SECTION I	PRODUCT AND COMPANY INFORMATION	
TRADE NAME:	MicroEssential SZ	
CHEMICAL NAME:	Monoammonium Phosphate with Sulfur, and Zinc	
CAS NUMBER:	MAP Ammonium Sulfate Sulfur Zinc Oxide	7722 - 76 – 1 7783 - 20 - 2 7704 - 34 – 9 1314 - 13 - 2
CHEMICAL FAMILY:	Ammonium Phosphates - Inorganic Salt	
SYNONYMS:	Monoammonium Phosphate + Sulfur and Zinc Monobasic Ammonium Phosphate + Sulfur and Zinc Ammonium Dihydrogen Phosphate + Sulfur and Zinc MESZ MAP + S + Zn	
PRIMARY USE:	Crop nutrient	
COMPANY INFORMATION:	MOSAIC 8813 U.S. Highway 41 South Riverview, Florida 33578 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:	Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Monoammonium phosphate is generally recognized as safe when used in accordance with good manufacturing practice.
	Physical Hazards:	Slippery when wet.
	Physical Form:	Solid
	Appearance:	Gray, tan, brown or black granules
	Odor:	Slight ammonia odor
	Toxicity:	Non-toxic

NFPA HAZARD CLASS	
Health:	1
Flammability:	0
Instability:	0
Special Hazard:	None

HMIS HAZARD CLASS	
Health:	1
Flammability:	0
Physical Hazard:	0
PPE:	Section 8

POTENTIAL HEALTH EFFECTS:	**Eye:**	Contact may cause mild eye irritation including stinging, watering and redness.
	Skin:	Contact may cause mild irritation including redness and a burning sensation. No harmful effects from skin absorption have been reported.
	Inhalation (Breathing):	Studies by other exposure routes suggest a low degree of hazard by inhalation.
	Ingestion (Swallowing)	Low degree of toxicity by ingestion.

	Signs and Symptoms:	Effects of overexposure may include irritation of the nose, throat and digestive tract, nausea, vomiting, diarrhea, coughing and shortness of breath.
	Cancer:	Data not available.
	Target Organs:	Data not available.
	Developmental:	Data not available.
	Other Comments:	Effects of overexposure to dusts can include irritation of the eyes and respiratory tract, pneumoconiosis (dust congested lungs) pneumonitis (lung inflammation), coughing, vomiting, diarrhea, abdominal pain and jaundice.
	Pre-Existing Medical Conditions:	Respiratory (asthma-like) disorders.
POTENTIAL ENVIRONMENTAL EFFECTS:	MESZ is considered biodegradable and is taken up as a nutrient by vegetation. Large spills can harm or kill vegetation. May release ammonium ions in water systems that are toxic to fish. May release phosphates which will result in algae growth, increased turbidity and depleted oxygen in water systems.	
SECTION III	**COMPOSITION INFORMATION ON INGREDIENTS**	
FORMULA:	$(NH_4)H_2PO_4 + (NH_4)_2SO_4 + S + ZnO$	
COMPOSITION:	Phosphate as P_2O_5 Nitrogen as N Water Sulfur as S Ammonium Sulfate as S Zinc as Zn Fluorides as F	40% 12% 0.5 - 2% 5.0% 5.0% 1.0% 2 - 4%
SECTION IV	**FIRST AID MEASURES**	
FIRST AID PROCEDURES:	Eyes:	Move victim away from exposure and into fresh air. Flush eyes with plenty of clean water for at least 15 minutes. If symptoms persist, seek medical attention.
	Skin:	Wash contaminated area thoroughly with mild soap and water. If chemical or solution soaks through clothing, remove clothing and wash contaminated skin. If irritation develops and persists after washing, seek medical attention.
	Inhaled:	If respiratory symptoms develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention.
	Ingestion:	If person is conscience, immediately give water or milk. Do not induce vomiting. Seek medical attention. If person is unconscious, do not give anything by mouth.
NOTE TO PHYSICIAN:	If person has been exposed to concentrated decomposition products, treat symptomatically and watch for delayed symptoms of pulmonary edema.	
SECTION V	**FIRE FIGHTING MEASURES**	
FLAMMABLE PROPERTIES:	Flash Point:	Not applicable
	OSHA Flammability Class:	Not applicable

	LEL/UEL:	LEL: Not explosible (at product concentration) / UEL: Not explosible (at product concentration)
	Auto-Ignition Temperature:	Not applicable
EXTINGUISHING MEDIA:	Use extinguishing agent suitable for type of surrounding fire. Avoid excessive water to minimize runoff. Small fires: Water spray, foam, dry chemical or CO_2 Large fires: Water spray, fog or foam	
PROTECTION OF FIREFIGHTERS:	Positive pressure, self-contained breathing apparatus is required for all fire fighting activities involving hazardous materials.	
SECTION VI	**ACCIDENTAL RELEASE MEASURES**	
RESPONSE TECHNIQUES:	Stay upwind and away from spill (dust hazard). Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). Prevent spilled material from entering sewers, storm drains, other unauthorized treatment drainage systems, and natural waterways. Notify appropriate federal, state, and local agencies as may be required (see Section 15). Minimize dust generation. Sweep up and package appropriately for disposal.	
SECTION VII	**HANDLING AND STORAGE**	
HANDLING:	The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Sections 8). Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. Wash contaminated clothing or shoes. Use good personal hygiene practices. Avoid systems that would tend to segregate dust or any components of this product. Avoid accumulation of fugitive dust as high concentrations of sulfur dust may present an explosion hazard. Follow standard Hot Work guidelines when working around this product.	
STORAGE:	Use and store this material in cool, dry, well-ventilated areas. Store only in approved containers. Keep container(s) tightly closed. Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Material may absorb moisture from the air.	
SECTION VIII	**EXPOSURE CONTROLS / PERSONAL PROTECTION**	
ENGINEERING CONTROLS:	Use process enclosure, general dilution ventilation or local exhaust systems where necessary to maintain airborne dust concentration below the OSHA standards or in accordance with applicable regulations.	
PERSONAL PROTECTIVE EQUIPMENT (PPE):	Eye/Face:	Approved eye protection to safeguard against potential eye contact, irritation, or injury is recommended.
	Skin:	The use of cloth or leather work gloves is advised to prevent skin contact, possible irritation and absorption.
	Respiratory:	Protection is not required where adequate ventilation conditions exist. Use a dust mask or other appropriate respiratory protection where engineering controls are not feasible or during operations that generate airborne concentrations exceeding the relevant standards.
	Other:	A source of clean water should be available in the work area for flushing eyes and skin.

GENERAL HYGIENE CONSIDERATIONS:	Wash thoroughly after handling Use in adequate ventilation	
EXPOSURE GUIDELINES:	OSHA Permissible Exposure Limits (PEL):	Particulates Not Otherwise Specified: 5 mg/m3 TWA (respirable); 15 mg/m^3 TWA (total) Ammonia: 50 ppm (35 mg/m^3) TWA
	ACGIH Threshold Limit Value (TLV):	Ammonia: 25 ppm (18 mg/m^3) TWA; 35 ppm (27 mg/m^3) STEL
SECTION IX	**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 explosible (at product concentration)/UEL: Not explosible)at product concentration)	
Auto-Ignition Temperature:	Not applicable	
Appearance:	Gray, tan, brown or black granules	
Physical State:	Solid	
Odor:	Slight ammonia odor	
Molecular Weight of Pure Material:	MAP Ammonium Sulfate Sulfur Zinc Oxide	115.0 132.0 32.0 81.4
pH:	4.2 – 5.0 in a 1% solution	
Vapor Pressure (mm Hg):	Not applicable	
Vapor Density (air=1):	Not applicable	
Boiling Point:	Not applicable	
Freezing/Melting Point:	Decomposes at 374°F (190 °C) before melting	
Solubility in Water:	80% - 90 % 328 g/L at 20°C	
Specific Gravity:	Not applicable	
Volatility:	Not applicable	
Bulk Density:	57 - 66 lbs./ft^3 **(Packed);** 54 – 62 lbs./ft^3 **(Loose)**	
SECTION X	**STABILITY AND REACTIVITY**	
Chemical Stability:	Stable under normal conditions of storage and handling. Decomposes at 374°F (190°C).	
Conditions to Avoid:	Extreme temperatures	
Incompatible Materials:	Avoid contact with alkaline materials	
Hazardous Decomposition Products:	If heated to the point of decomposition, oxides of phosphorus, oxides of nitrogen and/or SO_2 may be released.	
Corrosiveness:	May be corrosive to iron and mild steels, aluminum, zinc and copper	
Hazardous Polymerization:	Will not occur.	
SECTION XI	**TOXICOLOGICAL INFORMATION**	
Acute Oral Toxicity	Data not available	

Acute Inhalation Toxicity	Data not available
Acute Dermal Toxicity	Data not available
Mutagenesis	Data not available
Target Organ	Data not available
Developmental Toxicity	Data not available
Carcinogenicity	The ingredient(s) of this product is (are) not classified as carcinogenic by NTP (National Toxicology Program), IARC, or OSHA

SECTION XII	**ECOLOGICAL INFORMATION**
ECOTOXICOLOGY:	May release ammonium ions that are toxic to fish. Un-ionized ammonia concentrations above 0.02 mg/l are considered toxic in fresh water. May release phosphates which will result in algae growth, increased turbidity, and depleted oxygen. At extremely high concentrations, this may be hazardous to fish or other marine organisms. Release to watercourses may cause effects downstream.
SECTION XIII	**DISPOSAL CONSIDERATIONS**
	Properly characterize all waste materials. Consult state and local regulations regarding the proper disposal of this material.
SECTION XIV	**TRANSPORTATION INFO**
Regulatory Status	Not regulated
Proper Shipping Name	Chemical N.O.S. (non-regulated)
Hazard Class	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.
Packing Group	Not applicable
Identification Number	Not applicable
Guide Number	Not applicable
SECTION XV	**REGULATORY INFORMATION**
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.)	SARA – 311/312: Not listed
	SARA – 313: Not listed
	SARA – 302/304: Not listed
NTP, IARC, OSHA:	This material has not been identified as a carcinogen by NTP, IARC, or OSHA.
Canada DSL and NDSL:	DSL: Yes NDSL: Not listed

TSCA:	All components 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 XVI	**OTHER INFORMATION**
Disclaimer:	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. **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.** 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.
Preparation:	The preparation of this MSDS was in accordance with ANSI Z400.1-2004.
References:	
Note to ____ (*if applicable)*:	Not applicable