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## Information Request - NSF/ANSI 60 - Product Information

### About NSF

NSF International, The Public Health & Safety Company™ (NSF) is an independent, not-for-profit organization of scientists, engineers, technicians, educators, and analysts. It is a trusted neutral non-governmental agency, serving government, industry, and consumers in achieving solutions to problems relating to public health and the environment since 1944. The mission of NSF is to provide clients and the general public with objective, high quality, timely, third-party Certification services. Services include development of consensus standards, voluntary product testing, Certification with policies and practices which protect the integrity of registered Marks, education and training, and research and demonstration, all relating to public health and the environmental sciences.

### NSF Standards

NSF has developed over 70 voluntary American National Standards under the scope of public health and safety. NSF/ANSI Standards are developed through involvement of those who are directly and materially affected by the scope of the standard. The process ensures balanced input from industry representatives, public health/regulatory officials, and users/consumer representatives. NSF is accredited by the American National Standards Institute (ANSI) to develop American National Standards. ANSI's accreditation verifies that NSF develops standards in a manner to ensure openness and due process allowing for equity and fair play.

### NSF/ANSI 60: Drinking Water Treatment Chemicals - Health Effects

NSF/ANSI 60 is the nationally recognized health effects standard for chemicals, which are used to treat drinking water.

### Product certification

NSF is one of the most widely respected and recognized third-party Certification providers in the world. As such, NSF is uniquely qualified to evaluate and certify your products and systems. NSF Certification programs are accepted and frequently mandated by public health regulators throughout the United States, as well as internationally. NSF currently provides testing, Certification, and audit services for more than 250,000 products in 126 countries worldwide. NSF Certification is used to provide evidence compliance with the regulatory and market requirements for products.

### How does the process work?

- Submittal of the information requested on this form will initiate the evaluation of the product to be Certified.
- NSF reviews the information for completeness and to develop specific test requirements, cost, and time estimates. Additional information may be needed from your suppliers.
- After all information has been received and reviewed, NSF will request samples for testing.
- NSF may conduct a production facility inspection to review process, materials, quality systems, etc.
- NSF will receive the sample in our laboratory and perform required testing for performance and or health effects.
- NSF will evaluate the results for compliance with the applicable standard and policy requirements.
- If the evaluation of the product is in compliance with requirements, the product is submitted for NSF Listing.

### Confidentiality:

Only NSF-Authorized personnel shall be permitted access to this form. The form shall be secured according to NSF Confidential Security Procedures. Proprietary information will not be revealed or provided to applicants or their suppliers or third parties unless your company provides written approval.





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Fluoridation (FLR)  
 Foaming Agent (FOA) \*\*

Well Sealant (WGS) \*\*  
\*See 3.7. \*\*See 3.8. \*\*\*See 3.9.

- 2.5. Please indicate physical form of this product:  liquid  solid  gas
- 2.6. For Calcium and Sodium Hypochlorite products, please indicate the final concentration of the **end product**:  
 \_\_\_\_\_ w/w%
- 2.7. For all other products, please indicate the final concentration of **end product**: 24+/-1 %

### 3. Production and chemical information:

- 3.1. Please indicate if this product is  manufactured at the facility(s) indicated in 1.2 (and 1.4)  
 or this product is a  blend  dilution  relabel  repackage
- 3.2. For a blend, dilution, relabel or repackage, is this product's supplier(s) and supplier product(s) already NSF Certified to NSF/ANSI 60?  
 Yes  No  NA (product is manufactured as indicated in 3.1)
- 3.3. If water is used as a **reactant, ingredient or processing aid**, please indicate:  
 Potable  Non-potable  Non-potable but treated to potable quality by \_\_\_\_\_  
 If water is used as a reactant, ingredient or processing aid, please include it and its source in the formulation. Please note that additional laboratory testing may apply if non-potable dilution water is used.
- 3.4. Please indicate the water source for the reactant, ingredient or processing aid:  Municipal  Other Fresh Spring Water - The Mosaic Company - Riverview, FL
- 3.5.  If water is non-potable, attach a chemical analysis, if available.
- 3.6.  Attach a description of the manufacturing process including known or suspected impurities.  
 For polymers, please itemize reaction products of initiators, stabilizers, and catalysts used in the manufacture or synthesis of your product.
- 3.7.  Attach a Certificate of Analysis for a metal salt product with a Coagulation & Flocculation (COF) function. Example: A Certificate of Analysis for the finished product indicating % aluminum oxide would be needed for an aluminum sulfate product.
- 3.8.  Attach this product's offline use instructions (e.g. dose and rinse instructions) for the following functions: Drilling Fluid (DRF), Foaming Agent (FOA), Membrane Cleaner (MBC), Pipe Cleaning Aid (PCA), Well Cleaning Aid (WCA), Well Drilling Aid (WDA), Well Pump Lubricant (WPL), Well Rehabilitation Aid (WRA) and Well Sealant (WGS).
- 3.9.  If "Other (OTH)" function was selected under section 2.4, please attach a description of this product's function.
- 3.10. How is this product handled or packaged? Please attach a description.  
 Single use (dedicated) system  Multiple use (non-dedicated) system  
 **If multiple use system, please attach:**
  - a description of the cleaning process used between products
  - a list of cleaning agents
  - other products handled on the system
- 3.11. Are any recycled or reprocessed materials used in this product?  Yes  No  
 If yes, please attach a description of impurities and lot-to-lot variations controls (i.e. quality control procedures). Please note that additional laboratory testing may apply if recycled or reprocessed materials are used.

**4. Formulation information:** List the formulation of the product **including processing aids**. If needed, separate the formulation into cumulative manufacturing processes each with its own formulation and label and Total [8] each part [e.g. Part B: 50% x from Part A + 10% y +40% z=100% Total]. If additional space is needed, please copy this page (enter the Total [8] on the last page or after each part). For complete descriptions of the requested information, please see page 6 of this form.

Please attach the Certificate of Analysis (C of A) for each raw material in the formulation.

If available, please attach a supplier specific Safety Data Sheet (FDS, HDS, MSDS, etc) or similar information for each raw material in the formulation.

Chemical Abstract Service Number (CAS no.) [1]	Ingredient, Reactant or Processing Aid's Chemical Name (1 per line) [2]	Full Raw Material Supplier(s) Name (include alternate suppliers) (1 supplier per line) [3]	Supplier's Trade Name [4]	Ingredient, Reactant or Processing Aid's Concentration or % Strength (%) [5]	I,R,P [6]	Parts by Weight (% or ppw with tolerances) [7]		Indicate supplier plant location where raw material is purchased [8]
						%	ppw Units=	
	Phosphate Rock	The Mosaic Company	Rock	29-39%	I			FCO
	Sulfuric Acid	The Mosaic Company	Sulfuric Acid	41-51%	I			
	Water	The Mosaic Company	Water	0-24	I			
	Defoamer	Arrmaz Custom Chemicals	CCS-640	0-0.01	P			
	Sodium Bisulfite	Arrmaz Custom Chemicals	Sodium Bisulfite 34-42%	0-0-05%	P			
	Sodium Bisulfite	Harcros Chemicals	Sodium Bisulfite 34-425	0-0-05%	P			

Total % or ppw [9]: 

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**Omission of information may significantly delay the completion of the Certification process.**

**All information contained on this page is confidential.**



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**5. Return instructions:**

**To send by e-mail**, completely fill out the form and type your name and contact information in Section 5. Check the box indicating your agreement with the Certification statement. Send your e-mail to **Standard60@nsf.org**.

**To send by fax**, completely fill out and sign the form, then fax to **734-827-7728**. This fax number goes to a secure computer in the Toxicology Services department of NSF International.

**To send by U.S. mail or courier**, insert completed form in an envelope marked "Confidential Business Information", seal in an outer envelope, and return to the attention of your Certification Project Manager at NSF International. If you don't know your NSF Certification Project Manager, send the form to:

NSF International  
NSF Standard 60 Business Unit Manager  
789 Dixboro Road  
Ann Arbor, MI. 48105  
USA

Phone: 1-800-NSF-MARK

### **Formulation page: What should be entered in each column?**

[1] The **CAS number** (Chemical Abstracts Service registry number) is a systematic numbering convention that uniquely identifies each chemical, which may be found on the FDS, HDS, MSDS, etc. for the ingredient, reactant or processing aid. If the ingredient is a mixture of several chemicals or of proprietary formulation, enter the word “mixture” or “proprietary.” However, please note that more information may be requested for this entry. There are multiple resources available on the web and elsewhere for finding specific CAS numbers (e.g., <http://chem.sis.nlm.nih.gov/chemidplus/cmplxqry.html>). All CAS numbers are up to nine digits, which are separated into three groups by hyphens. The first part of the number, starting from the left, has up to six digits; the second part after the first hyphen has two digits. Finally, the third part of the CAS number following the last hyphen is single digit. For example, a CAS number may look 123456-12-1. If it is not in this format, it is not a valid CAS number. If the CAS number for an ingredient, reactant or processing aid cannot be determined, leave this area blank.

[2] The **chemical name** for each ingredient, reactant or processing aid can be found on its FDS, HDS, MSDS, etc. Please asterisk and note alternate ingredients, reactants or processing aids with different chemical names.

[3] The **supplier** is the company that provides this ingredient, reactant or processing aid directly for the manufacture of your product. If the supplier is a distributor, and the manufacturer or origin company is known, please enter both company names here. Write (D) after the distributor’s name, and (M) after the manufacturer or origin company’s name. For each alternate ingredient supplier including distributors please enter the supplier’s name and supplier trade name on a separate line below the first supplier for that ingredient, reactant or processing aid. For all suppliers, please write the full company name including corporation and geographical suffixes.

[4] The **supplier’s trade name** is the unique name or number of the ingredient, reactant or processing aid as purchased from this supplier. This information can be obtained from your purchasing department.

[5] **Concentration or % strength** is the percent by weight or volume of the active ingredient.

[6] **I, R, P** indicates whether the specific material is an ingredient, reactant or processing aid.

[7] The **parts by weight (% or ppw)** must be completed for each ingredient, reactant or processing aid. Please include tolerances in a range format (e.g. 90-110 kg or 55-65%).

[8] Indicate **supplier plant location where raw material is purchased**: Enter the city or district; province, region, state or territory; and country of the supplier’s location where this ingredient is manufactured or distributed.

[9] The **total** of all ingredients, reactants and processing aids must always equal 100% (total min. range < 100% > total max. range).

**An example formulation is shown below:**

Chemical Abstract Service Number (CAS no.) [1]	Ingredient, Reactant or Processing Aid’s Chemical Name [2]	Full Raw Material Supplier(s) Name (include alternate suppliers) (1 supplier per line) [3]	Supplier’s Trade Name [4]	Ingredient, Reactant or Processing Aid’s Concentration or % Strength (%) [5]	I,R,P [6]	Parts by Weight (% or ppw with tolerances) [7]		Indicate supplier plant location where raw material is purchased [8]
						%	ppw Units=	
42751-79-1	Polyamines	Smith Polymers Co. (M)	Floc 2050	50	I	69-71		Newark, NJ, USA
		D & M Distribution, Inc. (D)	DM50SP					Cleveland, OH, USA
7732-18-5	Water	Municipal	Potable water	100	I	29-31		Local supply
<b>Total % or ppw [9]:</b>						100		



SECTION 1	PRODUCT AND COMPANY INFORMATION
TRADE NAME:	Phosphate Rock
CHEMICAL NAME:	Fluorapatite
CAS NUMBER:	1306-06-5
CHEMICAL FAMILY:	Minerals
SYNONYMS:	Phos Rock, Wet Rock, Florida Land Pebble
PRIMARY USE:	Raw Material in the Production of Phosphate Fertilizers
COMPANY INFORMATION:	<p style="text-align: center;"><b>The Mosaic Company</b>            Atria Corporate Center            3033 Campus Drive, Suite E490            Plymouth, MN 55441 USA            www.mosaicco.com</p> <p style="text-align: center;">For non-emergency questions, phone hours are 8 AM to 5 PM            Central Time US            800.918.8270 (toll free)            763.577.2700 (phone)</p>
EMERGENCY TELEPHONE:	<p style="text-align: center;"><b>EMERGENCY OVERVIEW</b>  <b>24 Hour Emergency Telephone Number</b>  <b>For Chemical Emergencies:</b>  <b>Spill, Leak, Fire or Accident</b>  <b>Call CHEMTREC</b>  <b>North America: (800) 424-9300</b>  <b>Others: (703) 52703887 (Collect)</b></p>

SECTION 2	HAZARD IDENTIFICATION																															
EMERGENCY OVERVIEW :	Health Hazards:	Dusts, if generated may cause eye and respiratory irritation																														
	Physical Hazards:	None																														
	Physical Form:	Solid																														
	Appearance:	Multicolored pebbles																														
	Odor:	None																														
	Toxicity:	Non-Toxic																														
	<table border="1" data-bbox="492 1570 768 1833"> <thead> <tr> <th colspan="2">NFPA HAZARD CLASS</th> </tr> </thead> <tbody> <tr> <td>Health:</td> <td>1</td> </tr> <tr> <td>Flammability:</td> <td>0</td> </tr> <tr> <td>Instability:</td> <td>0</td> </tr> <tr> <td>Special Hazard:</td> <td></td> </tr> </tbody> </table>	NFPA HAZARD CLASS		Health:	1	Flammability:	0	Instability:	0	Special Hazard:		<table border="1" data-bbox="768 1570 1076 1833"> <thead> <tr> <th colspan="2">HMIS HAZARD CLASS</th> </tr> </thead> <tbody> <tr> <td>Health:</td> <td>1</td> </tr> <tr> <td>Flammability:</td> <td>0</td> </tr> <tr> <td>Physical Hazard:</td> <td>0</td> </tr> <tr> <td>PPE:</td> <td>Section 8</td> </tr> </tbody> </table>	HMIS HAZARD CLASS		Health:	1	Flammability:	0	Physical Hazard:	0	PPE:	Section 8	<table border="1" data-bbox="1076 1570 1395 1833"> <thead> <tr> <th colspan="2">WHMIS HAZARD CLASS</th> </tr> </thead> <tbody> <tr> <td>Symbol</td> <td>N/A</td> </tr> <tr> <td>Classification</td> <td>N/A</td> </tr> <tr> <td>Sub Class (N/A)</td> <td></td> </tr> </tbody> </table>		WHMIS HAZARD CLASS		Symbol	N/A	Classification	N/A	Sub Class (N/A)	
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POTENTIAL HEALTH EFFECTS:	Eyes	No Data available
	Skin	Contact with skin may cause irritation. No harmful effects from skin absorption have been reported.
	Inhalation (Breathing)	Avoid breathing dust, studies by other exposure routes suggest a low degree of hazard by inhalation. Use in adequate ventilation
	Ingestion (Swallowing)	Avoid ingestion, low degree of toxicity by ingestion
	Sings and Symptoms	Effects of overexposure may include irritation of the nose, throat, coughing, shortness of breath and lung disease.
	Cancer	No Data available
	Target Organs	No Data available
	Developmental	No Data available
	Other Comments	No Data available
	Pre-Existing Medical Conditions	Contact may aggravate pre-existing skin disorders.
POTENTIAL ENVIRONMENTAL EFFECTS:	No Data available	

SECTION 3	COMPOSITION INFORMATION ON INGREDIENTS	
FORMULA:	$Ca_{10}F_2(PO_4)_6$	
COMPOSITION:	Phosphate as $P_2O_5$	31 – 32 %
	Calcium Oxide (CaO)	46 – 49 %
	CO <sub>2</sub>	3.1 – 3.8 %
	Silica (SiO <sub>2</sub> )	2.5 – 4.5%
	Fluorides as F	3.7 – 4.0%

SECTION 4	FIRST AID MEASURES	
FIRST AID PROCEDURES:	Eyes:	Flush with plenty of water for at least 15 minutes. Get medical attention as soon as possible.
	Skin:	Wash contaminated area with soap or mild detergent and water. If chemical or solution soaks through clothing, remove clothing in area and wash contaminated skin as above. If irritation persists after washing, seek medical attention



	Inhaled:	Move to fresh air. Treat symptomatically. Get medical attention promptly.
	Ingestion:	First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention
NOTE TO PHYSICIAN:	Prolonged exposure to respirable crystalline quartz, a component of dust from this material, may cause delayed lung injury/fibrosis (silicosis). If silicosis develops, chances of getting tuberculosis are increased.	

<b>SECTION 5</b>		<b>FIRE FIGHTING MEASURES</b>	
FLAMMABLE PROPERTIES:	Flash Point	Not applicable. This material is non-flammable	
	OSHA Flammability Class	Not applicable	
	LEL/UEL	Not applicable	
	Auto-ignition Temperature	Not applicable	
EXTINGUISHING MEDIA:	Not applicable, material is non-flammable		
PROTECTION OF FIREFIGHTERS:	For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential hazard is unknown, in enclosed or confined spaces, a self-contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8). Cool equipment exposed to fire with water, if it can be done with minimal risk. Avoid excessive water to minimize runoff.		

<b>SECTION 6</b>		<b>ACCIDENTAL RELEASE MEASURES</b>	
RESPONSE TECHNIQUES:	Cleanup workers should wear appropriate protective clothing as conditions warrant (see Section 8). Prevent material from entering sewers, storm drains, other unauthorized treatment drainage systems, and natural waterways. Notify appropriate federal, state, provincial, and local agencies. Minimize dust generation. Sweep up for recovery if uncontaminated or package appropriately for disposal.		
RELEASE NOTES:	No data available		



SECTION 7	HANDLING AND STORAGE
HANDLING:	The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Section 8). Wash thoroughly after handling. Wash contaminated clothing/shoes. Use good personal hygiene practices.
STORAGE:	Avoid contact with acids

SECTION 8	EXPOSURE CONTROLS / PERSONAL PROTECTION		
ENGINEERING CONTROLS:	If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional ventilation or exhaust systems may be required.		
PERSONAL PROTECTIVE EQUIPMENT (PPE):	Eye/Face	Approved eye protection to safeguard against potential eye contact, irritation, or injury is recommended. Depending on conditions of use, a face shield may be necessary. A source of clean water should be available in the work area for flushing eyes/face.	
	Skin	The use of cloth or leather work gloves is advised to prevent skin contact, possible irritation and absorption. A source of clean water should be available in the work area for flushing skin.	
	Respiratory	Single use dust respirator is recommended.	
	Other	Impervious clothing should be worn as needed.	
GENERAL HYGIENE CONSIDERATIONS:	Wash thoroughly after handling. Use good personal hygiene.		
EXPOSURE GUIDELINES:	OSHA Permissible Exposure Limits (PEL):	Silica (Quartz) Total Dust	$\frac{30 \text{ mg} / \text{m}^3}{\% \text{SiO}_2 + 2}$
	ACGIH Threshold Limit Value (TLV):	Silica Quartz	0.05 mg/m <sup>3</sup> TWA

SECTION 9	PHYSICAL AND CHEMICAL PROPERTIES	
Note: Unless otherwise stated, values in this section are determined at 20°C (68°F) and 760 mm Hg (1 atm).		
Flash Point:	Not applicable	
Flammability/ Explosive Limits (%):	LEL: Not applicable	UEL: Not applicable
Auto-ignition Temperature:	Not applicable	
Appearance:	Multicolored pebble	
Physical State:	Solid	
Odor:	None	



pH:	Not applicable
Vapor Pressure (mm Hg):	Not applicable
Vapor Density (air=1):	Not applicable
Boiling Point:	Not applicable
Freezing/Melting Point:	Not applicable
Solubility in Water:	Less than 1%
Specific Gravity:	2.9-3.1
Volatility:	Not applicable
Bulk Density:	80-150 lbs/ft <sup>3</sup>

<b>SECTION 10</b>	<b>STABILITY AND REACTIVITY</b>
Chemical Stability:	Stable under normal conditions of storage and handling.
Conditions to Avoid:	Extreme heat will cause emission of toxic fumes.
Incompatible Materials:	Avoid the contact with strong acids, will cause the release of toxic and irritating fluoride and POx gases.
Hazardous Decomposition Products:	If heated to the point of decomposition, fumes of phosphorous oxides and fluoride may be released
Corrosiveness:	Not applicable
Hazardous Polymerization:	Will not occur.

<b>SECTION 11</b>	<b>TOXICOLOGICAL INFORMATION</b>
Acute Oral Toxicity	3,160 mg/kg (rat)
Acute Dermal Toxicity	No data located
Mutagenesis	No data located
Target Organ	No data located
Developmental Toxicity	No data located
Carcinogenicity	No data located

<b>SECTION 12</b>	<b>ECOLOGICAL INFORMATION</b>
ECOTOXICOLOGY:	No ecotoxicity data located.

<b>SECTION 13</b>	<b>DISPOSAL CONSIDERATIONS</b>
	This material, if discarded as produced, is not a RCRA "listed" or "characteristic" hazardous waste. See section 6 for clean up procedures.



SECTION 14	TRANSPORT INFORMATION
Regulatory Status	Not listed in the hazardous materials shipping regulations (49 CFR, Table 172.101) by the U.S. Department of Transportation, or in the Transport of Dangerous Goods (TDG) Regulations Canada.
Proper Shipping Name	Not applicable
Hazard Class	Not applicable
Packing Group	Not applicable
Identification Number	Not applicable
DOT Guide Number	DOT Emergency Response Guidebook Not applicable
HTS	

SECTION 15	REGULATORY INFORMATION		
FDA:			
CERCLA:	Not listed		
RCRA 261.33:	Not listed		
SARA TITLE III: (Exemptions at 40 CFR, Part 370 may apply for agricultural use, or for quantities of less than 10,000 pounds on-site.)	<b>SARA 302/304:</b> Not listed		
	<b>SARA 311/312:</b>	Acute: Yes (dust)	Chronic: Yes (dust)
	Fire: No	Pressure: No	Reactivity: No
	<b>SARA 313:</b> Not listed		
NTP, IARC, OSHA:	See sections 2 and 11		
Canada DSL and NDSL:	DSL: Yes	NDSL: No	
TSCA:	All ingredients are listed in the TSCA Inventory.		
CA Proposition 65: (Health & Safety Code Section 25249.5)	Warning: This product contains substances that are known to the State of California to cause cancer and/or reproductive harm.		
WHMIS:	This MSDS has been prepared according to the hazard criteria of the Controlled Product Regulations (CPR) and the MSDS contains all of the information required by the CPR.		
CBSA:	This product does not contain any bovine, ruminant or other animal by-products.		



SECTION 16	OTHER INFORMATION
Disclaimer	<p>The information in this document is believed to be correct as of the date issued. Nothing herein contained shall be deemed to be a representation or warranty with respect to the product described herein. <b>NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE, AND ALL SUCH REPRESENTATIONS AND WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED BY MOSAIC.</b> This information and product are furnished on the condition that the person receiving them shall make their own determination as to suitability of the product for their particular purpose and on the condition that they assume the risk of their use thereof. The conditions and use of this product are beyond the control of Mosaic, and Mosaic disclaims any liability for loss or damage incurred in connection with the use or misuse of this substance.</p>
Preparation:	The preparation of this MSDS was in accordance with ANSI Z400.1-2010.
References:	
Note to _____ (if applicable):	



SECTION I	PRODUCT AND COMPANY INFORMATION																					
TRADE NAME:	Sulfuric Acid, Concentrated (98% & 93%) H <sub>2</sub> SO <sub>4</sub>																					
CHEMICAL NAME:	Sulfuric Acid																					
CAS NUMBER:	7664-93-9																					
CHEMICAL FAMILY:	Inorganic Acids																					
SYNONYMS:	Oil of Vitriol, Battery Acid, Sulphuric acid																					
PRIMARY USE:	Used in manufacture of crop nutrients																					
COMPANY INFORMATION:	MOSAIC 8813 U.S. Highway 41 South Riverview, Florida 33569 www.mosaicco.com 306-345-8400, 8 AM to 5 PM Central Time US.																					
EMERGENCY TELEPHONE:	CHEMTREC 1-800-424-9300																					
SECTION II	HAZARD IDENTIFICATION																					
EMERGENCY OVERVIEW :	Health Hazards:	Corrosive. May cause severe burns. Harmful if swallowed. Keep container tightly closed. Use ventilation adequate to keep exposures below recommended limits. Do not breathe mist. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Wash thoroughly after handling. Wear appropriate personal protective equipment.																				
	Physical Hazards:	Highly reactive and capable of igniting finely divided combustible materials on contact. Reacts violently with water and organic materials with evolution of heat. Avoid contact with water.																				
	Physical Form:	Viscous liquid																				
	Appearance:	Colorless to brown, oily liquid																				
	Odor:	Possible sulfur odor																				
	Toxicity:	Toxic																				
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POTENTIAL HEALTH EFFECTS:	<b>Eye:</b>	Corrosive, contact may cause severe irritation, eye burns, and permanent eye damage.																				
	<b>Skin:</b>	Corrosive. Contact may cause severe irritation, skin burns, and permanent skin damage. Inadequate information regarding skin absorption, however, corrosivity of material suggests significant skin absorption will occur																				



	<b>Inhalation (Breathing):</b>	Corrosive and toxic. May be harmful or fatal if inhaled. May cause severe irritation and burns of the nose, throat, and respiratory tract. Excessive irritation of the lungs may cause acute pneumonitis and pulmonary edema, which could be fatal. Chemical pneumonitis and pulmonary edema may result from exposure to the lower respiratory tract and deep lung
	<b>Ingestion (Swallowing)</b>	Corrosive and toxic. Harmful if swallowed. Ingestion may cause severe irritation and burns to the gastrointestinal tract
	<b>Signs and Symptoms:</b>	Effects of overexposure may include severe irritation and burns of the nose and throat and digestive tract, coughing, nausea, vomiting, abdominal pain, chest pain, pneumonitis (inflammation of the lungs)
	<b>Cancer:</b>	The International Agency for Research for Cancer ("IARC") Monographs on the Evaluation of Carcinogen risk to Humans at 106 (Vol. 54, 1992) lists strong inorganic acid mists containing sulfuric acid as a suspected carcinogen. The National Toxicology Program ("NTP") lists strong inorganic acid mists containing sulfuric acid as a known carcinogen in the 9th Report on Carcinogens (9th RoC, May 15,2000). This applies to inorganic acid mists containing sulfuric acid and does not apply to sulfuric acid or sulfuric acid solutions
	<b>Target Organs:</b>	Skin, mucous membranes, gastrointestinal tract, lungs, eyes, teeth
	<b>Developmental:</b>	Inadequate data available
	<b>Other Comments:</b>	None
	<b>Pre-Existing Medical Conditions:</b>	Conditions aggravated by exposure may include skin and respiratory (asthma-like) disorders.
POTENTIAL ENVIRONMENTAL EFFECTS:	Sulfuric acid is toxic to aquatic life at moderate concentrations	
<b>SECTION III</b>	<b>COMPOSITION INFORMATION ON INGREDIENTS</b>	
FORMULA:	H <sub>2</sub> SO <sub>4</sub>	
COMPOSITION:	Sulfuric Acid Water (H <sub>2</sub> O)	93.0 - 98.0% 2.0 – 7.0%
<b>SECTION IV</b>	<b>FIRST AID MEASURES</b>	
FIRST AID PROCEDURES:	Eyes:	Immediately flush with plenty of water for at least 15 minutes. Get medical attention immediately



	<p>Skin:</p> <p>Inhaled:</p> <p>Ingestion:</p>	<p>Immediately flush with plenty of water. Remove contaminated clothing. Discard contaminated clothing properly. If skin surface is damaged, apply a clean dressing and seek immediate medical attention. If skin surface is not damaged, cleanse the affected area(s) thoroughly by washing with mild soap and water. If irritation or redness develops, seek immediate medical attention</p> <p>Prompt medical attention is mandatory in all cases of over exposure. Rescue personnel should be equipped with positive pressure self-contained breathing apparatus. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Unconscious persons should be moved to an uncontaminated area, and given assisted (artificial) respiration. If breathing is difficult and medical oxygen and appropriately trained personnel are available, administer 100% oxygen to affected person. Keep victim warm and quiet. Monitor breathing and pulse continuously. Assure that mucous or vomited material does not obstruct the airway by positional drainage. Delayed pulmonary edema may occur. Keep patient under medical observation for at least 24 hours.</p> <p>If exposed person is conscious, immediately give milk or water (4-8 ounces) to dilute. Do not induce vomiting. If exposed person loses consciousness, assure airway is open and there is adequate oxygenation. Seek medical attention immediately</p>
NOTE TO PHYSICIAN:	This material is corrosive and may cause acid burns, including gastroesophageal perforation. Late complications of severe acid burns include pulmonary edema, esophageal, gastric or pyloric strictures and stenosis. Following exposure to high concentrations of sulfuric acid, keep patient under medical observation for at least 24 hours.	
<b>SECTION V</b>	<b>FIRE FIGHTING MEASURES</b>	
<b>Flammable Properties:</b>	Flash Point:	Not applicable
	OSHA Flammability Class:	Not applicable
	LEL/UEL:	Not applicable
	Auto-Ignition Temperature:	Not applicable
<b>Extinguishing Media:</b>	<p>Water spray may be used to keep fire-exposed containers cool. Use care because water applied directly to acid results in the evolution of heat and causes splattering.</p> <p>Small fires: Water spray, dry chemical or CO<sub>2</sub>.</p> <p>Large fires: Water spray, dry chemical or CO<sub>2</sub>.</p>	



<b>Protection of Firefighters:</b>	<p>Sulfuric acid is a strong oxidant and in contact with some organic materials may cause fires and explosions. Sulfuric acid will react with water or steam, and may generate hydrogen gas when in contact with some metals.</p>
<b>SECTION VI</b>	<b>ACCIDENTAL RELEASE MEASURES</b>
<b>RESPONSE TECHNIQUES:</b>	<ul style="list-style-type: none"> <li>• Evacuate all personnel from affected area. <u>Note</u>: sulfuric acid is extremely slippery.</li> <li>• Keep combustibles (wood, paper, oil) away from spilled material.</li> <li>• Do not add water to spilled material.</li> <li>• Notify persons downwind of spill / release. Keep area isolated until gas has dispersed.</li> <li>• For a small spill, isolate immediate hazard area for at least 200 feet (60 m) in all directions and keep unauthorized personnel out.</li> <li>• For a large spill, isolate immediate hazard area for at least 1,000 feet (330m) in all directions and keep unauthorized personnel out. Protect persons downwind for 1.5 mile (2.5 km) during daytime; 4 miles (6.5 km) night.</li> <li>• Stay upwind and away from spill / release.</li> <li>• Avoid skin contact and do not inhale gas or mist.</li> <li>• Stop spill/release if it can be done with minimal risk. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8).</li> <li>• Collect as much of the spilled material as possible in acid-resistant containers for possible reuse or proper disposal. Absorb the remaining material with sand, vermiculite, or other absorbent material, or neutralize with soda ash, sodium bicarbonate, limestone, or lime, until acidity is neutralized.</li> <li>• For a release or spill of sulfuric acid into water, neutralize with agricultural lime (slaked lime), crushed limestone, or sodium bicarbonate. Use mechanical dredges or lifts to remove immobilized masses of pollutants and precipitates.</li> <li>• Prevent spilled material from entering sewers, storm drains, other unauthorized confined treatment drainage systems. Dike far ahead of spill for later recovery or disposal.</li> <li>• Notify appropriate federal, state, and local agencies as may be required (see Section XV).</li> </ul>
<b>SECTION VII</b>	<b>HANDLING AND STORAGE</b>
<b>HANDLING:</b>	<p>Do not enter confined spaces such as tanks or pits without following proper entry procedures such as OSHA 29CFR1910.146 or ANSI Z117.1 (for confined space). The use of appropriate respiratory protection is required when concentrations exceed any established exposure limits (see Section 8). Wash thoroughly after handling. Do not wear contaminated clothing or shoes. Separate from carbides, chlorates, fulminates, nitrates, picrates, powdered metals and combustible materials. Keep away from strong oxidizing agents including oxygen and chlorine. This product has a great affinity for water, extracting it from the air and also from many organic substances; hence it will char wood, etc. When diluting, the acid should be added to the water.</p>



STORAGE:	Store in suitable containers in cool, dry, well-ventilated areas. Materials in storage should be segregated by the hazards they pose. Use "first in –first out" inventory system to prevent full containers being stored for excessive periods of time. Keep container(s) tightly closed. Keep away from any incompatible material. Protect container(s) against physical damage and exposure to water. Sulfuric acid is highly corrosive to most metals, especially when dilute. To prevent ignition of hydrogen gas generated in metal containers (from metal contact), smoking, open flames, and sparks must not be permitted in storage areas. As a precaution, post signs in storage area that say, "No Smoking or Open Flames."	
<b>SECTION VIII</b>	<b>EXPOSURE CONTROLS / PERSONAL PROTECTION</b>	
ENGINEERING CONTROLS:	Eye wash and shower stations should be available in areas where acid is being handled. Use process enclosure, general ventilation, or local exhaust systems, where necessary, to maintain airborne concentrations below the exposure limits.	
PERSONAL PROTECTIVE EQUIPMENT (PPE):	Eye/Face:	Wear splash goggles while handling sealed cylinders. Wear a facemask that provides both splash and impact protection for face and eyes when using respiratory protection described above.
	Skin:	Follow NIOSH recommendations for appropriate gloves that prevent skin contact to sulfuric acid. Depending on conditions of use, an apron and/or arm covers may be necessary.
	Respiratory:	NIOSH recommends that a full-face air-purifying respirator with a high efficiency particulate (HEPA) filter be used under conditions where airborne concentrations are expected to exceed exposure limits (see exposure guidelines below). Use a positive pressure air-supplied respirator and SCBA if there is potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air-purifying respirators may not provide adequate protection. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.
	Other:	A source of clean water should be available in the work area for flushing eyes and skin. Appropriate chemical protective clothing should be worn as needed.
GENERAL HYGIENE CONSIDERATIONS:	Wash thoroughly after handling. Maintain proper hygiene practices when handling this product.	
EXPOSURE GUIDELINES:	OSHA Permissible Exposure Limits (PEL):	1 mg/m <sup>3</sup>
	ACGIH Threshold Limit Value (TLV):	1 mg/m <sup>3</sup>



<b>SECTION IX</b>	<b>PHYSICAL AND CHEMICAL PROPERTIES</b>
Note: Unless otherwise stated, values in this section are determined at 20°C (68°F) and 760 mm Hg (1 atm).	
Flash Point:	Not applicable
Flammability/ Explosive Limits (%):	Not applicable
Auto-Ignition Temperature:	Not applicable
Appearance:	Dense, oily liquid; colorless to amber depending on purity
Physical State:	Oily liquid
Odor:	Possible sulfur odor
Molecular Weight of Pure Material:	98.08
pH:	0 – 2.1 (4.9 – 0.05% solution concentrations)
Vapor Pressure (mm Hg):	0.001 mmHg
Vapor Density (air=1):	3.4; heavier than air
Boiling Point:	621-635°F / 327-335 °C for a 98% solution
Freezing/Melting Point:	Freezing/Melting: 50°F / 10°C for a 100% solution
Solubility in Water:	Complete
Specific Gravity:	1.84 for a 100% solution
Volatility:	Low volatility
Bulk Density:	15.3 lbs./gal (@60°F)
<b>SECTION X</b>	<b>STABILITY AND REACTIVITY</b>
Chemical Stability:	Stable under proper conditions of storage and handling. Corrosive to metal. Can react with common metals, generating hydrogen gas. Water reactive. Contact with water can generate heat.
Conditions to Avoid:	Very powerful acidic oxidizer, which can ignite or explode in contact with many materials. Water reactive material, generating heat upon contact. Heat will increase overall reactivity and ignition may occur if the mixture is not cooled.
Incompatible Materials:	Highly reactive and capable of igniting finely divided (powder) combustible materials on contact. Extremely hazardous in contact with many materials, particularly carbides, chlorates, fulminates, nitrates, picrates, powdered metals and other combustible materials. Contact with hypochlorites, sulfides, or cyanides will produce toxic gases. Reacts violently with water, alkaline materials or organic materials, with evolution of heat. Corrosive to metal. Attacks many metals, releasing hydrogen gas.
Hazardous Decomposition Products:	Toxic fumes of sulfur. Will react with water or steam to produce toxic and corrosive fumes
Corrosiveness:	Corrosive to metal. Reacts with many metals releasing hydrogen gas.
Hazardous Polymerization:	Will not occur.



SECTION XI	TOXICOLOGICAL INFORMATION
Acute Inhalation Toxicity	LD <sub>50</sub> (rat oral): 2,140 mg/kg
Acute Dermal Toxicity	LC <sub>50</sub> (rat) = 347-420 ppm.
Mutagenesis	No evidence for mutagenicity
Target Organ	Skin, mucous membranes, gastrointestinal tract, lungs, eyes, teeth
Developmental Toxicity	NOEL (maternal) (mouse, rabbit): 5mg/m <sup>3</sup>
Carcinogenicity	The International Agency for Research for Cancer ("IARC") Monographs on the Evaluation of Carcinogen risk to Humans at 106 (Vol. 54, 1992) lists strong inorganic acid mists containing sulfuric acid as a suspected carcinogen. The National Toxicology Program ("NTP") lists strong inorganic acid mists containing sulfuric acid as a known carcinogen in the 9th Report on Carcinogens (9th RoC, May 15,2000). This applies to inorganic acid mists containing sulfuric acid and does not apply to sulfuric acid or sulfuric acid solutions
SECTION XII	ECOLOGICAL INFORMATION
ECOTOXICOLOGY:	LC <sub>50</sub> (bluegill)=pH 3.0-3.84 LC <sub>50</sub> (rainbow trout)=pH 3.7-4.41 LC <sub>50</sub> (zebra fish)=500 mg/L (pH 2.29) LC <sub>50</sub> (mosquito fish)=42mg/L (pH 3.37) EC <sub>50</sub> (Daphnia magna)=29 mg/L (pH 3.5) EC <sub>100</sub> (diatom)=88 mg/L (pH 3.05)
SECTION XIII	DISPOSAL CONSIDERATIONS
	<p>Sulfuric acid, if classified as a waste, would be a RCRA "characteristic" hazardous waste due to the characteristic of corrosivity (D002). If the undiluted material is spilled to soil or water, toxicity characteristic testing of the contaminated materials is recommended to characterize for treatment and/or disposal. Further, this waste may be subject to the land disposal restrictions in 40 CFR 268.40 and may require treatment prior to disposal to meet specific standards. Consult state and local regulations to determine whether they are more stringent than the federal requirements.</p> <p>Container contents should be completely used and containers should be emptied prior to discarding. Unless recycled or used as product, container rinsate could be considered a RCRA hazardous waste and must be disposed of with care and in full compliance with federal, state and local regulations. Larger empty containers, such as drums, should be returned to the distributor or to a drum reconditioner. To assure proper disposal of smaller empty containers, consult with state and local regulations and disposal authorities.</p>
SECTION XIV	TRANSPORTATION INFORMATION
Regulatory Status	Regulated by US DOT
Proper Shipping Name	Sulfuric Acid

Status: New  
 Section(s) Revised: N/A

Issue Date: May 5, 2006  
 MSDS #: MOS 76640506.1



Hazard Class	8
Packing Group	II
Identification Number	UN 1830
Guide Number	137
<b>SECTION XV</b>	<b>REGULATORY INFORMATION</b>
CERCLA:	Designated as an extremely hazardous substance (EHS) (40 CFR 302). Reportable Quantity (RQ) is 1,000 lb. Persons in charge of vessels or facilities are required to notify the National Response Center (NRC) immediately when there is a release in an amount equal to or greater than the RQ. Toll free (800) 424-8802 or Washington D.C. metropolitan area (202) 426-2675.
RCRA 261.33:	Sulfuric acid that is designated a waste would be a RCRA hazardous waste due to the characteristic of corrosivity (D002). If the sulfuric acid is spilled to soil, water, or other materials, testing for toxicity characteristic parameters is recommended to characterize waste if needed beyond generator knowledge. Further, this waste is subject to the land disposal restrictions in 40 CFR 268.40 and may require treatment prior to disposal to meet specific standards. Consult state and local regulations to determine whether they are more stringent than the federal requirements. Container rinseate could be considered a RCRA hazardous waste and must be disposed of with care and in full compliance with federal, state and local regulations.
SARA TITLE III: (Exemptions at 40 CFR, Part 370 may apply for agricultural use, or for quantities of less than 10,000 pounds on-site.)	SARA – 311/312: Acute: Yes; Chronic: Yes; Fire: No; Pressure: No; Reactivity: Yes; EHS: Yes SARA – 313: Listed SARA – 302/304: Threshold Planning Quantity (TPQ) = 1,000 lbs, RQ = 1,000 lbs, this chemical is classified as an EHS. (See CERCLA, above)
NTP, IARC, OSHA:	The International Agency for Research on Cancer (IARC) classified “strong inorganic acid mists containing sulfuric acid” as a Category I carcinogen (known human carcinogen). NTP has classified strong inorganic acid mists containing sulfuric acid as a known human carcinogen.
Canada DSL and NDSL:	Sulfuric acid is listed on the DSL NDSL: No
TSCA:	Sulfuric acid is listed on the Section 8(b) TSCA inventory.
CA Proposition 65: (Health & Safety Code Section 25249.5)	This product contains substances that are known to the state of California to cause cancer and/or reproductive harm.
WHMIS:	This MSDS has been prepared according to the hazard criteria of the Controlled Product Regulations (CPR) and the MSDS contains all of the information required by the CPR. Sulfuric acid meets the Canadian WHMIS criteria for class(es): <b>DIA</b> – Poisonous and infection material – Immediate and serious effects – Very toxic <b>DZA</b> – Poisonous and infection material – Other effects – Very toxic <b>E</b> - Corrosive material
CBSA:	This product does not contain any bovine, ruminant or other animal by-products



SECTION XVI	OTHER INFORMATION
Disclaimer:	The information in this document is believed to be correct as of the date issued. <b>HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE.</b> This information and product are furnished on the condition that the person receiving them shall make their own determination as to suitability of the product for their particular purpose and on the condition that they assume the risk of their use thereof. The conditions the use of this product are beyond the control of Mosaic, and Mosaic disclaims any liability for loss or damage incurred in connection with the use or misuse of this substance.
Preparation:	The preparation of this MSDS was in accordance with ANSI Z400.1-2004.
Note to _____ (if applicable):	Not applicable

**Mosaic MSDS Access**  
FLORIDA CONCENTRATES

**DEFOAMER CCS-540** ARMAZ CUSTOM CHEMICALS

FileName	Language	Internal ID	Revision Date
044100		06166	4/4/2008

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Hazards	NFPA	HMIS	HMIS III	MSDS State
<b>Health</b>	0	1		<i>(Active)</i>
<b>Flammability</b>	1	0		
<b>Reactivity/Physical Hazard</b>	0	0		
<b>Other</b>		X		

Physical Data	Synonyms
Physical State: Liquid Primary Unit of Measure: <i>(No Data)</i> Shelf Life (days): <i>(No Data)</i> Specific Gravity (H <sub>2</sub> O = 1, Air = 1): 1.055 Flash Point: <i>(No Data)</i> Density: <i>(No Data)</i> Vapor Density: <i>(No Data)</i> VOC: <i>(No Data)</i>	(No Data)

CAS	Ingredient	Amount
7732-18-5	FATTY ACID SULFONATES	
	WATER	

Exposure Limits	Parts
(No Data)	(No Data)

**Request and Approval Numbers**

MSDS
(No Data)

Replacement
(No Data)

Substitution
(No Data)

(No Data)
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## MATERIAL SAFETY DATA SHEET

DEFOAMER CCS-540

ARRMAZ CUSTOM CHEMICALS

DATE ISSUED: 03/03/2008

MSDS NO: ZD31130

DATE REVISED: 04/04/2008

REVISION NO: 1

1. PRODUCT AND COMPANY IDENTIFICATION

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GENERAL USE: DEFOAMER

PRODUCT DESCRIPTION: SODIUM SALT OF SULFONATED FATTY ACIDS

PRODUCT CODE: ZD31130

PRODUCT FORMULATION NAME: DEFOAMER CCS-540

CHEMICAL FAMILY: SODIUM SULFONATES

## MANUFACTURER:

ARRMAZ CUSTOM CHEMICALS

MULBERRY

4800 STATE RD. 60 EAST

MULBERRY FL 33860

EMERGENCY CONTACT: RICHARD GILLETTE

PRODUCT STEWARDSHIP: 863-578-1221

ALTERNATE EMERGENCY PHONE: 863-578-1206

## 24 HR. EMERGENCY TELEPHONE NUMBERS:

CANUTEC (CANADIAN TRANSPORTATION): (613) 996-6666

CHEMTREC (US TRANSPORTATION): (800) 424-9300

ARRMAZ CUSTOM CHEMICALS: (863) 578-1206

2. HAZARDS IDENTIFICATION

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## EMERGENCY OVERVIEW:

PHYSICAL APPEARANCE: LIQUID

## IMMEDIATE CONCERNS:

REDDISH BROWN FREE FLOWING LIQUID WITH MILD ODOR. THIS PRODUCT IS SLIPPERY ON FLOORING SURFACES AND MAY CAUSE FALLS. CONTACT WITH EYES MAY CAUSE IRRITATION. THIS PRODUCT WILL NOT READILY DISPERSE IN WATER AND WILL BURN IF INVOLVED IN A FIRE. THIS PRODUCT IN CONTACT WITH POROUS MATERIALS INCLUDING RAGS, TRASH, VESSEL AND PIPING INSULATION, WHEN STORED IN A CONFINED SPACE MAY SPONTANEOUSLY COMBUST.

## POTENTIAL HEALTH EFFECTS:

EYES: CAN CAUSE SEVERE EYE IRRITATION.  
 SKIN: PROLONGED OR EXPOSURE MAY CAUSE SKIN IRRITATION.  
 SKIN ABSORPTION: NOT DETERMINED  
 INGESTION: NO HAZARD IN NORMAL INDUSTRIAL USE.  
 INHALATION: NONE EXPECTED UNDER NORMAL CONDITIONS OF USE.

## SIGNS AND SYMPTOMS OF OVEREXPOSURE:

EYES: CAUSES EYE IRRITATION.  
 SKIN: CONTACT MAY CAUSE SKIN IRRITATION.  
 INGESTION: EXPECTED TO BE RELATIVELY NONTOXIC.

## INHALATION:

NONE EXPECTED UNDER NORMAL CONDITIONS OF USE. EXPOSURE TO MISTS, FUMES OR VAPORS MAY CAUSE IRRITATION OF THE NOSE AND THROAT, DROWSINESS, DIZZINESS, LOSS OF COORDINATION AND FATIGUE.

ACUTE TOXICITY: NOT DETERMINED

CHRONIC EFFECTS: NOT DETERMINED

CARCINOGENICITY: NOT DETERMINED

MUTAGENICITY: NOT DETERMINED

## REPRODUCTIVE TOXICITY:

REPRODUCTIVE EFFECTS: NOT DETERMINED  
 TERATOGENIC EFFECTS: NOT DETERMINED

ROUTES OF ENTRY: EYES, SKIN, LUNGS OR GASTROINTESTINAL.

PHYSICAL HAZARDS: SLIPPERY, CAN CAUSE FALLS IF WALKED ON.

## 3. COMPOSITION / INFORMATION ON INGREDIENTS

---

CHEMICAL NAME	CAS	EINECS
FATTY ACID SULFONATES	PROPRIETARY	PROPRIETARY
WATER	007732-18-5	231-791-2

## 4. FIRST AID MEASURES

## EYES:

IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR 15 MINUTES. GET MEDICAL ATTENTION, IF IRRITATION OR REDNESS PERSISTS.

SKIN: WASH WITH SOAP AND WATER.

INGESTION: GET MEDICAL ATTENTION IMMEDIATELY. DO NOT INDUCE VOMITING.

## INHALATION:

REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET MEDICAL ATTENTION.

## 5. FIRE FIGHTING MEASURES

---

FLASHPOINT AND METHOD: >100 DEG. C PENSKY-MARTENS CC

FLAMMABLE LIMITS: NOT ESTABLISHED

AUTOIGNITION TEMPERATURE: NOT ESTABLISHED

GENERAL HAZARD:

MATERIAL WILL NOT BURN UNLESS MOISTURE CONTENT IS ELIMINATED FROM PRODUCT.

EXTINGUISHING MEDIA:

USE ALCOHOL FOAM, CARBON DIOXIDE, WATER FOG OR DRY CHEMICAL WHEN FIGHTING FIRES INVOLVING THIS MATERIAL. WATER MAY BE INEFFECTIVE.

HAZARDOUS COMBUSTION PRODUCTS:

DUE TO THE MOISTURE CONTENT OF THIS PRODUCT, IT WILL NOT BURN. IF SUFFICIENTLY HEATED, STEAM AND VOLATILE ORGANICS MAY BE GENERATED.

OTHER CONSIDERATIONS:

KEEP CONTAINERS COOL BY SPRAYING WITH WATER IF EXPOSED TO FIRE.

FIRE FIGHTING EQUIPMENT:

WEAR FULL PROTECTIVE CLOTHING, INCLUDING SELF-CONTAINED POSITIVE PRESSURE/PRESSURE DEMAND BREATHING APPARATUS, HELMET, AND PROTECTIVE CLOTHING. USE WATER SPRAY TO COOL FIRE-EXPOSED CONTAINERS AND TO PROTECT PERSONNEL.

## 6. ACCIDENTAL RELEASE MEASURES

---

SMALL SPILL:

DIKE AREA TO CONTAIN SPILL. TAKE PRECAUTIONS AS NECESSARY TO PREVENT CONTAMINATION OF GROUND AND SURFACE WATERS. RECOVER SPILLED MATERIAL ON ADSORBENT, SUCH AS SAWDUST OR VERMICULITE, AND SWEEP INTO CLOSED CONTAINERS FOR DISPOSAL. AFTER ALL VISIBLE TRACES, INCLUDING IGNITABLE VAPORS, HAVE BEEN REMOVED THOROUGHLY WET VACUUM THE AREA. DO NOT FLUSH TO SEWER. IF AREA OF SPILL IS POROUS, REMOVE AS MUCH CONTAMINATED EARTH AND GRAVEL, ETC. AS NECESSARY AND PLACE IN CLOSED CONTAINERS FOR DISPOSAL. COLLECT ANY WASH WATER FOR DISPOSAL. DISPOSE OF ACCORDING TO LOCAL, STATE AND FEDERAL REGULATIONS.

LARGE SPILL:

DIKE AND CONTAIN SPILL. RECOVER LIQUID FOR REUSE OR DISPOSAL.

ABSORB RESIDUAL LIQUID WITH INERT MATERIAL (I.E. DRY SAND OR EARTH), THEN PLACE IN DOT APPROVED CONTAINER FOR TRANSPORTATION AND DISPOSAL.

AFTER REMOVAL FLUSH CONTAMINATED AREA THOROUGHLY WITH WATER. COLLECT WASH WATER FOR DISPOSAL.

ADVISE AUTHORITIES IF MATERIAL HAS ENTERED OR MAY ENTER WATERWAYS OR SEWER DRAINS.

ENVIRONMENTAL PRECAUTIONS:

WATER SPILL: DO NOT ALLOW TO ENTER WATERWAYS.

## 7. HANDLING AND STORAGE

---

HANDLING:

AVOID CONTACT WITH EYES, SKIN, AND CLOTHING. WASH THOROUGHLY AFTER HANDLING.  
USE WITH ADEQUATE VENTILATION. DO NOT REUSE SHIPPING CONTAINER.

STORAGE:

STORE IN A DRY AREA. KEEP FROM FREEZING. KEEP AWAY FROM FOOD AND DRINKING  
WATER.

STORAGE TEMPERATURE: ROOM TEMPERATURE

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

---

ENGINEERING CONTROLS:

NO SPECIAL VENTILATION REQUIREMENTS DURING NORMAL INDUSTRIAL USE.

PERSONAL PROTECTIVE EQUIPMENT:

EYES AND FACE:

WEAR SAFETY GLASSES WITH SIDE SHIELDS (OR GOGGLES) AND A FACE SHIELD.

SKIN:

WHERE CONTACT IS LIKELY WEAR CHEMICAL RESISTANT GLOVES. GLOVE PERMEATION DATA  
DOES NOT EXIST FOR THIS MATERIAL.

RESPIRATORY: NOT NORMALLY REQUIRED DURING NORMAL INDUSTRIAL USE.

PROTECTIVE CLOTHING:

WORK CLOTHING SUFFICIENT TO PREVENT ALL SKIN CONTACT SHOULD BE WORN, SUCH AS  
COVERALLS AND LONG SLEEVES. ENSURE COMPLIANCE WITH OSHA'S PERSONAL PROTECTIVE  
EQUIPMENT (PPE) STANDARD, 29 CFR 1910.132 (GENERAL) AND 138 (HAND PROTECTION).

WORK HYGIENIC PRACTICES:

FACILITIES STORING OR UTILIZING THIS MATERIAL SHOULD BE EQUIPPED WITH AN  
EYEWASH FACILITY AND A SAFETY SHOWER.

OTHER USE PRECAUTIONS:

IF HANDLED IN A SPRAY OR MIST:

PEL TOTAL: 15 MG/M3.

PEL RESPIRABLE FRACTION: 5 MG/M3.

9. PHYSICAL AND CHEMICAL PROPERTIES

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PHYSICAL STATE: LIQUID

ODOR: MILD.

APPEARANCE: BROWN/RED LIQUID

COLOR: DARK BROWN.

pH: 7.5 TO 8.5

PERCENT VOLATILE: NONE

VAPOR PRESSURE: NOT ESTABLISHED

VAPOR DENSITY: NOT ESTABLISHED

BOILING POINT: >100 DEG. C

FLASHPOINT AND METHOD: >100 DEG. C PENSKY-MARTENS CC

SOLUBILITY IN WATER: COMPLETE

EVAPORATION RATE: NOT ESTABLISHED

SPECIFIC GRAVITY: 1.055 @ 25 DEG. C

#### 10. STABILITY AND REACTIVITY

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STABILITY: STABLE.

POLYMERIZATION: WILL NOT OCCUR.

CONDITIONS TO AVOID: STRONG ACIDS

HAZARDOUS DECOMPOSITION PRODUCTS: NONE

#### 11. TOXICOLOGICAL INFORMATION

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EYE EFFECTS: NOT ESTABLISHED

SKIN EFFECTS: NOT ESTABLISHED

CHRONIC: NOT ESTABLISHED

SUBCHRONIC: NOT ESTABLISHED

CARCINOGENICITY:

IARC: NOT LISTED.

NTP: NOT LISTED.

OSHA: NOT LISTED.

TERATOGENIC EFFECTS: NOT ESTABLISHED

MUTAGENICITY: NOT ESTABLISHED

#### 12. ECOLOGICAL INFORMATION

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ENVIRONMENTAL DATA: DO NOT FLUSH TO SEWER OR TO ALLOW ENTRY INTO ANY WATERWAYS.

ECOTOXICOLOGICAL INFORMATION:

LC50 (MINNOWS): NOT ESTABLISHED

CHEMICAL FATE INFORMATION:

BOD5: NOT ESTABLISHED

BOD20: NOT ESTABLISHED

TOC: NOT ESTABLISHED

COD: NOT ESTABLISHED

#### 13. DISPOSAL CONSIDERATIONS

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PRODUCT DISPOSAL:

ARRMAZ CUSTOM CHEMICALS ENCOURAGES THE RECYCLE, RECOVERY AND REUSE OF MATERIALS, WHERE PERMITTED. IF DISPOSAL IS NECESSARY, ARMAZ CUSTOM CHEMICALS RECOMMENDS THAT ORGANIC MATERIALS, ESPECIALLY WHEN CHARACTERIZED AS HAZARDOUS

WASTE, BE DISPOSED OF BY THERMAL TREATMENT AT APPROVED FACILITIES. ALL LOCAL AND NATIONAL REGULATIONS SHOULD BE FOLLOWED.

#### 14. TRANSPORT INFORMATION

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DOT (DEPARTMENT OF TRANSPORTATION):  
PROPER SHIPPING NAME: NOT REGULATED

#### 15. REGULATORY INFORMATION

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UNITED STATES:

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT):  
313 REPORTABLE INGREDIENTS: CONTAINS NO TOXIC CHEMICAL SUBJECT TO REPORTING.

CERCLA (COMPREHENSIVE RESPONSE, COMPENSATION, AND LIABILITY ACT):  
CERCLA REGULATORY: CONTAINS NO HAZARDOUS SUBSTANCES PER 40 CFR 302.4.

TSCA (TOXIC SUBSTANCE CONTROL ACT):

TSCA REGULATORY:  
ALL OF THIS PRODUCT'S COMPONENTS ARE LISTED IN THE TSCA INVENTORY OF CHEMICALS.

REGULATIONS:

STATE REGULATIONS:

COMPONENTS SUBJECT TO REPORTING ARE (MA, NJ, PA): FATTY ACID SULFONATE

CALIFORNIA PROPOSITION 65:  
THE REQUIRED CHEMICAL AND RISK ASSESSMENT ANALYSIS WERE PERFORMED ON THIS PRODUCT OR AN ANALOGOUS PRODUCT. RESULTS INDICATE THAT THERE ARE NO SIGNIFICANT RISKS (OR OBSERVABLE EFFECTS), AS DEFINED BY THIS STATUTE, ASSOCIATED WITH THIS PRODUCT UNDER CONDITIONS OF NORMAL USE.

EUROPEAN COMMUNITY:

EUROPEAN COMMUNITY REGULATORY:  
CANADA (DSL): NOT DETERMINED  
EUROPE (EINECS): NOT DETERMINED  
JAPAN (MITI): NOT DETERMINED  
AUSTRALIA AICS): NOT DETERMINED

#### 16. OTHER INFORMATION

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REASON FOR ISSUE: NEW

APPROVED BY: RICHARD GILLETTE

TITLE: MSDS COORDINATOR

PREPARED BY: RICHARD GILLETTE

INFORMATION CONTACT: RICHARD GILLETTE

REVISION SUMMARY:

REVISION #: 1 THIS MSDS REPLACES THE MARCH 11, 2008 MSDS.

ANY CHANGES IN INFORMATION ARE AS FOLLOWS:  
IN SECTION 9 BOILING POINT (OPERATOR) BOILING DEG. C (FROM)

## HMIS RATING:

HEALTH	1
FLAMMABILITY	0
PHYSICAL HAZARD	0
PERSONAL PROTECTION	X

## NFPA CODES:

0  
1  
0

## MANUFACTURER DISCLAIMER:

THIS SAFETY DATA SHEET AND THE INFORMATION IT CONTAINS ARE OFFERED TO YOU IN GOOD FAITH AS ACCURATE. WE HAVE REVIEWED ANY INFORMATION CONTAINED IN THIS DATA SHEET THAT WE RECEIVED FROM SOURCES OUTSIDE OUR COMPANY. WE BELIEVE THAT THIS INFORMATION TO BE CORRECT BUT CANNOT GUARANTEE ITS ACCURACY OR COMPLETENESS. HEALTH AND SAFETY PRECAUTIONS IN THIS DATA SHEET MAY NOT BE ADEQUATE FOR ALL INDIVIDUALS AND/OR SITUATIONS. IT IS THE USER'S OBLIGATION TO EVALUATE AND USE THIS PRODUCT SAFELY AND TO COMPLY WITH ALL APPLICABLE LAWS AND REGULATIONS. NO STATEMENT MADE IN THIS DATA SHEET SHALL BE CONSTRUED AS PERMISSION OR RECOMMENDATION FOR THE USE OF ANY PRODUCT IN A MANNER THAT MIGHT INFRINGE EXISTING PATENTS. NO WARRANTY IS MADE, EITHER EXPRESSED OR IMPLIED.

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For exposure in excess of 10 times the TWA and up to 100 times the TWA or Unknown, wear a MSHA/NIOSH approved (or equivalent) self-contained breathing apparatus in the positive pressure mode, or, MSHA/NIOSH approved (or equivalent) full-facepiece airline respirator in the positive pressure mode with emergency escape provisions.

Air-purifying respirators should be equipped with acid gas cartridges.

**Other:** Where splashing is possible, full chemically resistant protective clothing (e.g. acid suit) and boots are required.

### III. HEALTH INFORMATION

#### PHYSIOLOGICAL & HEALTH EFFECTS

##### Routes of Entry:

**Eyes:** Direct contact with material can cause the following: severe irritation  
  
Repeated contact at high concentrations can cause the following: corneal burning

**Skin:** Prolonged or repeated skin contact or when confined to skin can cause the following: irritation - dermatitis

**Inhalation:** Inhalation of vapor or mist can cause the following: irritation of nose, throat, and lungs – coughing – shortness of breath

**Ingestion:** Material is harmful if swallowed.  
  
Material can cause the following: gastrointestinal irritation – allergic reaction  
  
Material in large doses can cause the following: abdominal pain – control nervous system depression – diarrhea – depression - death

**Toxicity:** LD50 in rats 2000 mg/kg orally

#### EMERGENCY & FIRST AID PROCEDURES

**Eyes:** IMMEDIATELY flush eyes with a large amount of water for at least 15 minutes. Get prompt medical attention.

**Skin:** Remove contaminated clothing. Wash skin thoroughly with soap and water. Get prompt medical attention. Wash contaminated clothing thoroughly before reuse.

**Inhalation:** Move subject to fresh air. If breathing is difficult, give oxygen. Give artificial respiration if breathing has stopped. Call a physician.

**Ingestion:** Induce vomiting by giving 2 glasses of water to drink and touching back of subject's throat with finger. IMMEDIATELY see a physician. Never give anything by mouth to an unconscious person.

#### IV. REACTIVITY DATA

**Stability:** This material is considered stable.

**Conditions To Avoid:** Avoid exposure to excessive heat.

**Incompatibility:** Avoid contact with the following: acids – oxidizing agents

#### **Hazardous Decomposition**

**Products:** Thermal decomposition may yield the following: sulfur dioxide – toxic fumes

#### **Hazardous**

**Polymerization:** Product will not undergo hazardous polymerization.

#### V. PHYSICAL AND CHEMICAL PROPERTIES

#### **Appearance and**

**Odor:** Clear yellow liquid, pungent odor

**Boiling Point:** 103°C/217°F Estimated

**Melting Point:** No Data

**Vapor Density  
(air = 1):** > 1.0 Estimate

**Vapor Pressure:** 32 mm Hg Estimate

**Solubility in water:** Dilutable

**Specific Gravity  
(H<sub>2</sub>O =1):** 1.31 to 1.38

**pH:** 3.5 to 5.0

**Other (i.e. wt.  
per gallon):** 10.8 to 11.3 lb/gal

## VI. SPECIAL PRECAUTIONS

### Handling and Storage

#### Precautions:

Avoid temperature extremes during storage; ambient temperature preferred. Do not store this material near food, animal feed or drinking water. Store in well ventilated area. Store away from excessive heat (e.g. steam pipes, radiators), and from reactive materials. Keep container tightly closed when not in use.

The vapor above sodium bisulfite solution contains water vapor and sulfur dioxide. The concentration of sulfur dioxide varies with conditions, temperature and the pH of the SBS being the most important. Caution is recommended in determining how and where such vapors are handled and vented. The ACGIH TWA for sulfur dioxide is 2 ppm.

Do not handle material near food, animal feed or drinking water. This material is corrosive. See the PERSONAL PROTECTION MEASURES Section prior to handling. Vapors can be evolved when material is

heated during processing operations. See FACILITY CONTROL MEASURES Section for types of ventilation required. Slight positive pressure may develop upon long-term storage in air-tight containers. Carefully relieve any pressure build-up when opening container. Wash after handling and shower at end of work period.

CONTAINERS HAZARDOUS WHEN EMPTY. Since emptied containers retain product residue (vapors and/or liquid) follow all MSDS and label warnings even after container is emptied. Empty drums should be rinsed with water before discarding. Dispose empty container in a sanitary landfill or by incineration as allowed by state and local authorities. Avoid inhalation of smoke if incinerated.

## VII. FIRE PROTECTION INFORMATION

**Flash Point:** Not applicable      **Flammable Limits:** Not flammable

**Extinguishing Media:** Use extinguishing media appropriate for surrounding fire.

### Special Firefighting

#### Procedures:

Move containers promptly out of fire zone. If removal is impossible, cool containers with water spray. Remain upwind. Avoid breathing noxious fumes (sulfur dioxide) from fire-exposed material.

**VIII. TRANSPORTATION REQUIREMENTS**

**DOT Proper Shipping Name:** Bisulfites, inorganic, aqueous solutions, n.o.s. (Sodium Bisulfite)

**DOT Classification:** 8

**UN/NA Identification Number:** UN2693

**Packing Group:** III

**Other Labels:** Corrosive

**IX. SPILL AND LEAK PROCEDURES****Precaution if**

**Spilled or Released:** Contain spills immediately with inert materials (i.e. sand, earth). Evacuate and ventilate spill area. Avoid all contact. Transfer liquids and solid diking material to separate suitable containers for recovery or disposal. CAUTION: Keep spills and cleaning runoff out of municipal sewers and open bodies of water.

**Neutralizing Chemicals:**

Sodium Bisulfite may be neutralized with sodium hydroxide, or soda ash to neutral pH. Avoid acidic conditions (i.e. pH <5.0), since under acidic conditions, sulfur dioxide a poisonous gas can be released.

**Waste Disposal**

**Methods:** For disposal, incinerate or landfill at a permitted facility in accordance with local, state, and federal regulations (see 40 CFR Part 268).

**Reportable**

**Quantities:** 5,000 lbs on dry weight basis for sodium bisulfite.

**X. NSF CERTIFICATION**

Sodium Bisulfite manufactured at Pasadena, TX and Tuscaloosa, AL are NSF-60 Certified. Maximum use in potable water is 50 mg/l.

**SALES OFFICE**

For Product Information:  
TEL: 662-494-3055  
FAX: 662-494-2828

Post Office Drawer 1217  
West Point, MS 39773

To Place An Order:  
TEL: 800-953-3585  
FAX: 800-953-3588

**IMPORTANT**

The information on this Material Safety Data Sheet is believed to be accurate but is not warranted to be so. Protective equipment, health effects, and other related safety measures are based on intended and anticipated product use. Recipients are advised to confirm in advance of need that the information is applicable and suitable to their circumstances.



8813 Highway 41 South - Riverview, Florida 33578  
Telephone 813-677-9111 - Telex 52666  
FAX - Accounting 813-6716283

## CERTIFICATE OF ANALYSIS

### PHOSPHATE ROCK

Analysis Summary (All Trains)

**All Trains**

DATE: April 12, 2013

ANALYSIS	RESULT
BPL	63.67 %
P <sub>2</sub> O <sub>5</sub>	29.14 %
Moisture	12.24 %
Acid Insolubles	14.47 %
CaO	42.36 %
Fe <sub>2</sub> O <sub>3</sub>	0.93 %
Al <sub>2</sub> O <sub>3</sub>	1.26 %
MgO	0.43 %



**Send To: 00960**

Mr. Art Espinosa  
The Mosaic Company  
13830 Circa Crossing Drive  
Lithia, FL 33547

**Facility: 00966**

The Mosaic Company  
8813 Highway 41 South  
Riverview FL 33578  
United States

<b>Result</b>	<b>PASS</b>	<b>Report Date</b>	08-OCT-2012
Customer Name	The Mosaic Company		
Tested To	NSF/ANSI 60		
Description	Sulfuric Acid 93%   clear liquid		
Trade Designation	Sulfuric Acid 93%		
Test Type	Annual Collection		
Job Number	A-00116406		
Project Number	9120471 (CLC, TEC)		
Project Manager	Soncea Braden-Mccann		

This report documents the testing of the referenced product to the requirements of NSF/ANSI Standard 60 (Drinking Water Treatment Chemicals - Health Effects). This standard establishes minimum requirements for chemicals, the chemical contaminants, and impurities that are added to drinking water from drinking water treatment chemicals. Contaminants produced as by-products through reaction of the treatment chemical with a constituent of the drinking water are not covered by this Standard. Reference the "About the Standard" section at the end of this report for additional information about NSF/ANSI Standard 60 and the products covered under this Standard.

**Thank you for having your product tested by NSF International.**

Please contact your Project Manager if you have any questions or concerns pertaining to this report.

**Report Authorization** Clifton J. McLellan  
Clifton J. McLellan - Director, Toxicology Services

**Date** 08-OCT-2012



**General Information**

Standard: NSF/ANSI 60  
Chemical Name: Sulfuric Acid  
DCC Number: DA04943  
Date of Manufacture: 9/7/2012  
Lot Number/Product Identifier: 9/7/2012  
Maximum Use Level: 50 mg/L  
Monitor Code: C  
Physical Description of Sample: clear liquid  
Trade Designation/Model Number: Sulfuric Acid 93%

Sample Id: **S-0000920247**  
Description: Sulfuric Acid 93% | clear liquid  
Sampled Date: 18-Sep-2012  
Received Date: 14-Sep-2012

Tox Normalization Information:		Lab Normalization Information:	
Calculated NF	0.0027	Date exposure completed	18-SEP-2012
Preparation method used	D	Final volume of solution	0.5 L
MUL	50 mg/L	Mass of material used	9258 mg
Compound Reference Key:	SPAC		

**Normalization Calculation:**

$$\text{Normalized Result} = \text{Test Result (ug/L)} * \text{NF} \quad \text{Where NF} = \text{MUL (mg/L)} * \frac{\text{Final Volume Of Solution (L)}}{\text{Mass of Material Used (mg)}}$$

- MUL = Maximum Use Level;
- Mass of Material Used = The mass of sample analyzed in the laboratory;
- Final Volume of Solution = The volume of water used to dilute the sample;
- An additional factor may be used to adjust the analytical result to field use conditions to account for product carryover, flushing, or other assumptions stipulated with the use of the product. If an additional factor is used, it is included in the information above.

Testing Parameter	Units	Sample	Control	Result	Norm. Result	Acceptance Criteria(1)	Evaluation Status
<b>Chemistry Lab</b>							
Arsenic	ug/L	ND(1)	ND(1)	ND(1)	ND(0.003)	1	Pass
Barium	ug/L	ND(1)	ND(1)	ND(1)	ND(0.003)	200	Pass
Beryllium	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.4	Pass
Cadmium	ug/L	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.0005)	0.5	Pass
Chromium	ug/L	2	ND(1)	2	0.005	10	Pass
Copper	ug/L	ND(1)	ND(1)	ND(1)	ND(0.003)	130	Pass
Mercury	ug/L	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.0005)	0.2	Pass
Lead	ug/L	ND(1)	ND(1)	ND(1)	ND(0.003)	1.5	Pass
Antimony	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.6	Pass
Selenium	ug/L	ND(2)	ND(2)	ND(2)	ND(0.005)	5	Pass
Thallium	ug/L	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.0005)	0.2	Pass
Volatile Organic Compounds (Ref: EPA 524.2)							
Dichlorodifluoromethane	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)		
Chloromethane	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	3	Pass
Vinyl Chloride	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.2	Pass
Bromomethane	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)		
Chloroethane	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.04	Pass



Sample Id: S-0000920247

Testing Parameter	Units	Sample	Control	Result	Norm. Result	Acceptance Criteria(1)	Evaluation Status
<b>Chemistry Lab ( Continued )</b>							
Trichlorofluoromethane	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	50	Pass
Trichlorotrifluoroethane	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.3	Pass
Methylene Chloride	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.5	Pass
1,1-Dichloroethylene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.7	Pass
trans-1,2-Dichloroethylene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	10	Pass
1,1-Dichloroethane	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)		
2,2-Dichloropropane	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)		
cis-1,2-Dichloroethylene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	7	Pass
Chloroform	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	[TTHM]	
Bromochloromethane	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.3	Pass
1,1,1-Trichloroethane	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	20	Pass
1,1-Dichloropropene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)		
Carbon Tetrachloride	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.5	Pass
1,2-Dichloroethane	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.5	Pass
Trichloroethylene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.5	Pass
1,2-Dichloropropane	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.5	Pass
Bromodichloromethane	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	[TTHM]	
Dibromomethane	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)		
cis-1,3-Dichloropropene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.2	Pass
trans-1,3-Dichloropropene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.2	Pass
1,1,2-Trichloroethane	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)		
1,3-Dichloropropane	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)		
Tetrachloroethylene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.5	Pass
Chlorodibromomethane	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	[TTHM]	
Chlorobenzene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	10	Pass
1,1,1,2-Tetrachloroethane	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	1	Pass
Bromoform	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	[TTHM]	
1,1,2,2-Tetrachloroethane	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.2	Pass
1,2,3-Trichloropropane	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	5	Pass
1,3-Dichlorobenzene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	60	Pass
1,4-Dichlorobenzene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	7.5	Pass
1,2-Dichlorobenzene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	60	Pass
Carbon Disulfide	ug/L	ND(1)	ND(1)	ND(1)	ND(0.003)	70	Pass
Methyl-tert-Butyl Ether (MTBE)	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	10	Pass
tert-Butyl ethyl ether	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	2000	Pass
Methyl Ethyl Ketone	ug/L	ND(5)	ND(5)	ND(5)	ND(0.01)	400	Pass
Methyl Isobutyl Ketone	ug/L	ND(5)	ND(5)	ND(5)	ND(0.01)	700	Pass
Toluene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	100	Pass



Sample Id: S-0000920247

Testing Parameter	Units	Sample	Control	Result	Norm. Result	Acceptance Criteria(1)	Evaluation Status
<b>Chemistry Lab ( Continued )</b>							
Ethyl Benzene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	70	Pass
m+p-Xylenes	ug/L	ND(1)	ND(1)	ND(1)	ND(0.003)	[Xylenes]	
o-Xylene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	[Xylenes]	
Styrene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	10	Pass
Isopropylbenzene (Cumene)	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	400	Pass
n-Propylbenzene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.3	Pass
Bromobenzene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)		
2-Chlorotoluene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)		
4-Chlorotoluene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)		
1,3,5-Trimethylbenzene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.3	Pass
tert-Butylbenzene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	10	Pass
1,2,4-Trimethylbenzene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)		
sec-Butylbenzene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.3	Pass
p-Isopropyltoluene (Cymene)	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)		
1,2,3-Trimethylbenzene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.3	Pass
n-Butylbenzene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.3	Pass
1,2,4-Trichlorobenzene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)		
Hexachlorobutadiene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.1	Pass
1,2,3-Trichlorobenzene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)		
Naphthalene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	10	Pass
Benzene	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	0.5	Pass
Total Trihalomethanes	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	8	Pass
Total Xylenes	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.001)	1000	Pass
1 - If the acceptance criteria is blank and the evaluation status is "Fail", then the criteria used will be noted on the letter accompanying these results.							
[TTHM] - Acceptance based on Total Trihalomethanes							
[Xylenes] - Acceptance based on Total Xylenes							



**Common Terms and Acronyms Used:**

Sample.....	Test result on the submitted product sample after prepared or exposed in accordance with the standard.
Control.....	Test result on a laboratory blank sample analyzed in parallel with the sample.
Result.....	Sample test result minus the Control test result.
Normalized Result...	Result normalized in accordance with the test standard to reflect potential at-the-tap concentrations
ND().....	Result is below the detection level of the analytical procedure as identified in the parenthesis.
DCC Number.....	NSF document control code of the registered formulation of the product tested
ug/L.....	Microgram per liter = 0.001 milligram per liter (mg/L)
SPAC.....	Acceptance criteria of the standard (Single Product Allowable Concentration)

**References to Testing Procedures:**

NSF Reference	Parameter / Test Description
C3035	Total Arsenic in Drinking Water by ICPMS (Ref: EPA 200.8)
C3038	Barium in Drinking Water by ICPMS (Ref: EPA 200.8)
C3041	Beryllium in Drinking Water by ICPMS (Ref: EPA 200.8)
C3046	Cadmium in Drinking Water by ICPMS (Ref: EPA 200.8)
C3052	Chromium in Drinking Water by ICPMS (Ref: EPA 200.8)
C3058	Copper in Drinking Water by ICPMS (Ref: EPA 200.8)
C3071	Mercury in Drinking Water by ICPMS (Ref: EPA 200.8)
C3100	Lead in Drinking Water by ICPMS (Ref: EPA 200.8)
C3113	Antimony in Drinking Water by ICPMS (Ref: EPA 200.8)
C3115	Selenium in Drinking Water by ICPMS (Ref: EPA 200.8)
C3127	Thallium in Drinking Water by ICPMS (Ref: EPA 200.8)
C4662	Volatile Organic Compounds (Ref: EPA 524.2)

Test descriptions preceded by an asterisk "\*" indicate that testing has been performed per NSF International requirements but is not within its scope of accreditation.

**Testing Laboratories:**

All work performed at:	Id	Address
—————→	NSF_AA	NSF International 789 N. Dixboro Road Ann Arbor MI 48105



**About the Standard:**

NSF/ANSI Standard 60: Drinking Water Treatment Chemicals - Health Effects

NSF/ANSI 60 establishes minimum health effects requirements for the chemicals, the chemical contaminants, and the impurities that are directly added to drinking water from drinking water treatment chemicals. It does not establish performance or taste and odor requirements. The standard contains requirements for chemicals that are directly added to water and are intended to be present in the finished water as well as other chemical products that are added to water but are not intended to be present in the finished water. Chemicals covered by this Standard include, but are not limited to, coagulation and flocculation chemicals, softening, precipitation, sequestering, pH adjustment, and corrosion/scale control chemicals, disinfection and oxidation chemicals, miscellaneous treatment chemicals, and miscellaneous water supply chemicals.

The testing performed to this standard is done to estimate the level of contaminants or impurities added to drinking water when the chemical is used at the "Maximum Use Level" under attestation. Prior to testing, information is obtained on the formulation and sources of supply used to manufacture the chemical. This information is then reviewed along with the minimum requirements of the standard to establish the potential contaminants of concern. A representative sample of chemical is obtained for testing. The chemical sample is prepared for analysis through specific methods established in the standard based on the type of chemical and then is analyzed for potential contaminants determined during the formulation review. The laboratory results are normalized to represent potential at-the-tap values and then compared to the "single product allowable concentration" (SPAC) established by the standard. The product is found in compliance with the standard if the normalized value is less than or equal to the allowable concentration.



**Send To: 00960**

Mr. Art Espinosa  
The Mosaic Company  
13830 Circa Crossing Drive  
Lithia, FL 33547

**Facility: 00966**

The Mosaic Company  
8813 Highway 41 South  
Riverview FL 33578  
United States

<b>Result</b>	<b>PASS</b>	<b>Report Date</b>	12-OCT-2012
Customer Name	The Mosaic Company		
Tested To	NSF/ANSI 60		
Description	Well Water   clear liquid		
Trade Designation	Well Water		
Test Type	Annual Collection		
Job Number	A-00116595		
Project Number	9120471 (CLZ, TEZ)		
Project Manager	Soncea Braden-Mccann		

This report documents the testing of the referenced product to the requirements of NSF/ANSI Standard 60 (Drinking Water Treatment Chemicals - Health Effects). This standard establishes minimum requirements for chemicals, the chemical contaminants, and impurities that are added to drinking water from drinking water treatment chemicals. Contaminants produced as by-products through reaction of the treatment chemical with a constituent of the drinking water are not covered by this Standard. Reference the "About the Standard" section at the end of this report for additional information about NSF/ANSI Standard 60 and the products covered under this Standard.

**Thank you for having your product tested by NSF International.**

Please contact your Project Manager if you have any questions or concerns pertaining to this report.

**Report Authorization** Clifton J. McLellan  
Clifton J. McLellan - Director, Toxicology Services

**Date** 12-OCT-2012



**General Information**

Standard: NSF/ANSI 60  
Chemical Name: N/A  
DCC Number: AI00145  
Date of Manufacture: 9/7/2012  
Lot Number/Product Identifier: 9/7/2012  
Maximum Use Level: N/A  
Monitor Code: Z  
Physical Description of Sample: clear liquid  
Trade Designation/Model Number: Well Water

Sample Id: **S-0000920249**  
Description: Well Water | clear liquid  
Sampled Date: 18-Sep-2012  
Received Date: 14-Sep-2012

Tox Normalization Information:		Lab Normalization Information:	
Calculated NF	0.0992	Date exposure completed	18-SEP-2012
Preparation method used	A	Final volume of solution	5 L
MUL	50 mg/L	Mass of material used	2519 mg
Compound Reference Key:	SPAC		

**Normalization Calculation:**

$$\text{Normalized Result} = \text{Test Result (ug/L)} * \text{NF} \quad \text{Where NF} = \text{MUL (mg/L)} * \frac{\text{Final Volume Of Solution (L)}}{\text{Mass of Material Used (mg)}}$$

- MUL = Maximum Use Level;
- Mass of Material Used = The mass of sample analyzed in the laboratory;
- Final Volume of Solution = The volume of water used to dilute the sample;
- An additional factor may be used to adjust the analytical result to field use conditions to account for product carryover, flushing, or other assumptions stipulated with the use of the product. If an additional factor is used, it is included in the information above.

Testing Parameter	Units	Sample	Control	Result	Norm. Result	Acceptance Criteria(1)	Evaluation Status
<b>Chemistry Lab</b>							
* Gross Alpha and Beta Radioactivity in Drinking Water (Ref: EPA 900.0)							
P1 Gross Alpha	pCi/L	ND(3)	ND(3)	ND(3)	ND(0.3)		
P1 Gross Beta	pCi/L	ND(4)	ND(4)	ND(4)	ND(0.4)		
Date Analyzed	27-SEP-2012						
BASE/NEUTRAL/ACID EPA METHOD 625 Scan for Tentatively Identified Compounds							
No Compounds Detected	ug/L	ND(4)		ND(4)	ND(0.4)		
Scan Control Complete	TRUE						
Semivolatile Compounds, Base/Neutral/Acid Target 625, Data Workup							
Pyridine	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Nitrosodimethylamine (N-)	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
N-Nitrosomethylethylamine	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
5-Methyl-2-hexanone (MIAK)	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
1-Methoxy-2-propanol acetate	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	70	Pass
2-Heptanone	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	50	Pass
Cyclohexanone	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Nitrosodiethylamine (N-)	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Isobutylisobutyrate	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Aniline	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		



Sample Id: S-0000920249

Testing Parameter	Units	Sample	Control	Result	Norm. Result	Acceptance Criteria(1)	Evaluation Status
<b>Chemistry Lab ( Continued )</b>							
Phenol	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Di(chloroethyl) ether	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	0.03	Pass
2-Chlorophenol	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	0.3	Pass
2,3-Benzofuran	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
1,3-Dichlorobenzene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	60	Pass
1,4-Dichlorobenzene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	7.5	Pass
3-Cyclohexene-1-carbonitrile	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	0.3	Pass
2-Ethylhexanol	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	80	Pass
Benzyl alcohol	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
1,2-Dichlorobenzene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	60	Pass
bis(2-Chloroisopropyl)ether	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
2-Methylphenol (o-Cresol)	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
N-Methylaniline	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Acetophenone	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
N-Nitrosodi-n-propylamine	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
N-Nitrosopyrrolidine	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
4-Methylphenol (p-Cresol)	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Hexachloroethane	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
2-Phenyl-2-propanol	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
N-Nitrosomorpholine	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Nitrobenzene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
2,6-Dimethylphenol	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
N-Vinylpyrrolidinone	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
N-Nitrosopiperidine	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Triethylphosphate	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Isophorone	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
2-Nitrophenol	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
2,4-Dimethylphenol	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
bis(2-Chloroethoxy)methane	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
2,4-Dichlorophenol	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	0.3	Pass
Trichlorobenzene (1,2,4-)	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Naphthalene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	10	Pass
4-Chloroaniline	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
1,1,3,3,-Tetramethyl-2-thiourea	ug/L	ND(4)	ND(4)	ND(4)	ND(0.4)	1	Pass
Hexachlorobutadiene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	0.1	Pass
Benzothiazole	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	50	Pass
N-Nitrosodi-n-butylamine	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	0.006	Pass
4-Chloro-3-methylphenol	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		



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Testing Parameter	Units	Sample	Control	Result	Norm. Result	Acceptance Criteria(1)	Evaluation Status
<b>Chemistry Lab ( Continued )</b>							
p-tert-Butylphenol	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
2-Ethylhexyl glycidyl ether	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
2,6-Di-t-butyl-4-methylphenol(BHT)	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	10	Pass
Methylnaphthalene, 2-	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Benzyl alcohol, a,a-dimethyl-p-isopropyl-	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	0.3	Pass
Cyclododecane	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
2,4,5-Trichlorophenol	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
2,4,6-trichlorophenol	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
1(3H)-Isobenzofuranone	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
2-Chloronaphthalene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
2-Nitroaniline	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
1,1'-(1,3-Phenylene)bis ethanone	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	0.3	Pass
2,6-Di-tert-butylphenol	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Dimethylphthalate	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
1,1'-(1,4-Phenylene)bis ethanone	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	0.3	Pass
Acenaphthylene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Benzenedimethanol, a,a,a',a'-tetramethyl-1,3-	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	5	Pass
2,6-Dinitrotoluene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
2,4-Dinitrotoluene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Benzenedimethanol, a,a,a',a'-Tetramethyl-1,4-	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	5	Pass
2,4-Di-tert-butylphenol	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Dimethyl terephthalate	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Acenaphthene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Dibenzofuran	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Ethyl-4-ethoxybenzoate	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	50	Pass
4-Nitrophenol	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Cyclododecanone	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Diethyl Phthalate	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
p-tert-Octylphenol	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Fluorene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
4-Chlorophenylphenylether	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
3-Nitroaniline	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
4-Nitroaniline	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Nitrosodiphenylamine (N-)	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Azobenzene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
4-Bromophenylphenylether	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Hexachlorobenzene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Pentachlorophenol	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		



Sample Id: S-0000920249

Testing Parameter	Units	Sample	Control	Result	Norm. Result	Acceptance Criteria(1)	Evaluation Status
<b>Chemistry Lab ( Continued )</b>							
Phenanthrene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Anthracene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Diisobutyl phthalate	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	0.6	Pass
Dibutyl phthalate	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)	70	Pass
Hydroxymethylphenylbenzotriazole	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Fluoranthene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Pyrene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Butyl benzyl phthalate	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Di(2-ethylhexyl)adipate	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
3,3-Dichlorobenzidine	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Benzo(a)anthracene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Di(2-ethylhexyl)phthalate	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Chrysene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Di-n-octylphthalate	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Benzo(b)fluoranthene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Benzo(k)fluoranthene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Benzo(a)Pyrene (PAH)	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Dibenzo(a,h)anthracene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Indeno(1,2,3-cd)pyrene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Benzo(g,h,i)perylene	ug/L	ND(2)	ND(2)	ND(2)	ND(0.2)		
Dioxin/Furan Scan by Method 1613							
2378-TCDF	pg/L	ND(10)	ND(10)	ND(10)	ND(0.000001)		
TOTAL TCDF	pg/L	ND(10)	ND(10)	ND(10)	ND(0.000001)		
2378-TCDD	pg/L	ND(10)	ND(10)	ND(10)	ND(0.000001)		
TOTAL TCDD	pg/L	ND(10)	ND(10)	ND(10)	ND(0.000001)		
12378-PeCDF	pg/L	ND(50)	ND(50)	ND(50)	ND(0.000005)		
23478-PeCDF	pg/L	ND(50)	ND(50)	ND(50)	ND(0.000005)		
TOTAL PeCDF	pg/L	ND(50)	ND(50)	ND(50)	ND(0.000005)		
12378-PeCDD	pg/L	ND(50)	ND(50)	ND(50)	ND(0.000005)		
TOTALPeCDD	pg/L	ND(50)	ND(50)	ND(50)	ND(0.000005)		
123478-HxCDF	pg/L	ND(50)	ND(50)	ND(50)	ND(0.000005)		
123678-HxCDF	pg/L	ND(50)	ND(50)	ND(50)	ND(0.000005)		
234678-HxCDF	pg/L	ND(50)	ND(50)	ND(50)	ND(0.000005)		
123789-HxCDF	pg/L	ND(50)	ND(50)	ND(50)	ND(0.000005)		
TOTAL HxCDF	pg/L	ND(50)	ND(50)	ND(50)	ND(0.000005)		
123478-HxCDD	pg/L	ND(50)	ND(50)	ND(50)	ND(0.000005)		
123678-HxCDD	pg/L	ND(50)	ND(50)	ND(50)	ND(0.000005)		
123789-HxCDD	pg/L	ND(50)	ND(50)	ND(50)	ND(0.000005)		



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Testing Parameter	Units	Sample	Control	Result	Norm. Result	Acceptance Criteria(1)	Evaluation Status
<b>Chemistry Lab ( Continued )</b>							
TOTALHxCDD	pg/L	ND(50)	ND(50)	ND(50)	ND(0.000005)		
1234678-HpCDF	pg/L	ND(50)	ND(50)	ND(50)	ND(0.000005)		
1234789-HpCDF	pg/L	ND(50)	ND(50)	ND(50)	ND(0.000005)		
TOTAL HpCDF	pg/L	ND(50)	ND(50)	ND(50)	ND(0.000005)		
1234678-HpCDD	pg/L	ND(50)	ND(50)	ND(50)	ND(0.000005)		
TOTAL HpCDD	pg/L	ND(50)	ND(50)	ND(50)	ND(0.000005)		
OCDF	pg/L	ND(100)	ND(100)	ND(100)	ND(0.00001)		
OCDD	pg/L	ND(100)	ND(100)	ND(100)	ND(0.00001)		
Semivolatile Organic Compounds (Ref: EPA 525.2)							
Date Prepared	24-SEP-2012						
Date Analyzed	24-SEP-2012						
Hexachlorocyclopentadiene (HCCPD)	ug/L	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.02)		
EPTC	ug/L	ND(1)	ND(1)	ND(1)	ND(0.1)		
Dimethylphthalate	ug/L	ND(4)	ND(4)	ND(4)	ND(0.4)		
2,6-Dinitrotoluene	ug/L	ND(1)	ND(1)	ND(1)	ND(0.1)		
2,4 Dinitrotoluene	ug/L	ND(1)	ND(1)	ND(1)	ND(0.1)		
Molinate	ug/L	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.02)		
Diethyl Phthalate	ug/L	ND(4)	ND(4)	ND(4)	ND(0.4)		
Propachlor	ug/L	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.02)		
Hexachlorobenzene	ug/L	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.02)		
Simazine	ug/L	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.04)		
Atrazine	ug/L	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.04)		
Lindane	ug/L	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.02)		
Terbacil	ug/L	ND(1)	ND(1)	ND(1)	ND(0.1)		
Metribuzin	ug/L	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.02)		
Alachlor	ug/L	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.02)		
Heptachlor	ug/L	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.02)		
Dibutyl phthalate	ug/L	ND(4)	ND(4)	ND(4)	ND(0.4)	70	Pass
Metolachlor	ug/L	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.02)		
Aldrin	ug/L	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.02)		
Heptachlor Epoxide	ug/L	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.02)		
Butachlor	ug/L	ND(0.4)	ND(0.4)	ND(0.4)	ND(0.04)		
p,p'-DDE (4,4'-DDE)	ug/L	ND(1)	ND(1)	ND(1)	ND(0.1)		
Dieldrin	ug/L	ND(1)	ND(1)	ND(1)	ND(0.1)		
Endrin	ug/L	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.02)		
Butyl benzyl phthalate	ug/L	ND(4)	ND(4)	ND(4)	ND(0.4)		
Di(2-ethylhexyl)adipate	ug/L	ND(4)	ND(4)	ND(4)	ND(0.4)		
Methoxychlor	ug/L	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.02)		



Sample Id: **S-0000920249**

Testing Parameter	Units	Sample	Control	Result	Norm. Result	Acceptance Criteria(1)	Evaluation Status
<b>Chemistry Lab ( Continued )</b>							
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	ND(4)	ND(4)	ND(4)	ND(0.4)	0.6	Pass
Benzo(a)Pyrene (PAH)	ug/L	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.02)		
1 - If the acceptance criteria is blank and the evaluation status is "Fail", then the criteria used will be noted on the letter accompanying these results.							



**Common Terms and Acronyms Used:**

- Sample..... Test result on the submitted product sample after prepared or exposed in accordance with the standard.
- Control..... Test result on a laboratory blank sample analyzed in parallel with the sample.
- Result..... Sample test result minus the Control test result.
- Normalized Result... Result normalized in accordance with the test standard to reflect potential at-the-tap concentrations
- ND()..... Result is below the detection level of the analytical procedure as identified in the parenthesis.
- DCC Number..... NSF document control code of the registered formulation of the product tested
- ug/L..... Microgram per liter = 0.001 milligram per liter (mg/L)
- SPAC..... Acceptance criteria of the standard (Single Product Allowable Concentration)

**References to Testing Procedures:**

NSF Reference	Parameter / Test Description
C0842	* Gross Alpha and Beta Radioactivity in Drinking Water (Ref: EPA 900.0)
C2023	BASE/NEUTRAL/ACID EPA METHOD 625 Scan for Tentatively Identified Compounds (TICs)
C2024	Semivolatile Compounds, Base/Neutral/Acid Target 625, Data Workup
C3254	Dioxin/Furan Scan by Method 1613
C4343	Semivolatile Organic Compounds (Ref: EPA 525.2)

Test descriptions preceded by an asterisk "\*" indicate that testing has been performed per NSF International requirements but is not within its scope of accreditation.

**Testing Laboratories:**

All work performed at:	Id	Address
—————▶	NSF_AA	NSF International 789 N. Dixboro Road Ann Arbor MI 48105



**About the Standard:**

NSF/ANSI Standard 60: Drinking Water Treatment Chemicals - Health Effects

NSF/ANSI 60 establishes minimum health effects requirements for the chemicals, the chemical contaminants, and the impurities that are directly added to drinking water from drinking water treatment chemicals. It does not establish performance or taste and odor requirements. The standard contains requirements for chemicals that are directly added to water and are intended to be present in the finished water as well as other chemical products that are added to water but are not intended to be present in the finished water. Chemicals covered by this Standard include, but are not limited to, coagulation and flocculation chemicals, softening, precipitation, sequestering, pH adjustment, and corrosion/scale control chemicals, disinfection and oxidation chemicals, miscellaneous treatment chemicals, and miscellaneous water supply chemicals.

The testing performed to this standard is done to estimate the level of contaminants or impurities added to drinking water when the chemical is used at the "Maximum Use Level" under attestation. Prior to testing, information is obtained on the formulation and sources of supply used to manufacture the chemical. This information is then reviewed along with the minimum requirements of the standard to establish the potential contaminants of concern. A representative sample of chemical is obtained for testing. The chemical sample is prepared for analysis through specific methods established in the standard based on the type of chemical and then is analyzed for potential contaminants determined during the formulation review. The laboratory results are normalized to represent potential at-the-tap values and then compared to the "single product allowable concentration" (SPAC) established by the standard. The product is found in compliance with the standard if the normalized value is less than or equal to the allowable concentration.



**Send To: 00960**

Mr. Art Espinosa  
The Mosaic Company  
13830 Circa Crossing Drive  
Lithia, FL 33547

**Facility: 00966**

The Mosaic Company  
8813 Highway 41 South  
Riverview FL 33578  
United States

<b>Result</b>	<b>PASS</b>	<b>Report Date</b>	12-OCT-2012
Customer Name	The Mosaic Company		
Tested To	NSF/ANSI 60		
Description	Fluosilicic Acid   Clear Liquid		
Trade Designation	Fluosilicic Acid		
Test Type	Annual Collection		
Job Number	A-00116924		
Project Number	9120471 (CLB, TEB)		
Project Manager	Soncea Braden-Mccann		

This report documents the testing of the referenced product to the requirements of NSF/ANSI Standard 60 (Drinking Water Treatment Chemicals - Health Effects). This standard establishes minimum requirements for chemicals, the chemical contaminants, and impurities that are added to drinking water from drinking water treatment chemicals. Contaminants produced as by-products through reaction of the treatment chemical with a constituent of the drinking water are not covered by this Standard. Reference the "About the Standard" section at the end of this report for additional information about NSF/ANSI Standard 60 and the products covered under this Standard.

**Thank you for having your product tested by NSF International.**

Please contact your Project Manager if you have any questions or concerns pertaining to this report.

**Report Authorization** Clifton J. McLellan  
Clifton J. McLellan - Director, Toxicology Services

**Date** 12-OCT-2012



**General Information**

Standard: NSF/ANSI 60  
Chemical Name: Fluosilicic Acid  
DCC Number: DA00918  
Date of Manufacture: 9/7/2012  
Lot Number/Product Identifier: 9/7/2012  
Maximum Use Level: 6 mg/L  
Monitor Code: B  
Physical Description of Sample: Clear Liquid  
Trade Designation/Model Number: Fluosilicic Acid

Sample Id: **S-0000920229**  
Description: Fluosilicic Acid | Clear Liquid  
Sampled Date: 18-Sep-2012  
Received Date: 14-Sep-2012

<b>Tox Normalization Information:</b>		<b>Lab Normalization Information:</b>	
Calculated NF	0.0690	Date exposure completed	18-SEP-2012
Preparation method used	B	Final volume of solution	2 L
MUL	6 mg/L	Mass of material used	174 mg
Compound Reference Key:	SPAC		

**Normalization Calculation:**

Normalized Result = Test Result (ug/L) \* NF                      Where NF = MUL (mg/L) \*  $\frac{\text{Final Volume Of Solution (L)}}{\text{Mass of Material Used (mg)}}$

- MUL = Maximum Use Level;
- Mass of Material Used = The mass of sample analyzed in the laboratory;
- Final Volume of Solution = The volume of water used to dilute the sample;
- An additional factor may be used to adjust the analytical result to field use conditions to account for product carryover, flushing, or other assumptions stipulated with the use of the product. If an additional factor is used, it is included in the information above.

Testing Parameter	Units	Sample	Control	Result	Norm. Result	Acceptance Criteria(1)	Evaluation Status
<b>Chemistry Lab</b>							
* Gross Alpha and Beta Radioactivity in Drinking Water (Ref: EPA 900.0)							
P1 Gross Alpha	pCi/L	ND(3)	ND(3)	ND(3)	ND(0.2)		
P1 Gross Beta	pCi/L	ND(4)	ND(4)	ND(4)	ND(0.3)		
Date Analyzed	27-SEP-2012						
Arsenic	ug/L	4	ND(1)	4	0.3	1	Pass
Barium	ug/L	ND(1)	ND(1)	ND(1)	ND(0.07)	200	Pass
Beryllium	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.03)	0.4	Pass
Cadmium	ug/L	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.01)	0.5	Pass
Chromium	ug/L	ND(1)	ND(1)	ND(1)	ND(0.07)	10	Pass
Copper	ug/L	ND(1)	ND(1)	ND(1)	ND(0.07)	130	Pass
Mercury	ug/L	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.01)	0.2	Pass
Lead	ug/L	ND(1)	ND(1)	ND(1)	ND(0.07)	1.5	Pass
Antimony	ug/L	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.03)	0.6	Pass
Selenium	ug/L	ND(2)	ND(2)	ND(2)	ND(0.1)	5	Pass
Thallium	ug/L	ND(0.2)	ND(0.2)	ND(0.2)	ND(0.01)	0.2	Pass

1 - If the acceptance criteria is blank and the evaluation status is "Fail", then the criteria used will be noted on the letter accompanying these results.



**Common Terms and Acronyms Used:**

Sample.....	Test result on the submitted product sample after prepared or exposed in accordance with the standard.
Control.....	Test result on a laboratory blank sample analyzed in parallel with the sample.
Result.....	Sample test result minus the Control test result.
Normalized Result...	Result normalized in accordance with the test standard to reflect potential at-the-tap concentrations
ND().....	Result is below the detection level of the analytical procedure as identified in the parenthesis.
DCC Number.....	NSF document control code of the registered formulation of the product tested
ug/L.....	Microgram per liter = 0.001 milligram per liter (mg/L)
SPAC.....	Acceptance criteria of the standard (Single Product Allowable Concentration)

**References to Testing Procedures:**

NSF Reference	Parameter / Test Description
C0842	* Gross Alpha and Beta Radioactivity in Drinking Water (Ref: EPA 900.0)
C3035	Total Arsenic in Drinking Water by ICPMS (Ref: EPA 200.8)
C3038	Barium in Drinking Water by ICPMS (Ref: EPA 200.8)
C3041	Beryllium in Drinking Water by ICPMS (Ref: EPA 200.8)
C3046	Cadmium in Drinking Water by ICPMS (Ref: EPA 200.8)
C3052	Chromium in Drinking Water by ICPMS (Ref: EPA 200.8)
C3058	Copper in Drinking Water by ICPMS (Ref: EPA 200.8)
C3071	Mercury in Drinking Water by ICPMS (Ref: EPA 200.8)
C3100	Lead in Drinking Water by ICPMS (Ref: EPA 200.8)
C3113	Antimony in Drinking Water by ICPMS (Ref: EPA 200.8)
C3115	Selenium in Drinking Water by ICPMS (Ref: EPA 200.8)
C3127	Thallium in Drinking Water by ICPMS (Ref: EPA 200.8)

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**Testing Laboratories:**

Id	Address
All work performed at: → NSF_AA	NSF International 789 N. Dixboro Road Ann Arbor MI 48105



**About the Standard:**

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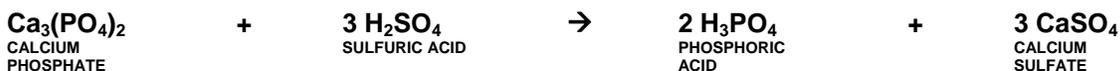
## Manufacturing Process for Fluorosilicic Acid

Fluorosilicic acid is manufactured in the same chemical plants as phosphoric acid. Phosphoric acid is a raw material for making phosphate fertilizers.

The processes that use phosphate minerals which are decomposed with an acid, are known as “wet processes” and they are the only economic alternative way to produce phosphoric acid.

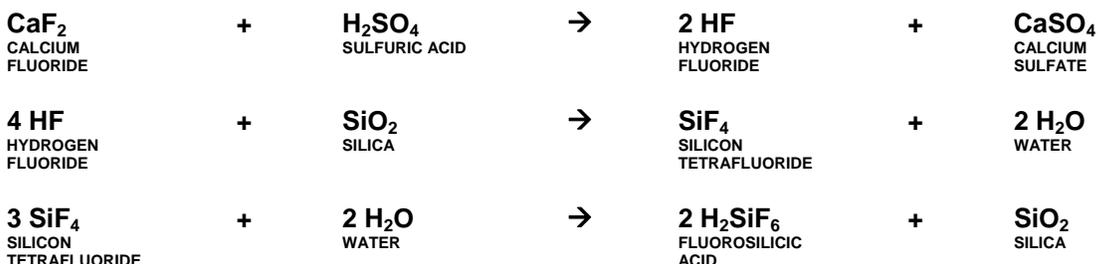
### Raw materials and chemical reactions of the process

The basic chemistry of the wet process is simple. The tricalcium phosphate in the phosphate rock is converted by reaction with concentrated sulfuric acid into phosphoric acid and the insoluble salt calcium sulfate



The insoluble calcium sulfate is then separated from the phosphoric acid. Most usually by filtration.

Fluorine is present as calcium fluoride ( $\text{CaF}_2$ ) in most phosphate rocks to the extent of 2-4% by weight. This element is liberated during acidulation, initially as hydrogen fluoride (HF) but in the presence of silica ( $\text{SiO}_2$ ) this reacts readily to form fluorosilicic acid,  $\text{H}_2\text{SiF}_6$ .



There are three main operations in the process of making phosphoric acid.

1. Reaction of the raw materials.
2. Separation of calcium sulfate (gypsum) from phosphoric acid
3. Concentration of phosphoric acid and production of fluorosilicic acid

### Phosphoric acid concentration and manufacture of fluorosilicic acid.

Dilute phosphoric acid (30%  $\text{P}_2\text{O}_5$ ) which contains small amounts of fluorine is continuously introduced into an evaporating vessel and phosphoric acid containing about 54%  $\text{P}_2\text{O}_5$  is continuously withdrawn (Concentrated acid). Using a heat exchanger, steam is passed into the heating coils to keep the phosphoric acid at the boiling point.

The vapors of water and fluorine compounds mainly in the form of hydrogen fluoride (HF) and silicon tetrafluoride ( $\text{SiF}_4$ ) are pulled out of the evaporating vessel by using vacuum and passed in an upward direction into a counter-current absorber also known as a water scrubber, where fresh water emanating from spraying nozzles is permitted to fall downwardly in a countercurrent direction permitting a gas-liquid contact that will allow the absorption of said HF and  $\text{SiF}_4$  to form fluorosilicic acid.

Part of the liquid is removed as finished product ( $\text{H}_2\text{SiF}_6$  Product) and the remainder is re-circulated to the spray heads.

We use instrumentation to monitor the product concentration by means of a specific gravity controller; a selected concentration of fluorosilicic acid is maintained. Product is automatically discharged into dedicated storage tanks. Fresh water is added to the recycle tank through a liquid level control.

Typical or suspected impurities of the fluorosilicic acid manufacturing process include residual phosphoric acid and metals.