Alcohol and Marijuana Control Office
550 W 7th Avenue, Suite 1600
Anchorage, AK 99501
marijuana.licensing@alaska.gov
https://www.commerce.alaska.gov/web/amco
Phone: 907.269.0350

Alaska Marijuana Control Board

Operating Plan Supplemental
Form MJ-04: Marijuana Cultivation Facility

What is this form?

This operating plan supplemental form is required for all applicants seeking a marijuana cultivation facility license and must accompany the **Marijuana Establishment Operating Plan (Form MJ-01)**, per 3 AAC 306.020(b)(11). Applicants should review **Chapter 306: Article 4** of the **Alaska Administrative Code.** This form will be used to document how an applicant intends to meet the requirements of those regulations. If your business has a formal operating plan, you may include a copy of that operating plan with your application, but all fields of this form must still be completed per 3 AAC 306.020 and 3 AAC 306.420(2).

What additional information is required for cultivation facilities?

Applicants must identify how the proposed establishment will comply with applicable regulations regarding the following:

- Prohibitions
- Cultivation plan
- Odor control
- Testing procedure and protocols
- Security

This form must be submitted to AMCO's main office before any marijuana cultivation facility license application will be considered complete.

Section 1 – Establishment Information

Enter information for the business seeking to be licensed, as identified on the license application.

Licensee:	JANIESE STEVENS	**License Number:**	10032		
License Type:	STANDARD MARIJUANA CULTIVATION FACILITY LICENSE				
Doing Business As:	THREE SISTERS COOP				
Premises Address:	2180 MILL BAY ROAD				
City:	KODIAK	**State:**	ALASKA	**ZIP:**	99615

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Section 2 – Prohibitions

Applicants should review 3 AAC 306.405 – 3 AAC 306.410 and be able to answer "Agree" to all items below.

The marijuana cultivation facility will not:	Agree	Disagree
Sell, distribute, or transfer any marijuana or marijuana product to a consumer, with or without compensation	■	☐
Allow any person, including a licensee, employee, or agent, to consume marijuana or marijuana product on its licenses premises or within 20 feet of the exterior of any building or outdoor cultivation facility	■	☐
Treat or otherwise adulterate marijuna with any organic or nonorganic chemical or compound to alter the color, appearance, weight, or odor of the marijuana	■	☐

Section 3 – Cultivation Plan

Review the requirements under 3 AAC 306.420, and identify how the proposed premises will meet the listed requirements.

Describe the size of the space(s) the marijuana cultivation facility intends to be under cultivation, including dimensions and overall square footage. Provide your calculations below:

THE MIDDLE BAY OF THE WAREHOUSE IS APROX 1500 SQUARE FEET. I INTEND TO USE A HYDROPONIC SYSTEM TO CULTIVATE. ON AVERAGE YOU CAN GET ONE PLANT PER SQUARE FOOT, I INTEND TO START AT 750 SQUARE FEET OF CULTIVATION SPACE AND PLANTS. THIS WILL GIVE ME ROOM TO WALK AROUND AND TEND TO THE SYSTEM. IF AFTER ONE YEAR IF I FEEL THE DEMAND IS PRESENT AND I CAN ADD MORE HYDROPONIC PLANTS TO THE SPACE I WILL.

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Describe the marijuana cultivation facility's growing medium(s) to be used:

I PLAN ON USING A CLOSED LOOP OR A DRIP HYDROPONIC CULTIVATION SYSTEM. I WILL USE A MIXTURE OF MEDIUMS SUCH AS EXPANDED CLAY AND PERLITE. I WILL BE TOURING WASHINGTON CULTIVATION FACILITIES THIS SUMMER AND COME UP WITH A SOLID SYSTEM ONCE I'M DONE. MY HUSBAND IS ALSO A COMMERCIAL FISHERMAN AND I HAVE LOTS OF OLD HALIBUT TOTES I CAN UTILIZE AS WELL FOR SOME TRADITIONAL DIRT CULTIVATION FOR MOTHER PLANTS OR EXPERIMENTAL HYBRIDS.

Describe the marijuana cultivation facility's fertilizers, chemicals, gases, and delivery systems, including carbon dioxide management, to be used:

I PLAN ON USING A HYDROPONIC SYSTEM AS DESCRIBED ABOVE.
I will mix my water with the following in the form of a hydroponic powder nutrient already combined:

nitrogen (N), phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg) and sulfur (S). Those are the macroelements (the big ones) and the small elements known as microelements are iron (Fe), chlorine (Cl), manganese (Mn), boron (B), zinc (Zn), copper (Cu) and molybdenum (Mo).
I WILL USE CO2 IN THE AIR AND HAVE A REGULATOR THAT TESTS AIR QUALITY

Describe the marijuana cultivation facility's irrigation and waste water systems to be used:

SEE ATTACHED DIAGRAM

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Form MJ-04: Marijuana Cultivation Facility

Describe the marijuana cultivation facility's growing medium(s) to be used:

The Growing medium will be a 50/50 mix of Coco coar and perlite.

Describe the marijuana cultivation facility's fertilizers, chemicals, gases, and delivery systems, including carbon dioxide management, to be used:

1. Calcium Nitrate
2. Grow-More's 5-11-16
3. Agsil Potassium Silicate
4. Magnesium Sulfate
5. Phosphoric Acid
6. BioAg Fulpower Fulvic Acid
7. Mono-Potassium Phosphate

MSDS's on all fertilizers has been included as prior attachment

Describe the marijuana cultivation facility's irrigation and waste water systems to be used:

The irrigation System will be a gravity fed - top drip irrigation system. The growing medium will be monitored for moisture, Ph and Temperature. The nutrient irrigation lines will be solenoid activated and computer controlled.

Irrigation run-off or wastewater will be captured in drains to an idependant collection tank. Waste discharge will be pumped from this tank to City of Kodiak sewage system. The City has been provided all information and initial discussion with the City public works director. City waste water codes have been referenced. Initial analysis is there will be no issue discharging into the City system, a discharge permit from the City of Kodiak will be applied for.

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Describe the marijuana cultivation facility's waste disposal arrangements:

I WILL INCINERATE WASTE AT THE KODIAK ISLAND BOROUGH LANDFILL ONCE I HAVE HARVESTED A CROP.

Section 4 – Odor Control

Review the requirements under 3 AAC 306.430, and identify how the proposed premises will meet the listed requirement.

Describe the odor control method(s) to be used and how the marijuana cultivation facility will ensure that any marijuana at the facility does not emit an odor that is detectable by the public from outside the facility:

I HAVE VENILATION IN PLACE AND AM NOT IMMEDIATELY NEAR ANY OTHER BUILDINGS. I HAVE CONTACTED A VENDOR IN TOWN WHO HAS INDICATED THEY WILL INSTALL ADDITIONAL VENILATION WITH CARBON FILTERS NEEDED FOR GROWTH AND ODOR ELIMINATION. I'VE INTERVIEWED OUR AUTO BODY SHOP IN TOWN AND DISCUSSED WITH THEM PROCEDURES USED TO REMOVE ODOR AND HAVE SPOKEN WITH INDIVIDUALS TO INSTALL A SYSTEM OF THIS NATURE ONCE PERMIT HAS BEEN GRANTED.

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Section 5 – Testing Procedure and Protocols

Review the requirements under 3 AAC 306.455 and 3 AAC 306.465, and identify how the proposed premises will meet the listed requirements.

Applicants should be able to answer "Agree" to the item below.

I understand and agree that:	Agree	Disagree
The board will or the director shall from time to time require the marijuana cultivation facility to provide samples of the growing medium, soil amendments, fertilizers, crop production aids, pesticides, or water for random compliance checks	■	☐

Describe the testing procedure and protocols the marijuana cultivation facility will follow:

I WILL TAKE SAMPLES OF ALL STRAINS GROWN AND SEND THEM FOR TESTING AS REQUIRED BY AMCB AND COMPLY WITH ALL TESTING REQUESTS. I ALSO INTEND TO DO IN HOUSE TESTING ONCE MY FACILITY IS UP AND RUNNING.

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Operating Plan Supplemental
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Section 6 – Security

Review the requirements under 3 AAC 306.430 and 3 AAC 306.470 – 3 AAC 306.475, and identify how the proposed premises will meet the listed requirements.

Applicants should be able to answer "Agree" to the two items below.

The marijuana cultivation facility applicant has:	Agree	Disagree
Read and understands and agrees to the packaging of marijuana requirements under 3 AAC 306.470	■	☐
Read and understands and agrees to the labeling of marijuana requirements under 3 AAC 306.475	■	☐

Restricted Access Area (3 AAC 306.430):	Yes	No
Will the marijuana cultivation facility include outdoor production?	☐	■

If "Yes", describe the outdoor structure(s) or the expanse of open or clear ground fully enclosed by a physical barrier:

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Describe the method(s) used to ensure that any marijuana at the marijuana cultivation facility cannot be observed by the public from outside the facility:

IT IS INSIDE A WAREHOUSE WITH NO WINDOWS.

I certify that as a marijuana cultivation facility, I will submit monthly reports to the Department of Revenue and pay the excise tax required under AS 43.61.010 and 43.61.020 on all marijuana sold or provided as a sample to a marijuana establishment, as required under 3 AAC 306.480.

I declare under penalty of perjury that I have examined this form, including all accompanying schedules and statements, and to the best of my knowledge and belief find it to be true, correct, and complete.

Signature of licensee

Printed name

Subscribed and sworn to before me this 28 day of March, 20 16.

KRISTLE BLANCO
Notary Public, State of Alaska
Commission # 1305134
My Commission Expires
May 17, 2017

Notary Public in and for the State of Alaska.

My commission expires: 05/17/2017

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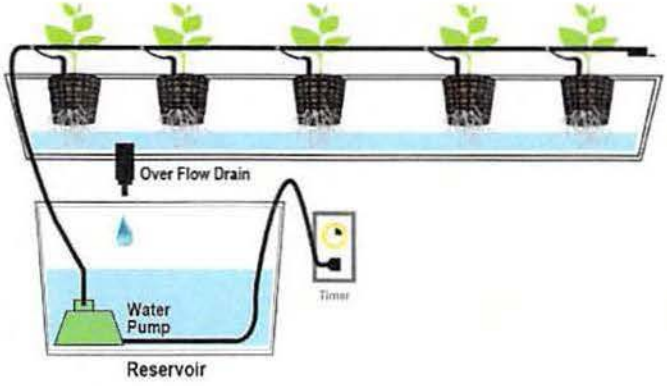
Operating Plan Supplemental

Form MJ-04: Marijuana Cultivation Facility

(Additional Space as Needed):

1. Rockwool
2. Oasis Cube
3. Expanded Clay
4. Coco Chips/ Fiber
5. Perlite
6. Vermiculite
7. Rock


Over Flow Drain
Water
Pump
Timer
Reservoir

Janiese Stevens
Box 8593
Kodiak, AK 99615
May 17th, 2016

Cynthia Franklin
Director, Marijuana Licensing
Department of Commerce, Community and Economic Development
550 West 7th Ave, Suite 1600
Anchorage, AK 99501

Dear Cynthia Franklin:

Please find below included with this correspondence to requested additional information for the processing of Marijuana Cultivation Facility license application # 10032.

- MJ-02 - Premises Diagram. Please find accompanying diagrams.
- MJ -04 - Marijuana Cultivation Facility Supplemental. Please find accompanying document.
- MJ- 08 – Local Notice Affidavit. Please find accompanying document.

Sincerely,

Janiese Stevens

Enclosure

THREE SISTERS CO-OP

MARIJUANA CULTIVATION FACILITY

Re: MJ-04 response

1. **Process Synopsis**

The proposed Marijuana Cultivation Facility will utilize what is commonly referred to as a drip hydroponic system. This will utilize a soil-less grow medium consisting of 50% Coco coar and 50% perlite. A top-drip gravity fed irrigation system will be employed with the drip cycle controlled by solenoid valves ran by computer. The PH and moisture level of the growing medium will be monitored to control the drip irrigation for optimum moisture levels in the medium. The PH, temperature and EC level of the nutrient solution will be monitored and tracked by computer using "Growtronics" software. The Temperature, relative humidity, CO2 and O2 levels of the grow spaces will be monitored and tracked.

A sample harvesting calendar would follow as such:

- January 1 – Move rooted 12" to 18" tall clones to the growing rooms with an 18-24 hr light cycle.
- January 30 – Induce flowering by modification of light to a 12 hour light 12 hour darkness schedule.
- February 7 – Take cuttings from mother plants and start the next crop of clones with 18 to 24 hours of light.
- March 30 – harvest first crop.

2. **Facility Layout – Utility space and Ground level**

The facility will be have two floors with an 18" utility space beneath the ground floor. The purpose for this space is two-fold. The primary purpose is for utility access – air, Heat and AC ducting and plumbing with a collection tank for nutrient run off. The secondary purpose will be to provide insulation of the grow rooms from the cold concrete floor of the space.

Access to the facility will be through two entry doors into a Security space. Access from this space into the Restricted Access Areas of the grow facility will be through one door with bio-metric access control. Access by employees and any visitors will be in compliance with 3 AAC 306.710. The security space will have two cameras providing 100% visual view of the security space. Video surveillance throughout the facility will be in compliance with 3 AAC 306.720. The Security Alarm system and locks for the facility will be in compliance with 3 AAC 306.715.

Access to the grow facility will be through the Wash room/ Utility space. From this space access will go to the Harvesting / Workroom Space. The facility will be in compliance with Health and Safety Standards as spelled out in 3 AAC 306.735

In the center of the Harvesting / Workroom space will be the Drying Space.

From the middle of the Drying space there will be a door granting access to a utility corridor between the two grow spaces. This corridor will house air vents, electrical runs, nutrient plumbing and solenoids to the two adjacent grow rooms.

There will be two 12' X 24' grow rooms on each side of the utility corridor. Plants in their early vegetative state will be planted and grown through the remainder of their growth cycle in these two rooms. Plants will be planted in a multitude of independent units which we will call the "Grow Modules". Each of these units will be a constructed cart on wheels of 48" X 48" in dimension. Each grow module will be independently lit. Each grow module will be an independent zone, independently monitored and will independently receive nutrients through a drip irrigation system. A list of fertilizing agents will be included as an attachment.

Through Light cycle modification the plants will progress from an early vegetative growth stage through to a flowering stage to be eventually harvested. The harvesting, processing, drying, weighing, submission of samples for lab testing, labeling and packaging and transport will all be in compliance with pertinent regulations - 3 AAC 306.445 (required lab testing), 3 AAC 306.470 (Packaging), 3 AAC 360.475 (Labeling), 3 AAC 360.745 (weighing) and 3 AAC 306.750 (Transportation). Marijuana tracking software –Metrc by Franwell will be used from the beginning of cultivation and throughout the process in order to comply with 3 AAC 306.435.

Once ready for harvest each growth module will be wheeled out of the grow room into the Harvesting / Workroom where the plant will be harvested. All plant matter not harvested, including roots, stalks, stems and leaves will be ground and mulched and mixed to a 50% ratio with compostable materials in compliance with 3 AAC 360.740. A compost pile will be maintained on the property for final disposition. The grow rooms and grow modules will be cleaned and sanitized before resumption of the next harvest cycle.

3. **Facility Layout – Second Floor**

The second floor access is from a stairwell in the Utility /Washroom. The Second floor is comprised of three rooms and a haul way running the length of the space.

The Primary space is referred to as the "Mother / Vegetation" room. This room is where all initial plantings from seeds will take place as well as the cutting and planting of clones for further cultivation. A dumbwaiter will provide lift and lowering of potted clones to the Workroom space on the first floor for planting in the Grow Modules.

The second space will be for the Nutrient mix tanks as well as air handling and atmosphere modification gases – primarily CO2. All air intake and exhaust will be filtered with high grade carbon filtration and HEPA filtration. The Nutrient tanks will feed via gravity to the grow modules in the two grow rooms on the first floor. Runoff from the grow modules will be collected via drain plumbing to a collection tank and then pumped as waste water discharge. Any run off water will be discharged in compliance with applicable State waste water discharge regulations.

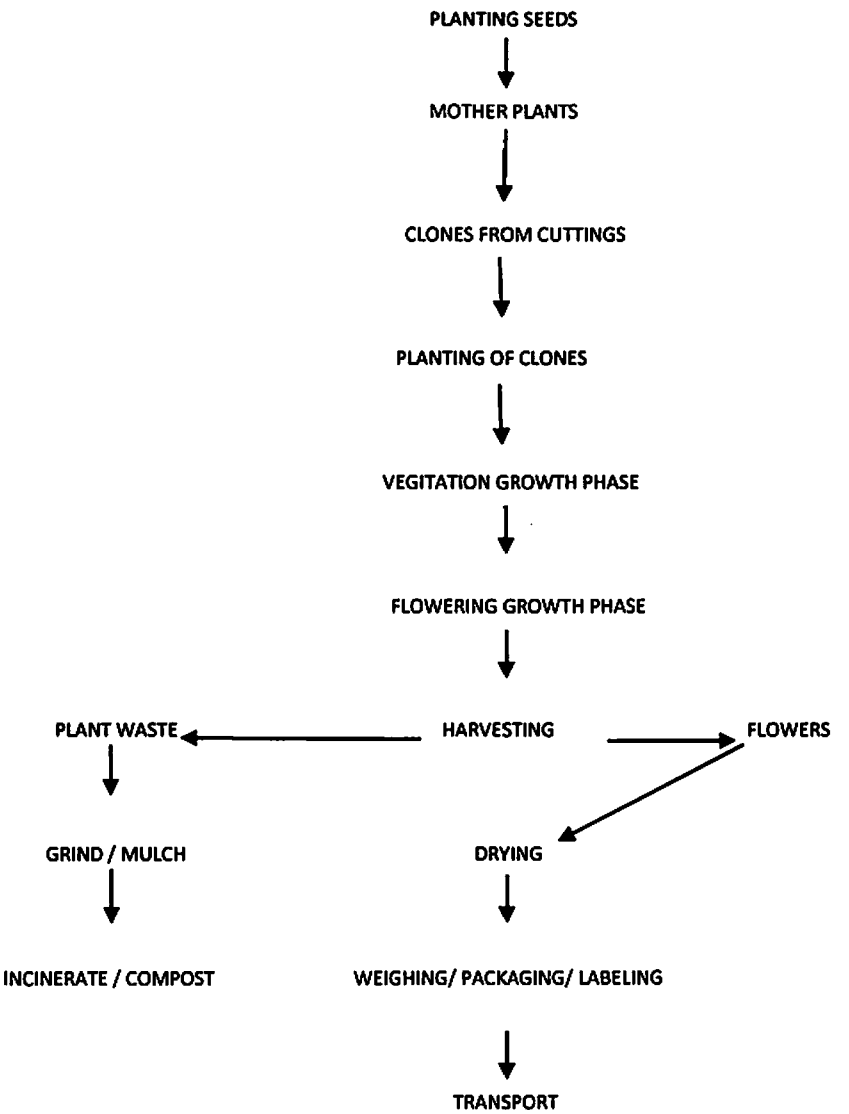
The Third Space will be for storage of potting materials, fertilizer and materials associated with the facility.

In summation. The concept for construction of the facility will be to utilize 6" SIP panels (Structurally Integrated Panels) for the complete construction of the proposed facility inside. The facility will be inside and structurally independent of the existing commercial steel building space. The Facility will be well insulated and clean. The grow rooms are intended to be hermetically sealed. All air and water into the facility will be thoroughly filtered.Included will be attachments showing a basic process flow diagram and a list of fertilizing agents.

Attachment A

PROCESS FLOW CHART

Marijuana Cultivation Facility



Attachment B

List of fertilizing agents

1. Calcium Nitrate
2. Grow- More's 5-11-26
3. Agsil Potassium Silicate
4. Magnesium Sulfate
5. Phosphoric Acid
6. BioAg Fulpower Fulvic acid
7. Mono-Potassium Phosphate

ISO9001:2000 Certified

Material Safety Data Sheet
Potassium phosphate, monobasic, ACS

Section 1 - Chemical Product and Company Identification

MSDS Name:
Potassium phosphate, monobasic, ACS
Catalog Numbers:
LC20095
Synonyms:
Dihydrogen potassium phosphate; Monopotassium phosphate; Phosphoric acid, monopotassium salt; Potassium dihydrogen phosphate; Potassium dihydrogen orthophosphate.
Company Identification:
LabChem, Inc.
200 William Pitt Way
Pittsburgh, PA 15238
Company Phone Number:
(412) 826-5230
Emergency Phone Number:
(800) 424-9300
CHEMTREC Phone Number:
(800) 424-9300

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name:	Percent
7778-77-0	Potassium phosphate, monobasic	100%

Section 3 - Hazards Identification

Emergency Overview

Appearance: colorless to white crystals.
Caution! May cause eye, skin, and respiratory tract irritation. Hygroscopic (absorbs moisture from the air).
Target Organs: none.

Potential Health Effects

Eye:
Dust may cause mechanical irritation.
Skin:
May cause skin irritation. Low hazard for usual industrial handling.
Ingestion:
May cause irritation of the digestive tract. Low hazard for usual industrial handling.
Inhalation:
May cause respiratory tract irritation.
Chronic:
Ingestion of large doses may cause nausea, vomiting, and diarrhea. Chronic exposure to this product may cause calcium phosphate deposition in the kidneys.

Section 4 - First Aid Measures

Eyes:
Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid.

Skin:
Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.

Ingestion:
Never give anything by mouth to an unconscious person. Get medical aid. Do NOT induce vomiting. If conscious and alert, rinse mouth and drink 2-4 cupfuls of milk or water.

Inhalation:
Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician:
Persons with impaired kidney function may be more susceptible to the effects of this substance. Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information:
As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.

Extinguishing Media:
Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Autoignition Temperature:
No information found.

Flash Point:
No information found.

NFPA Rating:
Health-1; flammability-0; reactivity-0

Explosion Limits:
Lower: n/a Upper: n/a

Section 6 - Accidental Release Measures

General Information:
Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks:
Vacuum or sweep up material and place into a suitable disposal container. Clean up spills immediately, observing precautions in the Protective Equipment section. Avoid generating dusty conditions. Provide ventilation.

Material Safety Data Sheet
Potassium phosphate, monobasic, ACS

Section 7 - Handling and Storage

Handling:

Use with adequate ventilation. Minimize dust generation and accumulation. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. Use with adequate ventilation. Wash clothing before reuse.

Storage:

Keep container closed when not in use. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Store protected from moisture.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Exposure Limits:

Chemical Name:	ACGIH	NIOSH	OSHA
Potassium phosphate, monobasic	none listed	none listed	none listed

OSHA Vacated PELs:

Potassium phosphate, monobasic: No OSHA Vacated PELs are listed.

Personal Protective Equipment

Eyes:

Do not wear contact lenses when working with chemicals. An eye wash fountain should be available in the immediate work area. Wear appropriate protective eyeglasses or chemical safety goggles as described in 29 CFR 1910.133.

Skin:

Wear appropriate protective gloves to prevent skin exposure.

Clothing:

Wear appropriate protective clothing to prevent skin exposure.

Respirators:

Follow the OSHA respirator regulations found in 29 CFR 1910.134. Use a NIOSH/MSHA approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State: Crystals
Color: White
Odor: Odorless
pH: Not available
Vapor Pressure: Not available

Material Safety Data Sheet
Potassium phosphate, monobasic, ACS

Vapor Density:	Not available
Evaporation Rate:	Not available
Viscosity:	Not available
Boiling Point:	Not available
Freezing/Melting Point:	252.6°C
Decomposition Temperature:	> 253°C
Solubility in water:	Soluble
Specific Gravity/Density:	2.338 g/cm3
Molecular Formula:	KH2PO4
Molecular Weight:	136.09

Section 10 - Stability and Reactivity

Chemical Stability:
Stable under normal storage and handling conditions.
Conditions to Avoid:
Dust generation, moisture.
Incompatibilities with Other Materials:
No significant incompatibilities identified with common materials and contaminants.
Hazardous Decomposition Products:
Oxides of phosphorus, irritating and toxic fumes and gases.
Hazardous Polymerization:
Has not been reported.

Section 11 - Toxicological Information

RTECS:
CAS# 7778-77-0: TC66
LD50/LC50:
CAS# 7778-77-0:
Skin, rabbit: LD50 = >4640 mg/kg
Carcinogenicity:
CAS# 7778-77-0: Not listed by ACGIH, IARC, NTP, or CA Proposition 65.
Epidemiology:
No information available.
Teratogenicity:
No information available.
Reproductive:
No information available.
Mutagenicity:
No information available.
Neurotoxicity:
No information available.

Section 12 - Ecological Information

Other: When too many nutrients such as phosphorus are in the water, algae grows maniacally. Algae blooms are followed by a die-off, and as material decays, it consumes oxygen like a forest fire. No fish, plants or insects can live in oxygen-free zones.

Section 13 - Disposal Considerations

Dispose of in accordance with Federal, State, and local regulations.

Section 14 - Transport Information

US DOT

Shipping Name: Not regulated.
Hazard Class:
UN Number:
Packing Group:

Section 15 - Regulatory Information

US Federal

TSCA:
CAS# 7778-77-0 is listed on the TSCA inventory. Does not have a Significant New Use Rule.

SARA Reportable Quantities (RQ):
CAS# 7778-77-0 does not have an RQ.

CERCLA/SARA Section 313:
Not reportable under Section 313.

OSHA - Highly Hazardous:
Not considered highly hazardous by OSHA.

US State

State Right to Know:
CAS# 7778-77-0 is not listed on the following state right to know lists: California, Florida, Minnesota, New Jersey, Pennsylvania, and Massachusetts.

California Regulations:
Not listed.

European/International Regulations

Canadian DSL/NDSL:
CAS# 7778-77-0 is listed on Canada's DSL List.

Canada Ingredient Disclosure List:
CAS# 7778-77-0 is not listed on the Ingredient Disclosure List.

Material Safety Data Sheet
Potassium phosphate, monobasic, ACS

Section 16 - Other Information

MSDS Creation Date: August 7, 2006
Revision Date: None

Information in this MSDS is from available published sources and is believed to be accurate. No warranty, express or implied, is made and LabChem Inc. assumes no liability resulting from the use of this MSDS. The user must determine suitability of this information for his application.

National Silicates
an affiliate of PQ Corporation

MSDS

MATERIAL SAFETY DATA SHEET

Trade Name: **AgSil 25 Potassium Silicate Solution**
Date Prepared: **April 4, 2012**

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product name: **AgSil 25 Potassium silicate solution**
Product description: **A 2.50 weight ratio potassium silicate, 29.1% solution in water**
Product Use: **Hydroponics use**
Manufacturer: **National Silicates**
429 Kipling Ave, Etobicoke, ON M8Z 5C7
Phone number: 416-255-7771
Fax number: 416-201-4347
In case of emergency call: **1 416-255-7771**

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical and Common Name	*CAS Registry Number*	*Wt. %*	*OSHA PEL*	*ACGIH TLV*
Water	**7732-18-5**	**70.9%**	**Not Established**	**Not Established**
Silicic acid, potassium salt; Potassium silicate	**1312-76-1**	**29.1%**	**Not Established**	**Not Established**

3. HAZARDS IDENTIFICATION

Emergency Overview: **Clear to hazy, colorless, odorless, thick liquid. Causes mild irritation, slight skin irritation, and digestive tract irritation. Spray mist causes irritation to respiratory tract. High pH is harmful to aquatic life. Noncombustible. Spills are slippery. Reacts with acids, ammonium salts, reactive metals and some organics.**
Eye contact: **Causes mild irritation to the eyes.**
Skin contact: **Causes slight irritation to the skin.**
Inhalation: **Spray mist irritating to respiratory tract.**
Ingestion: **May cause irritation to mouth, esophagus, and stomach.**
Chronic hazards: **No known chronic hazards. Not listed by NTP, IARC or OSHA as a carcinogen.**
Physical hazards: **Dries to form glass film which can easily cut skin. Spilled material is very slippery. Can etch glass if not promptly removed.**

4. FIRST AID MEASURES

Eye: **In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.**

Skin: **In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention.**

Inhalation: **Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.**

Ingestion: **If swallowed, DO NOT induce vomiting. Get medical attention immediately. If victim is fully conscious, give a cupful of water. Never give anything by mouth to an unconscious person.**

5. FIRE FIGHTING MEASURES

Flammable limits: **This material is noncombustible.**

Extinguishing Media: **This material is compatible with all extinguishing media**

Hazards to fire-fighters: **See Section 3 for information on hazards when this material is present in the area of a fire.**

Fire-fighting equipment: **The following protective equipment for fire fighters is recommended when this material is present in the area of a fire: chemical goggles, body-covering protective clothing, chemical resistant gloves, and rubber boots.**

Hazardous Combustion Products: **Not available**

Explosion Data:

Sensitivity to mechanical impact and static discharge: **Not available**

6. ACCIDENTAL RELEASE MEASURES

Personal protection: **Wear chemical goggles, body-covering protective clothing, chemical resistant gloves, and rubber boots. See section 8.**

Environmental Hazards: **Sinks and mixes with water. High pH of this material is harmful to aquatic life, see Section 12. Only water will evaporate from a spill of this material.**

Small spill cleanup: **Mop up and neutralize liquid, dispose in accordance with federal, provincial and local regulations or permits.**

Large spill cleanup: **Keep unnecessary people away; isolate hazard area and deny entry. Do not touch or walk through spilled material. Stop leak if you can do so without risk. Prevent runoff from entering into storm sewers and ditches which lead to natural waterways. Isolate, dike and store discharged material, if possible. Use sand or earth to contain spilled material. If containment is impossible, neutralize contaminated area and flush with large quantities of water.**

CERCLA RQ (US): **There is no CERCLA Reportable Quantity for this material. If a spill goes off site, notification of state and local authorities is recommended.**

7. HANDLING AND STORAGE

Handling: **Avoid contact with eyes, skin and clothing. Avoid breathing spray mist. Keep container closed. Promptly clean residue from closures with cloth dampened with water. Promptly clean up spills.**

Storage: **Keep containers closed. Store in clean steel or plastic containers. Separate from acids, reactive metals, and ammonium salts. Storage temperature 0-95º C. Loading temperature 45-95 º C. Do not store in aluminum, fiberglass, copper, brass, zinc or galvanized containers.**

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls: **Use with adequate ventilation. Keep containers closed. Safety shower and eyewash fountain should be within direct access.**

Respiratory protection: **Use a NIOSH-approved dust and mist respirator where spray mist occurs. Observe Provincial regulations for respirator use.**

Skin protection: **Wear body-covering protective clothing and gloves.**

Eye protection: **Wear chemical goggles.**

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: **Thick liquid.**
Color: **Clear to hazy white.**
Odor: **Odorless or musty odor.**
Odor Threshold: **Not available**
pH: **11.3**
Specific gravity: **1.26 g/cm$_3$ (20ºC), 29.8º Bé, 10.50 lbs/gal**
Solubility in water: **Miscible.**
Flashpoint: **Not applicable**
Auto-ignition Temperature: **Not applicable**
Vapor Pressure: **Not applicable**
Vapor Density: **Not applicable**
Evaporation Rate: **Not applicable**
Boiling Point: **Not applicable**
Freezing Point: **Not applicable**
Coefficient of water/oil Distribution: **Not applicable**

10. STABILITY AND REACTIVITY

Stability: **This material is stable under all conditions of use and storage.**
Conditions to avoid: **None.**
Materials to avoid: **Gels and generates heat when mixed with acid. May react with ammonium salts resulting in evolution of ammonia gas. Flammable hydrogen gas may be produced on contact with aluminum, tin, lead, and zinc.**
Hazardous decomposition products: **Hydrogen.**

11. TOXICOLOGICAL INFORMATION

Acute Data: **When tested for primary irritation potential, this material caused moderate irritation to the eyes and slight irritation to the skin. Human experience indicates that irritation occurs when potassium silicates get on clothes at the collar, cuffs or other areas where abrasion may occur. The acute oral toxicity of this product has not been tested. When chemically similar sodium silicates were tested on a 100% solids basis, their single dose acute oral LD_{50} in rats ranged from 1500 mg/kg to 3200 mg/kg. The acute oral lethality resulted from nonspecific causes.**

Subchronic Data: **The subchronic toxicity of this material has not been tested. In a study of rats fed chemically similar sodium silicate in drinking water for three months, at 200, 600 and 1800 ppm, changes were reported in the blood chemistry of some animals, but no specific changes to the organs of the animals due to potassium silicate administration were observed in any of the dosage groups. Another study reported adverse effects to the kidneys of dogs fed potassium silicate in their diet at 2.4g/kg/day for 4 weeks, whereas rats fed the same dosage did not develop any treatment-related effects. Decreased numbers of births and survival to weaning was reported for rats fed sodium silicate in their drinking water at 600 and 1200 ppm.**

Special Studies: **Frequent ingestion over extended periods of time of gram quantities of silicates is associated with the formation of kidney stones and other siliceous urinary calculi in humans.**
Mutagenicity: The mutagenic potential of this material has not been tested. Chemically similar sodium silicate was not mutagenic to the bacterium E. Coli when tested in a mutagenicity bioassay.
Carcinogenicity: There are no known reports of carcinogenicity of potassium silicates. Potassium silicate is not listed by IARC, NTP or OSHA as a carcinogen.
Sensitization to product: Not applicable
Reproductive toxicity: Not applicable
Teratogenicity: Not applicable
Name of toxicologically synergistic products: Not applicable

12. ECOLOGICAL INFORMATION

Ecotoxicity: **Several terrestrial toxicity assessments have been performed with potassium silicate solutions using Environment Canada test methods. The following data is reported: seed germination, seedling emergence, root elongation and earthworm survival LC50 / EC50, LC25 / EC25 > 100 - non-toxic. The following data is reported for chemically similar sodium silicates on a 100% solids basis: A 96 hour median tolerance for fish (Gambusia affnis) of 2320 ppm; a 96 hour median tolerance for water fleas (Daphnia magna) of 247 ppm; a 96 hour median tolerance for snail eggs (Lymnea) of 632 ppm; and a 96 hour median tolerance for Amphipoda of 160 ppm. This product contains approximately 29.1% potassium silicate.**

Environmental Fate: **This material is not persistent in aquatic systems, but its high pH when undiluted or unneutralized is acutely harmful to aquatic life. Diluted material rapidly depolymerizes to yield dissolved silica in a form that is indistinguishable from natural dissolved silica. It does not contribute to BOD. This material does not bioaccumulate except in species that use silica as a structural material such as diatoms and siliceous sponges. Where abnormally low natural silica concentrations exist (less than 0.1 ppm), dissolved silica may be a limiting nutrient for diatoms and a few other aquatic algal species. However, the addition of excess dissolved silica over the limiting concentration will not stimulate the growth of diatom populations; their growth rate is independent of silica concentration once the limiting concentration is exceeded. Neither silica nor potassium will appreciably bioconcentrate up the food chain.**

Physical/Chemical: **Sinks and mixes with water. Only water will evaporate from this material.**

13. DISPOSAL CONSIDERATIONS

Disposal Method: **Dispose in accordance with federal, provincial and local regulations.**

14. TRANSPORT INFORMATION

TDG UN Status: **This material is not regulated hazardous material for transportation.**

15. REGULATORY INFORMATION

WHMIS (Canada):	**Class D2B** **This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the MSDS contains all the information required by the *Controlled Products Regulations*.**
DSL (Canada):	**All components of this formulation are listed on the CEPA-DSL**
CERCLA (US):	**No CERCLA Reportable Quantity has been established for this material.**
SARA TITLE III (US):	**Not an Extremely Hazardous Substance under §302. Not a Toxic Chemical under §313. Hazard Categories under §§311/312: Acute**
TSCA (US):	**All ingredients of this material are listed on the TSCA inventory.**
FDA:	**Potassium silicate is regarded as GRAS (Generally Recognized As Safe) as a corrosion preventative in potable water.**

16. OTHER INFORMATION

Prepared by: **HSE Dept**
Supersedes revision of: **June 22, 2009**

THE INFORMATION ON THIS SAFETY DATA SHEET IS BELIEVED TO BE ACCURATE AND IT IS THE BEST INFORMATION AVAILABLE TO NATIONAL SILICATES THIS DOCUMENT IS INTENDED ONLY AS A GUIDE TO THE APPROPRIATE PRECAUTIONS FOR HANDLING A CHEMICAL BY A PERSON TRAINED IN CHEMICAL HANDLING. NATIONAL SILICATES MAKES NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED WITH RESPECT TO SUCH INFORMATION OR THE PRODUCT TO WHICH IT RELATES, AND WE ASSUME NO LIABILITY RESULTING FROM THE USE OR HANDLING OF THE PRODUCT TO WHICH THIS SAFETY DATA SHEET RELATES. USERS AND HANDLERS OF THIS PRODUCT SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE INFORMATION PROVIDED HEREIN FOR THEIR OWN PURPOSES.

MATERIAL SAFETY DATA SHEET CALCIUM NITRATE SOLUTION

CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Formulator's Name:
Fertizona – Willcox, L.L.C.
PO Box 519
Willcox, AZ 85644-0519

EMERGENCY TELEPHONE NO.:
DAYS: (520) 384.2264
24 Hour Emergency HAZMAT Response: (928) 783.3803

PRODUCT NAME: Calcium Nitrate Solution, CALNITAFL
CHEMICAL NAME: Calcium Nitrate $Ca(NO_3)_2$
CHEMICAL FAMILY: Inorganic Chemical Solution
EPA REG. NO.: Not applicable

MSDS Revisions: 05/25/2010 **Date Of Issue:** 10/15/2005

COMPOSITION, INFORMATION ON INGREDIENTS (Note: see product tag or label for specific ingredients)

Chemical Ingredients:	Percentage by Weight:	CAS No.
Calcium Nitrate $Ca(NO_3)_2$	48.0 to 54.0	Mixture
Water and inert ingredients	52.0 to 46.0	Mixture

HAZARDS IDENTIFICATION SUMMARY

CAUTION: KEEP OUT OF REACH OF CHILDREN. MAY BE HARMFUL IF SWALLOWED
This product is a clear to clear amber liquid. Primary routes of entry are Inhalation, eye contact and skin contact.

FIRST AID MEASURES

Eyes: Flush eyes with large amount of water for at least 15 minutes. Consult a physician if irritation persists.
Skin: Remove all contaminated clothing. Wash skin, hair, and fingernails thoroughly with soap and water. If irritation persists seek medical attention. Wash clothing before reuse.
Ingestion: If swallowed, do not induce vomiting or give anything by mouth to an unconscious person. Call a physician to get medical attention.
Inhalation: Move subject to fresh air. Give artificial respiration if breathing has stopped. If breathing is difficult, give oxygen. Get medical attention immediately.

FIRE FIGHTING MEASURES

FLAMMABILITY OF THE PRODUCT: May be combustible at high temperature
EXTINGUISHING MEDIA: Use medium appropriate to surrounding fire.
HAZARDOUS COMBUSTION PRODUCTS: May include but are not limited to oxides of nitrogen, and some metallic oxides.
SPECIAL FIRE FIGHTING PROCEDURES: Fire fighters should wear appropriate protective equipment and self-contained breathing apparatus and full protective gear.
HAZARDOUS THERMAL DECOMPOSITION: These products are nitrogen oxides (NO, NO_2, etc)

ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS REALEASED OR SPILLED:
Avoid breathing vapors. Absorb and sweep up liquid spills immediately and transfer to suitable containers for possible land application according to label use or for disposal. Check local, state and federal regulations for proper disposal.
CAUTION: Keep spills and cleaning runoff out of municipal sewers and open bodies of water.

HANDLING AND STORAGE

HANDLING: Store in a cool dry place away from children, feed and food products, and seed.
OTHER PRECAUTIONS: Toxic to fish and other aquatic organisms. Do not contaminate water supplies by handling and storage of product. Drift or runoff may adversely affect aquatic invertebrates and non-target plants.

EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Not normally required.
RESPIRATORY PROTECTION: Not normally required, if vapors or dusts exceed acceptable levels, wear a MSHA/NIOSH approved pesticide respirator.
EYE PROTECTION: Chemical goggles or shielded safety glasses.
SKIN PROTECTION: Wear protective clothing: long-sleeved shirts and pants, hat, rubber boots with socks. Wear rubber or Chemical-resistant gloves.
OSHA PEL 8 hr TWA ACGIH TLV-TWA
Not established Not Established

PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Clear to clear amber liquid with no odor
SOLUBILITY: Soluble
SPECIFIC GRAVITY (Water= 1): 1.40 to 1.50 g/ml
BULK DENSITY: 11.68 to 12.52 lbs/gallon
pH: 5 to 7
VAPOR PRESSURE: Not established
BOILING POINT: Not established
PERCENT VOLATILE (by volume): Not established
EVAPORATION RATE: Not established
Note: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

STABILITY AND REACTIVITY

STABILITY: Stable
CONDITIONS TO AVOID: None known.
INCOMPATIBILITY: Reactive with combustible materials, acids, alkalis.
Hazardous Decomposition Products: These products are nitrogen oxides (NO, NO2, etc)

TOXICOLOGICAL INFORMATION

Acute Oral LD50 (rat): >2000 mg/kg
Acute Dermal LD 50 (rabbit): >5000 mg/kg
Eye Irritation (rabbit): May cause moderate irritation
Skin Irritation (rabbit): May cause slight irritation
Inhalation: May cause respiratory tract irritation.
Ingestion: May cause stomach distress, nausea or vomiting.
Carcinogenic Potential: None listed in OSHA, NTP, IARC or ACGIH

ECOLOGICAL INFORMATION

Drift or runoff may adversely affect non-target plants. Do not apply directly to water. Do not contaminate water when disposing of equipment wash water.
Do not apply when weather conditions favor drift from target area.

DISPOSAL CONSIDERATIONS

Do not reuse container. Plastic Jugs: Triple rinse (or equivalent), then offer for recycling at an ACRC site or by reconditioning, or puncture and dispose of in a sanitary landfill or by other procedures approved by local, state and federal regulations.

TRANSPORT INFORMATION

DOT Shipping Description: Not regulated by DOT by highway.
TDG Classification: Not regulated

REGULATORY INFORMATION

NFPA & HMIS Hazard Ratings: NFPA HMIS
1 Health 0 Least 1 Health
0 Flammability 1 Slight 0 Flammability
0 Instability 2 Moderate 0 Reactivity
3 High H PPE
4 Severe
SARA Hazard Notification/Reporting
SARA Title III Hazard Category: Immediate __Y__ Fire __N__ Sudden Release of Pressure __N__
Delayed __N __ Reactive __N__
Reportable Quantity (RQ) under U.S. CERCLA: Not listed
SARA, Title III, Section 313: Not listed
RCRA Waste Code: Not listed
CA Proposition 65: Not listed

OTHER

MSDS STATUS: Revision made 05/25/2010
Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Fertizona – Willcox, L.L.C. makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving it will make their own determination as to its suitability for their purposes prior to use. **In no event will Fertizona – Willcox, L.L.C. be responsible for any damages of any nature including, without limitation, direct, special or consequential, resulting from the use, reliance upon, or the accuracy, completeness or furnishing of such information.** NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TOWHICH INFORMATION REFERS.

MATERIAL SAFETY DATA SHEET

I. PRODUCT IDENTIFICATION
MANUFACTURER'S NAME made by:
The BIOAG Corporation
EMERGENCY TELE. NO. 503-838-2467
ADDRESS Carson City, Nevada

TRADE NAME **Ful-Power Fulvic acid Extract**

SYNONYMS Golden colored Fulvic acid liquid # 2702.10.0000

II. INGREDIENTS

MATERIAL OR COMPONENT DOT SHIPPING AND HAZARD CLASSIFICATION:
Extract of Ancient Humus deposits from fresh water cretaceous deposits.
Fulvic Acid Non-hazardous.

Ph 3.5 +- 0.5

III. PHYSICAL DATA
MELTING POINT= n/a

SPECIFIC GRAVITY VAPOR PRESSURE: n/a ND

VAPOR DENSITY (AIR=1)= lighter than air

SOLUBILITY IN H_20= 100%

% VOLATILES BY VOL.= n/a

Specific Gravity= 1.10

APPEARANCE AND ODOR= Gold to orange liquid. No odor.

IV. FIRE AND EXPLOSION DATA
FLAMMABLE LIMITS IN AIR, % BY VOLUME: LOWER- n/a UPPER- n/a

EXTINGUISHING MEDIA= n/a

SPECIAL FIRE FIGHTING PROCEDURES none

UNUSUAL FIRE AND EXPLOSION HAZARDS none

V. HEALTH HAZARD INFORMATION
SYMPTOMS OF OVEREXPOSURE INHALATION: n/a

SKIN CONTACT: None known.

SKIN ABSORPTION: None known.

EYE CONTACT: Potential mild irritation.

INGESTION: None known. The LD_{50} in acute oral toxicity studies is greater than 6,000 mg/kg (~400 gallons per 100 pounds of body weight. Large quantities can cause gastrointestinal irritation. While recommended Doses improve gastrointestinal functions.

EFFECTS OF OVEREXPOSURE: Expected toxicity hazard none.

ACUTE OVEREXPOSURE: Expected toxicity hazard none to slight.

CHRONIC OVEREXPOSURE: Expected toxicity hazard none to slight.

EMERGENCY AND FIRST AID PROCEDURES

EYE: Flush with water.

SKIN: Flush with water.

INHALATION: If discomfort ensures, seek medical attention.

INGESTION: Due to the presence of iron salts, call a physician if large quantities are ingested.

SUSPECTED CANCER AGENT?
X NO This product's ingredients are not found in the lists below.
YES ___Federal OSHA ___NTP ___IARC ___TX/OSHA

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE None known

VI. REACTIVITY DATA
STABILITY: Stable under normal warehouse conditions.

INCOMPATIBILITY (materials to avoid) none

HAZARDOUS DECOMPOSITION/COMBUSTION PRODUCTS None known

HAZARDOUS POLYMERIZATION Will not occur

VII. SPILL, LEAK AND DISPOSAL PROCEDURES
STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED
RELEASED OR SPILLED: Wash with water. Non-toxic. Non-corrosive.

NEUTRALIZATION CHEMICALS: alkaline materials

WASTE DISPOSAL METHODS: Follow all applicable federal, state and local regulations.

VIII. SPECIAL PROTECTION INFORMATION
VENTILATION REQUIREMENTS: n/a

SPECIFIC PERSONAL PROTECTIVE EQUIPMENT
RESPIRATORY (SPECIFY IN DETAIL): None required

EYE: Safety goggles

GLOVES: None required

OTHER CLOTHING AND EQUIPMENT: None required

IX. SPECIAL PRECAUTIONS
PRECAUTIONARY STATEMENTS Avoid contact with eyes.

OTHER HANDLING AND STORAGE EQUIPMENT Store in a dry area out of light. Keep out of reach of children.

PREPARED BY FAUST BIO-AGRICULTURAL SERVICES, INC. Dr. Robert H. Faust president.

ADDRESS 6080 Wigrich Rd.; Independence, Or. 97351
certified true by

DATE:6/3/1998

All information, recommendations and suggestions appearing herein concerning this product are based upon tests and data believed to be reliable. However, it is the user's responsibility to determine the safety, toxicity, and suitability fro his own use of this product. Since the actual use by others is beyond our control, we make no guarantee, expressed or implied, as to the effects of such use, the results to be obtained, or the safety and toxicity of the product. This information is not to be construed as absolutely complete, since additional information may be necessary or desirable when exceptional conditions or circumstances exist or because of applicable laws or government regulations.

MATERIAL SAFETY DATA SHEET

M.S.D.S.

I – PRODUCT IDENTIFICATION

TRADE NAME (as labeled)	:	GROW MORE 5-11-26
MANUFACTURER'S NAME	:	GROW MORE, INC. 15600 New Century Drive Gardena, CA 90248 Tel. (310) 515-1700 Fax (310) 515-4937
DATE PREPARED/REVISED		March 20, 2000
NAME OF PREPARER		H. Langheim

II – HAZARDOUS INGREDIENTS

Chemical Name	CAS No. & %	Exposure Limits in Air (give units) ACGH TLV	OSHA PEL	OTHER (specify)
Sodium Molybdate	7439987	5 mg/m3	5 mg/m3	
Manganese EDTA	7439965			Oral LD50Rat: 1750 mg/kg
Copper EDTA	7440508			"
Zinc EDTA	7440666			"

III- PHYSICAL PROPERTIES

VAPOR DENSITY (AIR = 1)	: N/A
SPECIFIC GRAVITY	: Approx. 1.7 g/cc
SOLUBILITY IN WATER	: 300 g/l or greater
VAPOR PRESSURE, mmHg AT 20°C	: N/A
APPEARANCE AND ODOR	: Fine crystals & powder
MELTING POINT OR RANGE, °F	: Not established
BOILING POINT OR RANGE, °F	: N/A
EVAPORATION RATE (BUTYLACETATE = 1)	: 0
DECOMPOSITION TEMPERATURE:	: 250 – 374°F
pH 1% SOLUTION	: 4.5 – 5.5
MOLECULAR WEIGHT	: 110 - 117

CHEMICAL NAME : Proprietary mixture containing Ammonium Phosphate, Potassium Phosphate, Potassium Nitrate, Potassium Sulfate, Ammonium Sulfate, Ammonium Nitrate, Urea and Micronutrients

IV – FIRE AND EXPLOSION

FLASH POINT. °F (Give Method) : Greater than 300°F
AUTO IGNITION TEMPERATURE °F : N/A
FLAMMABLE LIMITS IN AIR (Vol.%) : Non-Flammable Lower (LEL) : N/A
Upper (UEL) : N/A

FIRE EXTINGUISHING MATERIALS

_____water spray _____carbon dioxide _____other
_____foam _____dry chemical

SPECIAL FIREFIGHTING PROCEDURE: Use abundant amount of water in early stages of fire.

UNUSUAL FIRE & EXPLOSION HAZARDS: When large quantities are involved in fire, solids may fuse or melt. Noxious Fumes may form, Nitrogen Oxides. In such conditions application of water may result in scattering of molten materials.

V – HEALTH HAZARD INFORMATION

L.D. 50 : Not established.

SYMPTOMS OF OVEREXPOSURE FOR EACH POTENTIAL ROUTE OF EXPOSURE:

INHALED : Dust can irritate upper respiratory system.

CONTACT WITH SKIN OR EYES : Prolonged skin contact may cause Dermatitis. Dust may irritate eyes.

ABSORBED THROUGH SKIN : Not known adverse effects at this time.

SWALLOWED : Nausea, diarrhea, diuresis, muscular debility.

FIRST AID (EMERGENCY) PRODEDURES:

EYE CONTACT : Wash thoroughly with water for at least 15 minutes. Hold eyelids apart during flushing. Send patient immediately to physician.

SKIN CONTACT : Wash with soap and water.

INHALED : Remove from exposure. Treat symptomatically.

SWALLOWED : Rinse mouth. Drink 2-3 glasses of water and seek medical assistance. Do not induce vomiting or give anything by mouth to an unconscious person.

SUSPECTED CANCER AGENT?

_X_ No This product's ingredients are not found in the list below.

___ Yes FEDERAL OSHA_____ NTP _____ IARC _____

(California employers using CAL-OSHA regulated carcinogens must register with CAL-OSHA. The CAL-OSHA and Federal OSHA carcinogen lists are similar).

VI – REACTIVITY DATA

STABILITY : __X___Stable _____ Unstable

CONDITIONS TO AVOID : Heating with Sodium Phosphite; dissolving with Sodium Hyposulfite long exposure to tin, solder, tin plate or stagnates.

INCOMPATIBILITY
Material to avoid) : Corrosive to Aluminum, Steel, Brass, Copper.

HAZARDOUS DECOMPOSITION PRODUCTS (INCLUDING COMBUSTION PRODUCTS): Nitrogen Oxides.

HAZARDOUS POLYMERIZATION: _____ May occur ___X___ Will not occur

CONDITIONS TO AVOID : Avoid fire.

VII – SPILL, LEAK & DISPOSAL PROCEDURES:

SPILL RESPONSE PROCEDURE (Include employee protection measures):

Sweep into breaker. Dilute with sufficient water. Add soda ash. Mix and neutralize with 6m HCL. Drain into the sewer with abundant water.

PREPARINNG WASTES FOR DISPOSAL (Container types, neutralization, etc.) :

Remove slowly into a large container of water. Add soda ash, slightly stirring. After 24 hours, decant or siphon into another container. Neutralize with 6m HCL and drain into the sewer with abundant water.

VIII – SPECIAL HANDLING INFORMATION

VENTILATION & ENGINEERING CONTROLS: Good mechanical ventilation as dust level is sufficiently high.

RESPIRATORY PROTECTION (TYPE): Wear dust mask if excessive airborne dust is present

EYE PROTECTION (TYPE): Safety glasses or goggles – wear it if dust levels causes discomfort.

GLOVES (SPECIFIC MATERIAL): Rubber or plastic – to prevent irritation

OTHER CLOTHING & EQUIPMENT: Wear protective work gown if desired.

WORK PRACTICES, HYGIENIC PRACTICES: Keep away from open flame. Avoid contact with organics. Put into a dry place

PROTECTIVE MEASURES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Wear a dust protector and eye wear.

Material Safety Data Sheet

Material Name: Magnesium Sulfate Heptahydrate (Epsom Salt)

ID: CL-126

* * * Section 1 - Chemical Product and Company Identification * * *

Chemical Name: Magnesium Sulfate Heptahydrate, Technical Standard & USP Grades
Product Use: For Commercial Use
Synonyms: Magnesium sulfate, 7-hydrate; Epsom Salt
Supplier Information

Chem One Ltd.
14140 Westfair East Drive
Houston, Texas 77041-1104

Phone: (713) 896-9966
Fax: (713) 896-7540
Emergency # (800) 424-9300 or (703) 527-3887

General Comments: FOR COMMERCIAL USE ONLY; NOT TO BE USED AS A PESTICIDE.

NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.

* * * Section 2 - Composition / Information on Ingredients * * *

CAS #	Component	Percent
10034-99-8	Magnesium Sulfate Heptahydrate	100

Component Related Regulatory Information

This product may be regulated, have exposure limits or other information identified as the following: Magnesium sulfate (7487-88-9).

Component Information/Information on Non-Hazardous Components

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

* * * Section 3 - Hazards Identification * * *

Emergency Overview

Magnesium Sulfate Heptahydrate is an odorless, colorless to white solid in crystalline form. Contact may cause irritation to eye, skin, and respiratory system. Magnesium Sulfate Heptahydrate is not flammable or reactive. Thermal decomposition of Magnesium Sulfate Heptahydrate produces irritating vapors and toxic gases (e.g. sulfur oxides). Emergency responders should wear proper personal protective equipment for the releases to which they are responding.

Hazard Statements

Caution! May cause irritation to eyes, skin, and respiratory system. Avoid contact with eyes and prolonged contact with skin. Avoid breathing dusts. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation.

Potential Health Effects: Eyes

Exposure to particulates or solution of Magnesium Sulfate Heptahydrate may cause mild irritation of the eyes with symptoms such as stinging, tearing and redness.

Potential Health Effects: Skin

Magnesium Sulfate Heptahydrate can cause slight irritation of the skin, especially after prolonged exposures. Repeated skin contact may lead to dermatitis (red, cracked skin). Symptoms are generally alleviated when exposure ends.

Potential Health Effects: Ingestion

Ingestion of Magnesium Sulfate Heptahydrate(especially in large volumes) can cause symptoms which include vomiting, diarrhea, and nausea. If elimination is blocked by bowel blockage or other reasons, depression of the central nervous system, lack of reflexes and hypocalcemia can occur.

Potential Health Effects: Inhalation

Breathing dusts or particulates generated by Magnesium Sulfate Heptahydrate can lead to irritation of the nose, throat or respiratory system. Symptoms of such exposure could include coughing and sneezing. Symptoms are generally alleviated when exposure ends.

HMIS Ratings: Health Hazard: 1 **Fire Hazard:** 0 **Physical Hazard:** 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

* * * Section 4 - First Aid Measures * * *

First Aid: Eyes

Immediately flush eyes with large amounts of room temperature water, occasionally lifting the lower and upper lids, for at least 15 minutes. If symptoms persist after 15 minutes of irrigation, seek medical attention.

First Aid: Skin

Remove all contaminated clothing. For skin contact, wash thoroughly with soap and water for at least 20 minutes. Seek immediate medical attention if irritation develops or persists.

First Aid: Ingestion

DO NOT INDUCE VOMITING, unless directed by medical personnel. Have victim rinse mouth thoroughly with water, if conscious. Never give anything by mouth to a victim who is unconscious or having convulsions. Contact a physician or poison control center immediately.

First Aid: Inhalation

Remove source of contamination or move victim to fresh air. Apply artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Administer oxygen if breathing is difficult. Get immediate medical attention.

First Aid: Notes to Physician

There is no specific antidote. Care is symptomatic and supportive.

* * * Section 5 - Fire Fighting Measures * * *

Flash Point: Not applicable.
Method Used: Not applicable.
Upper Flammable Limit (UEL): Not applicable.
Lower Flammable Limit (LEL): Not applicable.
Auto Ignition: Not available.
Flammability Classification: Not applicable.

General Fire Hazards

Magnesium Sulfate Heptahydrate is not combustible, and does not contribute to the intensity of a fire. When involved in a fire, this material may decompose and produce irritating vapors, acrid smoke and toxic gases.

Hazardous Combustion Products

When heated to decomposition, this product may emit toxic fumes of sulfur oxides.

Extinguishing Media

Use methods for surrounding fire.

Fire Fighting Equipment/Instructions

Firefighters should wear full protective clothing including self-contained breathing apparatus.

NFPA Ratings: Health: 1 **Fire:** 0 **Reactivity:** 0 **Other:**

Hazard Scale: 0= Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

* * * Section 6 - Accidental Release Measures * * *

Containment Procedures

Stop the flow of material, if this can be done without risk. Contain the discharged material. . If sweeping of a contaminated area is necessary use a dust suppressant agent, which does not react with product (see Section 10 for incompatibility information). Keep spilled material dry and away from moisture.

Clean-Up Procedures

Wear appropriate protective equipment and clothing during clean-up. Shovel the material into waste container. Thoroughly wash the area after a spill or leak clean-up. Avoid contamination of soil, and prevent spill residue from running to groundwater or storm drains.

Evacuation Procedures

Evacuate the area promptly and keep upwind of the spilled material. Isolate the spill area to prevent people from entering. Keep materials that burn away from spilled material. In case of large spills, follow all facility emergency response procedures.

Special Procedures

Remove soiled clothing and launder before reuse. Avoid all skin contact with the spilled material. Have emergency equipment readily available.

* * * Section 7 - Handling and Storage * * *

Handling Procedures

All employees who handle Magnesium Sulfate Heptahydrate should be trained to handle it safely. Do not breathe dust. Avoid all contact with skin and eyes. Use this product only with adequate ventilation. Wash thoroughly after handling.

Storage Procedures

Keep container tightly closed when not in use. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Keep containers closed--material is hygroscopic. Material should be stored in secondary containers or in a diked area, as appropriate. Store containers away from incompatible chemicals (see Section 10, Stability and Reactivity). Storage areas should be made of fire-resistant materials. Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. Use corrosion-resistant structural materials, lighting, and ventilation systems in the storage area. Floors should be sealed to prevent absorption of this material. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged. Have appropriate extinguishing equipment in the storage area (i.e., sprinkler system, portable fire extinguishers).

Empty containers may contain residual particulates; therefore, empty containers should be handled with care. Never store food, feed, or drinking water in containers which held this product. Keep this material away from food, drink and animal feed. Do not store this material in open or unlabeled containers. Limit quantity of material stored. Wipe down area of use periodically to avoid the accumulation of dusts

* * * Section 8 - Exposure Controls / Personal Protection * * *

Exposure Guidelines

A: General Product Information

No exposure guidelines have been established.

B: Component Exposure Limits

The exposure limits given are for Particulates Not Otherwise Classified.

ACGIH:	10 mg/m^3 TWA (Inhalable fraction)
	3 mg/m^3 TWA (Respirable fraction)
OSHA:	15 mg/m^3 TWA (Total dust)
	5 mg/m^3 TWA (Respirable fraction)
DFG MAKs	4 mg/m^3 TWA (Inhalable fraction)
	1.5 mg/m^3 TWA (Respirable fraction)

Engineering Controls

Use mechanical ventilation such as dilution and local exhaust. Use a corrosion-resistant ventilation system and exhaust directly to the outside. Supply ample air replacement. Provide dust collectors with explosion vents.

PERSONAL PROTECTIVE EQUIPMENT

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132). Please reference applicable regulations and standards for relevant details.

Personal Protective Equipment: Eyes/Face

Wear safety glasses with side shields (or goggles) and a face shield. If necessary, refer to U.S. OSHA 29 CFR 1910.133.

Personal Protective Equipment: Skin

Wear appropriate work gloves for type of operation. If necessary, refer to U.S. OSHA 29 CFR 1910.138.

Personal Protective Equipment: Respiratory

None required where adequate ventilation conditions exist. If airborne concentrations are above the applicable exposure limits, use NIOSH-approved respiratory protection. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), applicable U.S. State regulations. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

Personal Protective Equipment: General

Use good hygiene practices when handling this material including changing and laundering work clothing after use. Have a safety shower or eye-wash fountain available. Wash hands thoroughly after handling material. Do not eat, drink, or smoke in work areas.

* * * Section 9 - Physical & Chemical Properties * * *

Physical Properties: Additional Information

The data provided in this section are to be used for product safety handling purposes. Please refer to Product Data Sheets, Certificates of Conformity or Certificates of Analysis for chemical and physical data for determinations of quality and for formulation purposes.

Appearance:	Colorless to white crystals	**Odor:**	Odorless
Physical State:	Solid	**pH:**	7 (34% soln at 20 deg C)
Vapor Pressure:	8 mm Hg @ 68 deg F	**Vapor Density:**	Not applicable
Boiling Point:	Not Applicable	**Freezing/Melting Point:**	118.4 deg F (48.1 deg C)
Solubility (H2O):	34 g/mL at 20 deg c	**Specific Gravity:**	1.7 (H2O = 1)
Softening Point:	Not applicable	**Particle Size:**	Standard: 0.1-2mm, Fine crystals 0.8mm
		Bulk Density:	Standard: 0.95 g/cm3, Fine crystals: 0.92 g/cm3

Sublimation Point:	Not Applicable	**Volatility:**	Not Applicable
Molecular Weight:	246.48	**Heat of Combustion:**	Not Applicable
Octanol/H2O Coefficient:	Not Applicable	**Evaporation Rate:**	Not applicable
Saturated Vapor Concentration:	Not Applicable	**Chemical Formula:**	MgSO4 . 7H2O

* * * Section 10 - Chemical Stability & Reactivity Information * * *

Chemical Stability

Under normal conditions of temperature and pressure, Magnesium Sulfate Heptahydrate is stable. Loses some moisture on exposure to dry air at room temperature.

Chemical Stability: Conditions to Avoid

Avoid high temperatures, excessive heat, incompatible materials and air (material is hygroscopic.

Incompatibility

Ethoxy ethyl alcohols, arsenates, phosphates, tartrates, lead, barium, strontium and calcium, strong oxidizers.

Hazardous Decomposition

When heated to decomposition, this product may emit toxic sulfur oxides.

Hazardous Polymerization

Will not occur.

* * * Section 11 - Toxicological Information * * *

Acute Toxicity

A: General Product Information

Acute exposure may cause mild skin and eye irritation. Gastrointestinal absorption may cause acute magnesium poisoning. Symptoms include flushing, sweating, low blood pressure, depression of reflexes, flaccid paralysis, hypothermia, circulatory collapse, and depression of CNS and heart function. Excessive long-term ingestion of this product may cause also cause magnesium poisoning with symptoms described above.

B: Component Analysis - LD50/LC50

No information available.

B: Component Analysis - TDLo/LDLo

TDLo (Oral-Man) 183 mg/kg/4 hours-intermittent: Gastrointestinal: hypermotility, diarrhea; LDLo (Intraduodenal-Woman) 5344 mg/kg

Carcinogenicity

A: General Product Information

No information available.

B: Component Carcinogenicity

Magnesium Sulfate Heptahydrate is not listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

Epidemiology

No information available.

Neurotoxicity

No information available.

* * * Section 11 - Toxicological Information (Continued) * * *

Mutagenicity
No information available.
Teratogenicity
No information available.
Other Toxicological Information
None.

* * * Section 12 - Ecological Information * * *

Ecotoxicity
No information available.
Environmental Fate
No potential for food chain concentration.

* * * Section 13 - Disposal Considerations * * *

US EPA Waste Number & Descriptions
A: General Product Information
As shipped, product is not considered a hazardous waste by the EPA. You must test your waste using methods described in 40 CFR Part 261 to determine if it meets applicable definitions of hazardous wastes.
B: Component Waste Numbers
No EPA Waste Numbers are applicable for wastes of Magnesium Sulfate Heptahydrate.
Disposal Instructions
Dispose of in accordance with all applicable Federal, State or provincial, and local regulations.

* * * Section 14 - Transportation Information * * *

NOTE: The shipping classification information in this section (Section 14) is meant as a guide to the overall classification of the product. However, transportation classifications may be subject to change with changes in package size. Consult shipper requirements under I.M.O., I.C.A.O. (I.A.T.A.) and 49 CFR to assure regulatory compliance.
US DOT Information
Shipping Name: Not Regulated
Hazard Class: Not Classified
UN/NA #: Not Classified
Packing Group: None
Required Label(s): None
50th Edition International Air Transport Association (IATA):
For Shipments by Air transport: This information applies to air shipments both within the U.S. and for shipments originating in the U.S., but being shipped to a different country.
UN/NA #: UN 3077
Proper Shipping Name: Environmentally Hazardous Substance, solid, n.o.s. (Magnesium Sulfate Heptahydrate)
Hazard Class: 9 (Miscellaneous Dangerous Goods)
Packing Group: III
Passenger & Cargo Aircraft Packing Instruction: 911
Passenger & Cargo Aircraft Maximum Net Quantity: 400 kg
Limited Quantity Packing Instruction (Passenger & Cargo Aircraft): Y911
Limited Quantity Maximum Net Quantity (Passenger & Cargo Aircraft): 30 kg G
Cargo Aircraft Only Packing Instruction: 911
Cargo Aircraft Only Maximum Net Quantity: 400 kg
Excepted Quantities: E1
Special Provisions: A97, A158
ERG Code: 9L

Limited Quantity Shipments: Shipments for air must be marked with the Proper Shipping Name Environmentally Hazardous Substance, solid, n.o.s. (Magnesium Sulfate Heptahydrate) and shall be marked with the UN Number (3077) preceded by the letters "UN", placed within a diamond. The width of the line forming the diamond shall be at least 2 mm; the number shall be at least 6 mm high. The total weight of each outer packaging cannot exceed 30 kg.

Excepted Quantities: The maximum quantity of this material per inner receptacle is limited to 30 g per receptacle and the aggregate quantity of this material per completed package does not exceed 1kg. The inner receptacles must be securely packed in an intermediate packaging with cushioning material to prevent movement in the inner receptacles and packed in a strong outer box with a gross mass not to exceed 29kg. The completed package must meet a drop test. The requirements are found in 2.7.6.1. The package must not be opened or otherwise altered until it is no longer in commerce. For air transportation no shipping paper is required. The package must be legibly marked with the following marking:

NOTE: The "*" must be replaced by the primary hazard class, or when assigned, the division of each of the hazardous materials contained in the package. The "**" must be replaced by the name of the shipper or consignee if not shown elsewhere on the package. The symbol shall be not less than 100 mm x 100 mm and must be durable and clearly visible.

International Maritime Organization (I.M.O.) Classification

Magnesium Sulfate Heptahydrate is not regulated under I.M.O.

* * * Section 15 - Regulatory Information * * *

US Federal Regulations

A: General Product Information

None.

B: Component Analysis

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4).

Magnesium Sulfate Heptahydrate (10034-99-8)

CERCLA: Final RQ = Not Applicable

SARA 302 (EHS TPQ) There are no specific Threshold Planning Quantities for Magnesium Sulfate Heptahydrate. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs. (4,540 kg) therefore applies, per 40 CFR 370.20.

C: Sara 311/312 Tier II Hazard Ratings:

Component	CAS #	Fire Hazard	Reactivity Hazard	Pressure Hazard	Immediate Health Hazard	Chronic Health Hazard
Magnesium Sulfate Heptahydrate	10034-99-8	No	No	No	Yes	No

State Regulations

A: General Product Information

Other state regulations may apply.

B: Component Analysis - State

The following components appear on one or more of the following state hazardous substance lists:

Component	CAS #	CA	FL	MA	MN	NJ	PA
Magnesium Sulfate Heptahydrate	10034-99-8	No	No	No	No	No	No

Other Regulations

A: General Product Information

Not determined.

B: Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS
Magnesium Sulfate Heptahydrate	10034-99-8	Yes	Yes	Yes

C: Component Analysis - WHMIS IDL

Magnesium Sulfate Heptahydrate is not identified under the Canadian Hazardous Products Act Ingredient Disclosure List.

Component	CAS #	Minimum Concentration
Magnesium Sulfate Heptahydrate	10034-99-8	No disclosure limit

ANSI Labeling (Z129.1):

CAUTION! MAY CAUSE RESPIRATORY SYSTEM, SKIN AND EYE IRRITATION. HARMFUL IF INGESTED OR INHALED OR BY PROLONGED OR REPEATED SKIN CONTACT. Avoid contact with skin, eyes, or clothing. Do not taste or swallow. Avoid breathing dusts and particulates. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves, goggles, faceshields, suitable body protection, and NIOSH/MSHA-approved respiratory protection, as appropriate. **FIRST-AID:** In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention. **IN CASE OF FIRE:** Use water fog, dry chemical, CO_2, or "alcohol" foam. **IN CASE OF SPILL:** Absorb spill with inert material. Place residue in suitable container. Consult Material Safety Data Sheet for additional information.

* * * Section 16 - Other Information * * *

Other Information

Chem One Ltd. ("Chem One") shall not be responsible for the use of any information, product, method, or apparatus herein presented ("Information"), and you must make your own determination as to its suitability and completeness for your own use, for the protection of the environment, and for health and safety purposes. You assume the entire risk of relying on this Information. In no event shall Chem One be responsible for damages of any nature whatsoever resulting from the use of this product or products, or reliance upon this Information. By providing this Information, Chem One neither can nor intends to control the method or manner by which you use, handle, store, or transport Chem One products. If any materials are mentioned that are not Chem One products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed. Chem One makes no representations or warranties, either express or implied of merchantability, fitness for a particular purpose or of any other nature regarding this information, and nothing herein waives any of Chem One's conditions of sale. This information could include technical inaccuracies or typographical errors. Chem One may make improvements and/or changes in the product (s) and/or the program (s) described in this information at any time. If you have any questions, please contact us at Tel. 713-896-9966 or E-mail us at Safety@chemone.com.

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; WHMIS = Workplace Hazardous Materials Information System

Contact: Sue Palmer-Koleman, PhD **Contact Phone:** (713) 896-9966

Revision log

08/04/00 4:42 PM SEP Changed company name, Sect 1 and 16, from Corporation to Ltd; added "7H20" to chemical formula in Sect 9.

05/14/01 9:31 AM HDF Checked exposure limits; made changes to Sect 9; overall review; add SARA 311/312 Haz Ratings.

08/20/01 1:35 PM CLJ Add Shipments by Air information to Section 14, Changed contact to Sue, non-800 Chemtrec Num.

06/07/03: 9:45 PM HDF General review and up-date of entire MSDS. Up-graded Section 8 to include PNOC exposure limits. Up-date of HMIS categories. Up-date of Section 8. Addition of toxicological data Section 11. Up-date of Section 14.

06/22/05 3:14 PM SEP Update IATA Section 14

10/18/07 4:10 PM SEP Updated IATA Section 14

10/15/08 8:49 AM DLY Changed Chem One Physical Address, Section 1

12/03/2010 4:01 PM SEP Update IATA

This is the end of MSDS # CL-126

Material Safety Data Sheet
Phosphoric acid, 85 wt% solution in water

Section 1 - Chemical Product and Company Identification

MSDS Name:	Phosphoric acid, 85 wt% solution in water
Catalog Numbers:	20114-0000, 20114-0010, 20114-0025, 20114-0050, 20114-5000
Synonyms:	Orthophosphoric acid
Company Identification:	Acros Organics BVBA Janssen Pharmaceuticalaan 3a 2440 Geel, Belgium
Company Identification: (USA)	Acros Organics One Reagent Lane Fair Lawn, NJ 07410
For information in the US, call:	800-ACROS-01
For information in Europe, call:	+32 14 57 52 11
Emergency Number, Europe:	+32 14 57 52 99
Emergency Number US:	201-796-7100
CHEMTREC Phone Number, US:	800-424-9300
CHEMTREC Phone Number, Europe:	703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name:	%	EINECS#	Hazard Symbols:	Risk Phrases:
7664-38-2	Phosphoric acid	85%	231-633-2	C	34
7732-18-5	Water	<15%	231-791-2		

Text for R-phrases: see Section 16

Hazard Symbols: C

Risk Phrases: 34

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Causes burns.Hygroscopic (absorbs moisture from the air).

Potential Health Effects

Eye: May cause irreversible eye injury. Contact with liquid is corrosive to the eyes and

	causes severe burns.
Skin:	Contact with liquid is corrosive and causes severe burns and ulceration.
Ingestion:	Causes severe pain, nausea, vomiting, diarrhea, and shock. May cause hemorrhaging of the digestive tract. May cause corrosion and permanent tissue destruction of the esophagus and digestive tract.
Inhalation:	Irritation may lead to chemical pneumonitis and pulmonary edema. Causes severe irritation of upper respiratory tract with coughing, burns, breathing difficulty, and possible coma.
Chronic:	Prolonged inhalation may cause respiratory tract inflammation and lung damage. Prolonged or repeated skin contact may cause dermatitis. Prolonged or repeated eye contact may cause conjunctivitis.

Section 4 - First Aid Measures

Eyes:	Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.
Skin:	Get medical aid immediately. Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Discard contaminated clothing in a manner which limits further exposure.
Ingestion:	Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Get medical aid immediately.
Inhalation:	Get medical aid immediately. Remove from exposure and move to fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Notes to Physician:	

Section 5 - Fire Fighting Measures

General Information:	As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Wear appropriate protective clothing to prevent contact with skin and eyes. Wear a self-contained breathing apparatus (SCBA) to prevent contact with thermal decomposition products. Substance is noncombustible.
Extinguishing Media:	For small fires, use water spray, dry chemical, carbon dioxide or chemical foam. Use water spray to cool fire-exposed containers. Use water spray, dry chemical, carbon dioxide, or chemical foam.

Section 6 - Accidental Release Measures

General Information:	Use proper personal protective equipment as indicated in Section 8.
Spills/Leaks:	Cover with sand, dry lime or soda ash and place in a closed container for disposal. Flush spill area with water.

Section 7 - Handling and Storage

Handling:	Wash thoroughly after handling. Use only in a well-ventilated area. Do not breathe dust, vapor, mist, or gas. Do not get in eyes, on skin, or on clothing. Use only in a

chemical fume hood.

Storage: Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Corrosives area.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls:

Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low.

Exposure Limits

CAS# 7664-38-2:

United Kingdom, WEL - TWA: 1 mg/m3 TWA United Kingdom, WEL - STEL: 2 mg/m3 STEL

United States OSHA: 1 mg/m3 TWA

Belgium - TWA: 1 mg/m3 VLE Belgium - STEL: 2 mg/m3 VLE

France - VME: 0.2 ppm VME; 1 mg/m3 VME France - VLE: 0.5 ppm VLE; 2 mg/m3 VLE

Germany: 1 mg/m3 TWA

Japan: 1 mg/m3 OEL

Malaysia: 1 mg/m3 TWA

Netherlands: 0.5 ppm STEL; 2 mg/m3 STEL Netherlands: 0.2 ppm MAC; 1 mg/m3 MAC

Spain: 1 mg/m3 VLA-ED Spain: 2 mg/m3 VLA-EC

CAS# 7732-18-5:

Personal Protective Equipment

Eyes: Wear chemical splash goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European

Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Section 9 - Physical and Chemical Properties

Physical State:	Viscous liquid
Color:	APHA: 10 max - Clear
Odor:	odorless
pH:	Not available
Vapor Pressure:	Not available
Viscosity:	Not available
Boiling Point:	158 deg C @760mmHg (316.40°F)
Freezing/Melting Point:	21 deg C (69.80°F)
Autoignition Temperature:	Not available
Flash Point:	Not available
Explosion Limits: Lower:	Not available
Explosion Limits: Upper:	Not available
Decomposition Temperature:	
Solubility in water:	Miscible
Specific Gravity/Density:	1.680
Molecular Formula:	H3O4P
Molecular Weight:	98

Section 10 - Stability and Reactivity

Chemical Stability:	Stable under normal temperatures and pressures.
Conditions to Avoid:	Incompatible materials, metals, excess heat, exposure to moist air or water.
Incompatibilities with Other Materials	Metals, bases, alcohols, amines, halogenated agents, organic peroxides, phenols, steel, alcohols and glycols (e.g. butyl alcohol, ethanol, methanol, ethylene glycol), aldehydes (e.g. acetaldehyde, acrolein, chloral, formaldehyde), amides, azo, diazo, and hydrazines (e.g. dimethyl hydrazine, hydrazine, methyl hydrazine), carbamates (e.g. carbanolate, carbofuran), caustics (e.g. ammonia, ammonium hydroxide, calcium hydroxide, potassium hydroxide, sodium hydroxide), cyanides (e.g. potassium cyanide, sodium cyanide), esters (e.g. butyl acetate, ethyl acetate, propyl formate), fluorides (inorganic, e.g. ammonium fluoride, calcium fluoride, cesium fluoride), halogenated organics (e.g. dibromoethane, hexachlorobenzene, methyl chloride, trichloroethylene), ketones (e.g. acetone, acetophenone, MEK, MIBK), mercaptans and other organic sulfides (e.g. butyl mercaptan, carbon disulfide, methanethiol), phenols and cresols, organophosphates,

	phosphothioates (e.g. methylparathion, parathion, phorate, thionazin), sulfides (inorganic, e.g. ferric sulfide, lead sulfide, sodium sulfide), epoxides (e.g. butyl glycidyl ether), combustible and flammable materials (e.g. alkyl resins, asphalt, gasoline, grease, methyl acetone, polystyrene, polyurethane), explosives (e.g. ammonium nitrate, hydrazoic acid, sodium azide), nitromethane,
Hazardous Decomposition Products	Phosphine, oxides of phosphorus, hydrogen gas.
Hazardous Polymerization	May occur.

Section 11 - Toxicological Information

RTECS#:	CAS# 7664-38-2: TB6300000 CAS# 7732-18-5: ZC0110000
LD50/LC50:	RTECS: **CAS# 7664-38-2:** Draize test, rabbit, eye: 119 mg Severe; Draize test, rabbit, skin: 595 mg/24H Severe; Inhalation, mouse: LC50 = 25.5 mg/m3; Inhalation, rat: LC50 = >850 mg/m3/1H; Inhalation, rat: LC50 = 25.5 mg/m3; Oral, mouse: LD50 = 1.25 gm/kg; Oral, rat: LD50 = 1530 mg/kg; Oral, rat: LD50 = 1.25 gm/kg; Skin, rabbit: LD50 = 2740 mg/kg; . RTECS: **CAS# 7732-18-5:** Oral, rat: LD50 = >90 mL/kg; .
Carcinogenicity:	Phosphoric acid - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65. Water - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
Other:	See actual entry in RTECS for complete information.

Section 12 - Ecological Information

Ecotoxicity: Not available

Section 13 - Disposal Considerations

Dispose of in a manner consistent with federal, state, and local regulations.

Section 14 - Transport Information

	IATA	IMO	RID/ADR
Shipping	PHOSPHORIC ACID,	PHOSPHORIC ACID	PHOSPHORIC ACID,

Name:	SOLUTION	SOLUTION	SOLUTION
Hazard Class:	8	8	8
UN Number:	1805	1805	1805
Packing Group:	III	III	III

USA RQ: CAS# 7664-38-2: 5000 lb final RQ; 2270 kg final RQ

Section 15 - Regulatory Information

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols: C

Risk Phrases:

R 34 Causes burns.

Safety Phrases:

S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

WGK (Water Danger/Protection)

CAS# 7664-38-2: 1

CAS# 7732-18-5: Not available

Canada

CAS# 7664-38-2 is listed on Canada's DSL List

CAS# 7732-18-5 is listed on Canada's DSL List

</ TD>

US Federal

TSCA

CAS# 7664-38-2 is listed on the TSCA Inventory.

CAS# 7732-18-5 is listed on the TSCA Inventory.

Section 16 - Other Information

Text for R-phrases from Section 2

R 34 Causes burns.

MSDS Creation Date: 12/05/1996

Revision #1 Date 10/16/2003

Revisions were made in Sections: General revision.

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