastern Minerals, Inc.** expressly denies any liability in providing this supplemental handling or toxicological data to our managers, our employees, or our customers.



Attachment D



VICINITY MAP

SCALE: 1"=1 MILE

PROJECT DATA
 LAND AREA 643 ACRES
 DISTURBED AREA N/A
 BUILDING AREA N/A
 BUILDING CODE 2003 IBC
 ZONING HEAVY INDUSTRIAL

SURVEY DATA
 DISTRICT, MAP, PARCEL: 2-34 28.00 920
 DEED REFERENCE: BK 2794 PG. 135

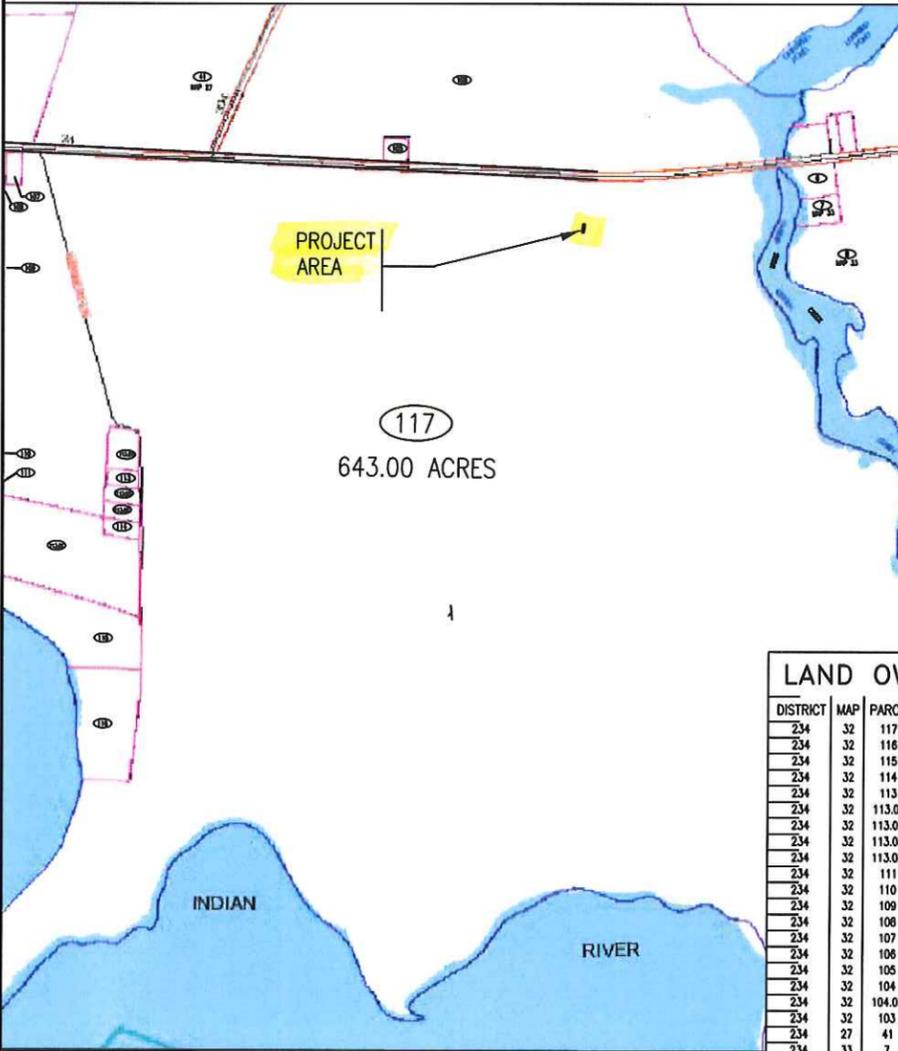
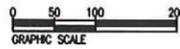
OWNER IS RESPONSIBLE FOR SURVEY TO ESTABLISH BOUNDARIES AND CLEARLY MARK THEM.

TOPOGRAPHIC DATA TAKEN FROM SURVEY DONE BY AEG ENGINEERS ON 10-31-08 AND 12-30-09, USING VERTICAL BENCHMARK INFORMATION FROM A SURVEY DONE BY CABE ASSOCIATES, INC., DATED 9-16-85, AND TITLED "TOWNSEND, INC. WASTE TREATMENT IMPROVEMENTS CONTRACT D, SITE LAYOUT".

THIS PROPERTY IS SHOWN ON F.L.R.M. COMMUNITY PANEL #100050457J (PANEL 457 OF 640), MAP REVISED DATE: JANUARY 6, 2005, COMMUNITY SUSSEX COUNTY, #100029 PANEL 0457 SUFFIX J, AND AS BEING IN FLOOD ZONE X, AREA OF MINIMAL FLOODING.

PROPERTY DATA

OWNER/APPLICANT:
 MOUNTAIRE FARMS OF DELAWARE
 ATTN: JOHN WREN,
 DIRECTOR OF ENGINEERING
 AND ENVIRONMENTAL SERVICES
 P.O. BOX 1320
 MILLSBORO, DELAWARE 19966
 (302) 934-3092

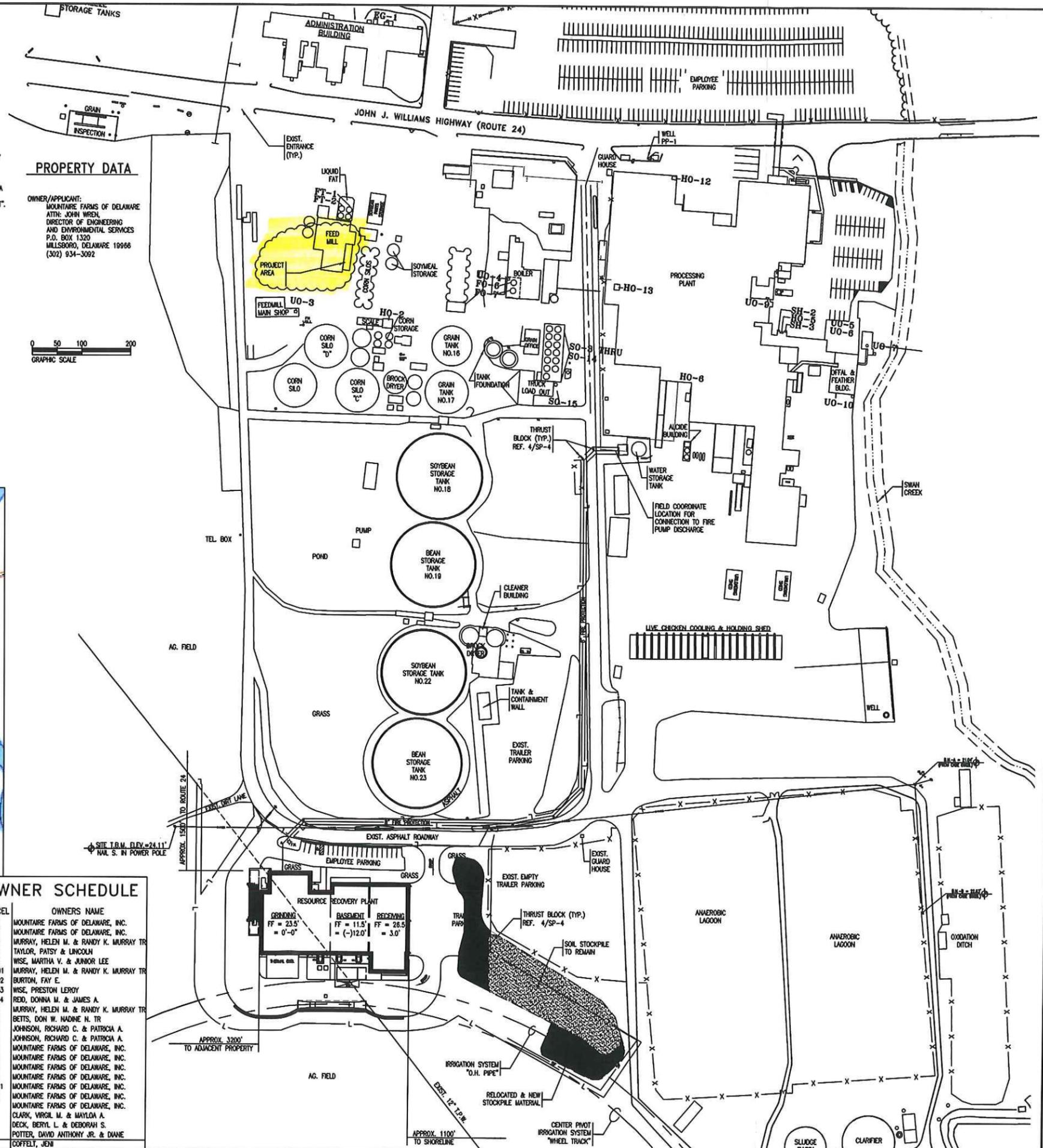


PROPERTY MAP

SCALE: 1"= 500'

LAND OWNER SCHEDULE

| DISTRICT | MAP | PARCEL | OWNERS NAME |
|----------|-----|--------|---|
| 234 | 32 | 117 | MOUNTAIRE FARMS OF DELAWARE, INC. |
| 234 | 32 | 116 | MOUNTAIRE FARMS OF DELAWARE, INC. |
| 234 | 32 | 115 | MURRAY, HELEN M. & RANDY K. MURRAY TR |
| 234 | 32 | 114 | TAYLOR, PATSY & LINCOLN |
| 234 | 32 | 113 | WISE, MARTHA V. & JUNIOR LEE |
| 234 | 32 | 113.01 | MURRAY, HELEN M. & RANDY K. MURRAY TR |
| 234 | 32 | 113.02 | BURTON, FAY E. |
| 234 | 32 | 113.03 | WISE, PRESTON LEROY |
| 234 | 32 | 113.04 | REID, DONNA M. & JAMES A. |
| 234 | 32 | 111 | MURRAY, HELEN M. & RANDY K. MURRAY TR |
| 234 | 32 | 110 | BETS, DON W. MADRE H. TR |
| 234 | 32 | 109 | JOHNSON, RICHARD C. & PATRICIA A. |
| 234 | 32 | 108 | JOHNSON, RICHARD C. & PATRICIA A. |
| 234 | 32 | 107 | MOUNTAIRE FARMS OF DELAWARE, INC. |
| 234 | 32 | 106 | MOUNTAIRE FARMS OF DELAWARE, INC. |
| 234 | 32 | 105 | MOUNTAIRE FARMS OF DELAWARE, INC. |
| 234 | 32 | 104 | MOUNTAIRE FARMS OF DELAWARE, INC. |
| 234 | 32 | 104.01 | MOUNTAIRE FARMS OF DELAWARE, INC. |
| 234 | 32 | 103 | MOUNTAIRE FARMS OF DELAWARE, INC. |
| 234 | 27 | 41 | MOUNTAIRE FARMS OF DELAWARE, INC. |
| 234 | 33 | 7 | CLARK, VIRGIL M. & MAYLOH A. |
| 234 | 32 | 6 | DECK, BERYL L. & DEBORAH S. |
| 234 | 32 | 1 | POTTER, DAVID ANTHONY JR. & DANE COFFELT, JEN |
| 234 | 32 | 8 | |



| RELEASE | BY |
|---------|----|
| | |
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| | |



MASTER SITE PLAN
 PELLET COOLER UPGRADE
 MILLSBORO, DELAWARE

| | |
|------------|---------|
| DATE | PERMIT |
| SCALE | SEE DWG |
| DRAWN | |
| PROJ. MGR. | |
| JOB | |
| FILE | |
| SHEET | |

SP-1

Attachment E

ATTACHMENT E

The installation of a new pellet cooler in the existing feed mill will increase the pellet cooler capacity from 50 T/hr to 85 T/hr. A 35 T/hr increase equates to a PM10 emission rate increase of 11.5 T/year.

The increase in pellet mill capacity will also require replacement of the existing Boone Bag House on the Hammermill to 95 TPH from the current permit limit of 70 TPH. This will increase the PM10 emissions by 1.3 T/year. The total increase in PM10 emissions resulting from the feed mill expessor will be $11.5 + 1.3 = 12.8$ T/year requiring an offset of 1.3×12.8 T/year = 16.64 T/year.

The application for a Coastal Zone Act permit for the resource recovery plant filed by Mountaire on July 22, 2009 provided evidence of past voluntary environmental improvements and investments made prior to the time of that application. The environmental improvements were created by converting two (2) complex boilers from oil to natural gas. The resulting reduction in complex air emissions was 71 T/year. Mountaire requested that 13.4 tons of the annual 71 ton reduction in emissions be used as an offset for that resource recovery Coastal Zone Act permit. As stated in the cited application, “the balance of available offset due to change of boiler fuel for two (2) of the three (3) complex boilers described above is being held in reserve should additional projects subject to Delaware’s Regulations Governing Coastal Zone be necessary. This balance is quantified at approximately 58 tons.”

We intend to apply 17 T/year of air emissions from the 58 T/year reserve balance to satisfy the offset requirement for the feed mill expansion, thereby leaving a balance of 41 T/year to be held in reserve should additional projects subject to Delaware Regulations Governing Coastal Zone be necessary.

The offset for this project occurred in August of 2010 when two (2) complex boilers were voluntarily replaced with boilers that would combust natural gas only. The two (2) boilers that

were replaced could also combust No. 6 fuel oil. The change in fuels resulted in a 71 ton reduction of total emissions of the fuel combustion products. The previous coastal zone application which was approved by the Secretary used 13 tons per year of these emission reductions as the offset for that project. Mountaire indicated in the application that the balance of available offset due to the change of boiler fuel quantified that approximately 58 tons was being held in reserve should additional projects subject to Delaware's Regulations Governing Coastal Zone be necessary. This pellet cooler upgrade project taps into that reserve for 17 T/year to provide the offset. This beneficial reduction in air emissions is and will be continuous as long as these boilers are in operation and providing steam to the complex should be equivalent to the operating life of the feed mill in which the cooler upgrade is occurring.

The success of the offset project is measured in both the short and long term and reported to the Department with air quality reports on an annual basis. The conversion to natural gas has been made as an enforceable condition in the current DNREC air permit. In our opinion, there are no negative impacts associated with the offset project which has been in place for the resource recovery plant since August, 2010.