Item A:
Petition for: **Synthetic substance allowed for use in organic crop production.**

Item B:

1. Substance common name:

   Sulfuric Acid – Technical grade

Other Names:	Sulphuric acid Hydrogen Sulfate Oil of Vitriol Oleum
Composition:	H_2SO_4

2. Manufacturer's name and contact information:

   NorFalco Sales Inc.
   6755 Mississauga Road Suite 304
   Mississauga, Ontario L5N 7Y2
   Canada
   Phone: (905) 542-6901
   Fax: (905) 542-6914
   E-mail: request@noranda.com

   NorFalco LLC
   6050 Oak Tree Blvd. Suite 190
   Independence, OH 44131
   USA
   Phone: (216) 642-7342
   Fax: (216) 642-9169
   E-mail: request@noranda.com

3. Intended use of the substance:

   Livestock manures – allowance of sulfuric acid for pH adjustment not below 5.0.
   Sulfuric acid, phosphoric acid and citric acid are currently NOP-approved processing aids for pH adjustment in organically processed liquid fish products and some aquatic plant extracts for use in crop production (NOP 205.601(j)(7). Sulfuric acid would be used in the same way with livestock manures as a processing aid in the production of dehydrated manure for use in organic crop production.

4. A list of the handling/ processing for which the substance will be used:

To adjust the pH of livestock manures, potentially occurring as high as pH 8.3 during natural degradation, to not less than pH 5.0, prior to dehydrating the solids for final use as a soil amendment allowable for use in organic crop production.

The method of acid handling and addition will vary between animal species, diet formulation and respective farm manure handling facilities. Typically, small amounts (less than 0.5% by volume wet) will be added on a continuous basis via a metering valve or pump off of a supply tank. This would occur during manure transport, mixing and storage to decrease the risk of odor generation. In cases of long storage times or non-continuous mixing and transport, acid may be added in batch mode but the volume of acid needed should be consistent with the continuous feed method.

5. The source of the substance and a detailed description of its manufacturing or process procedures from basic component to the final product:

Sulfuric acid is produced from sulfur dioxide (SO_2) collected by pollution control devices (scrubbers) while smelting various metal ores. The SO_2 at these facilities is first captured in the scrubbers to reduce emissions contributing to acid rain. The resulting "Scrubber Feedstock" from the pollution control scrubbers is further cleansed, concentrated, and used for the production of sulfuric acid.

The second step in making sulfuric acid from the resulting "Scrubber Feedstock" is removing any impurities that are still present from the smelting process; purity and accuracy of grade are the primary goals of sulfuric acid production. The Contact Process, described here, is almost universally used to convert SO_2 to sulfuric acid (H_2SO_4).

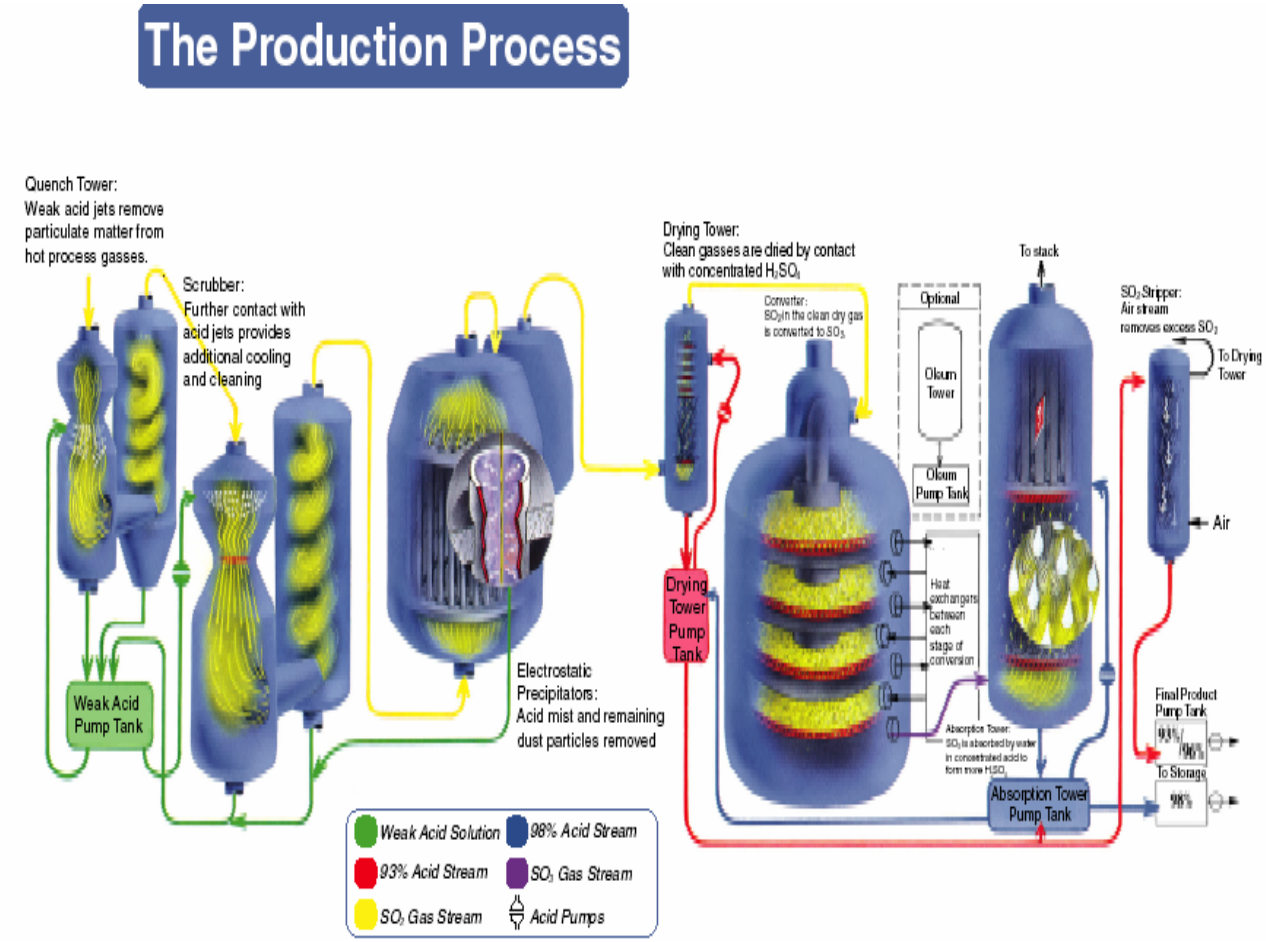
Although there have been other methods used to produce sulfuric acid, the majority of modern production is now done via the Contact Process. Sulfur dioxide is oxidized by atmospheric air at high temperatures in the presence of a vanadium pentoxide catalyst. The vanadium pentoxide does not contribute anything chemically to the process, but just facilitates the conversion process. Specifics will vary from one plant to another, but the following description is provided as an overview of a typical Contact Process.

1). The process begins with cleaning of SO_2 gas. The sulfur dioxide, resulting from smelting and roasting operations, passes through a series of gas cleaning steps to cool and remove almost all metallurgical dusts (see attached technical specification). The sulfur dioxide gas is drawn through electrostatic precipitators where acid mist and any remaining dust particles are removed.

2). The wet SO_2 gas is dried in a tower by direct contact with already purified 93% sulfuric acid, and a blower forces the gas over the catalyst beds and through a series of heat exchangers to cool the gas. This process causes the SO_2 to oxidize with oxygen (O_2) in the air, resulting in sulfur trioxide (SO_3).

3). The SO_3 gas then passes through an absorption tower, where it combines with the water in 98% sulfuric acid to make additional sulfuric acid.

Once again, this system process is a pollution control measure which first focuses on capturing SO_2 gas for pollution control. In the second phase of additional scrubbing it is designed to remove any impurities and further concentrate and purify the product for final sale.



from the NorFalco website at www.sulfuricacid.com

6. <u>A summary of any available previous reviews by State or private certification programs or other organizations of the petitioned substance:</u>

USDA/NOP: Sulfuric acid, citric acid, and phosphoric acid are currently on the National List as synthetic substances allowed for use in organic crop production under section 205.601(j)(7) as additives to liquid fish products. The sulfuric acid is used to pH adjust the liquid fish products, preventing further degradation or creating odorous gases. The amount of added acid shall not exceed the minimum needed to lower the pH of the product to 3.5.

NOP interpretive letter: Per a February 6, 2004 letter from USDA-NOP to David Hiltz, with Acadian Seaplants Limited, regarding interpretation of current rules on use of phosphoric acid for pH adjustment in aquatic plant extract: "…Therefore, aquatic plant extracts, as long as manufactured consistent with the restrictions specified in section 205.601(j)(1), are allowed as synthetic substances for use in organic crop production, including the use of phosphoric acid to adjust the pH of the aquatic plant extracts".

Although phosphoric acid and sulfuric acid are not the same chemicals, they are grouped into the same regulatory text. They are used in the same manner for liquid fish products and for aquatic plant extracts. We are submitting this petition for the same use of sulfuric acid to be added in livestock manures.

7. Information regarding EPA, FDA, and State Regulatory authority registrations, including registration numbers:

EPA: Initial notification is required to have this substance on our site under the Comprehensive Environmental Response Compensation and Liability Act of 1980 (CERCLA) 40 CFR part 302. Release notification of the substance if spilled is regulated under Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) 40 CFR part 372 and part 304. The sulfuric acid proposed for use does not contain any List 1, 2 or 3 inerts as per §6517c(1)(B)(ii);205.601(m)2. Manure itself is listed as an inert on EPA list 3. Sulfuric acid and water is on the EPA List 4 – Inerts of Minimal Concern.

FDA: Regulations pursuant to the FDA's food bioterrorism regulations apply to distribution, storage or use for food and food processing.

State(s): An initial written notification to the State Emergency Response Commission (SERC) and the Local Emergency Planning Commission (LEPC) are required within 60 days of having this substance on site. Any spillage of over 1000 lbs. must be reported immediately to the National Response Center (NRC), the SERC, and the LEPC. Both requirements will be met once sulfuric acid is brought on-site. Sulfuric acid was put on the State of California's Proposal 65 list effective March 14, 2003 which requires labeling of product if sold in the State of California.

8. The Chemical Abstract Service (CAS) number or other product numbers of the substance and labels of products that contain the petitioned substance - Sulfuric Acid:

Chemical Abstract Service (CAS) number: 7664-93-9
NIOSH Registry of Toxic Effects of Chemical Substances number: WS5600000
Department of Transportation (DOT) identification number: 1830 137

There are numerous product listings on the internet for liquid fish products (crop use) using phosphoric, sulfuric or citric acid for pH stabilization under current NOP rules.

Two consolidated lists found were: Organic Materials Research Institute's (OMRI) brand name list, located at http://www.omri.org/OMRI_datatable.htm; and the Washington State department of Agriculture – 2004 Brand name materials list, located at http://agr.wa.gov/FoodAnimal/Organic/MaterialsLists.htm.

Labels of products that contain the substance: On the OMRI brand name list there are currently 23- "fish products, liquid – stabilized" listed as approved crop products. The Washington State department of Agriculture lists 16 "fish products" as a fertilizer & soil amendment on their brand name materials list.

Information about each product varied a great deal in detail. At individual vendors' sites (Rainyside.com – "How a fish becomes fertilizer") explains how "a small amount – less than 0.1% by weight- of phosphoric acid is used to drop the pH of the solubles to 4.5 or below. Without this acid addition, the enzymes in the fish would cause it to decay, create gases and to smell horrid-and, all the states realize this, and within certain guidelines is still considered 100% Natural Organic".

9. The substance's physical properties and chemical mode of action including:

(a) Chemical interactions with other substances, especially substances in organic production:

Sulfuric acid used within in livestock manures will allow biologically derived nitrogen compounds to remain in solution versus being volatilized during the manure-drying process. The pH of some excreted manures tends to be alkaline (7.8 – 8.3 s.u.) because of the use of limestone (calcium source for bone mass) in the animal feed, and because of the natural generation of uric acids and ammonium in the urine and feces of the animal. This is caused via the animals' digestion of proteins into simpler nitrogen compounds. By adding a small amount of sulfuric acid to lower the pH to not less than 5.0, the biological breakdown of the uric acids and ammonium into more volatile forms of nitrogen (ammonia) and organic (carbon based) compounds (fatty acids) are slowed which would otherwise release odorous compounds.

As the manure is dehydrated, concentration of the uric acids and ammonium are also increasing resulting in higher pH values. At higher pHs, the instability of some of these biological breakdown compounds, like ammonia, also increases. If the pH were allowed to naturally rise, volatility of some of the compounds would increase. By adding sulfuric acid to decrease pH of the manure to not less than pH 5.0, generation of these odors is greatly reduced.

Manure and dehydrated manure is an approved soil amendment by state and federal fertilizer regulatory agencies when used in conjunction with proper nutrient management practices. With adherence to NOP 205.203, Soil fertility and crop nutrient management practice standard, manures are also approved by the National Organic Program.

(b) Toxicity and environmental persistence of sulfuric acid:

Once sulfuric acid is added to manure and dried by our process, it is negligible (0.5% by volume wet weight.) Once sulfuric acid is added to manure, the acid portion of the substance is neutralized by the manure and its oxidized form sulfate (SO_4^{2-}) is left.

The added sulfur (S), although negligible, is considered beneficial to the crop. Sulfur, in its oxidized form sulfate (SO_4^{2-}), is an essential nutrient in the formation of chlorophyll and the amino acids within the plant.

The residual oxidized form of sulfate (SO_4^{2-}) in the manure takes on forms and functions within crops to be considered a nutrient as opposed to being a contaminant.

1. FORMS
   - Plants absorb mostly SO_4^{2-}; small quantities of SO_2 can be absorbed by plant leaves
   - Plant S ranges between 0.1 and 0.5% S and varies with plant type:
     → Gramineae (0.18 - 0.19% S in seed)
     → Leguminosae (0.25 - 0.3% S in seed)
     → Cruciferae (1.1 - 1.7% S in seed)
2. Functions
   - S-containing amino acids cystine, cysteine, and methionine, essential components of protein, comprise 90% of plant S.
   - S deficient plants produce less protein and accumulate nonprotein N as NH_2 and NO_3 → leaf NO_3^- accumulates under S deficiency reducing food quality
   - Adequate S improves crop quality by narrowing N/S ratio to 9:1 to 12:1 needed for effective use of N by rumen microorganisms.
   - S is needed for synthesis of chlorophyll and coenzyme A, this being important for oxidation and synthesis of fatty acids and amino acids.
   - S is a component of ferredoxins, an Fe-S protein in chloroplasts. Ferredoxin is important in NO_2^- and SO_4^{2-} reduction and N_2 assimilation by root nodule bacteria.
   - S is responsible for the characteristic taste and smell of mustard and onion plants.

Toxicity and environmental persistence of any other material within the sulfuric acid, such as residual metals, is tightly controlled during the second phase of the production process of sulfuric acid. Technical grade product will be used in the manure product to insure any residual metals will meet the technical specifications enclosed with this application and to otherwise not jeopardize any state or federal limits for metals in soil amendments.

(c) Environmental impacts from its use or manufacture. Sulfuric acid is a pollution control byproduct of the metal smelting industry. If not turned into a product this byproduct would ultimately form acid rain in our atmosphere. Consumer use (industrial, agricultural, commercial) of sulfuric acid truly benefits the environment by allowing the metal industry to produce a high quality product instead of a large volume waste.

(d) Effects on human health. Like any acid, sulfuric acid can be harmful to humans if it comes in contact with skin during handling. This is detailed in the attached material safety data sheet (MSDS) as well as the report titled "criteria for a recommended standard… Occupational Exposure to Sulfuric Acid" compiled by these organizations:

- U.S. Department of Health, Education, and Welfare
- Public Health Service
- Center for Disease Control
- National Institute for Occupational Safety and Health

Like most chemicals, sulfuric acid is beneficial to humans when used under the proper conditions. Page 87 of the attached report lists several dozen end uses for sulfuric acid, including agriculture.

The amount of sulfuric acid we propose to use in the dehydrated livestock manure product constitutes <0.5% by volume and will not drop the pH below 5.0. At this level of use, we do not know of any detrimental human health effects (acute and chronic) of the substance and final product.

10. Safety information about the substance including a Material Safety Data Sheet (MSDS) and a comprehensive substance report from the National Institute of Environmental Health (NIEH) Studies.

MSDS and technical specification is included from the manufacturer and a second MSDS is included in the enclosed "criteria for a recommended standard on Occupational Exposure to Sulfuric Acid" authored by the agencies listed in 9(d).

The MSDS and above referenced study are being submitted instead of the substance report from the NIEH, which could not be found. The enclosed reports are very comprehensive and were done to establish occupational health concentration action levels.

11. Research information about the petitioned substance which includes comprehensive substance research reviews and research bibliographies, including reviews and bibliographies which present contrasting positions to those presented by the petitioner in supporting the substance's inclusion on the National list.

One contrasting position to adding sulfuric acid to the National list is an August 1, 2003 petition to the NOSB from Harmon Systems International, LLC. Harmon Systems International petition advocates the inclusion of sulfurous acid to the National list processed via one of their generators instead of "...sulfuric acid, which requires a synthetic and unnatural process to produce…"

Much of the information regarding other approved products' use of an acid to adjust pH remains very general, or does not exist, either via their respective websites, or by calling

the informational numbers. Under current NOP rules each of these products could and may already use some sulfuric, phosphoric or citric acid.

Our petition does not attempt to gloss over the details of the sulfuric acid manufacturing process or say that the substance is not harmful when used incorrectly. We do however, recognize that sulfuric acid is a value-added product of pollution prevention, and when the substance is used in accordance to current NOP guidelines either in liquid fish products or in dehydrated livestock manures, we believe it promotes soil and plant health and allows for the safe and minimally odorous transport of livestock manures to organic crops around the country.

Sulfuric acid, as stated earlier in the application, is a product of pollution control. This fact alone is of enormous environmental benefit because of the sheer volume of sulfuric acid produced annually in North America. Sulfuric acid production topped 39,500 tons in 1985 and continues to be one of the most widely used production chemicals year after year. [1]

12. <u>This synthetic substance is necessary for the production and handling of a dehydrated manure based organic soil amendment because:</u>

Sulfuric acid was shown to be the most effective acid to minimize ammonia emissions and odors during our five-year pilot testing manures during the dehydrating process. In our trial process, we tried various methods to control odor, including enzymatic microbiological inhibitors, carbon dioxide and peracetic acid. We have also contemplated the use of other strong mineral acids like nitric and hydrochloric acid; but we believe these acids are cost prohibitive, do not provide the added benefit to crops that sulfur would, and do not provide the additional pollution control benefits from recycling by-product chemicals.

Other organic materials that could potentially lower the pH of manure would include citric acid or acetic acid. Because citric acid and acetic acids are considered weaker acids than sulfuric acid, larger amounts of these acids would be needed to lower the pH of the final product. This would increase costs of producing the final product, resulting in higher costs to be passed to the end-customer.

After over five years of research in this process we believe sulfuric acid is the best choice for this product for the following reasons:

- It is a by-product of pollution control so the manufacture of the material has a positive environmental benefit.
- Any residual sulfur in the end product provides a positive nutritional benefit to the crop as described in question nine of this application.
- It is already used in other products listed for use in organic crop production like liquid fish products.

[1] Lewis Sr., Richard J. 1993. Hawley's Condensed Chemical Dictionary 12th ed. Pg 1104. Van Nostrand Reinhold Company New York

13. A Commercial Confidential Information Statement which describes the specific required information contained in the petition that is considered to be Confidential Business Information (CBI).

We are not claiming any CBI at this time.