



Application for a State Waste Discharge Permit to Discharge Industrial Wastewater to a Publicly-Owned Treatment Works (POTW)

This application is for a state waste discharge permit for a discharge of industrial wastewater to a publicly-owned treatment works (POTW) as required by Chapter 90.48 RCW and Chapter 173-216 WAC. It is designed to provide Ecology with information on pollutants in the waste stream, materials that may enter the waste stream, and the flow characteristics of the discharge.

Ecology may request additional information to clarify the conditions of this discharge. The applicant should reference information previously submitted to Ecology that applies to this application in the appropriate section.

SECTION A. GENERAL INFORMATION

1. Applicant Name: SGL Automotive Carbon Fiber, LLC

2. Facility Name: SGL Automotive Carbon Fiber - Chinook Site
(if different from Applicant)

3. Applicant Mail Address: 8781 Randolph Road NE
Street

Moses Lake, WA 98837
City/State Zip

4. Facility Location Address: _____
(if different from 3 above) Street

_____ City/State Zip

5. UBI No. 602996887

Sometimes called a registration, tax, "C," or resale number, the Unified Business Identifier (UBI) number is a nine-digit number used to identify persons engaging in business activities. The number is assigned when a person completes a Master Business Application to register with or obtain a license from state agencies. The Departments of Revenue, Licensing, Employment Security, Labor and Industries, and the Corporations Division of the Secretary of State are among the state agencies participating in the UBI program.

6. Latitude/longitude of the facility as decimal degrees (NAD83/WGS84):
47°12'27.42" N / 119°17'14.86" W

FOR OFFICE USE ONLY		Check One:	
		New/Renewal <input type="checkbox"/>	Modification <input type="checkbox"/>
Date Application Received _____	Date Fee Paid _____	Application/ Permit No. _____	Date Application Accepted _____

7. Person to contact who is familiar with the information contained in this application:

Nichol Savko

Name

Environmental Engineer

Title

509-762-4633

Telephone number

Fax number

8. Check One:

Permit Renewal (including renewal of temporary permits)

Does this application request a greater amount of wastewater discharge, a greater amount of pollutant discharge, or a discharge of different pollutants than specified in the last permit application for this facility? YES NO

For permit renewals, the current permit is an attachment, by reference, to this application.

Permit Modification

Existing Unpermitted Discharge

Proposed Discharge

Anticipated date of discharge: _____

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and/or imprisonment for knowing violations.

Signature*



Printed Name

Date

2/26/14

Title

V. P. Operations

*Applications must be signed as follows: corporations, by a principal executive officer of at least the level of vice-president; partnership, by a general partner; sole proprietorship, by the proprietor. If these titles do not apply to your organization, the person who makes budget decisions for this facility must sign the application.

The application signatory may delegate signature authority for submittals required by the permit, such as monthly reports, to a suitable employee. You can delegate this authority to a qualified individual or to a position, which you expect to fill with a qualified individual. If you wish to delegate signature authority, please complete the following:

Signature of delegated employee



Date

2/26/2014

Title or function at the facility

Environmental Engineer

Printed name

Nichol Savko

SECTION B. PRODUCT INFORMATION

- Briefly describe all manufacturing processes and products, and/or commercial activities, at this facility. Provide the applicable Standard Industrial Category (SIC) and the North American Industry Classification System (NAICS) Code(s) for each activity (see *North American Industrial Classification System*, 2007 ed.). You can find the 1997 NAICS codes and the corresponding 1987 Standard Industry Category (SIC) codes at (<http://www.census.gov/epcd/naics/frames3.htm>).

Description: SIC Code - 3624 The manufacturing production of carbon fibers which form the basis for composite fiber materials. Carbon fiber material is organic polymers, characterized by long strings of molecules bound together by carbon atoms. The carbon atoms are bond together in microscopic crystals that are more or less aligned parallel to the long axis of the fiber. The crystal alignment makes the fiber very strong for its size. The density of carbon fiber is considerably lower than the density of steel, making it ideal for applications requiring low weight. The properties of carbon fiber such as high tensile strength, low weight, and low thermal expansion make it very popular in aerospace, civil engineering, military, and motorsports, along with other competition sports. For additional information see the Waste Water Report prepared by Western Pacific Engineering and Survey.

- List raw materials and products used at his facility:

Type	RAW MATERIALS	Quantity
<i>Grapes (Example)</i>		<i>1,000 tons per year</i>
See Attached Raw Materials Table		
Type	PRODUCTS	Quantity
<i>Grape Juice(Example)</i>		<i>300,000 gallons per year</i>
Carbon Fiber		1,500 metric/year/line

SECTION C. PLANT OPERATIONAL CHARACTERISTICS

1. For each process listed in B.1. that generates wastewater, list the process, assign the waste stream a name and an ID # and describe whether it is a batch or continuous flow.

Process	Waste Stream Name	Waste Stream ID#	Batch (B) or Continuous (C) Process
	See Attached Wastewater Steam Diagram		

2. On a separate sheet, produce a schematic drawing showing production processes, water flow through the facility, wastewater treatment devices and waste streams as named above. The drawing should indicate the source of intake water and show the operations contributing wastewater to the effluent. The treatment units should be labeled. Construct a water balance by showing average flows between intakes, operations, treatment units, and points of discharge to the POTW. (See the example on page 16 of this application form.)

3. What is the maximum daily wastewater discharge flow? 235,000 gallons/day

What is the maximum average monthly wastewater discharge flow (daily flows averaged over a month)? 135,000 gallons/day

4. Describe any planned wastewater treatment improvements or changes in wastewater disposal methods, and the schedule for these improvements. (Use additional sheets, if necessary and label as attachment C4.)

N/A

5. If production processes are subject to seasonal variations, provide the following information. The combined value for each month should equal the estimated total monthly flow. Please indicate the proper flow unit by checking one of the following boxes:

- gallons per day
 gallons per month
 million gallons per month

Waste Stream ID#	MONTHS											
	J	F	M	A	M	J	J	A	S	O	N	D
Estimated Total Monthly Flow (GPD)												

6. How many hours a day does this facility typically operate? 24
- How many days a week does this facility typically operate? 7
- How many weeks per year does this facility typically operate? 52

7. List all incidental materials, such as oil, paint, grease, solvents, and cleaners, that are used or stored on site (*list only those with quantities greater than 10 gallons for liquids and 50 pounds for solids*). For solvents and solvent-based cleaners, include a copy of the material safety data sheet and estimate the quantity used. (*Use additional sheets, if necessary, and label as attachment C.7.*)

Materials/Quantity Stored: Industrial Cleaner (similar to Simple Green) - 110 gallons, grease - 55 gallons, Propane - 80 lbs.

- | 8. | Some types of facilities are required to have spill or waste control plans. Does this facility have: | Yes | No |
|----|--|-------------------------------------|-------------------------------------|
| a. | A spill prevention, control, and countermeasure plan (40 CFR 112)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| b. | An Oil Spill Contingency Plan (chapter 173-182 WAC)? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| c. | An emergency response plan (per WAC 173-303-350)? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| d. | A runoff, spillage, or leak control plan (per WAC 173-216-110(f))? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| e. | Any spill or pollution prevention plan required by local, state or federal authorities? If yes specify: <u>WA State Dept. of Ecology</u> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| f. | A solid waste control plan? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| g. | A Slug Discharge Control Plan (40 CFR 403.8(f)(2)(v))? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

SECTION D. WATER CONSUMPTION AND WATER LOSS

1. Potable water source(s):

Public System (Specify) City of Moses Lake

Private Well

Surface Water

a. Water Right Permit Number: _____

b. Legal Description of Water Source

_____ ¼S, _____ ¼E, _____, Section, _____ TWN, _____ R

2. Potable water use

a. Indicate total water use_____

Gallons per day (average) 51,000 gals existing, 141,000 gals proposed

Gallons per day (maximum) 250,000 gals proposed

b. Is water metered?

YES NO

SECTION E. WASTEWATER INFORMATION

1. How are the water intake and effluent flows measured?

Intake: metered

Effluent metered

2. Describe the collection method for the samples analyzed below. (*i.e.*, grab, 24-hour composite). Applicants must collect grab samples (not composites) for analysis of pH, temperature, cyanide, total phenols, residual chlorine, oil and grease, fecal coliform (including *E. coli*), and Enterococci (previously known as fecal streptococcus at § 122.26 (d)(2)(iii)(A)(3)), or volatile organics.

Grab samples

3. Has the effluent been analyzed for any other parameters than those identified in question E.4.? YES NO
If yes, attach results and label as attachment E.4. This data must clearly show the date, method and location of sampling. (*Note: Ecology may require additional testing.*)

4. Provide measurements or range of measurements for treated wastewater prior to discharge to the POTW for the parameters with an "X" in the left column. If you obtain the application from the internet, contact Ecology's regional office to see if testing for a subset of these parameters is permissible. All analyses (except pH) must be conducted by a laboratory registered or accredited by Ecology (WAC 173-216-125). If this is an application for permit renewal, provide data for the last year for those parameters that are routinely measured. For parameters measured only for this application, place the values under "Maximum." Report the values with units as specified in the parameter name or in the detection level.

The Permittee must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) in the following table unless Ecology approves an alternate method or the method used produces measurable results in the sample and EPA has listed it as an EPA approved method in 40 CFR Part 136. If the Permittee uses an alternative method as allowed above, it must report the test method, DL, and QL on the discharge monitoring report or in the required report.

X	Parameter	Measurement Values			Number of Analyses	Analytical Method Std. Methods 19 th , 20 th edition or EPA	Detection Limit/Quantitation Level
		Minimum	Maximum	Average			
x	BOD (5 day)	15	64	41	6	SM 5210 B	/2 mg/l
	COD					SM 5220 D	/10 mg/l
	Total suspended solids					SM 2540 D	/5 mg/l
	Fixed Dissolved Solids					SM 2540 E	
X	Total dissolved solids	290	538	350	6	SM 2540 C	
X	Conductivity (micromhos/cm)	227	6253	1669	6	SM 2510 B	
X	Ammonia-N as N	0	54.5	22	6	SM 4500-NH ₃ C	/0.3 mg/L
X	pH	2.7	10.1	7.5	6	SM 4500-H	0.1 standard units
	Fecal coliform (organisms/100 mL)					SM 9221 E or 9222 D	
	Total coliform (organisms/100 mL)					SM 9221 B or 9222 B	
	Dissolved oxygen					SM 4500-O C/G	
	Nitrate + nitrite-N as N					SM 4500-NO ₃ E	100 µg/L
X	Total kjeldahl N as N	0	132	35.3	6	SM 4500-N _{org} C/E/FG	300 µg/l
	Ortho-phosphate-P as P					SM 4500-P E/F	10 µg/l
X	Total-phosphorous-P as P	0.2	0.6	0.4	4	SM 4500-P E/P/F	10 µg/l
	Total Oil & grease					EPA 1664A	1.4/5 mg/l
	NWTPH - Dx					Ecology NWTPH Dx	250/250 µg/l
	NWTPH - Gx					Ecology NWTPH Gx	250/250 µg/l
X	Calcium	6.6	23.4	14	6	EPA 200.7	10 µg/l
X	Chloride	8.6	21.5	15	6	SM 4500-Cl C	0.15 µg/l
	Fluoride					SM 4500-F E	.025/0.1 mg/l
X	Magnesium	3.6	10.3	6.4	6	EPA 200.7	10/50 µg/l
X	Potassium	9	21	14	6	EPA 200.7	700/ µg/l
X	Sodium	53	116	78	6	EPA 200.7	29/ µg/l
X	Sulfate	10.8	19.6	14	6	SM 4500-SO ₄ C/D	/200 µg/l
	Arsenic(total)					EPA 200.8	0.1/0.5 µg/l

X	Parameter	Measurement Values			Number of Analyses	Analytical Method Std. Methods 19 th , 20 th edition or EPA	Detection Limit/Quantitation Level
		Minimum	Maximum	Average			
	Barium (total)				EPA 200.8	0.5/2 µg/l	
	Cadmium (total)				EPA 200.8	.05/.25 µg/l	
	Chromium (total)				EPA 200.8	0.2/1 µg/l	
	Copper (total)				EPA 200.8	0.4/2 µg/l	
	Lead (total)				EPA 200.8	0.1/1.5 µg/l	
	Mercury (total) pg/L				EPA 1631E	0.2/0.5 pg/l	
	Molybdenum(total)				EPA 200.8	0.1/0.5 µg/l	
	Nickel(total)				EPA 200.8	0.1/0.5 µg/l	
	Selenium (total)				EPA 200.8	1/1 µg/l	
	Silver (total)				EPA 200.8	.04/.2 µg/l	
	Zinc (total)				EPA 200.8	0.5/2.5 µg/l	

6. Does this facility use any of the following chemicals as raw materials or produce them as part of the manufacturing process, or are they present in the wastewater? YES NO

(The number in the column next to the chemical name is the Chemical Abstract Service (CAS) reference number to aid in identifying the compound.)

If yes, specify how the chemical is used and the quantity used or produced:

METALS, CYANIDE & TOTAL PHENOLS			
Antimony, Total	7440-36-0	Nickel, Total	7440-02-0
Arsenic, Total	7440-38-2	Selenium, Total	7782-49-2
Beryllium, Total	7440-41-7	Silver, Total	7440-22-4
Cadmium, Total	7440-43-9	Thallium, Total	7440-28-0
Chromium (hex) dissolved	18540-29-9	Zinc, Total	7440-66-6
Chromium, Total	7440-47-3		
Copper, Total	7440-50-8	Cyanide, Total	57-12-5
Lead, Total	7439-92-1	Cyanide, Weak Acid Dissociable	
Mercury, Total	7439-97-6	Phenols, Total	

PESTICIDES			
Aldrin	309-00-2	Endrin	72-20-8
alpha-BHC	319-84-6	Endrin Aldehyde	7421-93-4
beta-BHC	319-85-7	Heptachlor	76-44-8
gamma-BHC	58-89-9	Heptachlor Epoxide	1024-57-3
delta-BHC	319-86-8	PCB-1242	53469-21-9
Chlordane	57-74-9	PCB-1254	11097-69-1
4,4'-DDT	50-29-3	PCB-1221	11104-28-2
4,4'-DDE	72-55-9	PCB-1232	11141-16-5
4,4' DDD	72-54-8	PCB-1248	12672-29-6
Dieldrin	60-57-1	PCB-1260	11096-82-5
alpha-Endosulfan	959-98-8	PCB-1016	12674-11-2
beta-Endosulfan	33213-65-9	Toxaphene	8001-35-2
Endosulfan Sulfate	1031-07-8		

VOLATILE COMPOUNDS			
Acrolein	107-02-8		
Acrylonitrile	107-13-1	1,1-Dichloroethylene	75-35-4
Benzene	71-43-2	1,2-Dichloropropane	78-87-5
Bromoform	75-25-2	1,3-dichloropropene (mixed isomers) (1,2-dichloropropylene)	542-75-6
Carbon tetrachloride	56-23-5	Ethylbenzene	100-41-4
Chlorobenzene	108-90-7	Methyl bromide (Bromomethane)	74-83-9
Chloroethane	75-00-3	Methyl chloride (Chloromethane)	74-87-3
2-Chloroethylvinyl Ether	110-75-8	Methylene chloride)	75-09-2
Chloroform	67-66-3	1,1,2,2-Tetrachloroethane	79-34-5
Dibromochloromethane	124-48-1	Tetrachloroethylene	127-18-4
1,2-Dichlorobenzene	95-50-1	Toluene (108-88-3)	
1,3-Dichlorobenzene	(541-73-1)	1,2-Trans-Dichloroethylene (Ethylene dichloride)	156-60-5
1,4-Dichlorobenzene	106-46-7	1,1,1-Trichloroethane	71-55-6
Dichlorobromomethane	75-27-4	1,1,2-Trichloroethane	79-00-5
1,1-Dichloroethane	75-34-3	Trichloroethylene	79-01-6
1,2-Dichloroethane	107-06-2	Vinyl chloride	75-01-4

ACID COMPOUNDS			
2-Chlorophenol	95-57-8	4-nitrophenol	100-02-7
2,4-Dichlorophenol	120-83-2	Parachlorometa cresol (4-chloro-3-methylphenol)	59-50-7
2,4-Dimethylphenol	105-67-9	Pentachlorophenol	87-86-5
4,6-dinitro-o-cresol (2-methyl-4,6,-dinitrophenol)	534-52-1	Phenol	108-95-2
2,4 dinitrophenol	51-28-5	2,4,6-Trichlorophenol	88-06-2
2-Nitrophenol	88-75-5		

BASE/NEUTRAL COMPOUNDS (compounds in bold are Ecology PBTs)			
Acenaphthene	83-32-9	3,3-Dichlorobenzidine	91-94-1
Acenaphthylene	208-96-8	Diethyl phthalate	84-66-2
Anthracene	120-12-7	Dimethyl phthalate	131-11-3
Benzidine	92-87-5	Di-n-butyl phthalate)	84-74-2
Benzyl butyl phthalate	85-68-7	2,4-dinitrotoluene	121-14-2
Benzo(a)anthracene	56-55-3	2,6-dinitrotoluene	606-20-2
Benzo(b)fluoranthene (3,4-benzofluoranthene)	205-99-2	Di-n-octyl phthalate	117-84-0
Benzo(j)fluoranthene	205-82-3	1,2-Diphenylhydrazine (as <i>Azobenzene</i>)	122-66-7
Benzo(k)fluoranthene (11,12-benzofluoranthene)	207-08-9	Fluoranthene	206-44-0
Benzo(r,s,t)pentaphene	189-55-9	Fluorene	86-73-7
Benzo(a)pyrene	50-32-8	Hexachlorobenzene	118-74-1
Benzo(ghi)Perylene	191-24-2	Hexachlorobutadiene	87-68-3
Bis(2-chloroethoxy)methane	111-91-1	Hexachlorocyclopentadiene	77-47-4
Bis(2-chloroethyl)ether	111-44-4	Hexachloroethane	67-72-1
Bis(2-chloroisopropyl)ether	39638-32-9	Indeno(1,2,3-cd)Pyrene	193-39-5
Bis(2-ethylhexyl)phthalate	117-81-7	Isophorone	78-59-1
4-Bromophenyl phenyl ether	101-55-3	3-Methyl cholanthrene	56-49-5
2-Chloronaphthalene	91-58-7	Naphthalene	91-20-3
4-Chlorophenyl phenyl ether	7005-72-3	Nitrobenzene	98-95-3
Chrysene	218-01-9	N-Nitrosodimethylamine	62-75-9
Dibenzo (a,j)acridine	224-42-0	N-Nitrosodi-n-propylamine	621-64-7
Dibenzo (a,h)acridine	226-36-8	N-Nitrosodiphenylamine	86-30-6
Dibenzo(a-h)anthracene (1,2,5,6-dibenzanthracene)	53-70-3	Perylene	198-55-0
Dibenzo(a,e)pyrene	192-65-4	Phenanthrene	85-01-8
Dibenzo(a,h)pyrene	189-64-0	Pyrene	129-00-0
		1,2,4-Trichlorobenzene	120-82-1

7. Are any other pesticides, herbicides or fungicides used at this facility? YES NO

If yes, specify the material and quantity used:

Common household pesticides and herbicides are used in the maintenance of the facility.

8. Are there other pollutants that you know of or believe to be present? YES NO

If yes, specify the pollutants and their concentration if known
(attach laboratory analyses if available as Attachment E8):

9. Is the wastewater being discharged, or proposed for discharge, to the POTW designated as a dangerous waste according to the procedures in Chapter 173-303 WAC?

YES NO DON'T KNOW

10. If the answer to question 9 above is yes, how did the waste designate as a dangerous waste (check appropriate box)?

For Listed and TCLP Characteristic Wastes only, also provide the Dangerous Waste Number(s).

Listed Waste Dangerous Waste Number(s) _____

Characteristic Wastes Dangerous Waste Number(s) _____

Ignitable

Reactive

Corrosive

TCLP

State Only Dangerous Wastes Dangerous Waste Number(s) _____

Toxicity

Persistent

For questions about waste designation under the *Dangerous Waste Regulations*, Chapter 173-303 WAC, contact Ecology's Hazardous Waste and Toxics Program at:

Northwest Regional Office - Bellevue (425) 649-7000

Southwest Regional Office - Lacey (360) 407-6300

Central Regional Office - Yakima (509) 575-2490

Eastern Regional Office - Spokane (509) 329-3400

SECTION F. SEWER INFORMATION

1. Is an inspection and sampling manhole or similar structure available on-site? YES NO
*If yes, attach a map or hand drawing of the facility that shows the location of these structures
(Label as attachment F1 or this may be combined with map in H8, if H8 is applicable to your
facility.)*

SECTION G. OTHER PERMITS

1. List all environmental control permits or approvals needed for this facility; for example, air emission permits.

Air Emission Permit

SECTION H. STORMWATER

1. Do you have coverage under the Washington State Industrial Stormwater NPDES General Permit? YES NO

If yes, please list the permit number here. _____

If no, have you applied for a Washington State Stormwater Industrial Stormwater General Permit? YES NO

If you answered no to both questions above, complete the following questions 2 through 5.

2. Does your facility discharge stormwater: *(Check all that apply)*

To storm sewer system *(provide name of storm sewer system operator: _____)*

Directly to any surface waters of Washington State *(e.g., river, lake, creek, estuary, ocean).*

Specify waterbody name(s) _____

Indirectly to surface waters of Washington State *(i.e., flows over adjacent properties first).*

To a Sanitary Sewer

Directly to ground waters of Washington State via:

Dry well

Drainfield

Other

3. Areas with industrial activities at facility: *(check all that apply)*

Manufacturing Building

Material Handling

Material Storage

Hazardous Waste Treatment, Storage, or Disposal *(Refers to RCRA, Subtitle C Facilities Only)*

Waste Treatment, Storage, or Disposal

Application or Disposal of Wastewaters

Storage and Maintenance of Material Handling Equipment

Vehicle Maintenance

Areas Where Significant Materials Remain

Access Roads and Rail Lines for Shipping and Receiving

Other (please specify): _____

4. Material handling/management practices

a. Types of materials handled and/or stored outdoors: *(check all that apply)*

- | | |
|--|--|
| <input checked="" type="checkbox"/> Solvents | <input type="checkbox"/> Hazardous Wastes |
| <input type="checkbox"/> Scrap Metal | <input type="checkbox"/> Acids or Alkalies |
| <input type="checkbox"/> Petroleum or Petrochemical Products | <input type="checkbox"/> Paints/Coatings |
| <input type="checkbox"/> Plating Products | <input type="checkbox"/> Woodtreating Products |
| <input type="checkbox"/> Pesticides | <input checked="" type="checkbox"/> Other <i>(please list)</i> : <u>anhydrous ammonia, propane</u> |

b. Identify existing management practices employed to reduce pollutants in industrial stormwater discharges: *(check all that apply)*

- | | |
|--|---|
| <input type="checkbox"/> Oil/Water Separator | <input type="checkbox"/> Detention Facilities |
| <input type="checkbox"/> Containment | <input checked="" type="checkbox"/> Infiltration Basins |
| <input checked="" type="checkbox"/> Spill Prevention | <input type="checkbox"/> Operational BMPs |
| <input type="checkbox"/> Surface Leachate Collection | <input type="checkbox"/> Vegetation Management |
| <input type="checkbox"/> Overhead Coverage | <input type="checkbox"/> Other <i>(please list)</i> : _____ |

5. Attach a facility site map showing stormwater drainage/collection areas, disposal areas and discharge points. This may be a hand-drawn map if no other site map is available *(See example on page 16 of this application)*. Label this as attachment H.5.

SECTION I. OTHER INFORMATION

1. Describe liquid wastes or sludges being generated by your facility that are not disposed of in the waste stream(s) and how they are being disposed of. For each type of waste, provide type of waste and the name, address, and phone number of the hauler.

Domestic sewage pumped to City of Moses Lake

Sizing Waste – Picked up and hauled by Emerald Services and taken to Emerald Recycling at 3808 N. Sullivan Suite 11C, Spokane, WA 99216. EPA ID WAH000033156

2. Describe storage areas for raw materials, products, and wastes.

Warehouse building

3. Have you designated the wastes described above according to the applicable YES NO procedures of Dangerous Waste Regulations, Chapter 173-303 WAC?

SECTION J. CERTIFICATIONS

1. Approval by Publicly-Owned Treatment Works [required by WAC 173-216-070(4)(b)]

I approve of the discharge as described in this application. The applicant is:

(Please check the appropriate box below.)

A Significant Industrial User (see Definitions at the end of this Section)

A Categorical Industrial User

Neither of the above

Name and location of sewer system to which this project will be tributary:

Port of Moses Lake

Treatment Works Owner: Port of Moses Lake
Street: 7810 Andrews St. N.E., Ste. 200
City/State: Moses Lake, WA Zip: 98837

Signature of Treatment Works Authority Date Title

Printed Name

2. Application review by Intermediate Sewer Owner at point of discharge (if applicable)

I hereby acknowledge that I have reviewed the application for discharge to this sewer system.

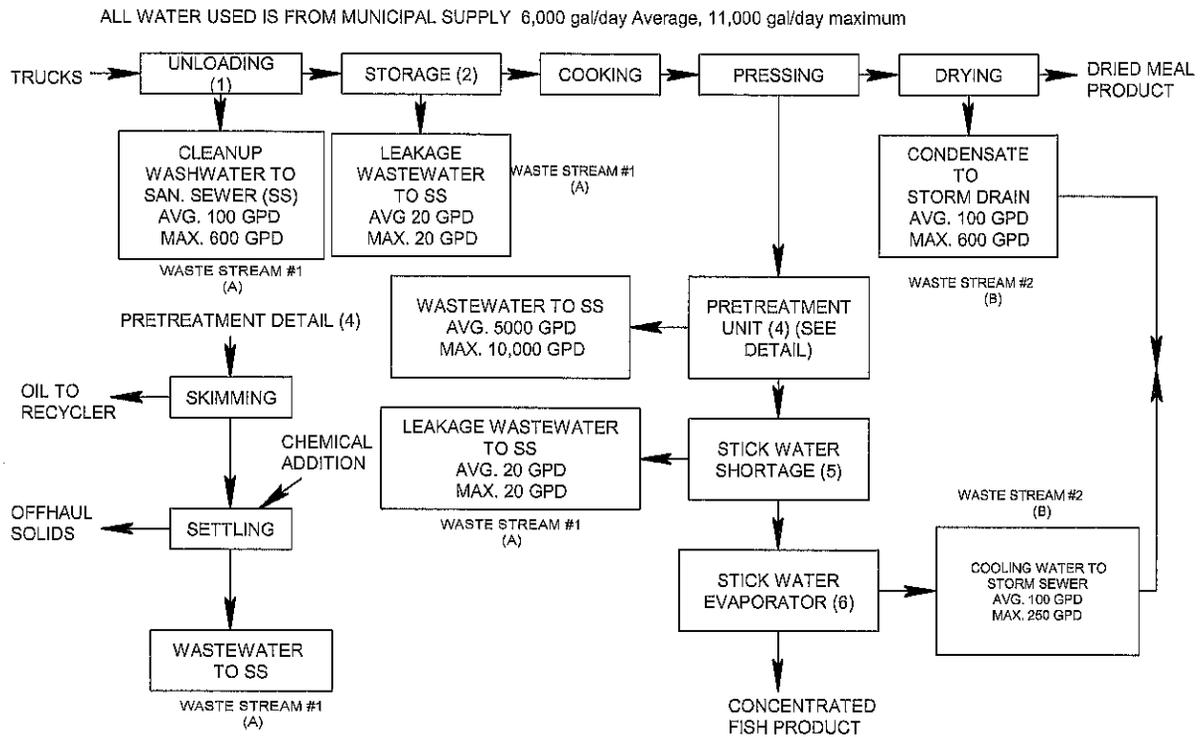
Name and location of sewer system to which this project will be tributary:

Sewer System Owner: _____
Street: _____
City/State: _____ Zip: _____

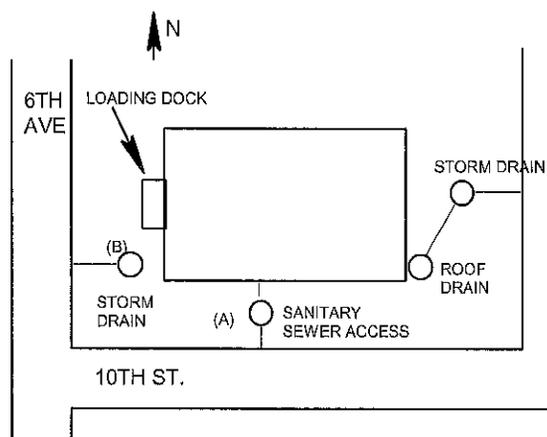
Signature of Sewer System Authority Date Title

Printed Name

Example 1 for application section C.2. (SCHEMATIC DIAGRAM)



Example 2 for application section F1 or H8 (FACILITY SITE MAP)



DEFINITIONS

Significant Industrial User (SIU)--

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N; and
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

Control Authority - means the Washington State Department of Ecology in the case of non-delegated POTWs or means the POTW in the case of delegated POTWs.

Categoric Industrial User (CIU): An industrial user subject to national categorical pretreatment standards promulgated by EPA (40 CFR 403.6 and 40 CFR parts 405-471).

Summary of Attachments That May be Required for This Application:

(Please check those attachments that are included)

- C.2. Production schematic flow diagram and water balance
- C.4. Wastewater treatment improvements
- C.7. Additional incidental materials
- E.8. Additional results of effluent testing
- F.1. Facility site map
- H.5. Stormwater drainage map

If you need this document in a format for the visually impaired, call the Water Quality Program at 360-407-6600. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

Appendices and Attachments

- Raw Materials Table B.2
- MSDS C.7
- Spill & Slug Discharge Control Plans C.8
- Facility Site Map (F.1) Plate 1
- Wastewater Stream Diagram (C.2) Plate 2
- Wastewater Map (H.8) Plate 3
- Stormwater Drainage Map (H.5) Plate 4

B.2

Raw Materials

Type	Quantity (On Site)
Ammonium bicarbonate	270,000 lbs
Anhydrous ammonia	1,000 gallons
Methyl Ethyl Ketone	45 gallons
Pyrofil AH Precursor	1,200,000 lbs
Duroxyn SEF 968	120,000 lbs
Antichlor 30	135 gallons
Vitec 3000	30 gallons
Acetone	45 gallons
Ethanol	12 gallons
All in One BT	600 liters
Caustic	600 liters
Powdered Sulfite	600 liters
Vitec 4000	270 gallons
Bio Power 524	30 gallons
Antichlor 427	165 gallons
Safe-T-Therm heat transfer fluid	660 gallons
909 Cooling Tower Biocide	60 gallons
CTT 20S	60 gallons

Note: values are for 6 lines



C.7

MSDS

Ammonium bicarbonate

Anhydrous ammonia

Methyl Ethyl Ketone

Pyrofil AH Precursor

Duroxyn SEF 968

Antichlor 30

Vitec 3000

Acetone

Ethanol

All in One BT

Caustic

Powdered Sulfite

Vitec 4000

Bio Power 524

Antichlor 427

Safe-T-Therm heat transfer fluid

909 Cooling Tower Biocide

CTT 20S



CHURCH & DWIGHT CO., INC.

CONSUMER PRODUCTS • SPECIALTY PRODUCTS



MATERIAL SAFETY DATA SHEET

MSDS NUMBER: MSDS-976

ISSUE DATE: 10/30/07

PAGE 1 OF 5

1. PRODUCT IDENTIFICATION

Product Name

AMMONIUM BICARBONATE
(Treated and Untreated)

Information Phone:

1-800-631-5591

Medical Emergency Phone:

1-888-234-1828

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

White crystalline powder
Faint ammonia odor
Slight fire hazard
Moderate health hazard
Reportable environmental release.

HMIS Rating

Health	2
Fire	1
Reactivity	1

Potential Health Effects

EYE: A mild eye irritant.

SKIN CONTACT: A moderate skin irritant with potential for skin damage upon prolonged contact with moist material.

INGESTION: Material is moderately toxic. Ingesting amounts greater than a teaspoonful may cause injury.

INHALATION: May cause respiratory irritation.

SUBCHRONIC EFFECTS/CARCINOGENICITY: None known. Not listed as a carcinogen or potential carcinogen by IARC, NTP, OSHA, or ACGIH.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Ingredient (% by Weight)

Ammonium Bicarbonate	99%
Magnesium Carbonate (Treated Version)	0.1-1.0%

CAS Number

1066-33-7
7757-69-9

Contains no other hazardous ingredients at 1% or more as listed or defined in 29 CFR 1910.

4. FIRST AID MEASURES

EYES: Immediately flood eyes with clean flowing water, occasionally lifting upper and lower eyelids. Check for and remove contacts after a few minutes. Continue flushing for 15 minutes. Seek medical attention if irritation occurs.

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CONSUMER PRODUCTS • SPECIALTY PRODUCTS



MATERIAL SAFETY DATA SHEET

MSDS NUMBER: MSDS-976

ISSUE DATE: 10/30/07

PAGE 2 OF 5

SKIN: Rinse exposed areas thoroughly with a large amount of water. Seek medical attention if irritation develops.

INGESTION: If large amounts of this material are swallowed, do not induce vomiting. Administer water if person is conscious. Never give anything by mouth to an unconscious person. Seek medical attention.

INHALATION: Remove victim to fresh air. Give artificial respiration if not breathing. Seek medical attention.

NOTE TO PHYSICIAN: Large ingestion doses present the possibility of sufficient absorption to produce diuresis and systemic ammonia poisoning.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASHPOINT: Not combustible

METHOD USED: Not applicable

EXTINGUISHING MEDIA: Non-combustible material. Use extinguishing media appropriate for surrounding fire.

FIRE-FIGHTING INSTRUCTIONS: Carbon Dioxide and ammonia gas may be generated making necessary the use of a self-contained breathing apparatus (SCBA) and full protective equipment. Carbon dioxide is an asphyxiant at levels over 5% w/w. Flammable limits of ammonia are 16-25% w/w in air.

UNUSUAL FIRE AND EXPLOSION HAZARDS: None known.

FLAMMABLE LIMITS

LFL: Not applicable

UFL: Not applicable

6. ACCIDENTAL RELEASE MEASURES

Scoop into clean, dry waste containers for disposal. Avoid stirring up irritating dusts. Wear appropriate skin, eye, and respiratory protection (See Section 8).

Reportable quantity: 5000 lb. (2270 kg). This product releases ammonia to the environment under normal conditions of processing or use. Ammonia, a toxic chemical, is subject to the reporting requirements of Section 3.3 of the Emergency Planning and Community right-To-Know Act of 1986 and of 40 CFR 372.

<u>Chemical Name</u>	<u>Percent by Weight</u>	<u>CAS #</u>
Ammonia	21.5%	7664-41-7

7. HANDLING AND STORAGE

Store in cool, dry areas and away from incompatible substances (see Section 10). Ammonium Bicarbonate reacts with acids to yield carbon dioxide gas which can accumulate in confined spaces. Do not enter confined spaces until they have been well ventilated and carbon dioxide and oxygen levels have been determined to be safe.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

RESPIRATORY PROTECTION: Dust mask required if total dust level exceeds 10 mg/m³. Air purifying respirator required if ammonia gas concentration exceeds 25 ppm.

CHURCH & DWIGHT CO., INC.

CONSUMER PRODUCTS • SPECIALTY PRODUCTS



MATERIAL SAFETY DATA SHEET

MSDS NUMBER: MSDS-976

ISSUE DATE: 10/30/07

PAGE 3 OF 5

PROTECTIVE GLOVES: General purpose for handling dry product. Impervious gloves when working with solutions.

EYE PROTECTION: Safety glasses or chemical goggles when handling bulk material or when dusts are generated. Avoid wearing contact lenses.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: Full cover clothing. Apron where splashing may occur when working with solutions.

PROTECTIVE WORK/HYGIENIC PRACTICES: No special requirements with respect to chemical exposure beyond those provided above. Specific requirements with respect to equipment and individual applications are the responsibility of the user.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: White crystalline powder.

ODOR: Faint ammonia odor.

PHYSICAL STATE: Solid

pH (1% SOLN. w/v): 8.2

VAPOR PRESSURE: 1 mm at 20°C

VAPOR DENSITY: Not applicable.

BOILING POINT: Not applicable.

FREEZING/MELTING POINT: Not applicable.

SOLUBILITY IN WATER: 17.4 g/100 ml @ 20°C.

BULK DENSITY (g/cc): 51 lb/Ft³

% VOLATILE: Not applicable.

VOLATILE ORGANIC COMPOUNDS: Not applicable.

MOLECULAR WEIGHT: 79.05

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable at room temperature. Decomposes at 49°C (120°F).

CONDITIONS TO AVOID: Temperatures of 49°C or above.

INCOMPATIBILITY WITH OTHER MATERIALS: Reacts with acids to yield carbon dioxide.

HAZARDOUS DECOMPOSITION PRODUCTS: Heating above 49°C may cause dangerous levels of carbon dioxide and ammonia gases to be present in confined spaces.

HAZARDOUS POLYMERIZATION: Not applicable.

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS: The material was mildly irritating to unwashed eyes (rabbit). Irritation cleared by 72 hours. There was no corneal involvement.

SKIN EFFECTS: Moderately irritating to skin. PDII was 2.63 when tested 4 hours semi-occluded. Not toxic dermal- LD₅₀ > 5000 mg/kg.

ACUTE ORAL EFFECTS: Acute Oral (rat) LD₅₀ = 1237 mg/kg.

ACUTE INHALATION: No data available.

CHURCH & DWIGHT CO., INC.

CONSUMER PRODUCTS • SPECIALTY PRODUCTS



MATERIAL SAFETY DATA SHEET

MSDS NUMBER: MSDS-976

ISSUE DATE: 10/30/07

PAGE 4 OF 5

12. ECOLOGICAL INFORMATION

No data available

13. DISPOSAL CONSIDERATIONS

Bury in a secured landfill in accordance with all local, state and federal environmental regulations. Do not release to water.

14. TRANSPORTATION INFORMATION

D.O.T. SHIPPING NAME: Not regulated

TECHNICAL SHIPPING NAME: Ammonium Bicarbonate

D.O.T. HAZARD CLASS: None

U.N./N.A. NUMBER: None

HAZARDOUS SUBSTANCE/RQ: Yes (CERCLA), RQ 5000 lbs. (2270 kg)

D.O.T. LABEL: None

D.O.T. PLACARD: None

15. REGULATORY INFORMATION

CERCLA REPORTABLE QUANTITY: 40 CFR 302.4, Final RQ category D, 5000 lbs. (2270 kg)

Material is reported in the EPA TSCA Inventory List.

FDA: Affirmed as a GRAS direct human food ingredient (21 CFR 184.1135)

EUROPEAN INVENTORY (EINECS): 213-911-5

16. OTHER INFORMATION

SUPERSEDES DATE: 10/30/04

REASON FOR REVISION: ANSI 2007 Update.

For additional non-emergency health, safety and environmental information call 609.279.7705 or write to:

Church & Dwight Co. Inc.
R & D Technical Regulatory Affairs
469 North Harrison Street
Princeton, New Jersey 08543

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Product: Ammonia, Anhydrous	SDS No. P-4562-I February 2012
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1. Chemical Product and Company Identification

Product Name: Ammonia, Anhydrous (MSDS No. P-4562-I)		Trade Names: Ammonia
Chemical Name: Ammonia		Synonyms: Ammonia gas, refrigerant gas R717, spirit of hartshorn
Chemical Family: Amine		Product Grades: 4.5, 5.0, research
Emergency Telephone Numbers: *		Company Name: Praxair, Inc. 39 Old Ridgebury Road Danbury, CT 06810-5113
Onsite emergencies:	1-800-645-4633	
CHEMTREC:	1-800-424-9300	

* Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier, Praxair sales representative, or call 1-800-772-9247.

2. Hazard Identification

EMERGENCY OVERVIEW

**DANGER! Corrosive liquid and gas under pressure.
Harmful if inhaled.**

Can cause eye, skin, and respiratory tract burns.

May cause kidney and respiratory system damage.

Can catch fire.

**Self-contained breathing apparatus and protective clothing
must be worn by rescue workers.**

Under ambient conditions, this is a colorless gas with a pungent, irritating odor.

OSHA REGULATORY STATUS: This material is considered hazardous by the OSHA Hazard Communications Standard (29 CFR 1910.1200).

POTENTIAL HEALTH EFFECTS:

Effects of a Single (Acute) Overexposure

Inhalation. Exposure to concentrations moderately above the TLV may irritate the eyes, nose, and throat. Higher concentrations may cause breathing difficulty; chest pain; bronchospasm; pink, frothy sputum; and pulmonary edema (fluid on the lungs).

Skin Contact. Liquid may cause moderate-to-severe redness, swelling, and ulceration of the skin, depending on the degree and duration of contact. At high concentrations, gas

Product: Ammonia, Anhydrous

SDS No. P-4562-I
February 2012

may cause chemical burns. Prolonged or widespread skin contact may result in the absorption of potentially harmful amounts of material.

Swallowing. An unlikely route of exposure; this product is a gas at normal temperature and pressure. But exposure, should it occur, may cause chemical burns of the mouth, throat, esophagus, and stomach.

Eye Contact. Liquid may cause pain, severe redness, and swelling of the conjunctiva, damage to the iris, corneal opacification, glaucoma, and cataracts. Gas may cause pain and excessive tearing with acute corneal injury at high concentrations.

Effects of Repeated (Chronic) Overexposure. Chronic exposure may cause chemical pneumonitis and kidney damage.

Other Effects of Overexposure. Asphyxiant. Lack of oxygen can kill. Contact with the liquid may cause frostbite.

Medical Conditions Aggravated by Overexposure. Inhalation may aggravate asthma and inflammatory or fibrotic pulmonary disease. Skin irritation may aggravate an existing dermatitis.

CARCINOGENICITY: Ammonia is not listed by NTP, OSHA, or IARC.

POTENTIAL ENVIRONMENTAL EFFECTS: None expected. For further information, see section 12, Ecological Information.

3. Composition/Information on Ingredients

See section 16 for important information about mixtures.

COMPONENT	CAS NUMBER	CONCENTRATION
Ammonia	7664-41-7	>99%*

* The symbol > means "greater than."

4. First Aid Measures

INHALATION: Immediately remove to fresh air. If not breathing, give artificial respiration.

WARNING: Rescuer may receive chemical burns from giving mouth-to-mouth resuscitation. If breathing is difficult, qualified personnel may give oxygen. Keep victim warm. Call a physician.

SKIN CONTACT: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing, shoes, and gloves. Call a physician. Wash clothing before reuse. Discard contaminated shoes.

SWALLOWING: An unlikely route of exposure. This product is a gas at normal temperature and pressure. If patient is fully conscious, give two glasses of water or milk at once. Never give anything by mouth to an unconscious person. Do not induce vomiting. Call a physician.

EYE CONTACT: Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are thoroughly flushed. See a physician, preferably an ophthalmologist, immediately.

Product: Ammonia, Anhydrous

SDS No. P-4562-I
February 2012

NOTES TO PHYSICIAN: *There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.*

5. Fire Fighting Measures

FLAMMABLE PROPERTIES: Forms explosive mixtures with air and oxidizing agents.

SUITABLE EXTINGUISHING MEDIA: CO₂, dry chemical, water spray, or fog.

PRODUCTS OF COMBUSTION: Nitrogen, water, trace amounts of ammonium nitrate and nitrogen dioxide.

PROTECTION OF FIREFIGHTERS: DANGER! Corrosive liquid and gas under pressure. Can catch fire. Evacuate all personnel from danger area. Do not approach area without self-contained breathing apparatus and protective clothing. Immediately spray cylinders with water from maximum distance until cool, taking care not to extinguish flames. Remove sources of ignition if without risk. Remove all cylinders from fire area if without risk; continue cooling water spray while moving cylinders. Stop flow of gas if without risk, or allow flames to burn out. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

Specific Physical and Chemical Hazards. Heat of fire can build pressure in cylinder and cause it to rupture. No part of a cylinder should be subjected to a temperature higher than 125°F (52°C). Cylinders are equipped with a pressure-relief device. (Exceptions may exist where authorized by DOT, in this case where cylinders contain less than 165 pounds of product.) If leaking or spilled product catches fire, do not extinguish flames. Flammable and toxic vapors may spread from leak and could explode if reignited. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering area, especially confined areas, check atmosphere with an appropriate device. Reverse flow into cylinder may cause rupture. To protect persons from cylinder fragments and toxic fumes if a rupture occurs, totally evacuate the area if the fire cannot be brought under immediate control.

Protective Equipment and Precautions for Firefighters. Firefighters should wear self-contained breathing apparatus and full fire-fighting turnout gear.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

DANGER! Corrosive liquid and gas under pressure. Can catch fire. Forms explosive mixtures with air and oxidizing agents.

Personal Precautions. Evacuate all personnel from danger area. Self-contained breathing apparatus and protective clothing must be worn by rescue workers. Remove all sources of ignition if without risk. Reduce vapors with fog or fine water spray. Reverse flow into cylinder may cause rupture. (See section 16.) Shut off flow if without risk. Ventilate area or move cylinder to a well-ventilated area. Flammable vapors may spread from leak. Before entering area, especially confined areas, check atmosphere with an appropriate device.

Product: Ammonia, Anhydrous	SDS No. P-4562-I February 2012
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Environmental Precautions. Prevent waste from contaminating the surrounding environment. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN HANDLING: Do not breathe gas. Do not get vapors or liquid in eyes, on skin, or on clothing. Have safety showers and eyewash fountains immediately available. May form explosive mixtures with air. Keep away from heat, sparks, and open flame. Use only spark-proof tools and explosion-proof equipment. Static ignition hazard can result from handling and use. Store and use with adequate ventilation at all times. Keep away from oxidizing agents and other flammables.

Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open valve. If valve is hard to open, discontinue use and contact your supplier. Close valve after each use; keep closed even when empty. Keep away from oxidizing agents and from other flammables.

PRECAUTIONS TO BE TAKEN IN STORAGE: Store and use with adequate ventilation. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Store only where temperature will not exceed 125°F (52°C). Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

RECOMMENDED PUBLICATIONS: For further information on storage, handling, and use, see Praxair publication P-14-153, *Guidelines for Handling Gas Cylinders and Containers*. Obtain from your local supplier.

8. Exposure Controls/Personal Protection

COMPONENT	OSHA PEL	ACGIH TLV (2011)
Ammonia	50 ppm	25 ppm TLV-TWA; 35 ppm TLV-STEL
IDLH = 300 ppm		

ENGINEERING CONTROLS:

Local Exhaust. Use a local exhaust system, if necessary, to prevent oxygen deficiency and to keep hazardous fumes and gases below all applicable exposure limits in the worker's breathing zone.

Mechanical (General). Not recommended as a primary ventilation system to control worker's exposure.

Special. Use only in a closed system. An explosion-proof, corrosion-resistant, forced-draft fume hood is preferred.

Product: Ammonia, Anhydrous	SDS No. P-4562-I February 2012
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Other. None

PERSONAL PROTECTIVE EQUIPMENT:

Skin Protection. Metatarsal shoes and work gloves for cylinder handling; protective clothing where needed. Wear neoprene gloves during cylinder changeout or wherever contact with product is possible. Select per OSHA 29 CFR 1910.132, 1910.136, and 1910.138.

Eye/Face Protection. Wear safety glasses when handling cylinders; vapor-proof goggles and a face shield during cylinder changeout or wherever contact with product is possible. Select eye protection in accordance with OSHA 29 CFR 1910.133.

Respiratory Protection. A respiratory protection program that meet OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable) requirements must be followed whenever workplace conditions warrant respirator use. Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure (e.g., an organic vapor cartridge). For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus.

9. Physical and Chemical Properties

APPEARANCE:	Colorless gas
ODOR:	Pungent, irritating
ODOR THRESHOLD:	Not available.
PHYSICAL STATE:	Gas at normal temperature and pressure
pH:	Not applicable.
MELTING POINT at 1 atm:	-107.93°F (-77.74°C)
BOILING POINT at 1 atm:	-28.17°F (-33.43°C)
FLASH POINT (test method):	Flammable Gas
EVAPORATION RATE (Butyl Acetate = 1):	High
FLAMMABILITY:	Flammable
FLAMMABLE LIMITS IN AIR , % by volume:	LOWER: 16% UPPER: 25%
VAPOR PRESSURE at 70°F (21.1°C):	128.8 psia (888 kPa abs)
VAPOR DENSITY at 70°F (21.1°C) and 1 atm:	0.0440 lb/ft ³ (0.705 kg/m ³)
SPECIFIC GRAVITY (H ₂ O = 1) at 27.4°F/ 39.2°F (-33°C/4°C):	0.6819
SPECIFIC GRAVITY (Air = 1) at 32°F (0°C) and 1 atm:	0.588
SOLUBILITY IN WATER , vol (liq.)/vol (liq.) at 68°F (20°C) and 1 atm:	Total
PARTITION COEFFICIENT: n-octanol/water:	Not available.
AUTOIGNITION TEMPERATURE:	1204°F (651.1°C)
DECOMPOSITION TEMPERATURE:	Not available.
PERCENT VOLATILES BY VOLUME:	100
MOLECULAR WEIGHT:	17.031
MOLECULAR FORMULA:	NH ₃

Product: Ammonia, Anhydrous

SDS No. P-4562-I
February 2012

10. Stability and Reactivity

CHEMICAL STABILITY: Unstable Stable

CONDITIONS TO AVOID: None known.

INCOMPATIBLE MATERIALS: Gold, silver, mercury, oxidizing agents, halogens, halogenated compounds, acids, copper, copper-zinc alloys (brass), chlorates, zinc.

HAZARDOUS DECOMPOSITION PRODUCTS: The normal products of combustion are nitrogen and water. Hydrogen may be formed at temperatures above 1,544°F (840°C).

POSSIBILITY OF HAZARDOUS REACTIONS: May Occur Will Not Occur

Contact with incompatible materials may result in explosive or violent reactions or form explosive mixtures with air.

11. Toxicological Information

ACUTE DOSE EFFECTS: LC₅₀ = 7338 ppm, 1 hr, rat.

MUTAGENIC EFFECTS: In-vitro studies have shown toxic levels of ammonia to be mutagenic in e-coli bacteria. Mutagenic effects have also been reported in drosophilia (fruit flies). There is no evidence that ammonia is mutagenic in mammals.

12. Ecological Information

ECOTOXICITY: No adverse ecological effects expected.

OTHER ADVERSE EFFECTS: Ammonia does not contain any Class I or Class II ozone-depleting chemicals.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier.

Product: Ammonia, Anhydrous	SDS No. P-4562-I February 2012
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14. Transport Information

DOT/IMO SHIPPING NAME:	Ammonia, anhydrous		
HAZARD CLASS:	IDENTIFICATION NUMBER:	PRODUCT RQ:	
2.2 (domestic shipment) 2.3 (international shipment)	UN1005	100 lb (45.4 kg)	
SHIPPING LABEL(s):	Domestic Shipment: NONFLAMMABLE GAS with the words "inhalation hazard" shown near the proper shipping name on the label or on the cylinder near the diamond label. International Shipment: POISON GAS, CORROSIVE*		
PLACARD (when required):	Domestic Shipment: NONFLAMMABLE GAS International Shipment: POISON GAS, CORROSIVE*		

*The POISON GAS diamond must be as shown in the UN Model Regulations. In addition, a (domestic) POISON GAS label with the words INHALATION HAZARD must be applied to the cylinder near the international POISON GAS label.

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, non-ventilated compartment of a vehicle can present serious safety hazards.

Additional Marking Requirement: INHALATION HAZARD

Shipment of compressed gas cylinders that have been filled without the owner's consent is a violation of federal law [49 CFR 173.301(e)].

MARINE POLLUTANTS: Ammonia is not listed as a marine pollutant by DOT.

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

U.S. FEDERAL REGULATIONS:

EPA (ENVIRONMENTAL PROTECTION AGENCY)

CERCLA: COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (40 CFR Parts 117 and 302):

Reportable Quantity (RQ): 100 lb (45.4 kg)

SARA: SUPERFUND AMENDMENT AND REAUTHORIZATION ACT:

SECTIONS 302/304: Require emergency planning based on Threshold Planning Quantity (TPQ) and release reporting based on Reportable Quantities (RQ) of Extremely Hazardous Substances (EHS) (40 CFR Part 355):

TPQ: 500 lb (226.8 kg)

EHS RQ (40 CFR 355): 100 lb (45.4 kg)

Product: Ammonia, Anhydrous

SDS No. P-4562-I
February 2012

SECTIONS 311/312: Require submission of MSDSs and reporting of chemical inventories with identification of EPA hazard categories. The hazard categories for this product are as follows:

IMMEDIATE: Yes

DELAYED: Yes

PRESSURE: Yes

REACTIVITY: No

FIRE: Yes

SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

Ammonia is subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA) and 40CFR Part 372.

40 CFR 68: RISK MANAGEMENT PROGRAM FOR CHEMICAL ACCIDENTAL RELEASE PREVENTION: Requires development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Ammonia, anhydrous is listed as a regulated substance in quantities of 10,000 lb (4536 kg) or greater.

TSCA: TOXIC SUBSTANCES CONTROL ACT: Ammonia is listed on the TSCA inventory.

OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR 1910.119: PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS: Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

Ammonia, anhydrous is listed in Appendix A as a highly hazardous chemical in quantities of 10,000 lb (4536 kg) or greater.

STATE REGULATIONS:

CALIFORNIA: Ammonia is not listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).

PENNSYLVANIA: Ammonia is subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320).

16. Other Information

Read and understand all labels and instructions supplied with all containers of this product.

OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE: *Corrosive liquid and gas under pressure.* Use only with compatible materials and equipment. Use only in a closed system. Prevent reverse flow. Reverse flow into cylinder may cause rupture. Use a check valve or other backflow prevention device in any line or piping from the cylinder. Ground all equipment. Electrical equipment must be non-sparking or explosion-proof. Never work on a pressurized system. If there is a leak, close the cylinder valve. Blow down the system in a safe and environmentally sound manner in compliance with all federal, state, and local laws; then repair the leak. Follow safe practices when returning cylinder to supplier, be sure valve is

Product: Ammonia, Anhydrous	SDS No. P-4562-I February 2012
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closed; then install valve outlet plug, leak-tight. Never place a compressed gas cylinder where it may become part of an electrical circuit.

NOTE: Prior to using any plastics, confirm their compatibility with ammonia.

Mixtures. When you mix two or more gases or liquefied gases, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Remember, gases and liquids have properties that can cause serious injury or death.

RECOMMENDED EQUIPMENT: In semiconductor process gas and other suitable applications, Praxair recommends the use of engineering controls such as gas cabinet enclosures, automatic gas panels (used to purge systems on cylinder changeout), excess-flow valves throughout the gas distribution system, double containment for the distribution system, continuous gas monitors, fire sprinkler, heat sensor for fire monitoring and Class 1, Division 2 Hazard Class electrical inside the gas cabinet.

HAZARD RATING SYSTEMS:

NFPA RATINGS:

HEALTH = 3 (gas), 3 (liq.)
 FLAMMABILITY = 1 (gas), 1 (liq.)
 INSTABILITY = 0 (gas), 0 (liq.)
 SPECIAL = None

HMIS RATINGS:

HEALTH = 3
 FLAMMABILITY = 1
 PHYSICAL HAZARD = 2

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

THREADED: CGA-705, CGA-240 standard, CGA-660 limited standard

PIN-INDEXED YOKE: Not applicable.

ULTRA-HIGH-INTEGRITY CONNECTION: CGA-720

Use the proper CGA connections. **DO NOT USE ADAPTERS.** Additional limited-standard connections may apply. See CGA pamphlet V-1 listed below.

Ask your supplier about free Praxair safety literature as referred to in this MSDS and on the label for this product. Further information about this product can be found in the following pamphlets published by the Compressed Gas Association, Inc. (CGA), www.cganet.com.

- P-1 *Safe Handling of Compressed Gases in Containers*
- V-1 *Compressed Gas Cylinder Valve Inlet and Outlet Connections*
- *Handbook of Compressed Gases*

Praxair Material Safety Data Sheet

Product: Ammonia, Anhydrous

SDS No. P-4562-I
February 2012

Praxair asks users of this product to study this MSDS and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this MSDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

Praxair MSDSs are furnished on sale or delivery by Praxair or the independent distributors and suppliers who package and sell our products. To obtain current MSDSs for these products, contact your Praxair sales representative or local distributor or supplier. If you have questions regarding Praxair MSDSs, would like the form number and date of the latest MSDS, or would like the names of the Praxair suppliers in your area, phone or write the Praxair Call Center (**Phone:** 1-800-PRAXAIR; **Address:** Praxair Call Center, Praxair, Inc., PO Box 44, Tonawanda, NY 14151-0044).

Praxair and the *Flowing Airstream* design are trademarks or registered trademarks of Praxair Technology, Inc. in the United States and/or other countries.



Praxair, Inc.
39 Old Ridgebury Road
Danbury, CT 06810-
5113

MSDS Number: **M4628** * * * * * *Effective Date: 08/17/05* * * * * * *Supersedes:*
07/07/04

MSDS MATERIAL SAFETY DATA SHEET
(USA)

CHEMTREC: 800-424-9300

----- 703-527-3887(Outside USA and Canada)

CANUTEC: 613-996-6666

From: Mallinckrodt Baker, Inc
222 Red School Lane
Phillipsburg, NJ 08865
CANUTEC

NOTE: Use CHEMTREC and

phone numbers only in the

event

Emergency Telephone Number: 908-859-2151

of a chemical emergency.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

M A L L I N C K R O D T

J. T. B A K E R

METHYL ETHYL KETONE

1. Product Identification

Synonyms: 2-Butanone; ethyl methyl ketone; MEK; Methyl acetone

CAS No.: 78-93-3

Molecular Weight: 72.11

Chemical Formula: CH₃COCH₂CH₃

Product Codes:

J.T. Baker: 5385, 9214, 9319, 9323, 9414, Q531

Mallinckrodt: 6206, 6233, 6240, 6243

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent
Hazardous	-----	-----
-----	-----	-----

3. Hazards Identification

Emergency Overview

DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL OR FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. AFFECTS CENTRAL NERVOUS SYSTEM. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.

SAF-T-DATA^(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate (Life)

Flammability Rating: 3 - Severe (Flammable)

Reactivity Rating: 1 - Slight

Contact Rating: 2 - Moderate

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD;
PROPER GLOVES; CLASS B EXTINGUISHER

Storage Color Code: Red (Flammable)

Potential Health Effects

Inhalation:

Causes irritation to the nose and throat. Concentrations above the TLV may cause headache, dizziness, nausea, shortness of breath, and vomiting. Higher concentrations may cause central nervous system depression and unconsciousness.

Ingestion:

May produce abdominal pain, nausea. Aspiration into lungs can produce severe lung damage and is a medical emergency. Other symptoms expected to parallel inhalation.

Skin Contact:

Causes irritation to skin. Symptoms include redness, itching, and pain. May be absorbed through the skin with possible systemic effects.

Eye Contact:

Vapors are irritating to the eyes. Splashes can produce painful irritation and eye damage.

Chronic Exposure:

Prolonged skin contact may defat the skin and produce dermatitis. Chronic exposure may cause central nervous system effects.

Aggravation of Pre-existing Conditions:

Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance.

4. First Aid Measures

Inhalation:

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

Ingestion:

Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately.

Skin Contact:

Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact:

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

5. Fire Fighting Measures

Fire:

Flash point: -9C (16F) CC

Autoignition temperature: 404C (759F)

Flammable limits in air % by volume:

l_{el}: 1.4; u_{el}: 11.4

Extremely Flammable.

Explosion:

Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Vapors can flow along surfaces to distant ignition source and flash back. Contact with strong oxidizers may cause fire. Sealed containers may rupture when heated. Sensitive to static discharge.

Fire Extinguishing Media:

Dry chemical, foam or carbon dioxide. Water spray may be used to keep fire exposed containers cool, dilute spills to nonflammable mixtures, protect personnel attempting to stop leak and disperse vapors.

Special Information:

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. This highly flammable liquid must be kept from sparks, open flame, hot surfaces, and all sources of heat and ignition.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker SOLUSORB® solvent adsorbent is recommended for spills of this product.

7. Handling and Storage

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:

-OSHA Permissible Exposure Limit (PEL):

200 ppm (TWA)

-ACGIH Threshold Limit Value (TLV):

200 ppm (TWA), 300 ppm (STEL)

Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details. Use explosion-proof equipment.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respirator with organic vapor cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. **WARNING:** Air purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Butyl rubber is a suitable material for personal protective equipment.

Eye Protection:

Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

9. Physical and Chemical Properties

Appearance:

Clear, colorless liquid.

Odor:

Sharp mint-like odor.

Solubility:

29 g in 100 g of water.

Specific Gravity:

0.81 @ 20C/4C

pH:

No information found.

% Volatiles by volume @ 21C (70F):

100

Boiling Point:

80C (176F)

Melting Point:

-86C (-123F)

Vapor Density (Air=1):

2.5

Vapor Pressure (mm Hg):

78 @ 20C (68F)

Evaporation Rate (BuAc=1):

2.7 (Ether = 1)

10. Stability and Reactivity

Stability:

Stable under ordinary conditions of use and storage.

Hazardous Decomposition Products:

Carbon dioxide and carbon monoxide may form when heated to decomposition.

Hazardous Polymerization:

Will not occur.

Incompatibilities:

Oxidizing materials, caustics, amines, ammonia, strong bases, chloroform, chlorosulfonic acid, oleum, potassium-t-butoxide, heat or flame, hydrogen peroxide, nitric acid. Can attack many plastics, resins and rubber.

Conditions to Avoid:

Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Toxicological Data:

Oral rat LD50: 2737 mg/kg; inhalation rat LC50: 23,500 mg/m³/8-hr; skin rabbit LD50: 6480 mg/kg; investigated as a mutagen, reproductive effector.

Reproductive Toxicity:

Has shown teratogenic effects in laboratory animals.

Ingredient Category	---NTP Carcinogen---		IARC
	Known	Anticipated	
Methyl Ethyl Ketone (78-93-3)	No	No	
None			

12. Ecological Information

Environmental Fate:

When released into the soil, this material may leach into groundwater. When released into the soil, this material may evaporate to a moderate extent. When released into water, this material may biodegrade to a moderate extent. When released into water, this material may evaporate to a moderate extent. When released into water, this material is expected to have a half-life between 10 and 30 days. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life between 1 and 10 days.

Environmental Toxicity:

This material is not expected to be toxic to aquatic life. The LC50/96-hour values for fish are over 100 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: ETHYL METHYL KETONE
Hazard Class: 3
UN/NA: UN1193
Packing Group: II
Information reported for product/size: 366LB

International (Water, I.M.O.)

Proper Shipping Name: ETHYL METHYL KETONE
Hazard Class: 3
UN/NA: UN1193
Packing Group: II
Information reported for product/size: 366LB

15. Regulatory Information

```
-----\Chemical Inventory Status - Part 1\-----  
-----  
Ingredient                                TSCA  EC   Japan  
Australia  
-----  
Methyl Ethyl Ketone (78-93-3)           Yes  Yes  Yes  
Yes
```

```
-----\Chemical Inventory Status - Part 2\-----  
-----  
Ingredient                                Korea  DSL  NDSL  --Canada--  
Phil.  
-----  
-----
```

Methyl Ethyl Ketone (78-93-3)	Yes	Yes	No
Yes			
-----\Federal, State & International Regulations - Part 1\-----			
313-----	-SARA 302-	-----SARA	
Ingredient	RQ	TPQ	List
Chemical Catg.			

Methyl Ethyl Ketone (78-93-3)	No	No	Yes
No			
-----\Federal, State & International Regulations - Part 2\-----			
TSCA-		-RCRA-	-
Ingredient	CERCLA	261.33	8(d)

Methyl Ethyl Ketone (78-93-3)	5000	U159	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
Reactivity: No (Pure / Liquid)

Australian Hazchem Code: 2[Y]E

Poison Schedule: S5

WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. Other Information

NFPA Ratings: Health: **1** Flammability: **3** Reactivity: **0**

Label Hazard Warning:

DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL OR FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. AFFECTS CENTRAL NERVOUS SYSTEM. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.

Label Precautions:

- Keep away from heat, sparks and flame.
- Keep container closed.
- Use only with adequate ventilation.
- Wash thoroughly after handling.
- Avoid breathing vapor.
- Avoid contact with eyes, skin and clothing.

Label First Aid:

Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases, get medical attention.

Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 3.

Disclaimer:

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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

Material Safety Data Sheet

Product Name: Pyrofil AH Precursor

MSDS No.: 010-002-1E(EU)

Published on Nov/26/2009

1. Identification of Supplier and Chemical

MSDS Number: 010-002-1E(EU)

Manufacturer' Company Mitsubishi Rayon Co., Ltd

Information Acrylonitrile business unit

Address 6-41, Konan 1-chome, Minato-ku, Tokyo, 108-8506, Japan

Phone: +81-(0)3-5495-3046

Facsimile: +81-(0)3-5495-3206

Emergency Call +81-(0)3-5495-3046

(Japan day time only)

Published date : Nov.26.2009

Rev. : N/A

Product name : Pyrofil AH Precursor

Product Designation: AH150H

Recommendation for Use : Carbon fiber manufacturing

2. Hazards information

GHS Classification

Physical Hazards

Explosives	Not classified
Flammable Gases	Not classified
Flammable Aerosols	Not classified
Oxidizing Gases	Not classified
Gases under pressure	Not classified
Flammable Liquids	Not classified
Flammable Solids	Not classified
Self-reactive Substances and Mixtures	Not classified
Pyrophoric Liquids	Not classified
Pyrophoric Solids	Not classified
Self-heating substances and mixtures	Not classified
Substances and Mixtures, Which in contact with water, emit flammable gases	Not classified
Oxidizing Liquids	Not classified
Oxidizing Solids	Not classified
Organic Peroxides	Not classified

Material Safety Data Sheet

Product Name: Pyrofil AH Precursor

MSDS No.: 010-002-1E(EU)

Published on Nov/26/2009

Corrosive to metals	Not available
Health and Environmental Hazards	
Acute Toxicity: Oral	Not available
Acute Toxicity: Skin	Not available
Acute Toxicity: Inhalation (Gases)	Not classified
Acute Toxicity: Inhalation (Vapor)	Not available
Acute Toxicity: Inhalation (Fine Particle, Mist)	Not available
Skin Corrosion/Irritation	Category 3
Serious sys damage/ Eye irritation	Category 2B
Respiratory sensitization	Not available
Skin sensitization	Not classified
Germ cell mutagenicity	Not classified
Carcinogenicity	Not classified
Toxic to reproduction	Not available
Specific target organ systemic toxicity (Single exposure)	Not available
Specific target organ systemic toxicity (Repeated exposure)	Not available
Aspiration hazard	Not available
Aquatic toxicity (Acute)	Not classified
Aquatic toxicity (Chronic)	Not classified

Label Element	Pictogram	(Not Classified)
	Signal Word	Warning
Hazard	Causes skin irritation	
Statements	Causes eye irritation	
Precautionary Statements	IF ON SKIN: Wash with plenty of soap and water.	
	Remove/Take off immediately all contaminated clothing. Wash contaminated clothing before reuse.	
	If skin irritation occurs: Get medical advice/attention.	
	IF IN EYE: Rinse cautiously with water for several minutes.	
	Remove contact lenses, if present and easy to do. Continue rinsing.	
	If eye irritation persists: Get medical advice/attention.	

Material Safety Data Sheet

Product Name: Pyrofil AH Precursor

MSDS No.: 010-002-1E(EU)

Published on Nov/26/2009

3. Composition/ Information on ingredients

Common name: Acrylic fiber

Synonyms: Poly acrylonitriles

Components and Contents

Components	Content (%)	CAS No. as substance
Acrylic Fiber	Over 95	Trade Secret
Silicone Oils	Less than 2	Trade Secret

4. First aid measures

Inhalation: : Call a POISON CENTER or doctor/physician if you feel unwell.

Eye contact: : Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Skin contact: : Wash with plenty of soap and water.
Remove/Take off immediately all contaminated clothing.
Wash contaminated clothing before reuse.
If skin irritation occurs: Get medical advice/attention.

Ingestion: : Induce vomiting immediately and Get medical advice/attention.

Special notification : Show precaution written on the product or this MSDS.
to physician

5. Fire-fighting measures

Suitable Extinguishing Media : Carbon dioxide, extinguishing powder, foam, Water

Unsuitable extinguishing media : Allow spraying water for cooling down.

Specific Hazards Arising from the rising Chemical : Development of hazardous gases or vapours possible in the event of fire. The following may develop in event of fire: Carbon monoxide, hydrogen cyanide, ammonia, unsaturated hydrocarbon, and nitrogen oxides.

Extinguishing method : Extinguish fire from windward.

Special protective device : In order to avoid swallowing the hazardous gases, wear suitable protective clothing with self-contained breathing apparatus.

6. Accidental release measures

Material Safety Data Sheet

Product Name: Pyrofil AH Precursor

MSDS No.: 010-002-1E(EU)

Published on Nov/26/2009

Personal precaution: No special requirement

Spill Procedure: No special requirement

Waste Disposal Methods: Dispose in accordance with Federal, State & Local regulation.

Environmental precautions: Prevent product from entering drains. Do not contaminate surface water.

7. Handling and storage

Handling: Too heavy. Comply with OSHA regulation.

Wearing protective gloves is recommended.

If on skin, wash with plenty of soap and water.

Storage: Conditions for safe storage:

Keep away from heat/sparks/open flames/hot surfaces.

Protect from moisture and rain.

Protect from sunlight.

Package: Use the materials to protect from water and stain or moisture.

8. Exposure controls/personal protection

Exposure limits: OSHA PEL Not Established

ACGIH TLV Not Established

Ventilation: No Special requirement.

Respiratory protection: No Special requirement.

Hand protection:



Protective Gloves, in case of sensitive skin.

The glove material has to be impermeable and resistant to the product.

Eye protection:



Safety goggles

Skin and body protection: Well-washed standard issue work cloths. Safety boots.

Other protective equipment: In case of sensitive skin, wear protective clothing/face protection.

General hygiene: Wash hands with soap and water after use.

9. Physical and chemical properties

Appearance: Fiber. Ivory

Material Safety Data Sheet

Product Name: Pyrofil AH Precursor

MSDS No.: 010-002-1E(EU)

Published on Nov/26/2009

Odor: Odorless
Boiling point: Not applicable
Melting point: Not applicable
Flash point: over 270°C
Flammability (solid, gas): Flammable
Vapor pressure: Not available
Decomposition point: over 200°C
Volatility: Not applicable
Specific gravity: 1.15~1.20
Solubility: Insoluble in water (Acrylic fiber)

10. Stability and reactivity

Combustibility: Stable under normal temperatures and pressures

Flash point: over 270°C

Possibility of Negligible

hazardous reactions:

Conditions to avoid: No applicable data

Hazardous decomposition products: Carbon monoxide, hydrogen cyanide, ammonia, unsaturated hydrocarbon, nitrogen oxides(over 200°C)

11. TOXICOLOGICAL INFORMATION

This product itself has not been specifically tested for toxicological properties.

Acute toxicity Oral/ Dermal/ Inhalation Oral (LD50): No data available
/Skin: Skin (LD50): No data available

Irritation Eye: Irritating effects by Silicone oils

Skin: Irritating effects by Silicone oils

Sensitization: Sensitization possible through skin contact.

Repeated Dose Toxicity: No data available

Chronic Toxicity: No data available

Mutagenicity: No data available

Carcinogenicity: No effective information.

There has been so far no report of positive cases that carbon fiber might have caused to human body. Organizations including IPCS, IARC, WHO and ILO consider there is no evidence of carbon fiber as hazardous and it is not listed in the classification of carcinogenicity for various substances.

Material Safety Data Sheet

Product Name: Pyrofil AH Precursor

MSDS No.: 010-002-1E(EU)

Published on Nov/26/2009

Reproductive and development No data available

Toxicity:

12. ECOLOGICAL INFORMATION

Aquatic toxicity

Aquatic toxicity (Acute) : No data available

Aquatic toxicity (Chronic) : No data available

Ecotoxicity : No data available

Persistence and Degradability : No data available

Bioaccumulative potential : No data available

Mobility in soil : No data available

13. DISPOSAL CONSIDERATIONS

Dispose as industrial waste according to the laws and regulations of the municipality in accordance with national and local regulations

Do not dump this product in to sewers, on the ground or into any body of water.

14. TRANSPORT INFORMATION

Not dangerous for conveyance under UN, IMO, and IATA/ICAO codes.

Not classified in DOT regulation as dangerous material.

Take sufficient considering against water leakage and breakage of bags.

Follow the other precautions of handling and storage.

15. Regulatory Information

This product is classified in Substance in chemical control law EPA, TSCA.

All of component intended to be used in this product are listed in:

METI (JAPAN): Listed

TSCA (USA) Listed

16. Other Information including information of preparation and revision of the

The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind expressed or implied is made with respect to the information contained herein.

REVISION: 1st Edition: Nov.26.2009

Editorial Group: Carbon Fiber & Composite Materials Administration Department

Material Safety Data Sheet

Product Name: Pyrofil AH Precursor

MSDS No.: 010-002-1E(EU)

Published on Nov/26/2009



MSDS: 0041142
Print Date: 09/03/2009
Revision Date: 09/03/2009

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: DUROXYN® SEF 968w/25WA Liquid Coating Resins
Synonyms: None
Chemical Family: Modified epoxy resin
Molecular Formula: Mixture
Molecular Weight: Mixture

CYTEC INDUSTRIES INC., FIVE GARRET MOUNTAIN PLAZA, WOODLAND PARK, NEW JERSEY 07424, USA
For Product Information call 1-800/652-6013. Outside the USA and Canada call 1-973/357-3193.

EMERGENCY PHONE (24 hours/day) - For emergency involving spill, leak, fire, exposure or accident call:

Asia Pacific Region:

Australia - +61-3-9663-2130 or 1800-033-111
China (PRC) - +86(0)532-8388-9090 (NRCC)
New Guinea - +61-3-9663-2130
New Zealand - +61-3-9663-2130 or 0800-734-607
All Others - +65-633-44-177 (CareChem24 Singapore)
Canada: 1-905-356-8310 (Cyttec Welland, Canada plant)
Europe/Africa/Middle East: +44-(0)208-762-8322 (CareChem24 UK)

Latin America:

Brazil - 0800 0111 767 (SOS Cotec)
Chile - +56-2-247-3600 (CITUC QUÍMICO)
All Others - +52-376-73 74122 (Cyttec Atequiza, Mexico plant)
USA: +1-703-527-3887 or 1-800-424-9300 (CHEMTREC)

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2. COMPOSITION/INFORMATION ON INGREDIENTS

OSHA REGULATED COMPONENTS

No Permissible Exposure Limits (PEL/TLV) have been established by OSHA or ACGIH.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE AND ODOR:

Color: translucent to opaque white
Appearance: low viscosity liquid
Odor: weak

STATEMENTS OF HAZARD:

CAUTION! MAY CAUSE EYE AND SKIN IRRITATION

POTENTIAL HEALTH EFFECTS

EFFECTS OF EXPOSURE:

Acute oral (rat) and dermal (rabbit) LD50 values are estimated to be greater than 5,000 mg/kg and greater than 2,000 mg/kg, respectively. The 4-hour inhalation LC50 (rat) value is estimated to be greater than 20 mg/L. Direct contact with this material may cause mild eye and skin irritation. Refer to Section 11 for toxicology information on the regulated components of this product.

4. FIRST AID MEASURES

Ingestion:

If swallowed, call a physician immediately. Only induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.

Skin Contact:

Wash immediately with plenty of water and soap.

Eye Contact:

Rinse immediately with plenty of water for at least 15 minutes.

Inhalation:

Remove to fresh air. If breathing is difficult, give oxygen. Obtain medical advice if there are persistent symptoms.

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media:

Use water spray or fog, carbon dioxide or dry chemical.

Protective Equipment:

Firefighters, and others exposed, wear self-contained breathing apparatus.

Special Hazards:

Keep containers cool by spraying with water if exposed to fire.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:

Where exposure level is not known, wear approved, positive pressure, self-contained respirator. Where exposure level is known, wear approved respirator suitable for level of exposure. In addition to the protective clothing/equipment in Section 8 (Exposure Controls/Personal Protection), wear impermeable boots.

Methods For Cleaning Up:

Cover spills with some inert absorbent material; sweep up and place in a waste disposal container. Flush spill area with water.

7. HANDLING AND STORAGE

HANDLING

Precautionary Measures: Avoid contact with eyes, skin and clothing. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

Special Handling Statements: Provide good ventilation of working area (local exhaust ventilation if necessary). During processing and handling of the product, comply with the indicative occupational exposure limit values.

STORAGE

Store in a cool, dry, well ventilated place and keep container tightly closed. Take precautionary measures against electrostatic loading - earthing necessary during loading operations. Observe the general rules of industrial fire protection. Sensitive to frost.

Storage Temperature: Store at 0 - 25 °C 32 - 77 °F

Reason: Quality.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Measures:

Engineering controls are not usually necessary if good hygiene practices are followed.

Respiratory Protection:

For operations where inhalation exposure can occur, use an approved respirator recommended by an industrial hygienist after an evaluation of the operation. Where inhalation exposure can not occur, no respiratory protection is required.

Eye Protection:

Wear eye/face protection such as chemical splash proof goggles or face shield.

Skin Protection:

Avoid skin contact. Wear impermeable gloves.

Additional Advice:

Before eating, drinking, or smoking, wash face and hands thoroughly with soap and water.

9. PHYSICAL AND CHEMICAL PROPERTIES

Color:	translucent to opaque white
Appearance:	low viscosity liquid
Odor:	weak
Boiling Point:	90 - 120 °C 194 - 248 °F
Melting Point:	Not available
Vapor Pressure:	Not available
Specific Gravity/Density:	~1.04 g/cm ³ DIN EN ISO 2811-2 @ 20 °C
Vapor Density:	Not available
Percent Volatile (% by wt.):	74 - 76 mostly water
pH:	3 - 4 (10% aqueous solution)
Saturation In Air (% By Vol.):	Not available
Evaporation Rate:	Not available
Solubility In Water:	completely miscible
Volatile Organic Content:	Not available
Flash Point:	>94 °C 201.2 °F ASTM D 6450
Flammable Limits (% By Vol):	Not available
Autoignition Temperature:	Not available
Decomposition Temperature:	Not available
Partition coefficient (n-octanol/water):	Not available
Odor Threshold:	Not available

10. STABILITY AND REACTIVITY

Stability: Stable

Conditions To Avoid: Avoid exposure to excessive heat, strong acids and alkalies, oxidizing agents, and open flame.

Polymerization:	Will not occur
Conditions To Avoid:	None known
Materials To Avoid:	Alkalies and acids degrade product.
Hazardous Decomposition Products:	Carbon dioxide Carbon monoxide (CO)

11. TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under Section 3. HAZARDS IDENTIFICATION. Toxicological information on the regulated components of this product is as follows:

This product contains no OSHA regulated (hazardous) components.

California Proposition 65 Warning (applicable in California only) - This product contains (a) chemical(s) known to the State of California to cause cancer and birth defects or other reproductive harm.

12. ECOLOGICAL INFORMATION

This material is not classified as dangerous for the environment. The ecological assessment for this material is based on an evaluation of its components.

13. DISPOSAL CONSIDERATIONS

The information on RCRA waste classification and disposal methodology provided below applies only to the product, as supplied. If the material has been altered or contaminated, or it has exceeded its recommended shelf life, the guidance may be inapplicable. Hazardous waste classification under federal regulations (40 CFR Part 261 et seq) is dependent upon whether a material is a RCRA 'listed hazardous waste' or has any of the four RCRA 'hazardous waste characteristics.' Refer to 40 CFR Part 261.33 to determine if a given material to be disposed of is a RCRA 'listed hazardous waste'; information contained in Section 15 of this MSDS is not intended to indicate if the product is a 'listed hazardous waste.' RCRA Hazardous Waste Characteristics: There are four characteristics defined in 40 CFR Section 261.21-61.24: Ignitability, Corrosivity, Reactivity, and Toxicity. To determine Ignitability, see Section 9 of this MSDS (flash point). For Corrosivity, see Sections 9 and 14 (pH and DOT corrosivity). For Reactivity, see Section 10 (incompatible materials). For Toxicity, see Section 2 (composition). Federal regulations are subject to change. State and local requirements, which may differ from or be more stringent than the federal regulations, may also apply to the classification of the material if it is to be disposed. The Company encourages the recycle, recovery and reuse of materials, where permitted, as an alternate to disposal as a waste. The Company recommends that organic materials classified as RCRA hazardous wastes be disposed of by thermal treatment or incineration at EPA approved facilities. The Company has provided the foregoing for information only; the person generating the waste is responsible for determining the waste classification and disposal method.

14. TRANSPORT INFORMATION

14. TRANSPORT INFORMATION

This section provides basic shipping classification information. Refer to appropriate transportation regulations for specific requirements.

US DOT

Dangerous Goods? Not applicable/Not regulated

TRANSPORT CANADA

Dangerous Goods? Not applicable/Not regulated

ICAO / IATA

Dangerous Goods? Not applicable/Not regulated

IMO

Dangerous Goods? Not applicable/Not regulated

15. REGULATORY INFORMATION

Inventory Information

United States (USA): All components of this product are included on the TSCA Chemical Inventory or are not required to be listed on the TSCA Chemical Inventory.

Canada: This product contains components not on the Domestic Substances List.

Australia: One or more components of this product have NOT yet been included in the Australian Inventory of Chemical Substances (AICS) or assessed by NICNAS.

China: All components of this product are included on the Chinese inventory or are not required to be listed on the Chinese inventory.

Japan: All components of this product are NOT included on the Japanese (ENCS) inventory.

Korea: All components of this product are NOT included on the Korean (ECL) inventory.

Philippines: All components of this product are NOT included on the Philippine (PICCS) inventory.

OTHER ENVIRONMENTAL INFORMATION

The following components of this product may be subject to reporting requirements pursuant to Section 313 of CERCLA (40 CFR 372), Section 12(b) of TSCA, or may be subject to release reporting requirements (40 CFR 307, 40 CFR 311, etc.) See Section 13 for information on waste classification and waste disposal of this product.

This product does not contain any components regulated under these sections of the EPA

PRODUCT HAZARD CLASSIFICATION UNDER SECTION 311 OF SARA

- Not applicable

16. OTHER INFORMATION

NFPA Hazard Rating (National Fire Protection Association)

Health: 1 - Materials that, under emergency conditions, can cause significant irritation.

Fire: 1 - Materials that must be preheated before ignition can occur.

Instability: 0 - Materials that in themselves are normally stable, even under fire exposure conditions.

Reasons For Issue:

Revised Section 15

Randy Deskin, Ph.D., DABT +1-973-357-3100

This information is given without any warranty or representation. We do not assume any legal responsibility for same, nor do we give permission, inducement, or recommendation to practice any patented invention without a license. It is offered solely for your consideration, investigation, and verification. Before using any product, read its label.

MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

PART I *What is the material and what do I need to know in an emergency?*

1. PRODUCT IDENTIFICATION

TRADE NAME (AS LABELED): AntiChlor® 30
CHEMICAL NAME/CLASS: Sodium Salt Solution
SYNONYMS: Not applicable
PRODUCT USE: Water Treatment
SUPPLIER/MANUFACTURER'S NAME: AVISTA TECHNOLOGIES
ADDRESS: 140 Bosstick Blvd
San Marcos, CA 92069
CHEMTREC EMERGENCY NO.: 1-800-424-9300 (United States)
1-703-527-3887 (International)
BUSINESS PHONE: (760) 744-0536
DATE OF PREPARATION: January 6, 2000, Revised April 6, 2009

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	% w/w	EXPOSURE LIMITS IN AIR					OTHER mg/m ³
			ACGIH-TLV		OSHA-PEL			
			TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³	IDLH mg/m ³	
Sulfite Salt Compound	Proprietary	10-30	5 A4 (Not Classifiable as a Human Carcinogen)	NE	NE	NE	NE	NIOSH REL: TWA = 5
Water and other components which are present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers and mutagens).		Balance	None of the other components contribute significant additional hazards at the concentration present in this product. All pertinent hazard information has been provided in this document, per the requirements of the Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalent Standards and Canadian Workplace Hazardous Materials Identification System Standards (CPR 4).					

NE = Not Established. C = Ceiling Limit. See Section 16 for Definitions of Terms Used.

NOTE: All WHMIS information is included; it is located in appropriate sections based on the ANSI Z400.1-1998 format.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a clear, colorless to pale yellow, corrosive solution with a mild odor of rotten eggs. This product can irritate or burn contaminated tissue depending on concentration and duration of exposure. Sulfite Salt Compound (the main component of this product) is a skin and respiratory sensitizer; subsequent exposures to very small amounts can cause allergic reaction. This product is neither reactive nor flammable. Thermal decomposition of this product produces irritating vapors and toxic gases (e.g. sodium oxides and sulfur oxides). Emergency responders must wear personal protective equipment (and have appropriate fire-extinguishing protection) suitable for the situation to which they are responding.

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: The most significant routes of occupational overexposure are inhalation and contact with skin and eyes. The symptoms of overexposure to this product are as follows:

INHALATION: : If vapors, mists, or sprays of this solution are inhaled, irritation of the nose and throat and difficulty breathing and coughing may occur. Severe inhalation overexposure may result in burns to the respiratory system. The Sulfite Salt Compound (the main component of this product) is a respiratory sensitizer; subsequent exposures to very small amounts can cause allergic reaction in susceptible individuals. Symptoms can include shortness of breath, wheezing, cough, and chest tightness.

CONTACT WITH SKIN or EYES: Depending on the duration and concentration of overexposure, skin contact can be mildly to moderately irritating or may cause burns. Symptoms of skin contact can include redness and irritation. Prolonged contact may result in burns to exposed tissue. Repeated, low level contact with this product may cause dermatitis (dry, red skin). The Sulfite Salt Compound (the main component of this product) is a skin sensitizer; subsequent exposures to very small amounts can cause allergic reaction (e.g., rash, itching) in susceptible individuals. Direct eye contact with the liquid can cause stinging, tearing and redness; prolonged eye contact may cause burns to tissue and permanent damage to the eyes.

3. HAZARD IDENTIFICATION (Continued)

SKIN ABSORPTION: Skin absorption is not a significant route of exposure for any component of this product.

INGESTION: Ingestion is not anticipated to be a likely route of exposure to this product. Ingestion of this product will result in moderate to severe irritation, or burns of the digestive tract. In addition, ingestion of this product may cause central nervous system depression, gastrointestinal and cardiac abnormalities, and violent colic. Individuals who are sensitive to the Sulfite Salt Compound (the main component of this product) may experience symptoms such as those described under "Inhalation". Ingestion of large quantities of this product may be fatal.

INJECTION: Accidental injection of this product can cause burning, reddening, and swelling in addition to the wound. Individuals who are sensitive to the Sulfite Salt Compound (the main component of this product) may experience symptoms such as those described under "Inhalation".

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in **Lay Terms.**

ACUTE: Inhalation exposure can cause mild to moderate irritation, coughing, and difficulty breathing or burns of the respiratory system, depending on concentration and duration of exposure. Skin and eye contact can cause redness and mild to moderate irritation or burns, depending on concentration and duration of exposure. Ingestion may cause central nervous system depression, gastrointestinal and cardiac abnormalities, and violent colic, as well as irritation or burns to digestive system.

CHRONIC: Prolonged or repeated skin overexposure to this product may cause dermatitis (dry, red skin). The Sulfite Salt Compound (the main component of this product) is a skin and respiratory sensitizer; subsequent exposures to very small amounts can cause allergic reaction in susceptible individuals. Symptoms can include those described under "Inhalation".

TARGET ORGANS: ACUTE: Skin, eyes, central nervous system, gastrointestinal system, heart, respiratory system.
CHRONIC: Skin, respiratory system.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM			
HEALTH		(BLUE)	3
FLAMMABILITY		(RED)	0
REACTIVITY		(YELLOW)	0
PROTECTIVE EQUIPMENT			C
EYES	RESPIRATORY	HANDS	BODY
	SEE SECTION 8		
For routine industrial applications			

See Section 16 for Definition of Ratings

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

Victims of chemical exposure must be taken for medical attention if any adverse effects occur. Rescuers should be taken for medical attention if necessary. Take a copy of label and MSDS to physician or health professional with victim.

SKIN EXPOSURE: If this product contaminates the skin, immediately begin decontamination with running water. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim should seek immediate medical attention if any adverse exposure symptoms develop.

EYE EXPOSURE: If this product enters the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek medical attention.

INHALATION: If vapors, mists, or sprays of this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Remove or cover gross contamination to avoid exposure to rescuers.

INGESTION: If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING. Have victim rinse mouth with water, if conscious. Never induce vomiting or give a diluent (e.g., water) to someone who is unconscious, having convulsions, or unable to swallow. If contaminated individual is convulsing, maintain an open airway and obtain immediate medical attention.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Preexisting dermatitis, other skin conditions, and respiratory conditions may be aggravated by exposures to this product.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate exposure.

5. FIRE-FIGHTING MEASURES

FLASH POINT: Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume. %):

Lower: Not applicable.

Upper: Not applicable.

5. FIRE-FIGHTING MEASURES (Continued)

FIRE EXTINGUISHING MATERIALS: This material will not contribute to the intensity of a fire. Use extinguishing material suitable to the surrounding fire.

Water Spray: YES Carbon Dioxide: YES
Foam: YES Dry Chemical: YES
Halon: YES Other: Any "ABC" Class

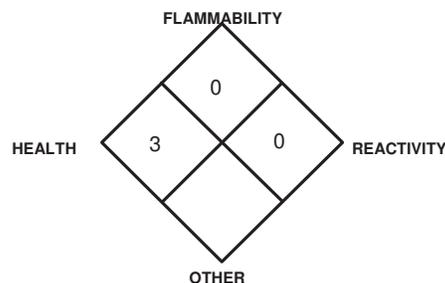
UNUSUAL FIRE AND EXPLOSION HAZARDS: This product is corrosive and presents a contact hazard to fire-fighters. In addition, the Sulfite Salt Compound (the main component of this product) is a skin and respiratory sensitizer; subsequent exposures to very small amounts can cause allergic reaction. When involved in a fire, this material may decompose and produce irritating fumes and toxic gases (e.g., sodium oxides and sulfur oxides).

Explosion Sensitivity to Mechanical Impact: Not applicable.

Explosion Sensitivity to Static Discharge: Not applicable.

SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move containers from fire area if it can be done without risk to personnel. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

NFPA RATING



**See Section 16 for
Definition of Ratings**

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area and protect people. In the event of an incidental release of this product, personnel should wear gloves and safety glasses (or goggles). In the event of a non-incidental release, Minimum Personal Protective Equipment should be **Level C: triple-gloves, chemical resistant apron, boots, and splash goggles and an Air-Purifying respirator with organic vapor cartridge. Level B, which includes the use of Self-Contained Breathing Apparatus, should be worn when oxygen levels are below 19.5% or are unknown.** Absorb spilled liquid with polypads or other suitable absorbent materials. Neutralize the pH of the residue of the product with neutralizer appropriate for mildly acidic materials. Decontaminate the area thoroughly. Prevent spill rinsate from contamination of storm drains, sewers, soil or groundwater. Place all spill residues in a suitable container and seal. Dispose of in accordance with applicable U.S. Federal, State, or local procedures or appropriate standards of Canada (see Section 13, Disposal Considerations).

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat or drink while handling this material. Avoid generating mists and sprays of this product. Remove contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Open containers carefully on a stable surface. Empty containers may contain residual liquid; therefore, empty containers should be handled with care. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials (see Section 10, Stability and Reactivity). Material should be stored in secondary containers, or in a diked area, as appropriate. Storage and use areas should be covered with impervious materials. Storage areas should be made of fire-resistant materials. Keep container tightly closed when not in use. If appropriate, post warning signs in storage and use areas. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely if necessary. Collect all rinsates and dispose of according to applicable U.S. Federal, State, or local procedures or appropriate Canadian standards.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in Section 2 (Composition and Information on Ingredients). Ensure eyewash/safety shower stations are available near areas where this product is used.

RESPIRATORY PROTECTION: Use NIOSH approved acid/mist respirators if ventilation is inadequate to control mists. Maintain airborne contaminate concentrations below guidelines listed in Section 2 (Composition and Information on Ingredients). 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, or the Canadian CSA Standard Z94.4-93 and applicable standards of Canadian Provinces. (continued on following page)

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (Continued)

RESPIRATORY PROTECTION (continued): 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).

EYE PROTECTION: Use approved safety goggles or safety glasses, as described in OSHA 29 CFR 1910.133. Splash goggles with a faceshield may be needed if splash hazards exist.

HAND PROTECTION: Wear chemical impervious gloves (e.g., rubber, Neoprene).

BODY PROTECTION: Use body protection appropriate for task (e.g., Tyvek suit, rubber apron) to protect from splashes and sprays.

HMIS PERSONAL PROTECTIVE EQUIPMENT RATING: C (Safety Glasses, Gloves, Apron)

9. PHYSICAL and CHEMICAL PROPERTIES

RELATIVE VAPOR DENSITY (air = 1): Similar to water.

SPECIFIC GRAVITY: 1.1 – 1.25

SOLUBILITY IN WATER: Soluble.

VAPOR PRESSURE, mm Hg @ 20°C: Not available

ODOR THRESHOLD: Not available.

COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT): Not available.

APPEARANCE, ODOR AND COLOR: This product is a clear, colorless to pale yellow solution with a mild odor of rotten eggs.

HOW TO DETECT THIS SUBSTANCE (warning properties): The odor may act as a warning property associated with this product.

EVAPORATION RATE (water = 1): Approximately 1.

MELTING/FREEZING POINT: Not available

BOILING POINT: Not available

pH: 4.0 – 5.0

10. STABILITY and REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: Thermal decomposition of this product may generate oxides of sodium and sulfur.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong acids and oxidizers.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Avoid contact with incompatible chemicals.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: There are currently no toxicity data available for this product; the following toxicology information is available for components greater than 1 % in concentration.

SULFITE SALT COMPOUND:

Mutation in Microorganisms (*Salmonella typhimurium*) = 100 mmol/L

Cytogenetic Analysis (ovary, hamster) = 180 µg/L

Sister Chromatid Exchange (ovary, hamster) = 200 µg/L

TDLo (oral, rat) = 75 mg/kg/15 days/continuous; Kidney, Urethra, Bladder: other changes; Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: phosphatases, dehydrogenases

TDLo (oral, rat) = 40 g/kg; multigenerations: Reproductive: Effects on Newborn: weaning or lactation index (e.g., # alive at weaning per # alive at day 4)

SULFITE SALT COMPOUND (continued):

TDLo (oral, rat) = 20 g/kg; multigenerations: Reproductive: Effects on Newborn - stillbirth

TDLo (oral, mouse) = 14 g/kg/female 8–12 days after conception; Reproductive: Effects on Newborn

TDLo (oral, pig) = 562 g/kg/48 weeks/continuous; Liver: changes in liver weight Kidney, Urethra, Bladder: changes in bladder weight Nutritional and Gross Metabolic - weight loss or decreased weight gain

TDLo (subcutaneous, mouse) = 806 mg/kg/26 weeks/intermittent; Tumorigenic: equivocal tumorigenic agent by RTECS criteria Skin and Appendages - tumors

SULFITE SALT COMPOUND (continued):

TDLo (parenteral, mouse) = 60 mg/kg/female 8 days after conception; Reproductive: Effects on Fetus: fetotoxicity (except death, e.g., stunted fetus), Specific Developmental Abnormalities: musculoskeletal system

LD₅₀ (intravenous, rat) = 115 mg/kg

LD₅₀ (parenteral, mouse) = 910 mg/kg

LDLo (intravenous, mouse) = 1220 mg/kg

LDLo (intravenous, rabbit) = 192 mg/kg

LD₅₀ (oral, mouse) = 5989 mg/kg

LD₅₀ (intravenous, rabbit) = 1220 mg/kg

SUSPECTED CANCER AGENT: The Sulfite Salt Compound (the main component of this product) is found on the following lists:

IARC-3 Unclassifiable as to Carcinogenicity in Humans.

ACGIH-A4 Not Classifiable as a Human Carcinogen.

The other components of this product are not found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, and CAL/OSHA, and therefore are neither considered to be nor suspected to be cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: This product can irritate contaminated tissue.

SENSITIZATION TO THE PRODUCT: The Sulfite Salt Compound (the main component of this product) is a skin and respiratory sensitizer; subsequent exposures to very small amounts can cause allergic reaction.

TOXICOLOGICAL SYNERGISTIC PRODUCTS: No information is currently available on toxicologically synergistic products of this material.

11. TOXICOLOGICAL INFORMATION (Continued)

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: This product is not reported to produce mutagenic effects in humans. Animal mutation data are available for the Sulfite Salt Compound component of this product; these data were obtained during clinical studies on specific animal tissues exposed to high doses of this compound.

Embryotoxicity: This product is not reported to produce embryotoxic effects in humans.

Teratogenicity: This product is not reported to cause teratogenic effects in humans.

Reproductive Toxicity: This product is not reported to cause reproductive effects in humans. Clinical studies on test animals exposed to relatively high doses of the Sulfite Salt Compound component of this product provided reproductive toxicity data.

A *mutagen* is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An *embryotoxin* is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A *teratogen* is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A *reproductive toxin* is any substance which interferes in any way with the reproductive process.

BIOLOGICAL EXPOSURES INDICES (BEIs): Currently, there are no Biological Exposure Indices (BEIs) for any component of this product.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: The components of this product will decompose into other inorganic compounds over time under normal environmental conditions. Additional environmental data are available as follows:

SULFITE SALT COMPOUND:

Water Solubility = 470 g/L (20°C).

Chemical Oxygen Demand (COD) = 165 mg oxygen/g compound.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: This product may be harmful to animal life if large volumes of it are released into the environment. Refer to section 11 (Toxicological Information) for information on the effects of components of this product on test animals.

EFFECT OF CHEMICAL ON AQUATIC LIFE: This product may be harmful to contaminated aquatic life (especially if large volumes of it are released into an aquatic environment. Additional aquatic toxicity data are available as follows:

SULFITE SALT COMPOUND:

LC₅₀ (*Salmo gairdneri*) 96 hours = 150-220 mg/L

EC/LC₅₀ (*Pseudomonas putida*) 17 hours = 56 mg/L

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations or with regulations of Canada. This product, if unaltered by the handling, may be disposed of by treatment at a permitted facility or as advised by your local waste regulatory authority.

EPA WASTE NUMBER: D002 (Characteristic/Corrosivity), applicable to wastes consisting only of this product.

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME:

Bisulfites, aqueous solutions, n.o.s. (Sodium Metabisulfite)

HAZARD CLASS NUMBER and DESCRIPTION:

8 (Corrosive)

UN IDENTIFICATION NUMBER:

UN 2693

DOT LABEL(S) REQUIRED:

Class 8, Corrosive

PACKAGING GROUP:

III

NORTH AMERICAN RESPONSE GUIDEBOOK NUMBER (1996): 154

NATIONAL MOTOR FREIGHT CLASSIFICATION: LTL: 100; T: 70

MARINE POLLUTANT: No component of this product is listed as a marine pollutant by the D.O.T. (49 CFR 172.101, Appendix B).

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This material is considered as dangerous goods, per the regulations of Transport Canada. Use above, U.S. DOT information for shipments to Canada.

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: No component of this product is subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for any component of this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs. (4,540 kg) therefore applies, per 40 CFR 370.20.

U.S. CERCLA REPORTABLE QUANTITY (RQ): The default RQ for Unlisted Wastes, Characteristic Corrosivity of 100 lb (45.4 kg) would apply to wastes of this product.

U.S. TSCA INVENTORY STATUS: The chemicals in this product are listed on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

U.S. STATE REGULATORY INFORMATION: Components of this product are covered under specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances: Sulfite Salt Compound.

California - Permissible Exposure Limits for Chemical Contaminants: Sulfite Salt Compound.

Florida - Substance List: Sulfite Salt Compound.

Illinois - Toxic Substance List: Sulfite Salt Compound.

Kansas - Section 302/313 List: No.

Massachusetts - Substance List: Sulfite Salt Compound.

Michigan - Critical Materials Register: No.

Minnesota - List of Hazardous Substances: Sulfite Salt Compound.

Missouri - Employer Information/Toxic Substance List: Sulfite Salt Compound.

New Jersey - Right to Know Hazardous Substance List: Sulfite Salt Compound.

North Dakota - List of Hazardous Chemicals, Reportable Quantities: Sulfite Salt Compound.

Pennsylvania - Hazardous Substance List: Sulfite Salt Compound.

Rhode Island - Hazardous Substance List: Sulfite Salt Compound.

Texas - Hazardous Substance List: No.

West Virginia - Hazardous Substance List: No.
Wisconsin - Toxic and Hazardous Substances: No.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component of this product is on the California Proposition 65 lists.

ANSI LABELING (Z129.1): **WARNING!** MAY CAUSE ALLERGIC RESPIRATORY AND SKIN SENSITIZATION. MAY ANSI LABELING (Z129.1): **DANGER!** CORROSIVE LIQUID. MAY CAUSE RESPIRATORY, SKIN, AND EYE IRRITATION OR BURNS. MAY CAUSE ALLERGIC RESPIRATORY AND SKIN SENSITIZATION. MAY BE HARMFUL OR FATAL IF SWALLOWED. Do not breathe mists or sprays. Avoid prolonged or repeated contact with skin. Avoid contact with eyes. Do not taste or swallow. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves, goggles, and suitable body protection if necessary. **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 not breathing, give artificial respiration. If breathing is difficult, give oxygen. If ingested, do not induce vomiting. Get medical attention if any adverse effects occur. **IN CASE OF FIRE:** Use water fog, dry chemical, CO₂, or "alcohol" foam. **IN CASE OF SPILL:** Absorb spill with inert material and place in suitable container. Consult Material Safety Data Sheet for additional information.

ENVIRONMENTAL HAZARDS: Do not discharge effluent containing this product into streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA.

ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product are listed on the DSL/NDSL Inventory.

OTHER CANADIAN REGULATIONS: Not applicable.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITY SUBSTANCES LISTS: Not applicable.

CANADIAN WHMIS SYMBOLS: **Class D2B** Materials Causing Other Toxic Effect (Contains a sensitizer)



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

16. OTHER INFORMATION

PREPARED BY:

CHEMICAL SAFETY ASSOCIATES, Inc.
9163 Chesapeake Drive, San Diego, CA 92123-1002
858/565-0302
April 27, 2009

DATE OF PRINTING

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each compound.

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.

TLV - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average (**TWA**), the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level (**C**). Skin absorption effects must also be considered.

OSHA - U.S. Occupational Safety and Health Administration.

PEL - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.

IDLH - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. **The DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (**OSHA**). NIOSH issues exposure guidelines called Recommended Exposure Levels (**RELs**). When no exposure guidelines are established, an entry of **NE** is made for reference.

HAZARD RATINGS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: Health

Hazard: **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); **3** (Class IB and IC flammable liquids with flash points below 38°C [100°F]); **4** (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]. Reactivity Hazard: **0** (normally stable); **1** (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures).

NATIONAL FIRE PROTECTION ASSOCIATION: Health Hazard: **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure could cause death or major residual injury). Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (**NFPA**). Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD₅₀** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC₅₀** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m³** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. Ecological Information: EC is the effect concentration in water.

REGULATORY INFORMATION:

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act (**SARA**); the Canadian Domestic/Non-Domestic Substances List (**DSL/NDL**); the U.S. Toxic Substance Control Act (**TSCA**); Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act (**CERCLA** or **Superfund**); and various state regulations. This section also includes information on the precautionary warnings which appear on the material's package label.



VITEC[®] 3000 NSF MATERIAL SAFETY DATA SHEET

PART I *What is the material and what do I need to know in an emergency?*

1. PRODUCT IDENTIFICATION

<u>TRADE NAME (AS LABELED):</u>	VITEC[®] 3000
<u>CHEMICAL NAME/CLASS:</u>	Not Applicable
<u>SYNONYM:</u>	Not Applicable
<u>PRODUCT USE:</u>	Water Treatment
<u>SUPPLIER/MANUFACTURER'S NAME:</u>	AVISTA TECHNOLOGIES
<u>ADDRESS:</u>	133 North Pacific Street San Marcos, CA 92069
<u>24 HOUR EMERGENCY NO.:</u>	1-800-424-9300 (United States)** 1-202-483-7616 (International Collect)
<u>BUSINESS PHONE:</u>	(760) 744-0536
<u>DATE OF PREPARATION:</u>	Revised January 30, 2006

This product is sold for commercial use. This MSDS has been developed to address safety concerns of those individuals working with bulk quantities of this material, as well as those of potential users of this product in industrial /occupational settings. All pertinent health, safety and environmental information has been presented based on ANSI Z400.1-2003, the US Federal OSHA Hazard Communication Standard (29 CFR 1910.1200) and Canadian Workplace Hazardous Materials Information System (WHMIS) and Controlled Products Regulations (CPR).

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

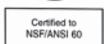
PHYSICAL DESCRIPTION: This product is a clear, amber colored, solution with a light, disinfectant odor. This product is neither reactive nor flammable.

WARNINGS (per ANSI Z129.1)

WARNING! MAY CAUSE SKIN AND EYE IRRITATION OR BURNS. MAY BE IRRITATING IF INHALED. HARMFUL IF SWALLOWED.

PRECAUTIONS (per ANSI Z129.1):

Do not taste or swallow. Do not get on skin or in eyes. Avoid breathing mists or sprays. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves, goggles, and suitable body protection if necessary.



DRINKING WATER TREATMENT ADDITIVES CLASSIFIED BY NATIONAL SANITATION FOUNDATION.[®] TO ANSI/NSF 60 IN SEPTEMBER, 2004 AS STANDARD DRINKING WATER TREATMENT CHEMICAL FOR USE IN REVERSE OSMOSIS SYSTEMS AT A MAXIMUM LEVEL OF 7 mg/l.

2. HAZARDS IDENTIFICATION (continued)

HAZARD SYMBOLS:

HMIS HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health	2
Flammability	0
Physical Hazard	0
Protective Equipment	C

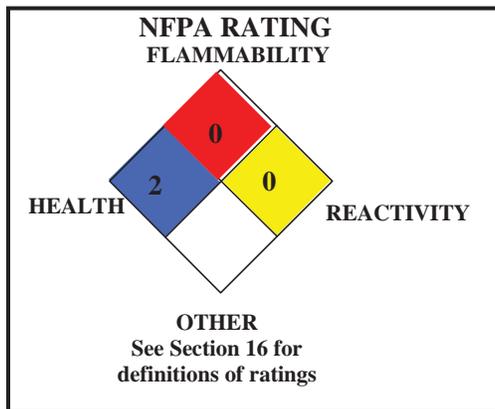
HMIS PERSONAL PROTECTIVE EQUIPMENT RATING: Industrial Use situations C; Safety glasses, gloves and body protection

CANADIAN WHMIS SYMBOLS:

D2B - Poisonous and infectious material - Other effects – Toxic



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



OSHA REGULATORY STATUS

This material is classified as not hazardous under OSHA regulations

POTENTIAL HEALTH EFFECTS

The most significant routes of occupational overexposure are inhalation and contact with skin and eyes. The symptoms of overexposure to this product are as follows:

CONTACT WITH SKIN or EYES: Contact can cause eye or skin irritation. Prolonged skin contact can result in dermatitis. Prolonged eye exposure may include redness, pain, and tearing

SKIN ABSORPTION: No component of this product is reported to be absorbed through intact skin

INGESTION: If the product is swallowed, irritation of the mouth, throat, and other tissues of the gastro-intestinal system can occur.

INHALATION: Overexposure to vapors, mists, sprays, or dusts of this product can cause irritation to the respiratory tract.

2. HAZARDS IDENTIFICATION (continued)

INJECTION: Accidental injection of this product can cause burning, reddening, and swelling in addition to the wound. Symptoms of such exposure can include those described under "Inhalation", "Contact with Skin or Eyes," and "Ingestion".

CHRONIC EFFECTS: Long-term skin or eye contact can result in dermatitis or eye irritation.

SIGNS AND SYMPTOMS OF OVEREXPOSURE: Eye and skin irritation (redness or swelling). See Section 11: TOXICOLOGICAL INFORMATION.

POTENTIAL ENVIRONMENTAL EFFECTS

This product does not normally present a significant hazard to aquatic or terrestrial life in small quantities. Do not discharge effluent containing this product into streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA. See Section 12: ECOLOGICAL INFORMATION.

3. MATERIAL IDENTIFICATION

CHEMICAL NAME	CAS #	% w/w
Deflocculant & Sequestrant	Proprietary	27.4
Phosphonic Acid Derivative Compound	Proprietary	15.6
pH Adjustment	Proprietary	21.8
Water and ingredients present in concentrations of less than 1% (or less than 0.1% if carcinogens)		Balance
The ingredients in the balance of this product do not contribute significant hazards beyond those described in this document.		

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

Victims of chemical exposure must be taken for medical attention if any adverse effects occur. Take a copy of label and MSDS to physician or health professional with victim.

FIRST AID PROCEDURES

SKIN EXPOSURE: If this product contaminates the skin, immediately begin decontamination with running water. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim must seek immediate medical attention if any adverse exposure symptoms develop.

EYE EXPOSURE: If this product enters the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek medical attention if any adverse exposure symptoms develop.

INHALATION: If vapors, mists, or sprays of this product are inhaled, remove victim to fresh air. Victim must seek immediate medical attention if any adverse exposure symptoms develop. If necessary, use artificial respiration to support vital functions.

INGESTION: If this product is swallowed, **CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING**, unless directed by medical personnel. Have victim rinse mouth with water, if conscious. Never induce vomiting or give a diluent (e.g., water) to someone who is unconscious, having convulsions, or unable to swallow. If contaminated individual is convulsing, maintain an open airway and obtain immediate medical attention.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE Preexisting dermatitis, other skin conditions, and respiratory conditions may be aggravated by exposures to this product.

4. FIRST-AID MEASURES (continued)

NOTE TO PHYSICIANS

Treat symptoms and eliminate overexposure.

5. FIRE-FIGHTING MEASURES

FLAMMABLE PROPERTIES

This product is non-combustible. Not sensitive to mechanical impact under normal conditions. Not sensitive to static discharge under normal conditions.

EXTINGUISHING MEDIA

SUITABLE EXTINGUISHING MEDIA:

<u>Water Spray:</u>	OK	<u>Carbon Dioxide:</u>	OK
<u>Foam:</u>	OK	<u>Dry Chemical:</u>	OK
<u>Halon:</u>	OK	<u>Other</u>	Any "ABC" Class

UNSUITABLE EXTINGUISHING MEDIA:

None.

PROTECTION OF FIREFIGHTERS

SPECIFIC HAZARDS ARISING FROM THE CHEMICAL:

When involved in a fire, this product may decompose and produce irritating fumes and toxic gases (e.g., carbon monoxide, carbon dioxide, phosphorous oxides, phosphine and sodium oxide).

PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIREFIGHTERS:

Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move containers from fire area if it can be done without risk to personnel. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

Responders should wear the level of protection appropriate to the type of chemical released, the volume of the material spilled, and the location where the incident has occurred.

ENVIRONMENTAL PRECAUTIONS

Minimize use of water to prevent environmental contamination. Prevent spill or rinsate from contamination of storm drains, sewers, soil or groundwater. Place all spill residues in a suitable container and seal. Dispose of in accordance with applicable U.S. Federal, State, or local procedures or appropriate standards of Canada (see Section 13, Disposal Considerations)

METHODS FOR CONTAINMENT

SPILL AND LEAK RESPONSE: Trained personnel using pre-planned procedures should respond to uncontrolled releases. Proper protective equipment should be used. In case of a spill, clear the affected area and protect people.

RESPONSE TO INCIDENTAL RELEASES: Personnel who have received basic chemical safety training can generally handle small-scale releases, such as 1 container of this product. Respond to incidental chemical releases by wearing gloves, goggles, and appropriate body protection.

RESPONSE TO NON-INCIDENTAL RELEASES: Respond to non-incident chemical releases of this product, such as the simultaneous puncturing of several containers, by clearing the impacted area and contacting appropriate emergency personnel. Clean up should only be done by qualified personnel.

METHODS FOR CLEAN-UP

Prevent spill or rinsate from contaminating storm drains, sewers, soil or groundwater. Absorb spilled liquid with polypads or other suitable absorbent materials. DO NOT use combustible materials, such as sawdust.

6. ACCIDENTAL RELEASE MEASURES (continued)

OTHER INFORMATION

US regulations require reporting spills reach any surface waters. The toll-free phone number for the US Coast Guard National Response Center is 1-800-424-8802.

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

HANDLING

As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after using this product. Do not eat or drink while using this material. Avoid generating dusts, mists or sprays of this product. Remove contaminated clothing immediately. Do not breathe (dust, vapor, mist, gas). Avoid contact with skin, eyes or clothing. In the event of a spill, follow practices indicated in Section 6 (Accidental Release Measures). During maintenance activities make certain that application equipment is locked and tagged-out safely if necessary. Collect any rinsates and dispose of according to applicable U.S. Federal, State, or local procedures or appropriate Canadian standards.

STORAGE

This product is stable under ordinary conditions of handling, use and storage. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials (see Section 10, Stability and Reactivity). Keep container tightly closed when not in use. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

EXPOSURE GUIDELINES:

<u>CHEMICAL NAME</u>	<u>CAS #</u>	<u>Guideline</u>	<u>Value</u>
Deflocculant & Sequestrant	Proprietary	NE	NE
Phosphonic Acid Derivative Compound	Proprietary	NE	NE
pH Adjustment	Proprietary	TLV-TWA (ACGIH) TLV-STEL (ACGIH) PEL- TWA (OSHA) REL-TWA (NIOSH) IDLH (NIOSH)	NE 2 mg/m ³ C 2 mg/m ³ 2 mg/m ³ C 10 mg/m ³

NE = Not Established. See Section 16 for Definitions of Terms Used.

ENGINEERING CONTROLS

Use with adequate ventilation to ensure exposure levels are maintained below the limits provided above.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

EYE/FACE PROTECTION

For specific industrial applications, enhanced eye protection can be necessary. Use approved safety goggles or safety glasses, as described in OSHA 29 CFR 1910.133. If necessary, refer to U.S. OSHA 29 CFR 1910.133, or appropriate Canadian standards.

SKIN PROTECTION

For specific industrial applications, wear chemical impervious gloves (e.g., Neoprene or Nitrile). If necessary, refer to U.S. OSHA 29 CFR 1910.138 or the appropriate standards of Canada. For consumer use, no specific body protection is normally needed.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION (continued)

BODY PROTECTION

For general industrial applications, chemically protective clothing is not normally needed. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects can pierce the soles of the feet or where employee's feet can be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136.

RESPIRATORY PROTECTION

None needed under normal conditions of use or handling. Use NIOSH approved respirators if ventilation is inadequate to control dusts, mists, fumes or vapors. Maintain airborne contaminant concentrations below guidelines listed above. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres use of a full-face-piece pressure/demand SCBA or a full face-piece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (29 CFR 1910.134).

General Hygiene Considerations

There are no known hygiene hazards associated with this material when used or handled as recommended.

9. PHYSICAL and CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

<u>RELATIVE VAPOR DENSITY</u> (air = 1):	>1	<u>EVAPORATION RATE</u> (BuAc =1):	Similar to water
<u>SPECIFIC GRAVITY</u> :	1.2 – 1.3	<u>MELTING/FREEZING POINT</u> :	0°C (32°F)
<u>SOLUBILITY IN WATER</u> :	Soluble	<u>BOILING POINT</u> :	100°C (212°F)
<u>VAPOR PRESSURE</u> , mm Hg @ 20°C:	18	<u>pH</u> :	10.7 – 11.8
<u>COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT)</u>			Not Available
<u>PHYSICAL STATE, APPEARANCE AND COLOR</u>	This product is a clear, amber liquid with a light disinfectant odor.		

HOW TO DETECT THIS SUBSTANCE (warning properties): The appearance and odor of this product can act as warning properties in the event of an accidental release

CHEMICAL PROPERTIES

<u>ODOR THRESHOLD</u> :	Not Available		
<u>VOC, less water and exempt</u> :	None		
<u>Weight % VOC</u> :	None		
<u>FLASH POINT</u> : Not ignitable	<u>AUTOIGNITION TEMPERATURE</u> :	Not ignitable	
<u>FLAMMABLE LIMITS (in air by volume, %)</u> :			
<u>Lower</u> : NA	<u>Upper</u> :	NA	

10. STABILITY and REACTIVITY

CHEMICAL STABILITY

Stable under normal circumstances of use and handling.

CONDITIONS TO AVOID

Avoid contact with incompatible chemicals and exposure to extreme temperatures.

INCOMPATIBLE MATERIALS

This product is not compatible with strong bases, strong acids, and powerful oxidizers.

HAZARDOUS DECOMPOSITION PRODUCTS

Thermal decomposition of this product can generate dusts, irritating fumes, and toxic gases (e.g., Carbon monoxide, Carbon dioxide).

POSSIBILITY OF HAZARDOUS REACTIONS

This product is not expected to undergo hazardous polymerization, decomposition, condensation or self-reactivity.

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: There are currently no toxicity data available for this product; the following toxicology information is available for components greater than 1% in concentration.

The following data are available for Phosphonic acid derivative:

Standard Draize Test (Skin-Rabbit) 500 mg/24 hours

Standard Draize Test (Eye-Rabbit) 100 mg: Moderate

LD₅₀ (Oral-Rat) 2100 mg/kg

LD₅₀ (Skin-Rabbit) > 6310 mg/kg

LD₅₀ (Oral-Quail) > 2510 mg/kg

LD₅₀ (Oral-Duck) > 2510 mg/kg

TDL_o (Oral-Rat) 1302 mg/kg/31 days-intermittent: Kidney, Urethra, Bladder: other changes in urine composition; Nutritional and Gross Metabolic: weight loss or decreased weight gain, changes in sodium.

The following data are available for pH adjustment:

Standard Draize Test (Eye-Monkey) 1%/24 hours: Severe

Standard Draize Test (Skin-Rabbit) 500 mg/24 hours: Severe

Standard Draize Test (Eye-Rabbit) 400 µg: Mild

Standard Draize Test (Eye-Rabbit) 1%: Severe

Standard Draize Test (Eye-Rabbit) 50 µg/24 hours: Severe

Standard Draize Test (Eye-Rabbit) 1 mg/24 hours: Severe

Rinsed with water (Eye-Rabbit) 1 mg/30 seconds: Severe

LD₅₀ (Intraperitoneal-Mouse) 40 mg/kg

LDLo (Oral-Rabbit) 500 mg/kg

Cytogenetic Analysis (Parenteral-Grasshopper) 20 mg

Cytogenetic Analysis (Hamster-Lung) 10 mmol/L

Cytogenetic Analysis (Hamster-Ovary) 16 mmol/L

SUSPECTED CANCER AGENT: The following table summarizes the carcinogenicity listing for the components of this product. "NO" indicates that the substance is not considered to be, or suspected to be, a carcinogen by the listed agency, see section 16 for definition of other ratings.

CHEMICAL	IARC	NTP	NIOSH	ACGIH	OSHA	CA PROP 65
Deflocculant & Sequestrant	No	No	No	No	No	No
Phosphonic Acid Derivative Compound	No	No	No	No	No	No
pH Adjustment	No	No	No	No	No	No

IRRITANCY OF PRODUCT: This product can be irritating to contaminated tissue.

SENSITIZATION TO THE PRODUCT: The components of this product are not reported to be sensitizers

TOXICOLOGICAL SYNERGISTIC PRODUCTS: None.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: When used as directed, this product is not expected to produce mutagenic effects in humans

Embryotoxicity: When used as directed, this product is not expected to produce embryotoxic effects in humans.

Teratogenicity: When used as directed, this product is not expected to produce teratogenic effects in humans

Reproductive Toxicity: When used as directed, this product is not expected to produce reproductive toxicity in humans.

11. TOXICOLOGICAL INFORMATION (continued)

A mutagen is a chemical that causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryotoxin is a chemical that causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical that causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance that interferes in any way with the reproductive process.

BIOLOGICAL EXPOSURES INDICES (BEIs): There are no BEI's established for any component of this product at this time.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ECOTOXICITY:

This product can be harmful to terrestrial plant and animal life if large volumes of it are released into the environment. Refer to Section 11, "Toxicological Information", for specific animal data. The following aquatic toxicity data is available for components of this product:

pH Adjustment:

Acute Hazard Level:

Lethal pH (goldfish) = 10.9

Lethal pH (bluegill) = 10.5

LC₁₀₀ (*Cyprinus carpio*) 24 hours = 180 ppm/ 25 °C

TL_m (mosquito fish) 96 hours = 125 ppm/ fresh water

TL_m (bluegill) 48 hours = 99 mg/L/ tap water

Phosphonic acid derivative

NOEC (*Daphnia magna*) 48 hours = 125 mg/L

NOEC (Rainbow Trout) 96 hours = 180 mg/L

NOEC (*Selenastrum* algae) 96 hours = 5.2 mg/L

EC₅₀ (*Selenastrum* algae) 96 hours = 1.9 mg/L

EC₅₀ (*Daphnia magna*) 48 hours = 242 mg/L

PERSISTENCE/DEGRADABILITY:

The following environmental data is available for components of this product:

pH Adjustment

Water Solubility = 111 g/100ml @ 20°C

BOD: None.

BIOACCUMULATION/ACCUMULATION:

pH Adjustment

Octanol/Water Partition Coefficient: SRP4: Too low to be measured (or possibly virtually 0)

Persistence: Can persist for extended periods of time.

Bioconcentration factor (BCF) Not determined.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Recover or recycle if possible. **Industrial Use**: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations or with regulations of Canada.

EPA WASTE NUMBER: Not applicable to wastes consisting only of this product; however, the specific RCRA codes depend on the exact nature of the discarded material.

14. TRANSPORTATION INFORMATION

BASIC SHIPPING DESCRIPTION

This product is not hazardous per 49 CFR 172.101, the U.S. Department of Transportation.

PROPER SHIPPING NAME:

Not Regulated

HAZARD CLASS NUMBER and DESCRIPTION:

Not Regulated

UN IDENTIFICATION NUMBER:

Not Regulated

DOT LABEL(S) REQUIRED:

Not Regulated

PACKAGING GROUP:

Not Regulated

NORTH AMERICAN RESPONSE GUIDEBOOK NUMBER (2000):

Not Regulated

MARINE POLLUTANT:

No component is designated as a DOT Marine Pollutant.

NATIONAL MOTOR FREIGHT CLASSIFICATION: LTL: 100; T: 70

14. TRANSPORTATION INFORMATION (continued)

ADDITIONAL INFORMATION

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This product is not considered as dangerous goods, per Transport Canada regulations

INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA) REGULATIONS

This product is not hazardous per IATA regulations.

INTERNATIONAL MARITIME ORGANIZATION REGULATIONS (IMO):

This product is not hazardous per IMO regulations.

MARINE POLLUTANT:

No component is designated as a Marine Pollutant.

INTERNATIONAL CIVIL AVIATION ORGANIZATION (ICAO)

This product is not hazardous per ICAO regulations.

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS - EPA REPORTING REQUIREMENTS:

The following reporting requirements are applicable to components of this product:

<u>CHEMICAL</u>	<u>SECTION 302 EHS (TPO)</u> (40 CFR 355, Appendix A)	<u>SECTION 304 RQ</u> (40 CFR Table 302.4)	<u>SECTION 313 TRI (threshold)</u> (40 CFR 372.65)
Deflocculant & Sequestrant	No	No	No
Phosphonic Acid Derivative Compound	No	No	No
pH Adjustment	No	YES, RQ = 1000 lbs.	No

U.S. SARA SECTION 311/312 FOR PRODUCT: None.

U.S. TSCA INVENTORY STATUS: The components of this product are listed on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65):

This material is not found on either the Proposition 65 Carcinogen List or the Adverse Reproductive Effects List.

ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product are listed on the DSL Inventory.

16. OTHER INFORMATION

PREPARED BY:

ADVANCED CHEMICAL SAFETY, Inc.
7563 Convoy Court
San Diego, CA 92111
(858)-874-5577

DATE OF PRINTING

April 24, 2007

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these, which are commonly used, include the following:

CAS #: This is the Chemical Abstract Service Number that uniquely identifies each compound.

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.

TLV - Threshold Limit Value - an airborne concentration of a substance that represents conditions under which it is generally believed that nearly all workers can be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average (TWA), the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level (C). Skin absorption effects must also be considered.

OSHA - U.S. Occupational Safety and Health Administration.

PEL - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL that was vacated by Court Order.

IDLH - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. The **DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (OSHA). NIOSH issues exposure guidelines called **Recommended Exposure Levels (RELs)**. When no exposure guidelines are established, an entry of **NE** is made for reference.

OEL - Occupational Exposure Level - In some cases, specific exposure guidelines have been assigned by industry. These are referred to as "Occupational Exposure Levels."

HAZARD RATINGS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: Health Hazard: **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; onetime overexposure can cause permanent injury and can be fatal); **4** (extreme acute exposure hazard; onetime overexposure can be fatal). An "*" indicates that the health hazard is chronic. Flammability Hazard: **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); **3** (Class IB and IC flammable liquids with flash points below 38°C [100°F]); **4** (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]). Reactivity Hazard: **0** (normally stable); **1** (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures).

NATIONAL FIRE PROTECTION ASSOCIATION: Health Hazard: **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure could cause death or major residual injury). Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (NFPA). Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD₅₀** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC₅₀** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m³** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, **LDo**, **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. Ecological Information: **EC** is the effect concentration in water.

Data from several sources are used to evaluate the cancer-causing potential of the material. The sources and ratings are: **IARC** - the International Agency for Research on Cancer; **1** = Carcinogenic to humans, **2A**, **2B** = Probably carcinogenic to humans, **3** = Unclassifiable as to carcinogenicity in humans, and **4** = Probably not carcinogenic to humans. **NTP** - the National Toxicology Program; **K** = Known to be a human carcinogen, and **R** = Reasonably anticipated to be a human carcinogen. **RTECS** - the Registry of Toxic Effects of Chemical Substances. **OSHA** - Occupational Safety and Health Administration and **CAL/OSHA** - California's subunit of the Occupational Safety and Health Administration; **Ca** = Carcinogen defined with no further categorization. **ACGIH** - American Conference of Governmental Industrial Hygienists; **A1** = Confirmed human carcinogen, **A2** = Suspected human carcinogen, **A3** = Confirmed animal carcinogen with unknown relevance to humans, **A4** = Not classifiable as a human carcinogen, and **A5** = Not suspected as a human carcinogen. **NIOSH** - U.S. National Institute for Occupational Safety and Health; **Ca** = Potential occupational carcinogen, with no further categorization. **EPA** - U.S. Environmental Protection; **A** = Human carcinogen, **B** = Probable human carcinogen, **C** = Possible human carcinogen, **D** = Not classifiable as to human carcinogenicity, **E** = Evidence of Non-carcinogenicity for humans, **K** = Known human carcinogen, **L** = Likely to produce cancer in humans, **CBD** = Cannot be determined, **NL** = Not likely to be carcinogenic in humans, and **I** = Data are inadequate for an assessment of human carcinogenic potential.

REGULATORY INFORMATION:

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act (**SARA**); the Canadian Domestic/Non-Domestic Substances List (**DSL/NDL**); the U.S. Toxic Substance Control Act (**TSCA**); Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act (**CERCLA or Superfund**); and various state regulations. This section also includes information on the precautionary warnings that appear on a material's industrial package label.

**Acetone (BDH1101-4LG, BDH1101-1LP, BDH1101-4LP, BDH1101-204L, BDH1101-19L)**

Version

Revision Date 03/17/2009

Print Date 03/17/2009

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Acetone (BDH1101-4LG, BDH1101-1LP, BDH1101-4LP, BDH1101-204L, BDH1101-19L)
MSDS Number : 000000011657
Product Use Description : Solvent

Manufacturer : Honeywell
1953 South Harvey Street
Muskegon, MI 49442

Manufactured for : VWR International LLC
1310 Goshen Parkway
West Chester, PA 19380

For more information call : (Monday-Friday, 8.00am-5:00pm)
1-800-932-5000

In case of emergency call : (24 hours/day, 7 days/week)
1-800-424-9300(USA Only)
For Transportation Emergencies:
1-800-424-9300 (CHEMTREC - Domestic)
1-613-966-6666 (CANUTEC - Canada)

SECTION 2. HAZARDS IDENTIFICATION**Emergency Overview**

Form : liquid, clear
Color : colourless
Odor : sweet mint-like

Hazard Summary : Extremely flammable. In use, may form flammable/explosive vapour-air mixture. Aspiration hazard if swallowed - can enter lungs and cause damage. May be harmful if absorbed through skin. Irritating to eyes and respiratory system. May cause irritation of the gastrointestinal tract. May irritate skin. The product may be absorbed through the skin. Repeated exposure may cause skin dryness or cracking.

Potential Health Effects



Acetone (BDH1101-4LG, BDH1101-1LP, BDH1101-4LP, BDH1101-204L, BDH1101-19L)

Version

Revision Date 03/17/2009

Print Date 03/17/2009

Skin	: May cause skin irritation. May cause systemic poisoning with symptoms paralleling those of inhalation. Prolonged or repeated skin contact with liquid may cause defatting resulting in drying, redness and possible blistering.
Eyes	: Irritating to eyes. Causes itching, burning, redness and tearing. May cause corneal injury.
Ingestion	: Aspiration hazard if swallowed - can enter lungs and cause damage. May cause irritation of the gastrointestinal tract. May cause systemic poisoning with symptoms paralleling those of inhalation.
Inhalation	: Causes respiratory tract irritation. Causes headache, drowsiness or other effects to the central nervous system. Inhalation of high vapour concentrations can cause CNS-depression and narcosis.
Chronic Exposure	: Causes headache, drowsiness or other effects to the central nervous system. Prolonged or repeated skin contact with liquid may cause defatting resulting in drying, redness and possible blistering.
Aggravated Medical Condition	: Skin disorders Eye disorders Cardiac irregularities
Target Organs	: Eyes Skin Respiratory system Central nervous system Heart

Carcinogenicity

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP, IARC, or OSHA.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Weight %
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Acetone (BDH1101-4LG, BDH1101-1LP, BDH1101-4LP, BDH1101-204L, BDH1101-19L)

Version

Revision Date 03/17/2009

Print Date 03/17/2009

Acetone

67-64-1

100.00

SECTION 4. FIRST AID MEASURES

- Inhalation : Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Use oxygen as required, provided a qualified operator is present. Call a physician.
- Skin contact : Wash off immediately with plenty of water for at least 15 minutes. Take off contaminated clothing and shoes immediately. Wash contaminated clothing before re-use. Call a physician.
- Eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician.
- Ingestion : Do not induce vomiting without medical advice. If a person vomits when lying on his back, place him in the recovery position. Never give anything by mouth to an unconscious person. Call a physician.

Notes to physician

- Treatment : Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

- Flash point : -20 °C (-4 °F)
closed cup
- Ignition temperature : 465 °C (869 °F)
- Lower explosion limit : 2.5 %(V)
- Upper explosion limit : 13 %(V)
- Suitable extinguishing media : Dry chemical
Foam
Carbon dioxide (CO₂)
Cool closed containers exposed to fire with water spray.
- Extinguishing media which shall not be used for safety reasons : Do not use a solid water stream as it may scatter and spread fire.

**Acetone (BDH1101-4LG, BDH1101-1LP, BDH1101-4LP, BDH1101-204L, BDH1101-19L)**

Version

Revision Date 03/17/2009

Print Date 03/17/2009

Specific hazards during fire fighting : Extremely flammable.
Vapours may form explosive mixtures with air.
Vapours are heavier than air and may spread along floors.
Vapors may travel to areas away from work site before igniting/flashing back to vapor source.
In case of fire hazardous decomposition products may be produced such as:
Carbon monoxide
Carbon dioxide (CO₂)

Special protective equipment for fire-fighters : Wear self-contained breathing apparatus and protective suit.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions : Wear personal protective equipment. Unprotected persons must be kept away.
Immediately evacuate personnel to safe areas.
Keep people away from and upwind of spill/leak.
Ensure adequate ventilation.
Remove all sources of ignition.
Do not swallow.
Do not breathe vapours or spray mist.
Avoid contact with skin, eyes and clothing.

Environmental precautions : Prevent further leakage or spillage if safe to do so.
Discharge into the environment must be avoided.
Do not flush into surface water or sanitary sewer system.
Prevent product from entering drains.
Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

Methods for cleaning up : Ventilate the area.
No sparking tools should be used.
Use explosion-proof equipment.
Contain and collect spillage with non-combustible absorbent materials, e.g. sand, earth, vermiculite, diatomaceous earth and place in container for disposal according to local regulations (see section 13).

SECTION 7. HANDLING AND STORAGE**Handling**

Handling : Wear personal protective equipment.
Use only in well-ventilated areas.



Acetone (BDH1101-4LG, BDH1101-1LP, BDH1101-4LP, BDH1101-204L, BDH1101-19L)

Version

Revision Date 03/17/2009

Print Date 03/17/2009

Keep container tightly closed.
 Do not smoke.
 Do not swallow.
 Do not breathe vapours or spray mist.
 Avoid contact with skin, eyes and clothing.

Advice on protection against fire and explosion : Keep away from fire, sparks and heated surfaces.
 Take precautionary measures against static discharges.
 Ensure all equipment is electrically grounded before beginning transfer operations.
 Use explosion-proof equipment.
 Keep product and empty container away from heat and sources of ignition.
 No sparking tools should be used.
 No smoking.

Storage

Requirements for storage areas and containers : Store in area designed for storage of flammable liquids. Protect from physical damage.
 Keep containers tightly closed in a dry, cool and well-ventilated place.
 Containers which are opened must be carefully resealed and kept upright to prevent leakage.
 Keep away from heat and sources of ignition.
 Keep away from direct sunlight.
 Store away from incompatible substances.
 Container hazardous when empty.
 Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective measures : Ensure that eyewash stations and safety showers are close to the workstation location.

Engineering measures : Use with local exhaust ventilation.
 Prevent vapor buildup by providing adequate ventilation during and after use.

Eye protection : Do not wear contact lenses.
 Wear as appropriate:
 Safety glasses with side-shields
 If splashes are likely to occur, wear:
 Goggles or face shield, giving complete protection to eyes



Acetone (BDH1101-4LG, BDH1101-1LP, BDH1101-4LP, BDH1101-204L, BDH1101-19L)

Version

Revision Date 03/17/2009

Print Date 03/17/2009

- Hand protection : Solvent-resistant gloves
Gloves must be inspected prior to use.
Replace when worn.
- Skin and body protection : Wear as appropriate:
Solvent-resistant apron and boots
Flame retardant antistatic protective clothing
If splashes are likely to occur, wear:
Protective suit
- Respiratory protection : In the case of vapour formation use a respirator with an approved filter.
For rescue and maintenance work in storage tanks use self-contained breathing apparatus.
Use NIOSH approved respiratory protection.
- Hygiene measures : When using, do not eat, drink or smoke.
Wash hands and face before breaks and immediately after handling the product.
Keep working clothes separately.
Remove and wash contaminated clothing before re-use.
Do not swallow.
Do not breathe vapours or spray mist.
Avoid contact with skin, eyes and clothing.

Exposure Guidelines

Acetone	67-64-1	CAD AB OEL	TWA	750 ppm	1,800 mg/m ³
		CAD AB OEL	STEL	1,000 ppm	2,400 mg/m ³
		CAD BC OEL	TWA		250 ppm
		CAD BC OEL	STEL		500 ppm
		CAD ON OEL	TWA		500 ppm
		CAD ON OEL	STEL		750 ppm

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

- Form : liquid, clear
- Color : colourless



Acetone (BDH1101-4LG, BDH1101-1LP, BDH1101-4LP, BDH1101-204L, BDH1101-19L)

Version

Revision Date 03/17/2009

Print Date 03/17/2009

Odor	: sweet mint-like
Molecular Weight	: 58.05 g/mol
pH	: not applicable
Melting point/range	: -94.8 °C (-138.6 °F)
Boiling point/boiling range	: 56 °C (133 °F)
Vapor pressure	: 240 hPa at 20 °C (68 °F)
Relative vapour density	: 2.0 (Air = 1.0)
Density	: 0.79 g/cm ³
Water solubility	: completely soluble
Partition coefficient: n-octanol/water	: POW: 0.58 log Pow: -0.24

SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid	: Heat, flames and sparks. Keep away from direct sunlight.
Materials to avoid	: Acids Aldehydes Alkalies Amines Ammonia Oxidizing agents Reducing agents Chlorine compounds
Hazardous decomposition products	: In case of fire hazardous decomposition products may be produced such as: Carbon monoxide Carbon dioxide (CO ₂)
Hazardous reactions	: Hazardous polymerisation does not occur. Stable under normal conditions.

**Acetone (BDH1101-4LG, BDH1101-1LP, BDH1101-4LP, BDH1101-204L, BDH1101-19L)**

Version

Revision Date 03/17/2009

Print Date 03/17/2009

SECTION 11. TOXICOLOGICAL INFORMATION

Acute oral toxicity	:	LD50 rat Dose: 5,800 mg/kg
Acute dermal toxicity	:	LD50 guinea pig Dose: > 7,426 mg/kg
Acute inhalation toxicity	:	LC50 rat Dose: 32000 ppm Exposure time: 4 h
Skin irritation	:	rabbit Exposure time: 24 h Mild skin irritation
Eye irritation	:	rabbit irritating
Repeated dose toxicity	:	rat 8-Week Inhalation Toxicity Study, 5 days/week for 8 weeks, Slightly reduced weight gain compared to controls NOEL: 19000 ppm
Repeated dose toxicity	:	rat 90-Day Oral Toxicity Study, increased liver and kidney weights, NOEL 100mg/kg/d
Repeated dose toxicity	:	rat 90-Day Oral Toxicity Study, increased liver and kidney weights, LOEL (Lowest observable effect level) 500mg/kg/d

SECTION 12. ECOLOGICAL INFORMATION

Toxicity to fish	:	LC50 Species: <i>Oncorhynchus mykiss</i> (rainbow trout) Dose: 5,540 mg/l Exposure time: 96 h
Toxicity to fish	:	LC50 Species: <i>Lepomis macrochirus</i> (Bluegill sunfish) Dose: 8,300 mg/l Exposure time: 96 h



Acetone (BDH1101-4LG, BDH1101-1LP, BDH1101-4LP, BDH1101-204L, BDH1101-19L)

Version

Revision Date 03/17/2009

Print Date 03/17/2009

Toxicity to daphnia and other aquatic invertebrates. : LC50
 Species: Daphnia magna (Water flea)
 Dose: 10 mg/l
 Exposure time: 24 h

SECTION 13. DISPOSAL CONSIDERATIONS

Waste Information: Observe all Federal, State, and Local Environmental regulations.

SECTION 14. TRANSPORT INFORMATION

TDG	UN-Number	: 1090
	Proper shipping name	: Acetone
	Class	: 3
	Packing group	: II
IATA	UN Number	: 1090
	Description of the goods	: Acetone
	Class	: 3
	Packaging group	: II
	Hazard Label	: 3
	Packing instruction (cargo aircraft)	: 307
	Packing instruction (passenger aircraft)	: 305
IMDG	Substance No.	: UN 1090
	Description of the goods	: Acetone
	Class	: 3
	Packaging group	: II
	Hazard Label	: 3
	EmS Number	: F-E
Marine pollutant	: no	

SECTION 15. REGULATORY INFORMATION

Inventories

EU. EINECS : On the inventory, or in compliance with the inventory

**Acetone (BDH1101-4LG, BDH1101-1LP, BDH1101-4LP, BDH1101-204L, BDH1101-19L)**

Version

Revision Date 03/17/2009

Print Date 03/17/2009

- US. Toxic Substances Control Act : On TSCA Inventory
- Australia. Industrial Chemical (Notification and Assessment) Act : On the inventory, or in compliance with the inventory
- Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL). (Can. Gaz. Part II, Vol. 133) : All components of this product are on the Canadian DSL list.
- Japan. Kashin-Hou Law List : On the inventory, or in compliance with the inventory
- Korea. Toxic Chemical Control Law (TCCL) List : On the inventory, or in compliance with the inventory
- Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act : On the inventory, or in compliance with the inventory
- China. Inventory of Existing Chemical Substances : On the inventory, or in compliance with the inventory
- CH INV - Switzerland : On the inventory, or in compliance with the inventory
- NZIOC - New Zealand : On the inventory, or in compliance with the inventory

National regulatory information

- WHMIS Classification** : B2
D2B
This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

NPRI

Canadian National Pollutant Release Inventory (NPRI): No component is listed on NPRI.

WHMIS

- Components** : Acetone 67-64-1



Acetone (BDH1101-4LG, BDH1101-1LP, BDH1101-4LP, BDH1101-204L, BDH1101-19L)

Version

Revision Date 03/17/2009

Print Date 03/17/2009

SECTION 16. OTHER INFORMATION

	HMIS III	NFPA
Health Hazard	: 2*	1
Flammability	: 3	3
Physical Hazard	: 0	
Instability	:	0

Further information

* - Chronic health hazard

**Reagent Alcohol Blends (BDH1158-4LP, BDH1158-19L, BDH1160-4LP, BDH1160-19L, BDH1162-4LP, BDH1162-19L, BDH1164-4LP, BDH1164-19L)**

Version 1

Revision Date 03/27/2009

Print Date 03/27/2009

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Reagent Alcohol Blends (BDH1158-4LP, BDH1158-19L, BDH1160-4LP, BDH1160-19L, BDH1162-4LP, BDH1162-19L, BDH1164-4LP, BDH1164-19L)

MSDS Number : 000000011701

Product Use Description : Solvent

Manufacturer : Honeywell
1953 South Harvey Street
Muskegon, MI 49442

Manufactured for : VWR International LLC
1310 Goshen Parkway
West Chester, PA 19380

For more information call : (Monday-Friday, 8:00am-5:00pm)
1-800-932-5000

In case of emergency call : (24 hours/day, 7 days/week)
1-800-424-9300 (USA Only)
For Transportation Emergencies:
1-800-424-9300 (CHEMTREC - Domestic)
1-613-966-6666 (CANUTEC - Canada)

SECTION 2. HAZARDS IDENTIFICATION**Emergency Overview**

Form : liquid, clear

Color : colourless

Odor : mild alcoholic

Hazard Summary : Flammable. In use, may form flammable/explosive vapour-air mixture. May be fatal if swallowed. May be fatal if inhaled. May be harmful if absorbed through skin. Irritating to eyes, respiratory system and skin. May cause blindness. The product may be absorbed through the skin. Repeated exposure may cause skin dryness or cracking. This product may cause adverse reproductive effects. Possible risk of harm to the unborn child. Avoid exposure to pregnant women especially. Cannot be made non-poisonous.

**Reagent Alcohol Blends (BDH1158-4LP, BDH1158-19L, BDH1160-4LP, BDH1160-19L, BDH1162-4LP, BDH1162-19L, BDH1164-4LP, BDH1164-19L)**

Version 1

Revision Date 03/27/2009

Print Date 03/27/2009

Potential Health Effects

- Skin** : Irritating to skin.
The product may be absorbed through the skin.
May cause systemic poisoning with symptoms paralleling those of inhalation.
Prolonged or repeated skin contact with liquid may cause defatting resulting in drying, redness and possible blistering.
- Eyes** : Irritating to eyes.
Causes itching, burning, redness and tearing.
May cause blindness.
May cause irreversible eye damage.
- Ingestion** : Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.
May cause systemic poisoning with symptoms paralleling those of inhalation.
May cause blindness if swallowed.
Repeated or prolonged exposure to the substance can produce liver damage.
Repeated or prolonged exposure to the substance can produce kidney damage.
- Inhalation** : Causes respiratory tract irritation.
Causes headache, drowsiness or other effects to the central nervous system.
Vapours may cause drowsiness and dizziness.
Inhalation of high vapour concentrations can cause CNS-depression and narcosis.
May cause blindness.
Repeated or prolonged exposure to the substance can produce liver damage.
Repeated or prolonged exposure to the substance can produce kidney damage.
- Chronic Exposure** : Causes damage to the kidneys/liver/eyes/brain/respiratory system/central nervous system through prolonged or repeated exposure.
Prolonged or repeated skin contact with liquid may cause defatting resulting in drying, redness and possible blistering.
This product may cause adverse reproductive effects.
Possible risk of harm to the unborn child.



Reagent Alcohol Blends (BDH1158-4LP, BDH1158-19L, BDH1160-4LP, BDH1160-19L, BDH1162-4LP, BDH1162-19L, BDH1164-4LP, BDH1164-19L)

Version 1

Revision Date 03/27/2009

Print Date 03/27/2009

Aggravated Medical Condition : Liver disorders
 Eye disorders
 Skin disorders
 Neurological disorders
 Kidney disorders
 Do not use if pregnant.

Target Organs : Eyes
 Skin
 Liver
 Kidney
 Blood
 Respiratory system
 Central nervous system
 Gastrointestinal tract

Carcinogenicity

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP, IARC, or OSHA.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Weight %
Ethanol	64-17-5	60.00 - 85.00
Water	7732-18-5	10.00 - 30.00
Propan-2-ol	67-63-0	3.00 - 5.00
Methanol	67-56-1	2.00 - 5.00

SECTION 4. FIRST AID MEASURES

Inhalation : Call a physician immediately. Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Use oxygen as required, provided a qualified operator is present.

Skin contact : Wash off immediately with plenty of water for at least 15 minutes. Take off contaminated clothing and shoes immediately. Wash contaminated clothing before re-use. Call a physician.

Eye contact : Rinse immediately with plenty of water, also under the eyelids,



Reagent Alcohol Blends (BDH1158-4LP, BDH1158-19L, BDH1160-4LP, BDH1160-19L, BDH1162-4LP, BDH1162-19L, BDH1164-4LP, BDH1164-19L)

Version 1

Revision Date 03/27/2009

Print Date 03/27/2009

Ingestion : for at least 15 minutes. Call a physician.
 : Call a physician immediately. Do NOT induce vomiting. Immediate medical attention is required. Never give anything by mouth to an unconscious person.

Notes to physician

Treatment : Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Flash point : 15 °C (59 °F)
 closed cup
 The information regarding the flash point is that of the pure substance.

Lower explosion limit : not determined

Upper explosion limit : not determined

Suitable extinguishing media : Alcohol-resistant foam
 Carbon dioxide (CO₂)
 Dry chemical
 Cool closed containers exposed to fire with water spray.

Extinguishing media which shall not be used for safety reasons : Do not use a solid water stream as it may scatter and spread fire.

Specific hazards during fire fighting : Flammable.
 Vapours may form explosive mixtures with air.
 Vapours are heavier than air and may spread along floors.
 Vapors may travel to areas away from work site before igniting/flashing back to vapor source.
 In case of fire hazardous decomposition products may be produced such as:
 Carbon monoxide
 Carbon dioxide (CO₂)
 Formaldehyde

Special protective equipment for fire-fighters : Wear self-contained breathing apparatus and protective suit.

**Reagent Alcohol Blends (BDH1158-4LP, BDH1158-19L, BDH1160-4LP, BDH1160-19L, BDH1162-4LP, BDH1162-19L, BDH1164-4LP, BDH1164-19L)**

Version 1

Revision Date 03/27/2009

Print Date 03/27/2009

SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions : Wear personal protective equipment.
Immediately evacuate personnel to safe areas.
Keep people away from and upwind of spill/leak.
Ensure adequate ventilation.
Remove all sources of ignition.
Do not swallow.
Do not breathe vapours or spray mist.
Avoid contact with skin, eyes and clothing.
- Environmental precautions : Prevent further leakage or spillage if safe to do so.
Discharge into the environment must be avoided.
Do not flush into surface water or sanitary sewer system.
Prevent product from entering drains.
Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
- Methods for cleaning up : Ventilate the area.
No sparking tools should be used.
Use explosion-proof equipment.
Contain and collect spillage with non-combustible absorbent materials, e.g. sand, earth, vermiculite, diatomaceous earth and place in container for disposal according to local regulations (see section 13).

SECTION 7. HANDLING AND STORAGE**Handling**

- Handling : Wear personal protective equipment.
Use only in well-ventilated areas.
Keep container tightly closed.
Do not smoke.
Do not swallow.
Do not breathe vapours or spray mist.
Avoid contact with skin, eyes and clothing.
- Advice on protection against fire and explosion : Keep away from fire, sparks and heated surfaces.
Take precautionary measures against static discharges.
Ensure all equipment is electrically grounded before beginning transfer operations.
Use explosion-proof equipment.
Keep product and empty container away from heat and sources



Reagent Alcohol Blends (BDH1158-4LP, BDH1158-19L, BDH1160-4LP, BDH1160-19L, BDH1162-4LP, BDH1162-19L, BDH1164-4LP, BDH1164-19L)

Version 1

Revision Date 03/27/2009

Print Date 03/27/2009

of ignition.
No sparking tools should be used.
No smoking.

Storage

Requirements for storage areas and containers : Store in area designed for storage of flammable liquids. Protect from physical damage.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Keep away from heat and sources of ignition.
Keep away from direct sunlight.
Store away from incompatible substances.
Container hazardous when empty.
Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective measures : Ensure that eyewash stations and safety showers are close to the workstation location.

Engineering measures : Use with local exhaust ventilation.
Prevent vapor buildup by providing adequate ventilation during and after use.

Eye protection : Do not wear contact lenses.
Wear as appropriate:
Safety glasses with side-shields
If splashes are likely to occur, wear:
Goggles or face shield, giving complete protection to eyes

Hand protection : Solvent-resistant gloves
Gloves must be inspected prior to use.
Replace when worn.

Skin and body protection : Wear as appropriate:
Solvent-resistant apron
Flame retardant antistatic protective clothing
If splashes are likely to occur, wear:
Protective suit



Reagent Alcohol Blends (BDH1158-4LP, BDH1158-19L, BDH1160-4LP, BDH1160-19L, BDH1162-4LP, BDH1162-19L, BDH1164-4LP, BDH1164-19L)

Version 1

Revision Date 03/27/2009

Print Date 03/27/2009

Respiratory protection : In case of insufficient ventilation wear suitable respiratory equipment.
For rescue and maintenance work in storage tanks use self-contained breathing apparatus.
Use NIOSH approved respiratory protection.

Hygiene measures : When using, do not eat, drink or smoke.
Wash hands before breaks and immediately after handling the product.
Keep working clothes separately.
Remove and wash contaminated clothing before re-use.
Do not swallow.
Do not breathe vapours or spray mist.
Avoid contact with skin, eyes and clothing.

Exposure Guidelines

Ethanol	64-17-5	OEL (QUE)	TWA	1,000 ppm	1,880 mg/m3
		CAD AB OEL	TWA	1,000 ppm	1,880 mg/m3
		CAD BC OEL	TWA		1,000 ppm
		CAD ON OEL	TWA	1,000 ppm	1,900 mg/m3
Methanol	67-56-1	CAD AB OEL	TWA	200 ppm	262 mg/m3
		CAD AB OEL	STEL	250 ppm	328 mg/m3

Skin designation:
Can be absorbed through the skin.

CAD BC OEL	TWA		200 ppm
CAD BC OEL	STEL		250 ppm

Skin designation:
Can be absorbed through the skin.

CAD ON OEL	TWA	200 ppm	260 mg/m3
CAD ON OEL	STEL	250 ppm	325 mg/m3

Skin designation:
Can be absorbed through the skin.



Reagent Alcohol Blends (BDH1158-4LP, BDH1158-19L, BDH1160-4LP, BDH1160-19L, BDH1162-4LP, BDH1162-19L, BDH1164-4LP, BDH1164-19L)

Version 1

Revision Date 03/27/2009

Print Date 03/27/2009

Isopropanol	67-63-0	CAD AB OEL	TWA	400 ppm	983 mg/m ³
		CAD AB OEL	STEL	500 ppm	1,230 mg/m ³
		CAD BC OEL	TWA		200 ppm
		CAD BC OEL	STEL		400 ppm
		CAD ON OEL	TWA		200 ppm
		CAD ON OEL	STEL		400 ppm
		OEL (QUE)	TWA	400 ppm	983 mg/m ³
		OEL (QUE)	STEL	500 ppm	1,230 mg/m ³

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Form	: liquid, clear
Color	: colourless
Odor	: mild alcoholic
pH	: not applicable
Melting point/range	: -114.1 °C (-173.4 °F) The information regarding melting point/freezing point are those of the pure substance.
Boiling point/boiling range	: 78.32 °C (172.98 °F) The information regarding the boiling point is that of the pure substance.
Vapor pressure	: 59.5 hPa at 20 °C (68 °F) The information regarding the vapour pressure is that of the solvent.
Relative vapour density	: 1.6 (Air = 1.0)
Density	: 0.78 g/cm ³

**Reagent Alcohol Blends (BDH1158-4LP, BDH1158-19L, BDH1160-4LP, BDH1160-19L, BDH1162-4LP, BDH1162-19L, BDH1164-4LP, BDH1164-19L)**

Version 1

Revision Date 03/27/2009

Print Date 03/27/2009

The information regarding the density is that of the pure substance.

Water solubility : completely soluble

SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid : Heat, flames and sparks.
Keep away from direct sunlight.

Materials to avoid : Strong oxidizing agents
Potassium superoxide
Bromine Pentafluoride
Acetyl bromide
Acetyl chloride
Platinum
Sodium

Hazardous decomposition products : In case of fire hazardous decomposition products may be produced such as:
Carbon monoxide
Carbon dioxide (CO₂)
Formaldehyde

Hazardous reactions : Hazardous polymerisation does not occur.
Stable under recommended storage conditions.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute oral toxicity : LD50 rat
Dose: 7,060 mg/kg
Test substance: Ethanol

Acute oral toxicity : LD50 rat
Dose: 5,628 mg/kg
Test substance: Methanol

Acute oral toxicity : LD50 rat
Dose: 5,045 mg/kg
Test substance: Isopropanol

Acute dermal toxicity : LD50 rabbit

**Reagent Alcohol Blends (BDH1158-4LP, BDH1158-19L, BDH1160-4LP, BDH1160-19L, BDH1162-4LP, BDH1162-19L, BDH1164-4LP, BDH1164-19L)**

Version 1

Revision Date 03/27/2009

Print Date 03/27/2009

	Dose: 15,800 mg/kg Test substance: Methanol
Acute dermal toxicity	: LD50 rabbit Dose: 12,800 mg/kg Test substance: Isopropanol
Acute inhalation toxicity	: LC50 rat Dose: 20000 ppm Exposure time: 10 h Test substance: Ethanol
Acute inhalation toxicity	: LC50 rat Dose: 64000 ppm Exposure time: 4 h Test substance: Methanol
Acute inhalation toxicity	: LC50 rat Dose: 16000 ppm Exposure time: 8 h Test substance: Isopropanol
Skin irritation	: rabbit irritating Exposure time: 24 h Test substance: Methanol
Skin irritation	: rabbit Mild skin irritation Test substance: Isopropanol
Eye irritation	: rabbit eye irritating Test substance: Methanol
Eye irritation	: rabbit Test substance: Isopropanol Severe eye irritation

SECTION 12. ECOLOGICAL INFORMATION

Biodegradability	: Biochemical Oxygen Demand (BOD) Biochemical oxygen demand within 5 days
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**Reagent Alcohol Blends (BDH1158-4LP, BDH1158-19L, BDH1160-4LP, BDH1160-19L, BDH1162-4LP, BDH1162-19L, BDH1164-4LP, BDH1164-19L)**

Version 1

Revision Date 03/27/2009

Print Date 03/27/2009

		Biodegradation: 58 % Test substance: Isopropanol
Toxicity to fish	:	LC50 Species: Fathead minnow Dose: 29.4 g/l Exposure time: 96 h Test substance: Ethanol
Toxicity to fish	:	LC50 Species: goldfish Dose: > 5 g/l Exposure time: 24 h Test substance: Isopropanol
Toxicity to fish	:	LC50 Species: Leuciscus idus (Golden orfe) Dose: 8,970 mg/l Exposure time: 48 h Test substance: Isopropanol
Toxicity to fish	:	LC50 Species: Pimephales promelas (fathead minnow) Dose: 10,400 mg/l Exposure time: 96 h Test substance: Isopropanol
Toxicity to daphnia and other aquatic invertebrates.	:	LC50 Species: Daphnia Dose: 10,000 mg/l Exposure time: 24 h Test substance: Methanol
Toxicity to daphnia and other aquatic invertebrates.	:	EC50 Species: Daphnia magna (Water flea) Dose: > 100 mg/l Exposure time: 48 h Test substance: Isopropanol
Toxicity to algae	:	LC50 Species: Scenedesmus subspicatus Dose: > 2,000 mg/l Exposure time: 72 h Test substance: Isopropanol



Reagent Alcohol Blends (BDH1158-4LP, BDH1158-19L, BDH1160-4LP, BDH1160-19L, BDH1162-4LP, BDH1162-19L, BDH1164-4LP, BDH1164-19L)

Version 1

Revision Date 03/27/2009

Print Date 03/27/2009

Toxicity to bacteria	:	EC50 Species: Photobacterium phosphoreum Dose: 43,000 mg/l Exposure time: 5 min Test substance: Methanol
Toxicity to bacteria	:	EC50 Species: Photobacterium phosphoreum Dose: 40,000 mg/l Exposure time: 15 min Test substance: Methanol
Toxicity to bacteria	:	EC50 Species: Photobacterium phosphoreum Dose: 39,000 mg/l Exposure time: 25 min Test substance: Methanol
Toxicity to bacteria	:	EC50 Species: Photobacterium phosphoreum Dose: 35,390 mg/l Exposure time: 5 min Test substance: Isopropanol

SECTION 13. DISPOSAL CONSIDERATIONS

Waste Information: Observe all Federal, State, and Local Environmental regulations.

SECTION 14. TRANSPORT INFORMATION

TDG	UN-Number	:	1987
	Proper shipping name	:	Alcohols, n.o.s. (ETHANOL, METHANOL , ISOPROPANOL)
	Class	:	3
	Packing group	:	II
IATA	UN Number	:	1987
	Description of the goods	:	Alcohols, n.o.s. (Ethanol, Methanol , Isopropanol



Reagent Alcohol Blends (BDH1158-4LP, BDH1158-19L, BDH1160-4LP, BDH1160-19L, BDH1162-4LP, BDH1162-19L, BDH1164-4LP, BDH1164-19L)

Version 1

Revision Date 03/27/2009

Print Date 03/27/2009

)
 Class : 3
 Packaging group : II
 Hazard Label : 3
 Packing instruction (cargo aircraft) : 307
 Packing instruction (passenger aircraft) : 305
 Packing instruction (passenger aircraft) : Y305

IMDG Substance No. : UN 1987
 Description of the goods : Alcohols, n.o.s.
 (ETHANOL
 , METHANOL
 , ISOPROPANOL
)
 Class : 3
 Packaging group : II
 Hazard Label : 3
 EmS Number : F-E
 Marine pollutant : no

SECTION 15. REGULATORY INFORMATION

Inventories

EU. EINECS : On the inventory, or in compliance with the inventory

US. Toxic Substances Control Act : On TSCA Inventory

Australia. Industrial Chemical (Notification and Assessment) Act : On the inventory, or in compliance with the inventory

Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL). (Can. Gaz. Part II, Vol. 133) : All components of this product are on the Canadian DSL list.

Japan. Kashin-Hou Law List : On the inventory, or in compliance with the inventory

Korea. Toxic Chemical : On the inventory, or in compliance with the inventory



Reagent Alcohol Blends (BDH1158-4LP, BDH1158-19L, BDH1160-4LP, BDH1160-19L, BDH1162-4LP, BDH1162-19L, BDH1164-4LP, BDH1164-19L)

Version 1

Revision Date 03/27/2009

Print Date 03/27/2009

Control Law (TCCL) List

Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act	:	On the inventory, or in compliance with the inventory
China. Inventory of Existing Chemical Substances	:	On the inventory, or in compliance with the inventory
CH INV - Switzerland	:	On the inventory, or in compliance with the inventory
NZIOC - New Zealand	:	On the inventory, or in compliance with the inventory

National regulatory information

WHMIS Classification	:	B2 D1B D2A D2B
		This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

WHMIS Components	:	Ethanol	64-17-5
	:	Methanol	67-56-1
	:	Isopropanol	67-63-0

NPRI Components	:	Ethanol	64-17-5
	:	Methanol	67-56-1
	:	Isopropanol	67-63-0

SECTION 16. OTHER INFORMATION

	HMIS III	NFPA
Health Hazard	: 2*	1
Flammability	: 3	3
Physical Hazard	: 0	
Instability	:	0



Reagent Alcohol Blends (BDH1158-4LP, BDH1158-19L, BDH1160-4LP, BDH1160-19L, BDH1162-4LP, BDH1162-19L, BDH1164-4LP, BDH1164-19L)

Version 1

Revision Date 03/27/2009

Print Date 03/27/2009

Further information

* - Chronic health hazard

Material Safety Data Sheet
ALL-IN-ONE BT

WESMAR CO. INC. 5720 204 TH ST. SW LYNNWOOD, WA 98036 (206) 783-5344	DATE PREPARED: MAR 1, 2006 REVISION NUMBER: MAR 1, 2008 24 HOUR EMERGENCY PHONE NUMBER CHEMTREC: 800-424-9300
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SECTION I – IDENTIFICATION

PRODUCT NAME: ALL-IN-ONE BT
CHEMICAL FAMILY: ALKALINE MATERIAL
FORMULA: N/A
CAS NUMBER: N/A

SECTION II – HAZARDOUS IDENTIFICATION

EMERGENCY OVERVIEW:

EYES: May cause severe eye irritation with possible permanent eye damage and impairment of vision.

SKIN (DERMAL): Brief exposure may cause skin irritation while prolonged or repeated exposure may cause chemical burns.

SWALLOWING (INGESTION): May cause severe gastrointestinal irritation and/or ulceration of the mouth and throat. Single dose oral LD50 has not been determined.

INHALATION: Vapors and mist may cause respiratory tract irritation.

MEDICAL CONDITION AGGRAVATED

BY EXPOSURE: Existing skin and/or respiratory disorders may be aggravated by exposure.

CHRONIC OVEREXPOSURE:.. None known

OSHA REGULATORY STATUS: Since this product is a mixture, there is no defined PEL's (Personal Exposure Limits) established by OSHA. ACGIH TLV's (Threshold Limit Values) for hazardous components are listed in the Hazardous Ingredients Section of this MSDS.

SECTION III – COMPOSITION INFORMATION ON INGREDIENTS

THRESHOLD LIMIT VALUE:.. The TLV in section in section III is the ACGIH/TLV-TWA (threshold limit value/time weighted average concentration for an eight hour work day). The STEL is the short term exposure limit and the (Ceil) is the ceiling limit.

HAZARDOUS INGREDIENT	PERCENT	CAS NO.	ACGIH/TWA	STEL/TLV
Sodium hydroxide	5-10	1310-73-2	NOT EST.	2 mg/M ³ (Ceil)
Diethylethanolamine	5-10	100-37-8	2 PPM	NOT EST.
Sodium sulfite	5-10	7757-83-7	NOT EST.	NOT EST.
Sodium hexametaphosphate	1-5	68915-31-1	NOT EST.	NOT EST.

(Also contains water treatment polymers and corrosion inhibitors.)

SECTION IV – FIRST AID DATA

Material Safety Data Sheet

ALL-IN-ONE BT

EYES: In case of contact, immediately flush eyes with lots of running water for at least 15 minutes. Call for medical assistance.

SKIN (DERMAL):..... Immediately flush skin with lots of cool running water for at least 15 minutes while removing contaminated clothing and/or shoes. Wash contaminated clothing and/or shoes before reuse.

SWALLOWING (INGESTION): NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. (If available, give several glasses of milk) If vomiting occurs spontaneously, keep airway clean and give more water. GET MEDICAL ATTENTION IMMEDIATELY.

INHALATION:..... If exposure by inhalation is suspected, immediately move exposed individual to fresh air. If individual experiences nausea, headache, dizziness, has difficulty in breathing or is cyanotic, seek a health care professional immediately. Never give anything by mouth to an unconscious person.

SECTION V – FIRE FIGHTING MEASURES

FLASHPOINT:..... Non flammable, non combustible

LOWER EXPLOSIVE LIMIT:... N/A

UPPER EXPLOSIVE LIMIT:..... N/A

EXTINGUISHING MEDIA: Use extinguishing media appropriate to primary cause of fire.

SECTION XVI – OTHER INFORMATION

SPECIAL FIRE FIGHTING

PROCEDURES: Avoid contact with fire fighting personnel as burns may result from contact with skin. when fighting a fire near or involving this product, wear a self-contained breathing apparatus. (SCBA)

UNUSUAL FIRE AND

EXPLOSION HAZARDS: None known

SECTION VI – ACCIDENTAL RELEASE MEASURES

SPILL/ LEAK PROCEDURES:.. Appropriate protective clothing must be worn by trained cleanup personnel. Dike the area to contain spill. Dilute with large quantities of water and neutralize with dilute acids such as acetic or phosphoric acid. Properly neutralized liquid (pH 6-9) may be disposed of in waste water treatment facilities. Check with local authorities first.

SECTION VII – HANDLING AND STORAGE

HANDLING INFORMATION: .. Store away from acids, oxidizing compounds and other incompatible materials. Keep container tightly closed when not in use. KEEP OUT OF REACH OF CHILDREN.

Material Safety Data Sheet

ALL-IN-ONE BT

STORAGE REQUIREMENTS:... Keep containers tightly closed when not in use. Empty container completely and dispose of in accordance with applicable regulations. **SPILLS:** Contain spill. Absorb with inert material and dispose in accordance with applicable regulations. Store away from food production areas and food storage areas.

SECTION VIII – EXPOSURE CONTROLS / PERSONAL PROTECTION

EYE PROTECTION:..... Chemical safety goggles and full face shield (8null min.) to protect against splashing in compliance with OSHA regulations are advised. OSHA regulations also permit other type safety glasses. (Consult your industrial hygienist) Contact lenses should not be worn when working with any chemicals.

RESPIRATORY PROTECTION:Respiratory protection should be worn if levels exceed defined PEL's for this product or any hazardous component listed in the Hazardous Ingredient Section of this MSDS.

OTHER PROTECTIVE

EQUIPMENT: Impervious protective clothing and chemical resistant safety shoes should be worn to minimize contact. Emergency shower and eyewash facility should be in close proximity. (ANSIZ358.1)

VENTILATION:..... Local exhaust sufficient to maintain TLV below permissible exposure limits.

SECTION IX – PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Clear light amber liquid with distinct odor.

BOILING POINT:..... Approx. 212° F.

VAPOR PRESSURE: NOT EST.

VAPOR DENSITY (AIR=1): NOT EST.

SPECIFIC GRAVITY:..... 1.17

pH: > 13.0 AS IS

SOLUBILITY IN WATER:..... Completely soluble in water.

SECTION X – STABILITY AND REACTIVITY DATA

STABILITY: Stable

HAZARDOUS

POLYMERIZATION: Will not occur

INCOMPATIBILITY: Strong oxidizing agent, strong acids.

HAZARDOUS

DECOMPOSITION: Carbon monoxide and carbon dioxide upon thermal decomposition.

SECTION XI – TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION:

SODIUM HYDROXIDE: The severity of the tissue damage is a function of its concentration, the length of tissue contact time, and local tissue conditions. After exposure there may be a time delay before irritation and other effects occur. This material is a strong irritant and is corrosive to the skin, eyes, and mucous membranes. This material may cause severe burns and permanent damage to any tissue with which it comes into contact. Inhalation will cause severe irritation,

Material Safety Data Sheet

ALL-IN-ONE BT

possible burns with pulmonary edema, which may lead to pneumonitis. Skin contact with this material may cause severe irritation and corrosion of tissue. Eye contact can cause severe irritation, corrosion with possible corneal damage and blindness. Ingestion may cause irritation, corrosion/ulceration, nausea, and vomiting. In general, chronic effects are due to long-term irritation. This material may cause dermatitis on the skin, or recurrent corneal ulceration and visual disturbances of vision. In rare cases reports have noted long-term inhalation causes bronchial inflammatory reaction or obstructive airway dysfunction. **SODIUM HYDROXIDE:** Irritation Data: 500 mg/24 hour(s) skin-rabbit severe, 400 ?g eyes-rabbit mild, 1 percent eyes-rabbit severe. Toxicity Data: 1350 mg/kg skin-rabbit LD50 104-340 mg/kg oral-rat LD50. **DIETHYLETHANOLAMINE:**Rat LD50 = 2.46 g/kg; administered in 10% dilution in water. Rabbit: LD50 = 1.26 ml/kg; 24 hr occluded. Irritation: Skin: Rabbit 4 hr occluded: Results: severe erythema and edema with necrosis, ulceration and scabbing.

SECTION XII – ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION:

SODIUM HYDROXIDE: Ecotoxicity Data: Shis Toxicity: This material has exhibited moderate toxicity to aquatic organisms. For Sodium Hydroxide: 100 ppm LC50 Daphnia: 25 ppm 24 hours LC50 Brook trout: 48 ppm LC50 King salmon; 33-100 ppm 48 hours LC50 Shrimp, 330-1000 ppm 48 hours LC50 Cockle: FATE and TRANSPORT: BIODEGRADATION: This material is inorganic and mot subject to biodegradation. PERSISTENCE: This material is believed to exist in the dissassociated state in the environment. OTHER BIOLOGICAL INFORMATION: This material has exhibited slight toxicity to rerrestrial organisms. **DIETHYLETHANOLAMINE:** BOD (% Oxygen consumption) Day 5 = 5%, Day 10 = 5%, Day 20 = 76%. Ecotoxicity: Toxicity to micro-organisms result value > 1000 mg/L. Toxicity to aquatic Invertebrates result value: 44.1 mg/L. Toxicity to fish result value 73 mg/L.

SECTION XIII – DISPOSAL CONSIDERATIONS

WASTE DISPOSAL:..... Consult all LOCAL, STATE, and FEDERAL regulations with regard to proper and suitable disposal methods.

SECTION XIV – TRANSPORTATION INFORMATION

PROPER SHIPPING NAME: UN-1824, SODIUM HYDROXIDE, SOLUTION 8, PG-II
HAZARD CLASS AND LABEL: 8 (CORROSIVE)
UN NUMBER: UN-1824
PACKAGING GROUP: PG - II

SECTION XV – REGULATORY INFORMATION

LISTED CARCINOGEN:..... None known

Material Safety Data Sheet
ALL-IN-ONE BT

TSCA STATUS:..... All components in this product are listed on the TSCA inventory.
SARA SECTION 313: This product **does not** contain any EPCRA section 313 chemicals subject to the reporting requirements of section 313 of the Emergency Planning Community Right-To-Know Act of 1986 (40CFR 372):
NFPA HEALTH: 2
NFPA FLAMMABILITY:..... 0
NFPA REACTIVITY:..... 0

SECTION XVI – OTHER INFORMATION
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REFERENCES: The information contained herein has been compiled from sources believed to be reliable and accurate to the best of our knowledge at this date. It is provided without warranty, expressed or implied, as to the results of use of this information or to the product to which it relates. Wesmar Co. assumes no responsibility for injury to any person or property resulting from any use of the material. Each user assumes the risk in their use of this product and should review the data and recommendations in the specific context of their intended use.

FOOT NOTES: NOT EST. = Not Established, N/A = Not Applicable, (Ceil) = TLV ceiling limit.

Safety Data Sheet
LIQUID CAUSTIC 50%

WESMAR CO. INC. 5720 204 TH ST. SW LYNNWOOD, WA 98036 (206) 783-5344	DATE PREPARED:.....JAN 12, 2011 DATE REVISED:.....JAN 2, 2013 24 HOUR EMERGENCY PHONE NUMBER PERS:.....800-633-8253
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SECTION I – IDENTIFICATION

PRODUCT NAME:.....LIQUID CAUSTIC 50%
CHEMICAL FAMILY:.....HIGHLY ALKALINE MATERIAL
FORMULA:.....N/A
CAS NUMBER:.....N/A

SECTION II – COMPOSITION INFORMATION ON INGREDIENTS

THRESHOLD LIMIT VALUE: ..The TLV in section in section III is the ACGIH/TLV-TWA (threshold limit value/time weighted average concentration for an eight hour work day). The STEL is the short term exposure limit and the (Ceil) is the ceiling limit.

HAZARDOUS INGREDIENT	PERCENT	CAS NO.	ACGIH/TWA	STEL/TLV
Sodium Hydroxide	45-51	1310-73-2	NOT EST.	2 mg/M ³ (Ceil)

SECTION III – HAZARDOUS IDENTIFICATION

EMERGENCY OVERVIEW:

EYES:.....May cause severe irritation with corneal injury and result in permanent impairment of vision, even blindness. Dust, mists, or vapors may irritate eyes.

SKIN (DERMAL):.....SKIN CONTACT: Short single exposure may cause severe skin burns. SKIN ABSORPTION: A single prolonged skin exposure is not likely to result in absorption of harmful amounts. The dermal LD50 has not been determined.

SWALLOWING (INGESTION):..May cause gastrointestinal irritation or ulceration and severe burns of the mouth and throat. Single dose oral LD50 has not been determined.

INHALATION:.....Dusts or mists may cause severe irritation in upper respiratory tract.

MEDICAL CONDITION AGGRAVATED

BY EXPOSURE:.....Existing skin and/or respiratory disorders may be aggravated by exposure.

CHRONIC OVEREXPOSURE: ..None known

OSHA REGULATORY STATUS:Since this product is a mixture, there is no defined PEL's (Personal Exposure Limits) established by OSHA. ACGIH TLV's (Threshold Limit Values) for hazardous components are listed in the Hazardous Ingredients Section of this MSDS.

SECTION IV – FIRST AID DATA

EYES:.....Water is the only acceptable method of removal of this product from the eyes or skin. You may have 10 seconds or less to avoid serious permanent injury. Therefore, IMMEDIATE first aid must be given after any exposure. Moving the victim from water access for transport to medical aid should be done only on the

Safety Data Sheet

LIQUID CAUSTIC 50%

advice of qualified medical personnel. While transporting victim to a medical facility, continue washing if possible. In case of contact, immediately flush eyes with lots of running water for at least 15 minutes. Call for medical assistance.

SKIN (DERMAL):Immediately remove contaminated clothing and footwear. Wash skin thoroughly with soap and water for at least 15 minutes. Obtain medical attention without delay. Wash clothing before reuse. Discard contaminated leather articles such as shoes or belts.

SWALLOWING (INGESTION):..NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. (If available, give several glasses of milk) If vomiting occurs spontaneously, keep airway clear and give more water. GET MEDICAL ATTENTION IMMEDIATELY.

INHALATION:Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen as directed by physician or medical personnel.

NOTE TO PHYSICIAN:CORROSIVE! May cause stricture. If lavage is performed, suggest endotracheal and/or esophagoscopy control. Material is strong alkali. If burn is present, treat as any thermal burn, after decontamination. For burns of skin only. Eye irrigation may be necessary for an extended period of time to remove as much caustic as possible. Duration of irrigation and treatment is at the discretion of medical personnel. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

SECTION V – FIRE FIGHTING MEASURES

FLASHPOINT:.....Non flammable, non combustible

LOWER EXPLOSIVE LIMIT: ...N/A

UPPER EXPLOSIVE LIMIT:N/A

EXTINGUISHING MEDIA:Use extinguishing media appropriate to primary cause of fire.

SPECIAL FIRE FIGHTING

PROCEDURES:Avoid contact with fire fighting personnel as burns may result from contact with skin. when fighting a fire near or involving this product, wear a self-contained breathing apparatus. (SCBA)

UNUSUAL FIRE AND

EXPLOSION HAZARDS:None known

SECTION VI – ACCIDENTAL RELEASE MEASURES

SPILL/ LEAK PROCEDURES: ..Only trained and properly protected personnel should be involved in spill cleanup operations. Acting cautiously, small accidental spills should be carefully flushed with water. Dilute acid, preferably acetic acid, may be used to neutralize only the final traces of product after flushing. Spills or releases should be reported, if required, to the appropriate local , state and federal regulatory agencies.

SECTION VII – HANDLING AND STORAGE

Safety Data Sheet LIQUID CAUSTIC 50%

HANDLING INFORMATION: ...Do not get in eyes, on skin or on clothing. Avoid breathing dust, mists or spray. Do not take internally. Wash thoroughly after handling or contact. Exposure can cause burns that are not immediately painful or visible. Do not add water to contents while in container because of possible violent reaction. Keep container out of sun and away from heat, sparks and flames. Keep container tightly closed when not in use to prevent leakage. Do not use pressure to empty container. Do not wash out container or use it for other purposes. Replace closure after each withdrawal and return it with empty container. Empty containers retain product residue and must be handled as if they were full. **KEEP OUT OF REACH OF CHILDREN.**

STORAGE REQUIREMENTS:...Keep containers tightly closed when not in use. Empty container completely and dispose of in accordance with applicable regulations. **SPILLS:** Contain spill. Absorb with inert material and dispose in accordance with applicable regulations. Store away from food products.

SECTION VIII – EXPOSURE CONTROLS / PERSONAL PROTECTION

EYE PROTECTION:.....Chemical safety goggles and full face shield to protect against splashing in compliance with OSHA regulations are advised. OSHA regulations also permit other type safety glasses. (Consult your industrial hygienist) Contact lenses should not be worn when working with any chemicals.

RESPIRATORY PROTECTION:Respiratory protection should be worn if levels exceed defined PEL's for this product or any hazardous component listed in the Hazardous Ingredient Section of this MSDS.

OTHER PROTECTIVE

EQUIPMENT:.....Impervious protective clothing and chemical resistant safety shoes should be worn to minimize contact. Emergency shower and eyewash facility should be in close proximity. (ANSIZ358.1)

VENTILATION:Local exhaust sufficient to maintain TLV below permissible exposure limits.

SECTION IX – PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:Clear colorless liquid with mild to no odor

BOILING POINT:Approx. 212° F.

VAPOR PRESSURE:.....NOT EST.

VAPOR DENSITY (AIR=1):.....NOT EST.

SPECIFIC GRAVITY:1.5

pH:> 13.5

SOLUBILITY IN WATER:Completely soluble in water.

SECTION X – STABILITY AND REACTIVITY DATA

STABILITY:.....Stable

HAZARDOUS

POLYMERIZATION:Will not occur

INCOMPATIBILITY:Avoid contact with aluminum, tin, zinc, bronze, brass and alloys containing these metals. Do not mix with acids or organic compounds due to possible violent

Safety Data Sheet

LIQUID CAUSTIC 50%

reaction. Avoid contact with leather, wool, organic halogens and nitrogen compounds.

HAZARDOUS

DECOMPOSITION:.....Carbon monoxide and carbon dioxide upon thermal decomposition.

SECTION XI – TOXICOLOGICAL INFORMATION

TOXICOLOGICAL

INFORMATION:.....**SODIUM HYDROXIDE:** The severity of the tissue damage is a function of its concentration, the length of tissue contact time, and local tissue conditions. After exposure there may be a time delay before irritation and other effects occur. This material is a strong irritant and is corrosive to the skin, eyes, and mucous membranes. This material may cause severe burns and permanent damage to any tissue with which it comes into contact. Inhalation will cause severe irritation, possible burns with pulmonary edema, which may lead to pneumonitis. Skin contact with this material may cause severe irritation and corrosion of tissue. Eye contact can cause severe irritation, corrosion with possible corneal damage and blindness. Ingestion may cause irritation, corrosion/ulceration, nausea, and vomiting. In general, chronic effects are due to long-term irritation. This material may cause dermatitis on the skin, or recurrent corneal ulceration and visual disturbances of vision. In rare cases reports have noted long-term inhalation causes bronchial inflammatory reaction or obstructive airway dysfunction.
SODIUM HYDROXIDE: Irritation Data: 500 mg/24 hour(s) skin-rabbit severe, 400 ?g eyes-rabbit mild, 1 percent eyes-rabbit severe. Toxicity Data: 1350 mg/kg skin-rabbit LD50 104-340 mg/kg oral-rat LD50.

SECTION XII – ECOLOGICAL INFORMATION

ECOLOGICAL

INFORMATION:.....**SODIUM HYDROXIDE:** Ecotoxicity Data: Shis Toxicity: This material has exhibited moderate toxicity to aquatic organisms. For Sodium Hydroxide: 100 ppm LC50 Daphnia: 25 ppm 24 hours LC50 Brook trout: 48 ppm LC50 King salmon; 33-100 ppm 48 hours LC50 Shrimp, 330-1000 ppm 48 hours LC50 Cockle: FATE and TRANSPORT: BIODEGRADATION: This material is inorganic and mot subject to biodegradation. PERSISTENCE: This material is believed to exist in the dissassociated state in the environment. OTHER BIOLOGICAL INFORMATION: This material has exhibited slight toxicity to terrestrial organisms.

SECTION XIII – DISPOSAL CONSIDERATIONS

WASTE DISPOSAL:Consult all LOCAL, STATE, and FEDERAL regulations with regard to proper and suitable disposal methods.

ADDITIONAL:.....1. Always add this product to water with constant agitation. NEVER add water to this product. 2. The water should be lukewarm (80° - 100° F). Never start with hot or cold water.The addition of this product to liquid will cause a rise in temperature. If this product becomes concentrated in one area, or is added too rapidly, or is added to hot or cold liquid, a rapid temperature increase can result in DANGEROUS mist, boiling, splattering or may cause an immediate VIOLENT ERUPTION.

Safety Data Sheet
LIQUID CAUSTIC 50%

SECTION XIV – TRANSPORTATION INFORMATION

PROPER SHIPPING NAME:.....UN-1824 SODIUM HYDROXIDE, SOLUTION 8 PG-II
HAZARD CLASS AND LABEL:..8 (CORROSIVE)
UN NUMBER:UN 1824
PACKAGING GROUP:PG - II

SECTION XV – REGULATORY INFORMATION

LISTED CARCINOGEN:None known
TSCA STATUS:All components in this product are listed on the TSCA inventory.
SARA SECTION 313:.....This product does not contain any EPCRA section 313 chemicals subject to the reporting requirements of section 313 of the Emergency Planning Community Right-To-Know Act of 1986 (40CFR 372):
NFPA HEALTH:.....3
NFPA FLAMMABILITY:.....0
NFPA REACTIVITY:.....1

SECTION XVI – OTHER INFORMATION

REFERENCES:.....The information contained herein has been compiled from sources believed to be reliable and accurate to the best of our knowledge at this date. It is provided without warranty, expressed or implied, as to the results of use of this information or to the product to which it relates. Wesmar Co. assumes no responsibility for injury to any person or property resulting from any use of the material. Each user assumes the risk in their use of this product and should review the data and recommendations in the specific context of their intended use.

FOOT NOTES:.....NOT EST. = Not Established, N/A = Not Applicable, (Ceil) = TLV ceiling limit.

Safety Data Sheet
KING POWDERED SULFITE

KING SOFT WATER CO. 1425 E HOUSTON AVE. SPOKANE, WA 99217 (509) 487-5464	DATE PREPARED:.....MAR 1, 2006 DATE REVISED:.....JAN 2, 2013 24 HOUR EMERGENCY PHONE NUMBER PERS:.....1-800-633-8253
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SECTION I – IDENTIFICATION

PRODUCT NAME:.....KING POWDERED SULFITE
CHEMICAL FAMILY:Sodium Sulfitte
FORMULA:.....N/A
CAS NUMBER:.....N/A

SECTION II – COMPOSITION INFORMATION ON INGREDIENTS

THRESHOLD LIMIT VALUE: ..The TLV in section in section III is the ACGIH/TLV-TWA (threshold limit value/time weighted average concentration for an eight hour work day). The STEL is the short term exposure limit and the (Ceil) is the ceiling limit.

HAZARDOUS INGREDIENT	PERCENT	CAS NO.	ACGIH/TWA	STEL/TLV
Sodium sulfite	> 80	7757-83-7	NOT EST.	NOT EST.

SECTION III – HAZARDOUS IDENTIFICATION

EMERGENCY OVERVIEW:
EYES:May cause severe eye irritation with possible permanent eye damage and impairment of vision.
SKIN (DERMAL):Skin contact may cause irritation while prolonged exposure may cause chemical burns.
SWALLOWING (INGESTION):..May cause severe gastrointestinal irritation and/or ulceration of the mouth and throat. Single dose oral LD50 has not been detemined.
INHALATION:Vapors and mist may cause respiratory tract irritation.
MEDICAL CONDITION AGGRAVATED
BY EXPOSURE:Existing skin and/or respiratory disorders may be aggravated by exposure.
CHRONIC OVEREXPOSURE: ..None known
OSHA REGULATORY STATUS:Since this product is a mixture, there is no definded PEL's (Personal Exposure Limits) established by OSHA. ACGIH TLV's (Threshold Limit Values) for hazardous components are listed in the Hazardous Ingredients Section of this MSDS.

SECTION IV – FIRST AID DATA

EYES:In case of contact, immediately flush eyes with lots of running water for at least 15 minutes. Call for medical assistance.
SKIN (DERMAL):Immediately flush skin with lots of cool running water for at least 15 minutes while removing contaminated clothing and/or shoes. Wash contaminated clothing and/or shoes before reuse.

Safety Data Sheet
KING POWDERED SULFITE

SWALLOWING (INGESTION): NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. (If available, give several glasses of milk) If vomiting occurs spontaneously, keep airway clear and give more water. GET MEDICAL ATTENTION IMMEDIATELY.

INHALATION:If exposure by inhalation is suspected, immediately move exposed individual to fresh air. If individual experiences nausea, headache, dizziness, has difficulty in breathing or is cyanotic, seek a health care professional immediately. Never give anything by mouth to an unconscious person.

SECTION V – FIRE FIGHTING MEASURES

FLASHPOINT:.....Non flammable, non combustible

LOWER EXPLOSIVE LIMIT: ...N/A

UPPER EXPLOSIVE LIMIT:N/A

EXTINGUISHING MEDIA:Use extinguishing media appropriate to primary cause of fire.

SPECIAL FIRE FIGHTING

PROCEDURES:Avoid contact with fire fighting personnel as burns may result from contact with skin. when fighting a fire near or involving this product, wear a self-contained breathing apparatus. (SCBA)

UNUSUAL FIRE AND

EXPLOSION HAZARDS:.....None known

SECTION VI – ACCIDENTAL RELEASE MEASURES

SPILL/ LEAK PROCEDURES: ...Appropriate protective clothing must be worn by trained cleanup personnel. Dike the area to contain spill. Dilute with large quantities of water and neutralize with dilute acids such as acetic or phosphoric acid. Properly neutralized liquid (pH 6-9) may be disposed of in waste water treatment facilities. Check with local authorities first.

SECTION VII – HANDLING AND STORAGE

HANDLING INFORMATION: ...Store away from acids, oxidizing compounds and other incompatible materials. Keep container tightly closed when not in use. KEEP OUT OF REACH OF CHILDREN.

STORAGE REQUIREMENTS:...Keep containers tightly closed when not in use. Empty container completely and dispose of in accordance with applicable regulations. SPILLS: Contain spill. Absorb with inert material and dispose in accordance with applicable regulations. Store away from food production areas and food storage areas.

SECTION VIII – EXPOSURE CONTROLS / PERSONAL PROTECTION

EYE PROTECTION:.....Chemical safety goggles and full face shield to protect against splashing in compliance with OSHA regulations are advised. OSHA regulations also permit

Safety Data Sheet
KING POWDERED SULFITE

other type safety glasses. (Consult your industrial hygienist) Contact lenses should not be worn when working with any chemicals.

RESPIRATORY PROTECTION: Respiratory protection should be worn if levels exceed defined PEL's for this product or any hazardous component listed in the Hazardous Ingredient Section of this MSDS.

OTHER PROTECTIVE

EQUIPMENT:Impervious protective clothing and chemical resistant safety shoes should be worn to minimize contact. Emergency shower and eyewash facility should be in close proximity. (ANSIZ358.1)

VENTILATION:Local exhaust sufficient to maintain TLV below permissible exposure limits.

SECTION IX – PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: White free flowing powder

BOILING POINT: NOT EST.

VAPOR PRESSURE: NOT EST.

VAPOR DENSITY (AIR=1): NOT EST.

SPECIFIC GRAVITY: > 1.1

pH: 9.0 - 10.5 (1% SOLUTION)

SOLUBILITY IN WATER: Completely soluble in water.

SECTION X – STABILITY AND REACTIVITY DATA

STABILITY: Stable

HAZARDOUS

POLYMERIZATION: Will not occur

INCOMPATIBILITY: Strong oxidizing agent, strong acids.

HAZARDOUS

DECOMPOSITION: Carbon monoxide and carbon dioxide upon thermal decomposition.

SECTION XI – TOXICOLOGICAL INFORMATION

TOXICOLOGICAL

INFORMATION: Acute Oral Effects: Not determined. Acute toxicity via the oral route is expected to be low. Acute Dermal Effects: Not determined. Acute toxicity via the dermal route is expected to be low.

SECTION XII – ECOLOGICAL INFORMATION

ECOLOGICAL

INFORMATION: No data available on the adverse effects of this material on the environment. Neither COD nor BOD data are available.

SECTION XIII – DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Consult all LOCAL, STATE, and FEDERAL regulations with regard to proper and suitable disposal methods.

Safety Data Sheet
KING POWDERED SULFITE

SECTION XIV – TRANSPORTATION INFORMATION

PROPER SHIPPING NAME:.....N/A
HAZARD CLASS AND LABEL:..NON HAZARDOUS
UN NUMBER:.....N/A
PACKAGING GROUP:N/A

SECTION XV – REGULATORY INFORMATION

LISTED CARCINOGEN:None known
TSCA STATUS:All components in this product are listed on the TSCA inventory.
SARA SECTION 313:.....This product **does not** contain any EPCRA section 313 chemicals subject to the reporting requirements of section 313 of the Emergency Planning Community Right-To-Know Act of 1986 (40CFR 372):
NFPA HEALTH:.....2
NFPA FLAMMABILITY:.....0
NFPA REACTIVITY:.....0

SECTION XVI – OTHER INFORMATION

REFERENCES:.....The information contained herein has been compiled from sources believed to be reliable and accurate to the best of our knowledge at this date. It is provided without warranty, expressed or implied, as to the results of use of this information or to the product to which it relates. KING SOFT WATER CO. assumes no responsibility for injury to any person or property resulting from any use of the material if reasonable safety procedures are not adhered to. Each user assumes the risk in their use of this product and should review the data and recommendations in the specific context of their intended use.
FOOT NOTES:.....NOT EST. = Not Established, N/A = Not Applicable, (Ceil) = TLV ceiling limit.



VITEC® 4000 NSF
MATERIAL SAFETY DATA SHEET

PART I *What is the material and what do I need to know in an emergency?*

1. PRODUCT IDENTIFICATION

TRADE NAME (AS LABELED): **VITEC® 4000**
CHEMICAL NAME/CLASS: Not Applicable
SYNONYMS: Organic Acid, Terpolymer
PRODUCT USE: Antiscalant/Antifoulant
SUPPLIER/MANUFACTURER'S NAME: **AVISTA TECHNOLOGIES**
ADDRESS: 140 Bosstick Blvd
 San Marcos, CA 92069
CHEMTREC EMERGENCY NO.: 1-800-424-9300 (United States)**
 1-703-527-3887 (International)
BUSINESS PHONE: (760) 744-0536
DATE OF PREPARATION: May 13, 1999, Revised August 2012

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	% w/w	EXPOSURE LIMITS IN AIR					OTHER mg/m ³
			ACGIH-TLV		OSHA-PEL			
			TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³	IDLH mg/m ³	
Acrylic Polymer		10-20	NE	NE	NE	NE	NE	NE
bis-phosphonic Acid	Proprietary	1-10	NE	NE	NE	NE	NE	NE
Inorganic Acid	Proprietary	< 0.1	1	3	1	3 (vacated 1989 PEL)	1000	NIOSH REL: TWA = 1 STEL = 3
Aromatic Carboxylic Acid Salt	Proprietary	< 1	NE	NE	NE	NE	NE	NE
Water and Sodium Hydroxide. Sodium Hydroxide is added for pH adjustment only and does not contribute any additional hazards to this product.		Balance	NE	NE	NE	NE	NE	NE

NE = Not Established. C = Ceiling Limit. See Section 16 for Definitions of Terms Used.

NOTE: All WHMIS information is included; it is located in appropriate sections based on the ANSI Z400.1-1998 format.



DRINKING WATER TREATMENT ADDITIVES CLASSIFIED BY NSF INTERNATIONAL TO ANSI/NSF 60 AS STANDARD DRINKING WATER TREATMENT CHEMICAL FOR USE IN REVERSE OSMOSIS SYSTEMS AT A MAXIMUM LEVEL OF 7 mg/l

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a clear, amber liquid with a mild odor. This product may slightly irritate contaminated tissue. This product is neither reactive nor flammable. Emergency responders must wear personal protective equipment (and have appropriate fire-extinguishing protection) suitable for the situation to which they are responding.

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: The most significant routes of occupational overexposure are inhalation and contact with skin and eyes. The symptoms of overexposure to this product are as follows:

INHALATION: Inhalation of mists or sprays of this product may irritate the nose, throat, or other tissues of the respiratory system. Symptoms of such exposure may include tingling, coughing, sneezing, and difficulty breathing.

CONTACT WITH SKIN or EYES: Depending on the duration and concentration of overexposure, eye or skin contact may cause slight irritation. Symptoms of skin contact may include redness and irritation. Prolonged or repeated overexposure to this product may cause dermatitis (dry, red skin). Repeated overexposure to this product may cause sensitization; subsequent exposures to very small amounts may cause allergic reaction. Symptoms may include tingling, redness, and rapid development of eczema. Symptoms of eye contact may include irritation, tingling, and tearing.

SKIN ABSORPTION: Skin absorption is not a significant route of exposure for any component of this product.

INGESTION: Ingestion is not anticipated to be a likely route of exposure to this product. If this product is swallowed, it may cause gastric discomfort. Symptoms may include stomach pains, cramps, and gastritis.

INJECTION: Accidental injection of this product can cause burning, reddening, and swelling in addition to the wound.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in [Lay Terms](#).

ACUTE: Inhalation exposure may cause tingling, coughing, sneezing, and difficulty breathing. Symptoms of skin and eye contact may include redness and irritation. Ingestion may cause stomach pains, cramps, and gastritis.

CHRONIC: Prolonged or repeated skin overexposure to this product may cause dermatitis (dry, red skin). Repeated skin overexposure may cause sensitization. Symptoms may include tingling, redness, and rapid development of eczema.

TARGET ORGANS: Acute: Skin, eyes. Chronic: Skin.

HAZARDOUS MATERIAL IDENTIFICATION SYSTEM

HEALTH	(BLUE)	1
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FLAMMABILITY	(RED)	0
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REACTIVITY	(YELLOW)	0
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PROTECTIVE EQUIPMENT	C
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EYES	RESPIRATORY	HANDS	BODY
	SEE SECTION 8		

For routine industrial applications

See Section 16 for Definition of Ratings

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

SKIN EXPOSURE: If this product contaminates the skin, immediately begin decontamination with running water. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim should seek immediate medical attention if any adverse exposure symptoms develop.

EYE EXPOSURE: If this product enters the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Victim must seek medical attention.

INHALATION: If vapors, mists, or sprays of this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Remove or cover gross contamination to avoid exposure to rescuers.

4. FIRST-AID MEASURES (Continued)

INGESTION: If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING. Have victim rinse mouth with water, if conscious. Never induce vomiting or give a diluent (e.g., water) to someone who is unconscious, having convulsions, or unable to swallow. If contaminated individual is convulsing, maintain an open airway and obtain immediate medical attention.

Victims of chemical exposure must be taken for medical attention if any adverse effects occur. Rescuers should be taken for medical attention if necessary. Take a copy of label and MSDS to physician or health professional with victim.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Preexisting dermatitis, other skin conditions, and respiratory conditions may be aggravated by exposures to this product.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate exposure.

5. FIRE-FIGHTING MEASURES

FLASH POINT: Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %):

Lower: Not applicable.

Upper: Not applicable.

FIRE EXTINGUISHING MATERIALS: This material will not contribute to the intensity of a fire. Use extinguishing material suitable to the surrounding fire.

Water Spray: YES

Carbon Dioxide: YES

Foam: YES

Dry Chemical: YES

Halon: YES

Other: Any "ABC" Class

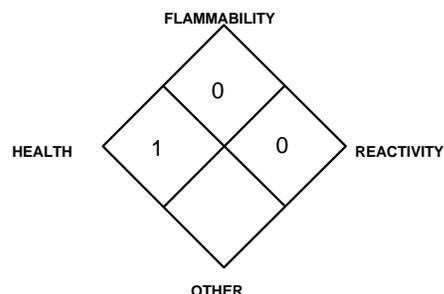
UNUSUAL FIRE AND EXPLOSION HAZARDS: When involved in a fire, this material may decompose and produce irritating fumes and toxic gases (e.g., carbon monoxide, carbon dioxide, and phosphorus and sodium oxides).

Explosion Sensitivity to Mechanical Impact: Not applicable.

Explosion Sensitivity to Static Discharge: Not applicable.

SPECIAL FIRE-FIGHTING PROCEDURES: Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Move containers from fire area if it can be done without risk to personnel. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas.

NFPA RATING



See Section 16 for Definition of Ratings

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area and protect people. Releases of this material may be slippery.

In the event of an incidental release of this product, personnel should wear gloves and safety glasses (or goggles). In the event of a non-incidental release, Minimum Personal Protective Equipment should be **Level D: lab-gloves, chemical resistant apron, boots, and splash goggles. Respiratory protection should not be necessary. Level B, which includes the use of Self-Contained Breathing Apparatus, should be worn when oxygen levels are below 19.5% or are unknown.** Absorb spilled liquid with polypads or other suitable absorbent materials. Decontaminate the area thoroughly. Prevent spill rinsate from contamination of storm drains, sewers, soil or groundwater. Place all spill residue in a suitable container and seal. Dispose of in accordance with applicable U.S. Federal, State, or local procedures or appropriate standards of Canada (see Section 13, Disposal Considerations).

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat or drink while handling this material. Avoid generating mists and sprays of this product. Remove contaminated clothing immediately.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Open containers carefully on a stable surface. Empty containers may contain residual liquid; therefore, empty containers should be handled with care.

7. HANDLING and STORAGE (Continued)

STORAGE AND HANDLING PRACTICES (continued): Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. Store away from incompatible materials (see Section 10, Stability and Reactivity). Material should be stored in secondary containers, or in a diked area, as appropriate. Storage and use areas should be covered with impervious materials. Storage areas should be made of fire-resistant materials. Keep container tightly closed when not in use. If appropriate, post warning signs in storage and use areas. Inspect all incoming containers before storage, to ensure containers are properly labeled and not damaged.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely if necessary. Collect all rinsates and dispose of according to applicable U.S. Federal, State, or local procedures or appropriate Canadian standards.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in Section 2 (Composition and Information on Ingredients). Ensure eyewash/safety shower stations are available near areas where this product is used.

RESPIRATORY PROTECTION: None needed under normal conditions of use. Use NIOSH approved respirators if ventilation is inadequate to control mists. Maintain airborne contaminate concentrations below guidelines listed in Section 2 (Composition and Information on Ingredients). 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, or the Canadian CSA Standard Z94.4-93 and applicable standards of Canadian Provinces. 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).

EYE PROTECTION: Use approved safety goggles or safety glasses, as described in OSHA 29 CFR 1910.133. Splash goggles with a faceshield may be needed if splash hazards exist.

HAND PROTECTION: Wear chemical impervious gloves (e.g., rubber, Neoprene).

BODY PROTECTION: Use body protection appropriate for task (e.g., Tyvek suit, rubber apron) to protect from splashes and sprays.

HMIS PERSONAL PROTECTIVE EQUIPMENT RATING: C

9. PHYSICAL and CHEMICAL PROPERTIES

RELATIVE VAPOR DENSITY (air = 1): Similar to water.

EVAPORATION RATE (water = 1): Approximately 1.

SPECIFIC GRAVITY: 1.1 – 1.2

MELTING/FREEZING POINT: Approximately 0°C

SOLUBILITY IN WATER: Soluble.

BOILING POINT: Approximately 100°C

VAPOR PRESSURE, mm Hg @ 20°C: 18

pH: 4.5 – 6.5

ODOR THRESHOLD: Not available.

COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT): Not available.

APPEARANCE AND COLOR: This product is a clear, amber liquid with a mild odor.

HOW TO DETECT THIS SUBSTANCE (warning properties): The color and odor may act as warning properties associated with this product.

10. STABILITY and REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: Thermal decomposition of this product may generate carbon monoxide, carbon dioxide, phosphorus and sodium oxides.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong bases, oxidizers, water reactive materials.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Avoid contact with incompatible chemicals.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: The following toxicology information is available for components greater than 1 % in concentration.

ACRYLIC POLYMER:

LD₅₀ (oral, rat) > 5000 mg/kg

LD₅₀ (dermal, rabbit) > 2000 mg/kg

Eye irritation-rabbit: inconsequential irritation

Skin irritation-rabbit: practically non-irritating

1-(HYDROXETHYLIDENE)-BIS-PHOSPHONIC ACID:

TDLo (intraperitoneal, mouse) = 200 mg/kg/female 7 days post; Teratogenic effects

TDLo (intraperitoneal, mouse) = 40 mg/kg/female 7 days post; Reproductive effects

1-(HYDROXETHYLIDENE)-BIS-PHOSPHONIC ACID (continued):

TDLo (subcutaneous, mouse) = 200 mg/kg/female 13 days after conception; Reproductive: Specific Developmental Abnormalities: musculoskeletal system

TDLo (subcutaneous, mouse) = 1400 mg/kg/female 11–17 days after conception; Reproductive: Effects on Embryo or Fetus: fetotoxicity (except death, e.g., stunted fetus), Specific Developmental Abnormalities: musculoskeletal system

LD₅₀ (oral, mouse) = 1800 mg/kg

SUSPECTED CANCER AGENT: The other components of this product are not found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, and CAL/OSHA, and therefore are neither considered to be nor suspected to be cancer-causing agents by these agencies.

IRRITANCY OF PRODUCT: This product can be irritating to contaminated tissue.

SENSITIZATION TO THE PRODUCT: This product may cause sensitization; subsequent exposures to very small amounts may cause allergic reaction.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: This product is not reported to produce mutagenic effects in humans. Animal mutation data are available for the Aromatic Carboxylic Acid Salt component of this product; these data were obtained during clinical studies on specific animal tissues exposed to high doses of this compound.

Embryotoxicity: This product is not reported to produce embryotoxic effects in humans.

Teratogenicity: This product is not reported to cause teratogenic effects in humans. Clinical studies on test animals exposed to relatively high doses of the Aromatic Carboxylic Acid Salt component of this product provided teratogenic data.

Reproductive Toxicity: This product is not reported to cause reproductive effects in humans. Clinical studies on test animals exposed to relatively high doses of the Aromatic Carboxylic Acid Salt component of this product provided reproductive toxicity data.

A *mutagen* is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An *embryotoxin* is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A *teratogen* is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A *reproductive toxin* is any substance which interferes in any way with the reproductive process.

BIOLOGICAL EXPOSURES INDICES (BEIs): Currently, there are no Biological Exposure Indices (BEIs) for any component of this product.

12a. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: The components of this product will decompose into other organic and inorganic compounds over time under normal environmental conditions. Additional environmental data for components are as follows:

INORGANIC ACID:

Food Chain Concentration Potential: Very Low

Chronic Hazard Level: The abundance of phosphates threatens algal blooms in fresh and some salt waters

Waterfowl toxicity: No data available

Biological Oxygen Demand (BOD): None

Water solubility: 548 g/ 100 cc (cold).

Persistence: If released to bodies of water, while acidity may be reduced readily by natural water hardness minerals, the phosphate may persist indefinitely. If released to soil, the acid will be neutralized to some degree with adsorption of the proton and phosphate ions also possible. However, significant amounts of acid will remain for transport down toward the groundwater table.

Mobility/Soil Adsorption: When spilled onto soil, this acid will infiltrate downward, the rate being greater with lower concentration because of reduced viscosity. During transport through the soil, this acid will dissolve some of the soil material, in particular, carbonate-based materials. This acid will be partially neutralized; however, some will remain to leach to groundwater. Upon reaching the groundwater table, the acid will continue to move in the direction of groundwater flow. A contaminated plume will be produced with dilution and dispersion serving to reduce the acid concentration.

12a. ECOLOGICAL INFORMATION (Continued)

EFFECT OF MATERIAL ON PLANTS or ANIMALS: This product may be harmful to animal life if large volumes of it are released into the environment. Refer to section 11 (Toxicological Information) for information on the effects of components of this product on test animals.

EFFECT OF CHEMICAL ON AQUATIC LIFE: This product may be harmful to contaminated aquatic life (especially if large volumes of it are released into an aquatic environment. Additional aquatic toxicity data are available as follows:

ACRYLIC POLYMER:

EC₅₀ (algae) = 72.4 mg/L/ 72 hours
EC₅₀ (*Daphnia magna*) > 1040 mg/L/ 48 hours
LC₅₀ (*Salmo gairdneri*) > 1100 mg/L/ 96 hours

1-(HYDROXETHYLIDENE)-BIS-PHOSPHONIC ACID:

NOEC (rainbow trout) 96 hours = 180 mg/L
NOEC (*Daphnia magna* water flea) 48 hours = 125 mg/L
NOEC (*Selenastrum* algae) 96 hours = 5.2 mg/L

1-(HYDROXETHYLIDENE)-BIS-PHOSPHONIC ACID (continued):

EC₅₀ (*Daphnia magna* water flea) 48 hours = 242 mg/L
EC₅₀ (*Selenastrum* algae) 96 hours = 1.9 mg/L

INORGANIC ACID:

TLm (immersion, mosquito fish) = 138 ppm/ 24-96 hours/ turbid water
Chronic Hazard Level: The abundance of phosphates threatens algal blooms in fresh and some salt waters

12b. AQUATIC TOXICITY INFORMATION

Ceriodaphnia 48-hour renewal bioassay:
No mortality was observed at the highest concentration tested:
0% mortality at 1000 mg/L
Fathead minnow 96-hour renewal bioassay.

No mortality was observed at the highest concentration tested:
0% mortality at 1000 mg/L
Daphnia 48-hour static renewal bioassay: No mortality observed at the highest concentration tested: 0% mortality at 1000 mg/L.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations or with regulations of Canada. This product, if unaltered by the handling, may be disposed of by treatment at a permitted facility or as advised by your local waste regulatory authority.

EPA WASTE NUMBER: Not applicable to wastes consisting only of this product.

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS NOT HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME:

Not applicable.

HAZARD CLASS NUMBER and DESCRIPTION:

Not applicable.

UN IDENTIFICATION NUMBER:

Not applicable.

DOT LABEL(S) REQUIRED:

Not applicable.

PACKAGING GROUP:

Not applicable.

NORTH AMERICAN RESPONSE GUIDEBOOK NUMBER (1996): Not applicable.

NATIONAL MOTOR FREIGHT CLASSIFICATION: # 70

MARINE POLLUTANT: No component of this product is listed as a marine pollutant by the D.O.T. (49 CFR 172.101, Appendix B).

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: THIS MATERIAL IS NOT CONSIDERED AS DANGEROUS GOODS.

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: The components of this product are subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act, as follows:

COMPONENT	SARA 302 (40 CFR 355, Appendix A)	SARA 304 (40 CFR Table 302.4)	SARA 313 (40 CFR 372.65)
Inorganic Acid	No	No	Yes

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the components of this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs (4,540 kg) therefore applies, per 40 CFR 370.20. **U.S. CERCLA REPORTABLE QUANTITY (RQ):** Inorganic Acid = 5000 lb (2268 kg).

15. REGULATORY INFORMATION (Continued)

U.S. TSCA INVENTORY STATUS: The chemicals in this product that are listed by CAS # are listed on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

U.S. STATE REGULATORY INFORMATION: Components of this product are covered under specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances: Inorganic Acid.

California - Permissible Exposure Limits for Chemical Contaminants: Inorganic Acid.

Florida - Substance List: Inorganic Acid.

Illinois - Toxic Substance List: Inorganic Acid.

Kansas - Section 302/313 List: Inorganic Acid.

Massachusetts - Substance List: Inorganic Acid.

Michigan - Critical Materials Register: None.

Minnesota - List of Hazardous Substances: Inorganic Acid.

Missouri - Employer Information/Toxic Substance List: Inorganic Acid.

New Jersey - Right to Know Hazardous Substance List: Inorganic Acid.

North Dakota - List of Hazardous Chemicals, Reportable Quantities: Inorganic Acid.

Pennsylvania - Hazardous Substance List: Inorganic Acid.

Rhode Island - Hazardous Substance List: Inorganic Acid.

Texas - Hazardous Substance List: Inorganic Acid.

West Virginia - Hazardous Substance List: Inorganic Acid.

Wisconsin - Toxic and Hazardous Substances: Inorganic Acid.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): This product does not contain any chemical on the Proposition 65 list.

ANSI LABELING (Z129.1): **CAUTION!** MAY CAUSE SENSITIZATION. MAY BE IRRITATING IF INHALED OR SWALLOWED. MAY CAUSE SKIN AND EYE IRRITATION. Do not taste or swallow. Do not get on skin or in eyes. Avoid breathing mists or sprays. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves, goggles, and suitable body protection if necessary. **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 if any adverse effects occur. **IN CASE OF FIRE:** Use water fog, dry chemical, CO₂, or "alcohol" foam. **IN CASE OF SPILL:** Absorb spill with inert material and place in suitable container. Consult Material Safety Data Sheet for additional information.

ENVIRONMENTAL HAZARDS: Do not discharge effluent containing this product into streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA.

ADDITIONAL CANADIAN REGULATIONS:

CANADIAN DSL/NDSL INVENTORY STATUS: The chemicals in this product that are listed by CAS # are listed on the DSL/NDSL Inventory.

OTHER CANADIAN REGULATIONS: Not applicable.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITY SUBSTANCES LISTS: None.

CANADIAN WHMIS SYMBOLS: Not applicable.

16. OTHER INFORMATION

PREPARED BY:

CHEMICAL SAFETY ASSOCIATES, Inc.
9163 Chesapeake Drive, San Diego, CA 92123-1002
619/565-0302

DATE OF PRINTING

September 24, 2012

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each compound.

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.

TLV - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average (**TWA**), the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level (**C**). Skin absorption effects must also be considered.

OSHA - U.S. Occupational Safety and Health Administration.

PEL - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.

IDLH - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. **The DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (**OSHA**). NIOSH issues exposure guidelines called **Recommended Exposure Levels (RELs)**. When no exposure guidelines are established, an entry of **NE** is made for reference.

HAZARD RATINGS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: Health Hazard: **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); **3** (Class IB and IC flammable liquids with flash points below 38°C [100°F]); **4** (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]). Reactivity Hazard: **0** (normally stable); **1** (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures).

NATIONAL FIRE PROTECTION ASSOCIATION: Health Hazard: **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure could cause death or major residual injury). Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (**NFPA**). Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD₅₀** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC₅₀** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m³** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. Ecological Information: **EC** is the effect concentration in water.

REGULATORY INFORMATION:

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act (**SARA**); the Canadian Domestic/Non-Domestic Substances List (**DSL/NDSL**); the U.S. Toxic Substance Control Act (**TSCA**); Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act (**CERCLA** or **Superfund**); and various state regulations. This section also includes information on the precautionary warnings which appear on the material's package label.

**Material Safety Data Sheet
BIO-POWER 524**

WESMAR CO. INC.

5720 204TH ST SW
LYNNWOOD, WA. 98036
Emergency Phone Number: (206) 783-5344

DATE PREPARED:APRIL 26, 2006

REVISED DATE:MARCH 5, 2011

PERS:800-633-8253

SECTION I – OSHA HAZARD CLASSIFICATIONS

Corrosive to eyes and skin. Sensitizer. Toxic by inhalation of mist.

SECTION II – HAZARDOUS COMPONENTS

HAZARDOUS INGREDIENT	PERCENT	CAS NUMBER	ACGIH/TLV
Magnesium Nitrate	1.7	10377-60-3	Not available

Wesmar Co. reports the component(s) listed above as known OSHA hazardous material(s) contained in this product. Product Contains: (5-Chloro-2-methyl-4-isothiazoline-3-one, 2-Methyl-4-isothiazoline-3-one): Less Than 2%.

SECTION III – FIRST AID INFORMATION

Eye Exposure: Flush immediately with copious amounts of tap water or normal saline (minimum of 15 minutes). Take exposed individual to a health care professional, preferably an ophthalmologist, for further evaluation.

Skin Exposure: Wash exposed area with plenty of water. Repeat washing. Remove contaminated clothing and wash thoroughly before reuse. If irritation persists consult a health care professional.

Inhalation: If exposure by inhalation is suspected, immediately move exposed individual to fresh air. If individual experiences nausea, headache, dizziness, has difficulty in breathing or is cyanotic, seek a health care professional immediately.

Ingestion: DO NOT INDUCE VOMITING. Rinse with copious amounts of water or milk, first. Irrigate the esophagus and dilute stomach contents by slowly giving one (1) to two (2) glasses of water or milk. Avoid giving alcohol or alcohol related products. In cases where the individual is semi-comatose, comatose or convulsing, DO NOT GIVE FLUIDS BY MOUTH. In case of intentional ingestion of the product, seek medical assistance immediately; take individual to nearest medical facility.

SECTION IV – PRIMARY ROUTES OF EXPOSURE

1. Effects from Acute Exposure:

Eye Exposure: Very hazardous in case of eye contact (irritant, corrosive). Inflammation of the eye is characterized by redness, watering, and itching.

Skin Exposure: Hazardous in case of skin contact (corrosive, irritant, sensitizer). Skin contact may produce burns. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Inhalation: May be harmful if inhaled. Do not breathe spray mists of the undiluted product. Effects will depend upon solution strength and length of time of exposure.

Ingestion: Ingestion is not expected to be a primary route of exposure.

2. Effects of Chronic Exposure:

The following information is base on tests with one or more of the active ingredients. In vitro mutagenicity studies reported both positive and negative results. Animal test for birth defects were negative. Chronic dietary and drinking water studies did not reveal any adverse effects. Repeated

Material Safety Data Sheet

BIO-POWER 524

exposure to skin may cause allergic reactions. This product has caused allergic reactions in animal studies and has been reported to cause allergic reactions in people.

SECTION V – TOXICOLOGICAL INFORMATION

Acute Effects:

Acute	Oral	(LD50)=3810 mg/kg Rat
Acute	Dermal	(LD50)=>5000 mg/kg Rabbit
Acute	Inhalation	(LC50)=1.4 mg/l (4 hours) Female rat.
Acute	Ingestion	(LC50)=1.5 mg/l (4 hours) Male rat.

Irritant / Sensitization Effects:

Very hazardous in case of eye contact (irritant, corrosive). Inflammation of the eye is characterized by redness, watering, and itching. Hazardous in case of skin contact (corrosive, irritant, sensitizer). Skin contact may produce burns. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. May be harmful if inhaled. Do not breathe spray mists of the undiluted product. Effects will depend upon solution strength and length of time of exposure.

Carcinogenic Potential:

Not tested by Wesmar Co. Not shown as a carcinogen by OSHA, IARC, or NTP.

Target Organs Effects:

May cause damage to the following organs: upper respiratory tract, skin, eyes.

Other Health Effects:

The following information is based on tests with one or more of the active ingredients. In vitro mutagenicity studies reported both positive and negative results. Animal tests for birth defects were negative. Chronic dietary and drinking water studies did not reveal any adverse effects. Repeated exposure to skin may cause allergic reactions. This product has caused allergic reactions in animal studies and has been reported to cause allergic reactions in people.

SECTION VI – ENVIRONMENTAL TOXICOLOGICAL INFORMATION

LC50=0.16 mg/l 48 hours Daphnia magna.
LC50=0.28 mg/l 96 hours Bluegill sunfish.
LC50=0.19 mg/l 96 hours Rainbow trout.
LC50=0.3 mg/l 96 hours Sheepshead minnow.
LC50=0.55 mg/l 96 hours Sand shrimp.
LC50=0.01 mg/l 96 hours Bay mussel.

SECTION VII PHYSICAL AND CHEMICAL PROPERTIES

Appearance & Odor:	Clear to light green liquid with pungent (Strong) odor.
Density:	1.02 to 1.04 (20°C/ 68°F)
Flash Point:	Closed cup:> 100°C (212°F).(Pensky-Martens.)
Melting/Freezing Point:	-3°C (26.6°F)
Boiling Point:	100°C (212°F).
Solubility:	Soluble in cold water. Soluble in hot water.
pH: (Neat):	2.5 to 5 (Acidic).
pH: (100 ppm in water):	6.5
Vapor Pressure:	0.01 mm of Hg (@ 20°C)
O/w Partition Coefficient:	N/A
Oxidizing/Reducing Properties:	N/A
Viscosity:	Dynamic: 3 cP

Material Safety Data Sheet

BIO-POWER 524

Additional pH information: N/A

NOTE: The physical data presented above are typical values and should not be construed as specification.

SECTION VIII – FIRE AND EXPLOSION INFORMATION

Flammable limits: Not available
Extinguishing media: Water fog, carbon dioxide, foam, dry chemical.
Special Firefighting Procedures: Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

SECTION IX – REACTIVITY INFORMATION

Stability: Stable under normal conditions of use and storage.
Incompatibility: Strong acids, strong bases, strong oxidizers, reducing agents, amines, and mercaptans.
Hazardous Decomposition Products: Thermal decomposition of product can produce toxic vapors of sulfur dioxide, hydrogen chloride, and oxides of nitrogen.

SECTION X – HANDLING PRECAUTIONS

Rubber gloves, safety glasses or goggles, body protective clothing and shoes are required. If splashing can occur, a face shield is advisable. Eye-wash fountains in the work place are recommended. Local exhaust should be maintained to control vapor and mist levels. Respiratory protection (organic vapor/acid gas respirator) is required for work areas where misting may occur. The handling precautions for this product are based on the characteristics of the neat product unless otherwise specified.

SECTION XI – SATISFACTORY MATERIALS CONSTRUCTION

304 stainless steel, 316 stainless steel, PVC- flexible, PVC- rigid, polyethylene- crosslink, polyethylene- high density, polyethylene- low density, polypropylene, rehau tubing, EPDM rubber, butyl rubber, ABS plastic, Teflon, Tygon F-4040, Tygon tubing R3603, pharmed tubing FRP, neoprene, dow sillastic tube, polycarbonate, polystyrene.
NOTE: With respect to all other materials not listed above, user should be aware that use of such materials with this product may be hazardous and result in damages to such materials and other property and personal injuries. No data concerning such materials not listed above should be implied by the user.

SECTION XII – SPILL, LEAK, AND DISPOSAL PROCEDURE

SPILL AND LEAK RESPONSE GUIDELINES:

Important: Before responding to a spill or leak of this product, review each section of this MSDS. Follow the recommendations given in the Handling Precautions sections. Check the Fire and Explosion Data section to determine if the use of non-sparking tools is merited. Insure that spilled or leaked product does not come into contact with materials listed as incompatible. If irritating fumes are present, consider evacuation of enclosed areas.
Emergency Response Assistance: Emergency technical assistance is available from Wesmar Co., by calling (206) 783-5344.

Initially minimize area affected by the spill or leak. Block any potential routes to water systems (e.g. sewers, streams, lakes, etc.). Based on the product's toxicological and chemical properties, and on the size and location of the spill or leak, assess the impact on contaminated environments (e.g. water systems, ground, air equipment, etc.). There are no methods available to completely eliminate any toxicity this product may have on aquatic environments. Minimize adverse effects on these environments. Wesmar Co. can be contacted for technical assistance. Determine if federal,

Material Safety Data Sheet

BIO-POWER 524

state, and/or local release notification is required (see Regulatory Classifications section of this MSDS). Recover as much of the pure product as possible into appropriate containers. Later, determine if this recovered product can be used for its intended purpose. Address clean-up of contaminated environments. Spill or leak residuals may have to be collected and disposed of. Clay, soil, or commercially available absorbents may be used to recover any material that can not readily be recovered as pure product. Flushing residual material to an industrial sewer, if present at the site of a spill or leak incident, may be acceptable if authorized approval is obtained. If product and/or spill/leak residuals are flushed to an industrial sewer, insure that they do not come into contact with incompatible materials. Contact the person(s) responsible for the operation of your facility's industrial sewer system prior to intentionally flushing or pumping spills or leaks of this product to the industrial sewer.

DISPOSAL GUIDELINES

Note: Follow federal, state, and local regulations governing the disposal of waste materials.

Neat Product: Contact your Wesmar Co. representative at (206) 783-5344.

Contaminated Materials: Determine if waste containing this product can be handled by available industrial effluent system or other on-site waste management unit. If off-site management is required, contact a company experienced in industrial waste management. This product is not specifically listed in 40 CFR 261 as a Resource Conservation and Recovery Act (RCRA) hazardous waste. However, spill or leak residuals may meet the criteria of a characteristic hazardous waste under this Act. Check the characteristics of the material to be disposed of and/or the physical and reactivity data given in the MSDS for the neat product.

Container Disposal: Empty containers, as defined by appropriate sections of the RCRA, are not RCRA hazardous wastes. However, insure proper management of any residuals remaining in container.

SECTION XIII – TRANSPORTATION AND SHIPPING INFORMATION

DOT Shipping Information:

CORROSIVE LIQUID, ORGANIC, N.O.S., (5-Chloro-2-methyl-4-isothiazolin-3-one), Class 8, UN 3265, P.G. II, (ERG Guide 153)

IMO/IMDG Shipping Information:

CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S., (5-Chloro-2-methyl-4-isothiazoline-3-one), Class 8, UN3265, P.G. II, (ERG Guide 153, ERG Code 8L)

IATA Shipping Information:

CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S., (5-Chloro-2-methyl-4-isothiazoline-3-one), Class 8, UN 3265, P.G. II, (ERG Guide 153, ERG Code 8L)

DOT "RQ": NONE

Unless otherwise stated, the shipping information provided above applies only to non-bulk containers of this product. Proper shipping name and general shipping information may vary depending on packaging and mode of shipment. All products shipped from Wesmar Co. locations have been properly packaged and labeled according to appropriate hazardous materials shipping regulations. If any alteration of packaging, product, or mode of transportation is further intended, different shipping information, including but not limited to proper shipping name, RQ designation, and labeling may apply. For further information pertaining to the shipping requirements for this product, contact Wesmar Co's. Transportation Department or DOT Coordinator.

SECTION XIV – REGULATORY INFORMATION

The following Regulations are known to apply to the use and disposal of this product. Additional Federal, State and Local regulations may also be applicable.

SARA (Superfund Amendments and Reauthorization Act)

SARA 302 Extremely Hazardous Substances List...

No components of this product are listed.

SARA 312 Hazard Category...

Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard

SARA 313 Toxic Chemicals List...

Material Safety Data Sheet

BIO-POWER 524

This product contains the following toxic chemical(s) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372: **Magnesium Nitrate**

CERCLA (Comprehensive Environmental Response, Compensation and Liability Act)

No components of this product are present above the *le minimus* levels.

RCRA (Resource Conservation and Recovery Act) Listed Hazardous Waste.

No components of this product are listed.

CWA (Clean Water Act) Listed Substances.

No components of this product are listed.

FDA (Food and Drug Administration)

This product is approved under the following FDA (21 CFR) sections: 175.105 – Limitation: For use only as an antimicrobial agent in polymer latex emulsions. /175.300, 175.320 – Limitation: For use only as an antimicrobial agent in emulsion-based silicon coatings at a level not to exceed 50 mg active ingredient/Kg in the coating formulation. /176.170, 176.180 – Limitations: For use only 1) as an antimicrobial agent for polymer latex emulsions in paper coating at a level not to exceed 50 ppm active ingredient in the coating formulation and 2) as an antimicrobial agent for finished coatings and for additives used in the manufacture of paper and paper board including fillers, binders, pigment slurries, and sizing solutions at a level not to exceed 25 ppm active ingredient in the coating formulations and additives. / 17a6.300- Limitation: Not to exceed 2.5 pounds per ton of dry weight fiber..

TSCA (Toxic Substances Control Act) Applicability

All components are listed on the TSCA Inventory. Registered pesticides are exempt from the requirements of TSCA.

FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act)

This product is a registered pesticide. EPA Reg.No. 1448-348

<u>HMIS/NPCA Rating...</u>	Health	3	Flammability	0	Reactivity	0
<u>NFPA Ratings.....</u>	Health	3	Flammability	0	Reactivity	0

State Regulations

Various State Right To Know Acts....

Non-proprietary hazardous chemicals are listed in Section 2 of this MSDS. Should you require further information on specific proprietary or inert ingredients please contact Wesmar Co. Inc.'s Regulatory Affairs Department.

The information on this Material Safety Data Sheet reflects the latest information and data that we have on hazards, properties, and handling of this product under the recommended conditions of use. Any use of this product or method of application which is not described in the Data Sheet is the responsibility of the user. This Material Data Safety Sheet was prepared to comply with the OSHA Hazard Communication regulations. While some components are claimed Trade Secret under OSHA Hazard Communication regulations, all known OSHA hazards associated with the Trade secret component(s), if contained in this product, are fully disclosed. Wesmar Co. Inc. warrants that this product conforms to its chemical description and is reasonably fit for the purpose referred to in the directions for use when used in accordance with the directions under normal conditions. Buyer assumes the risk of any use contrary to such directions.

Seller makes no other warranty or representation of any kind, express or implied, concerning the product, including NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS OF THE GOODS FOR ANY OTHER PARTICULAR PURPOSE. No specific warranties shall be implied by law and no agent of seller is authorized to alter this warranty in any way except in writing with a specific reference to this warranty. The exclusive remedy against seller shall be in a claim for damages not to exceed the purchase price of the product, without regard to whether such a claim is based upon breach of warranty or tort.

Any controversy or claim arising out or relating to this contract, or breach thereof, shall be settle by arbitration in accordance with the commercial arbitration rules of the American Arbitration Association, and judgement upon the rendered by the Arbitrator(s) may be entered in any court having jurisdiction thereof.

PART I

What is the material and what do I need to know in an emergency?

1. PRODUCT IDENTIFICATION

TRADE NAME (AS LABELED):

AntiChlor 427

CHEMICAL NAME/CLASS:

Inorganic Sulfite Salts

SYNONYM:

Mixture

PRODUCT USE:

Reverse Osmosis Membrane Treatment

SUPPLIER/MANUFACTURER'S NAME:

AVISTA TECHNOLOGIES

ADDRESS:

140 Bosstick Blvd.

San Marcos, CA 92069

24 HOUR EMERGENCY NO.:

1-800-424-9300 (United States)

1-703-527-3887 (International Collect)

BUSINESS PHONE:

(760) 744-0536

DATE OF PREPARATION:

9 Sep 2009, Revised June 10, 2013

2. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: This product is a clear, colorless to pale yellow, solution with a trace sulfur odor. This product may irritate tissue depending on concentration and duration of exposure. The sulfite salt (the main component of this product) is a skin and respiratory sensitizer; subsequent exposures to very small amounts can cause allergic reaction. This product is neither reactive nor flammable. Thermal decomposition of this product produces irritating vapors and toxic gases (e.g. sodium oxides and sulfur oxides). Emergency responders must wear personal protective equipment (and have appropriate fire-extinguishing protection) suitable for the situation to which they are responding.

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: The most significant routes of occupational overexposure are inhalation and contact with skin and eyes. The symptoms of overexposure to this product are as follows:

INHALATION: If vapors, mists, or sprays of this solution are inhaled, irritation of the nose and throat and difficulty breathing and coughing may occur. Severe inhalation overexposure may result in burns to the respiratory system. Sulfite salts (the main component of this product) is a respiratory sensitizer; subsequent exposures to very small amounts can cause allergic reaction in susceptible individuals. Symptoms can include shortness of breath, wheezing, cough, and chest tightness.

CONTACT WITH SKIN or EYES: Depending on the duration and concentration of overexposure, skin contact can be mildly to moderately irritating. Symptoms of skin contact can include redness and irritation. Repeated, low level contact with this product may cause dermatitis (dry, red skin). The sulfite salt (the main component of this product) is a skin sensitizer; subsequent exposures to very small amounts can cause allergic reaction (e.g., rash, itching) in susceptible individuals. Direct eye contact with the liquid can cause stinging, tearing and redness; prolonged eye contact may cause burns to tissue and permanent damage to the eyes.

SKIN ABSORPTION: Skin absorption is not a significant route of exposure for any component of this product.



DRINKING WATER TREATMENT ADDITIVES CLASSIFIED BY NSF INTERNATIONAL TO ANSI/NSF 60 AS A STANDARD DRINKING WATER TREATMENT CHEMICAL FOR USE IN REVERSE OSMOSIS SYSTEMS AT A MAXIMUM LEVEL OF 8 mg/l.

2. HAZARD IDENTIFICATION (Continued)

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

INGESTION: Ingestion is not anticipated to be a likely route of exposure to this product. Ingestion of this product will result in moderate to severe irritation, or burns of the digestive tract. In addition, ingestion of this product may cause central nervous system depression, gastrointestinal and cardiac abnormalities, and violent colic. Individuals who are sensitive to sulfite salts

(the main component of this product) may experience symptoms

such as those described under "Inhalation". Ingestion of large quantities of this product may be fatal.

HMIS PERSONAL PROTECTIVE EQUIPMENT RATING:

Industrial Use situations: B; Safety glasses and gloves, body protection

Health	2
Flammability	0
Physical Hazard	0
Protective Equipment	C

See Section 16 for Definition of Ratings

INJECTION: Accidental injection of this product can cause burning, reddening, and swelling in addition to the wound. Individuals who are sensitive to sulfite salts (the main component of this product) may experience symptoms such as those described under "Inhalation".

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms.

ACUTE: Inhalation exposure can cause mild to moderate irritation, coughing, and difficulty breathing or burns of the respiratory system, depending on concentration and duration of exposure. Skin and eye contact can cause redness and mild to moderate irritation, depending on concentration and duration of exposure. Ingestion may cause central nervous system depression, gastrointestinal and cardiac abnormalities, and violent colic, as well as irritation or burns to digestive system.

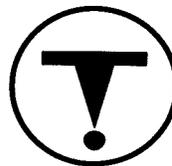
CHRONIC: Prolonged or repeated skin overexposure to this product may cause dermatitis (dry, red skin). Sulfite salts (the main component of this product) is a skin and respiratory sensitizer; subsequent exposures to very small amounts can cause allergic reaction in susceptible individuals. Symptoms can include those described under "Inhalation".

TARGET ORGANS: Acute: Skin, eyes, central nervous system, gastrointestinal system, heart, respiratory system. Chronic: Skin, respiratory system.

TARGET ORGANS: Acute: Skin, eyes, respiratory system.
Chronic: Skin, eyes, respiratory system.

CANADIAN WHMIS SYMBOLS:

Class D2B Materials Causing Other Toxic Effect (Contains a sensitizer)



3. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	% w/w	EXPOSURE LIMITS IN AIR					
			ACGIH-TLV		OSHA-PEL			OTHER
			TWA mg/m ³	STEL mg/m ³	TWA mg/m ³	STEL mg/m ³	IDLH mg/m ³	
Sulfite salts	Proprietary	25 – 35%	5 A4 (Not Classifiable as a Human Carcinogen)	NE	NE	NE	NE	NIOSH REL: TWA = 5
Water and other components which are present in less than 1 percent concentration (0.1% concentration for potential carcinogens, reproductive toxins, respiratory tract sensitizers and mutagens).		Balance	None of the other components contribute significant additional hazards at the concentration present in this product. All pertinent hazard information has been provided in this document, per the requirements of the Federal Occupational Safety and Health Administration Standard (29 CFR 1910.1200), U.S. State equivalent Standards and Canadian Workplace Hazardous Materials Identification System Standards (CPR 4).					

NE = Not Established

See Section 16 for Definitions of Terms Used

NOTE (1): ALL WHMIS required information is included in appropriate sections based on the ANSI Z400.1-1998 format. This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

Victims of chemical exposure must be taken for medical attention if any adverse effects occur. Rescuers should be taken for medical attention if necessary. Take a copy of label and MSDS to physician or health professional with victim.

SKIN EXPOSURE: If this product contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Do NOT interrupt flushing. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Victim should seek immediate medical attention if any adverse exposure symptoms develop.

EYE EXPOSURE: If this product enters the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes. Do NOT interrupt flushing. Victim must seek medical attention.

INHALATION: If airborne particulates of this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Remove or cover gross contamination to avoid exposure to rescuers.

INGESTION: If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING unless directed by a healthcare professional. Have victim rinse mouth with water, if conscious. Never induce vomiting or give a diluent (e.g., water) to someone who is unconscious, having convulsions, or unable to swallow. If contaminated individual is convulsing, maintain an open airway and obtain immediate medical attention.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Acute or chronic respiratory conditions or disorders involving the "Target Organs" (see Section 3, "Hazard Identification") may be aggravated by overexposure to dusts or particulates of this product.

RECOMMENDATIONS TO PHYSICIANS: Treat symptoms and eliminate overexposure. Provide oxygen, if necessary. Pulmonary function tests, chest X-rays, and nervous system evaluations may prove useful. Consultation with an ophthalmologist is recommended if eye exposure leads to tissue damage.

5. FIRE-FIGHTING MEASURES

FLASH POINT: Not applicable.

AUTOIGNITION TEMPERATURE: Not applicable.

FLAMMABLE LIMITS (in air by volume, %):

Lower: Not applicable.

Upper: Not applicable.

FIRE EXTINGUISHING MATERIALS: This material will not contribute to the intensity of a fire. Use extinguishing material suitable to the surrounding fire.

Water Spray: YES

Carbon Dioxide: YES

Foam: YES

Dry Chemical: YES

Halon: YES

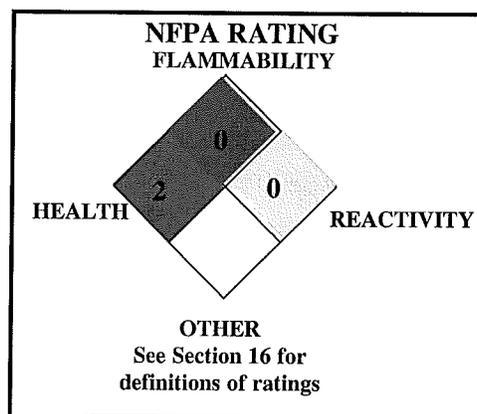
Other: Any "ABC" Class

UNUSUAL FIRE AND EXPLOSION HAZARDS: This product is an irritant and presents an inhalation and contact hazard to firefighters. When involved in a fire, this product may decompose and produce irritating fumes and toxic gases (e.g., carbon oxides, phosphorus oxides, and sodium oxides).

Explosion Sensitivity to Mechanical Impact: Not applicable.

Explosion Sensitivity to Static Discharge: Not applicable.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Chemical resistant clothing may be necessary. Move containers from fire area if it can be done without risk to personnel. If possible, prevent runoff water from entering storm drains, bodies of water, or other environmentally sensitive areas. Rinse contaminated equipment thoroughly with citric acid solution (or another neutralizer for bases) before returning such equipment to service.



6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area and protect people. For small releases, clean up spilled liquid wearing gloves, goggles, faceshield, and suitable body protection. The minimum Personal Protective Equipment recommended for response to non-incident releases should be **Level B: triple-gloves (neoprene gloves and nitrile gloves over latex gloves), chemical resistant suit and boots, hard hat, and Self-Contained Breathing Apparatus**. Monitor the area for dusts of this product's components and the level of oxygen. Monitoring must indicate that exposure levels are below those provided in Section 2 (Composition and Information on Ingredients) and that oxygen levels are above 19.5% before anyone is permitted in the area without Self-Contained Breathing Apparatus. Sweep up or vacuum spilled solid. Neutralize residue with citric acid or other neutralizing agent for bases. Decontaminate the area thoroughly. Test area with litmus paper to ensure neutralization. Place all spill residue in a suitable container. Dispose of in accordance with applicable U.S. Federal, State, or local procedures, or appropriate Canadian standards (see Section 13, Disposal Considerations).

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash thoroughly after handling this product. Do not eat or drink while handling this material. Avoid generating airborne dusts of this product. Remove contaminated clothing immediately. Wipe down area routinely to avoid the accumulation of dusts of this product.

STORAGE AND HANDLING PRACTICES: All employees who handle this material should be trained to handle it safely. Keep container tightly closed when not in use. If this product is transferred into another container, only use portable containers and tools approved for basic solid. Store containers in a cool, dry location, away from direct sunlight, or sources of intense heat. 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 corrosion resistant materials.

7. HANDLING and STORAGE (continued)

Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. Empty containers may contain residual material that is skin/eye irritating; therefore, empty containers should be handled with care. Never store food, feed, or drinking water in containers which held this product. Avoid temperatures above 230°C/446°F. Thermal decomposition is dependent on time and temperature.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely if necessary. Collect all rinsates and dispose of according to applicable U.S. Federal, State, or local procedures or appropriate Canadian standards.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation to ensure exposure levels are maintained below the limits provided in Section 2 (Composition and Information on Ingredients). Ensure eyewash/safety shower stations are available near areas where this product is used.

RESPIRATORY PROTECTION: None needed under normal conditions of use. Maintain airborne contaminate concentrations below guidelines listed in Section 2 (Composition and Information on Ingredients). Use NIOSH approved respirators if ventilation is inadequate to control airborne dusts. 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, or the Canadian CSA Standard Z94.4-93 and applicable standards of Canadian Provinces. 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).

EYE PROTECTION: Use approved safety goggles or safety glasses, as described in OSHA 29 CFR 1910.133. A full face-shield should be used when handling more than 10 pounds of this material. Splash goggles with a faceshield may be needed if splash hazards exist.

HAND PROTECTION: Wear chemical impervious gloves (e.g., rubber, Neoprene).

BODY PROTECTION: Use body protection appropriate for task (e.g., Tyvek suit, rubber apron) to protect from splashes and sprays.

HMIS PERSONAL PROTECTIVE EQUIPMENT RATING: C (Safety Glasses, Gloves, Apron)

9. PHYSICAL and CHEMICAL PROPERTIES

RELATIVE VAPOR DENSITY (air = 1): Similar to water.

SPECIFIC GRAVITY: 1.10-1.35

SOLUBILITY IN WATER: Soluble.

VAPOR PRESSURE, mm Hg @ 20°C: Not available

ODOR THRESHOLD: Not available.

COEFFICIENT OF OIL/WATER DISTRIBUTION (PARTITION COEFFICIENT): Not available.

APPEARANCE, ODOR AND COLOR: This product is a clear, colorless to pale yellow solution with a trace sulfur odor.

HOW TO DETECT THIS SUBSTANCE (warning properties): The slight odor may act as a warning property associated with this product.

EVAPORATION RATE (water = 1): Approximately 1.

MELTING/FREEZING POINT: -6.7°C

BOILING POINT: 100-110°C

pH: 5.8 – 6.4

10. STABILITY and REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: Thermal decomposition of this product may generate oxides of sodium and sulfur.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong acids and oxidizers.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Avoid contact with incompatible chemicals.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: There are currently no toxicity data available for this product; the following toxicology information is available for components greater than 1 % in concentration.

Sulfite Salts:

Mutation in Microorganisms (*Salmonella typhimurium*) = 100 mmol/L

Cytogenetic Analysis (ovary, hamster) = 180 µg/L
Sister Chromatid Exchange (ovary, hamster) = 200 µg/L

TDLo (oral, rat) = 75 mg/kg/15 days/continuous;
Kidney, Urethra, Bladder: other changes;
Biochemical: Enzyme inhibition, induction, or change in blood or tissue levels: phosphatases, dehydrogenases

TDLo (oral, rat) = 40 g/kg; multigenerations:
Reproductive: Effects on Newborn: weaning or lactation index (e.g., # alive at weaning per # alive at day 4)

Sulfite Salts:

TDLo (oral, rat) = 20 g/kg; multigenerations:
Reproductive: Effects on Newborn - stillbirth

TDLo (oral, mouse) = 14 g/kg/female 8-12 days after conception; Reproductive: Effects on Newborn

TDLo (oral, pig) = 562 g/kg/48 weeks/continuous;
Liver: changes in liver weight Kidney, Urethra, Bladder: changes in bladder weight
Nutritional and Gross Metabolic - weight loss or decreased weight gain

TDLo (subcutaneous, mouse) = 806 mg/kg/26 weeks/intermittent; Tumorigenic: equivocal tumorigenic agent by RTECS criteria Skin and Appendages - tumors

Sulfite Salts:

TDLo (parenteral, mouse) = 60 mg/kg/female 8 days after conception; Reproductive: Effects on Fetus: fetotoxicity (except death, e.g., stunted fetus), Specific Developmental Abnormalities: musculoskeletal system

LD₅₀ (intravenous, rat) = 115 mg/kg

LD₅₀ (parenteral, mouse) = 910 mg/kg

LDLo (intravenous, mouse) = 1220 mg/kg

LDLo (intravenous, rabbit) = 192 mg/kg

LD₅₀ (oral, mouse) = 5989 mg/kg

LD₅₀ (intravenous, rabbit) = 1220 mg/kg

Sulfite Salts:

Oral mouse LD₅₀: 820 mg/kg

Investigated as a tumorigen and mutagen.

SUSPECTED CANCER AGENT:

SUSPECTED CANCER AGENT: The following table summarizes the carcinogenicity listing for the components of this product. "NO" indicates that the substance is not considered to be, or suspected to be, a carcinogen by the listed agency, see section 16 for definition of other ratings.

CHEMICAL	IARC	NTP	NIOSH	ACGIH	OSHA	CA PROP 65
Sulfite Salts:	3 Unclassifiable as to Carcinogenicity in Humans	No	No	4 Not Classifiable as a Human Carcinogen	No	No

IRRITANCY OF PRODUCT: This product can irritate contaminated tissue.

SENSITIZATION TO THE PRODUCT: Sulfite salts are a skin and respiratory sensitizer; subsequent exposures to very small amounts can cause allergic reaction.

TOXICOLOGICAL SYNERGISTIC PRODUCTS: No information is currently available on toxicologically synergistic products of this material.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its components on the human reproductive system.

Mutagenicity: This product is not reported to produce mutagenic effects in humans. Animal mutation data are available for the sulfite salts (a component of this product); these data were obtained during clinical studies on specific animal tissues exposed to high doses of this compound.

Embryotoxicity: This product is not reported to produce embryotoxic effects in humans.

Teratogenicity: This product is not reported to cause teratogenic effects in humans.

Reproductive Toxicity: This product is not reported to cause reproductive effects in humans. Clinical studies on test animals exposed to relatively high doses of the sulfite salts (a component of this product) provided reproductive toxicity data.

A *mutagen* is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An *embryotoxin* is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A *teratogen* is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A *reproductive toxin* is any substance which interferes in any way with the reproductive process.

BIOLOGICAL EXPOSURES INDICES (BEIs): Currently, there are no Biological Exposure Indices (BEIs) for any component of this product.

12. ECOLOGICAL INFORMATION

ALL WORK PRACTICES MUST BE AIMED AT ELIMINATING ENVIRONMENTAL CONTAMINATION.

ENVIRONMENTAL STABILITY: The components of this product will decompose into other inorganic compounds over time under normal environmental conditions. Additional environmental data are available as follows:

Sulfite Salts:

Water Solubility = 470 g/L (20°C).

Chemical Oxygen Demand (COD) = 165 mg oxygen/g compound.

EFFECT OF MATERIAL ON PLANTS or ANIMALS: This product may be harmful to animal life if large volumes of it are released into the environment. Refer to section 11 (Toxicological Information) for information on the effects of components of this product on test animals.

EFFECT OF CHEMICAL ON AQUATIC LIFE: This product may be harmful to contaminated aquatic life (especially if large volumes of it are released into an aquatic environment. Additional aquatic toxicity data are available as follows:

Sulfite Salts:

LC₅₀ (*Salmo gairdneri*) 96 hours = 150-220 mg/L EC/LC₅₀ (*Pseudomonas putida*) 17 hours = 56 mg/L

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate U.S. Federal, State, and local regulations or with regulations of Canada. This product, if unaltered by the handling, may be disposed of by treatment at a permitted facility or as advised by your local waste regulatory authority.

EPA WASTE NUMBER: D002 (Characteristic/Corrosivity), applicable to wastes consisting only of this product.

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS NOT HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Not regulated

HAZARD CLASS NUMBER and DESCRIPTION: Not regulated

UN IDENTIFICATION NUMBER: Not regulated

DOT LABEL(S) REQUIRED: Not regulated

PACKAGING GROUP: Not regulated

NORTH AMERICAN RESPONSE GUIDEBOOK NUMBER (1996): Not regulated

NATIONAL MOTOR FREIGHT CLASSIFICATION: LTL: 100; T: 70

MARINE POLLUTANT: Not regulated

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This material is NOT considered as dangerous goods, per the regulations of Transport Canada.

15. REGULATORY INFORMATION

ADDITIONAL U.S. REGULATIONS:

U.S. SARA REPORTING REQUIREMENTS: No component of this product is subject to the reporting requirements of Sections 302, 304 and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for any component of this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lbs. (4,540 kg) therefore applies, per 40 CFR 370.20.

U.S. CERCLA REPORTABLE QUANTITY (RQ): The default RQ for Unlisted Wastes, Characteristic Corrosivity of 100 lb (45.4 kg) would apply to wastes of this product.

U.S. TSCA INVENTORY STATUS: The chemicals in this product are listed on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Not applicable.

15. REGULATORY INFORMATION (continued)

U.S. STATE REGULATORY INFORMATION: Components of this product are covered under specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances: Sodium Metabisulfite. Sodium sulfite	Massachusetts - Substance List: Sodium Metabisulfite. Sodium sulfite	North Dakota - List of Hazardous Chemicals, Reportable Quantities: Sodium Metabisulfite. Sodium sulfite
California - Permissible Exposure Limits for Chemical Contaminants: Sodium Metabisulfite. Sodium sulfite	Michigan - Critical Materials Register: No.	Pennsylvania - Hazardous Substance List: Sodium Metabisulfite. Sodium sulfite
Florida - Substance List: Sodium Metabisulfite. Sodium sulfite	Minnesota - List of Hazardous Substances: Sodium Metabisulfite. Sodium sulfite	Rhode Island - Hazardous Substance List: Sodium Metabisulfite. Sodium sulfite
Illinois - Toxic Substance List: Sodium Metabisulfite. Sodium sulfite	Missouri - Employer Information/Toxic Substance List: Sodium Metabisulfite. Sodium sulfite	Texas - Hazardous Substance List: No.
Kansas - Section 302/313 List: No.	New Jersey - Right to Know Hazardous Substance List: Sodium Metabisulfite. Sodium sulfite	West Virginia - Hazardous Substance List: No.
		Wisconsin - Toxic and Hazardous Substances: No.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No component of this product is on the California Proposition 65 lists.

ANSI LABELING (Z129.1): **WARNING!** IRRITATING LIQUID. MAY CAUSE RESPIRATORY, SKIN, AND EYE IRRITATION OR BURNS. MAY CAUSE ALLERGIC RESPIRATORY AND SKIN SENSITIZATION. MAY BE HARMFUL OR FATAL IF SWALLOWED. Do not breathe mists or sprays. Avoid prolonged or repeated contact with skin. Avoid contact with eyes. Do not taste or swallow. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves, goggles, and suitable body protection if necessary. **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 not breathing, give artificial respiration. If breathing is difficult, give oxygen. If ingested, do not induce vomiting. Get medical attention if any adverse effects occur. **IN CASE OF FIRE:** Use water fog, dry chemical, CO₂, or "alcohol" foam. **IN CASE OF SPILL:** Absorb spill with inert material and place in suitable container. Consult Material Safety Data Sheet for additional information.

ENVIRONMENTAL HAZARDS: Do not discharge effluent containing this product into streams, ponds, estuaries, oceans or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA.

ADDITIONAL CANADIAN REGULATIONS:

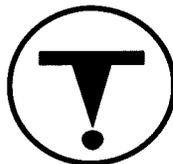
CANADIAN DSL/NDSL INVENTORY STATUS: The components of this product are listed on the DSL/NDSL Inventory.

OTHER CANADIAN REGULATIONS: Not applicable.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITY SUBSTANCES LISTS: Not applicable.

CANADIAN WHMIS SYMBOLS: **Class D2B** Materials Causing Other Toxic Effect (Contains a sensitizer)

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations



(CPR) and the MSDS contains all the information required by the CPR.

16. OTHER INFORMATION

PREPARED BY:

ADVANCED CHEMICAL SAFETY, Inc.
7563 Convoy Court
San Diego, CA 92111
(858)-874-5577

DATE OF PRINTING

July 26, 2013

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each compound.

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits.

TLV - Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average (**TWA**), the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level (**C**). Skin absorption effects must also be considered.

OSHA - U.S. Occupational Safety and Health Administration.

PEL - Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.

IDLH - Immediately Dangerous to Life and Health - This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. The **DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. Occupational Safety and Health Administration (**OSHA**). NIOSH issues exposure guidelines called **Recommended Exposure Levels (RELs)**. When no exposure guidelines are established, an entry of **NE** is made for reference.

HAZARD RATINGS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: Health Hazard: **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); **3** (Class IB and IC flammable liquids with flash points below 38°C [100°F]); **4** (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]). Reactivity Hazard: **0** (normally stable); **1** (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures).

NATIONAL FIRE PROTECTION ASSOCIATION: Health Hazard: **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure could cause death or major residual injury). Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR:

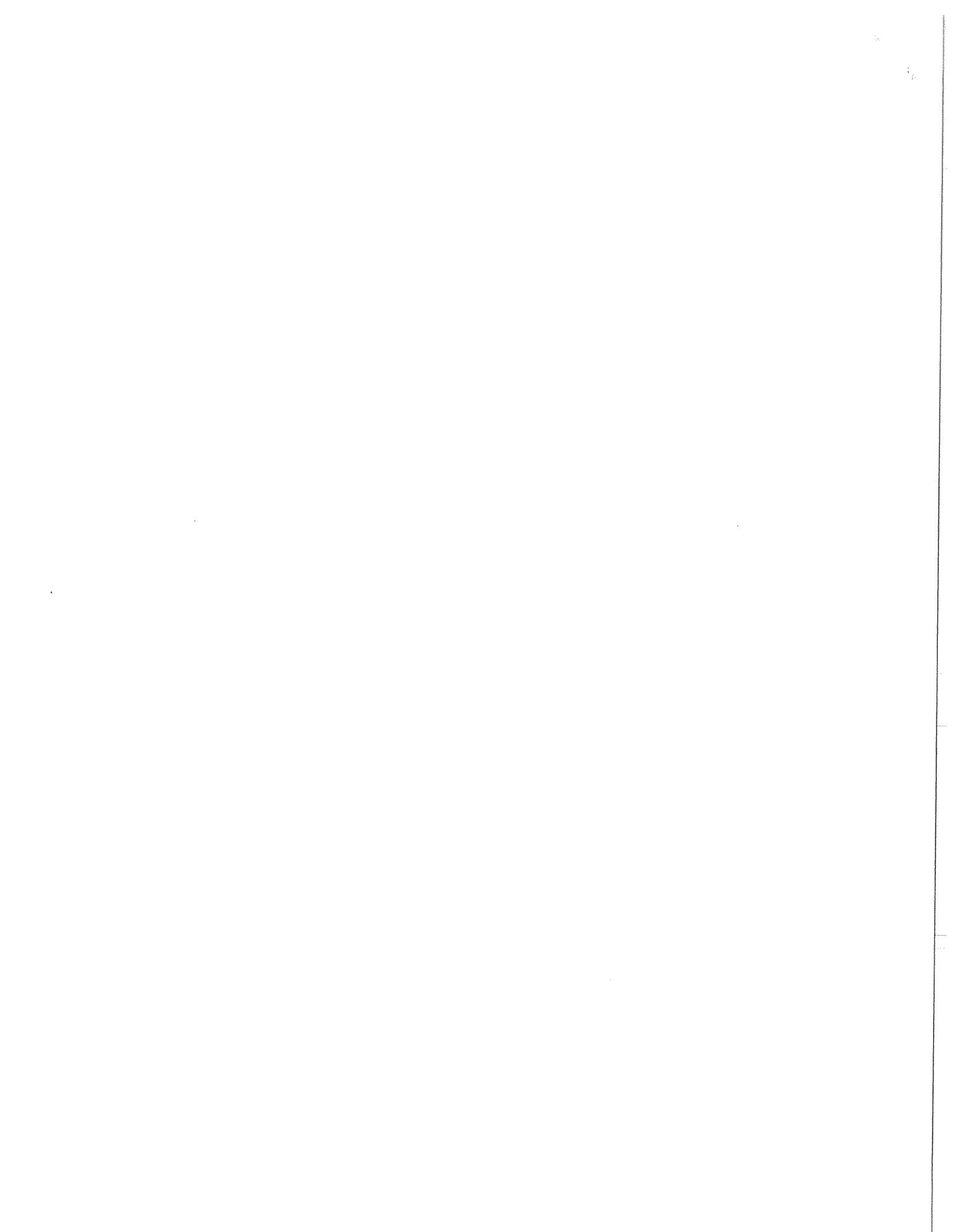
Much of the information related to fire and explosion is derived from the National Fire Protection Association (**NFPA**). Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD₅₀** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC₅₀** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m³** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. Ecological Information: **EC** is the effect concentration in water.

REGULATORY INFORMATION:

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act (**SARA**); the Canadian Domestic/Non-Domestic Substances List (**DSL/NDL**); the U.S. Toxic Substance Control Act (**TSCA**); Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act (**CERCLA** or **Superfund**); and various state regulations. This section also includes information on the precautionary warnings which appear on the material's package label.



Houghton Chemical Corporation

Material Safety Data Sheet

"SAFE-T-THERM®"



Section 1 - Identification			
Manufacturer Address	Houghton Chemical Corporation 52 Cambridge Street, Allston, MA 02134 1-617-254-1010 or 1-800-777-2466		
Emergency Telephone	Chemtrec: 1-800-424-9300		
Chemical Name & Synonyms	Antifreeze		
Chemical Family	Propylene Glycol Based		
Formula	Trade Secret		
CAS Registry Number	Not applicable for blended product		
DOT Shipping Classification	Not regulated		
Product Number	510787, 520787, 550787, 560787		
Section 2 – Hazardous Ingredients			
This material is NOT HAZARDOUS by OSHA Hazard Communication definition.			
Section 3 – Composition and Information on Ingredients			
Material	CAS #	% by weight	TLV (UNITS)
Propylene Glycol	57-55-6	≈95	Not applicable
Water	7732-18-5	≈2	Not applicable
Corrosion Inhibitors and Dye	TSR#80100075-5002P	3	Not applicable
Section 4 - Physical Data			
Boiling Point @760 mm Hg	311 ⁰ F		
Freezing Point	-70 ⁰ F		
Specific Gravity	1.06		
Vapor Pressure at 20 ⁰ C	0.1 mm Hg		
Vapor Density (air = 1)	2.1		
Solubility in Water	Complete		
% Volatile by Volume	Greater than 95%		
Evaporation Rate	Less than 1		
Appearance and Odor	Distinct Orange, Odorless		
Section 5 - Fire and Explosion Hazard Data			
Flash Point	225 ⁰ F		
Auto Ignition Temperature	>700 ⁰ F		
Flammable Limits in Air	≈2.6-12.5		
Extinguishing Media	Alcohol Foam		
Special Fire Fighting Procedures	Not applicable		
Unusual Fire and Explosion Hazards	None		
Section 6 – Reactivity Data			
Stability	This material is stable		
Incompatibility	Keep away from strong oxidizing agents		
Hazardous Decomposition Products	Not applicable		
Hazardous Polymerization	Will not occur		
Section 7 – Health Hazard Data			
Threshold Limit Value	Nuisance dust 15 mg/m ³ 8 hours		
Eye Contact	Irritation may result		
Skin Contact	No significant signs or symptoms expected		
Inhalation	This material is not expected to be a respiratory hazard except if aspirated. If swallowed, can enter lungs and cause damage.		
Ingestion	If more than several mouthfuls are swallowed, abdominal discomfort, nausea and diarrhea may occur. Aspiration during ingestion or vomiting may cause lung damage.		

Emergency and First Aid Procedures

Eyes	Flush with water for at least 15 minutes
Skin	Flush with water, wash with mild soap if available
Inhalation	Remove to fresh air
Ingestion	DO NOT induce vomiting, aspiration may cause lung damage; seek medical attention.

Section 8 – Spill or Leak Procedures

Steps to be Taken if Material is Spilled or Released	This liquid is biodegradable but large spills may contaminate public waters. Prevent flow to sewers/public waters. Restrict clean up water use. Notify water supply environment authorities. Impound/recover large land spills. Soak up small spills with absorbent material. Use suitable disposal containers. High biodegradability can stimulate algae growth. Dispose residue to reduce possible aquatic harm.
Waste Disposal Method	Consult with local sewer, municipal, state and/or federal agencies to determine appropriate current disposal options.

Section 9 – Special Protective Information

Respiratory Protection	Normally not required
Ventilation	None needed under anticipated conditions of normal use beyond that needed for normal comfort control.
Protective Gloves	If contact with hot liquid possible use suitable protective gloves.
Eye Protection	If contact with hot liquid possible use suitable splash goggles and face shield.
Other Protective Equipment	Not applicable

Section 10 – Special Precautions

Precautions to be taken in Handling and Storage	Follow good work/hygiene practices. Provide safety shower and wash in immediate area. Workers should wash with soap and water before eating, smoking or using toilet facilities. Launder contaminated clothing before re-use.
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STABROM® 909 Biocide

Material Safety Data Sheet

Revision Date: 20-Nov-2009
Supersedes 22-Sep-2009

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	STABROM® 909 Biocide		
Chemical Name	Proprietary.		
Chemical Family	Stabilized bromine biocide, aqueous solution		
CAS-No	Mixture		
Recommended use	Water treatment chemical		
Company	Albemarle Corporation 451 Florida Street Baton Rouge, LA 70801	NFPA	HMS
		3	3
Emergency Telephone Numbers	225-344-7147	Health	
For Non-Emergency	800-535-3030	Flammability	0 0
		Physical Hazards	0 0

2. HAZARDS IDENTIFICATION

Emergency Overview
Corrosive - causes irreversible eye damage
Causes skin burns
Harmful if swallowed
Harmful in contact with skin
Can decompose exothermically at elevated temperatures (see Environmental Protection, Storage Requirement Section for details)

Potential Health Effects

Eyes	Possible risks of irreversible effects.
Skin	Causes burns. Harmful in contact with skin.
Inhalation	In the event of fire and/or explosion do not breathe fumes. Not expected to be acutely toxic.
Ingestion	Harmful if swallowed.

See Section 11 for additional Toxicological information.

Occupational Exposure Limit See Section 8

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No	Weight %
Halogenated complex		18
Sodium hydroxide	1310-73-2	<10

4. FIRST AID MEASURES

Ad Lib	If medical advice is needed: Have product container or label at hand.
Eye contact	If in eyes, hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.
Skin Contact	If on skin or clothing, take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.
Inhalation	Move to fresh air.
Ingestion	If swallowed, Call a physician or Poison Control Centre immediately. Have person sip a glass of water if able to swallow. Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person.
Notes to Physician	Probable mucosal damage may contraindicate the use of gastric lavage.

5. FIRE-FIGHTING MEASURES

Combustion/explosion hazards	Not available.
Suitable Extinguishing Media	Not required
Hazardous Combustion Products	Bromine. Chlorine
Protective Equipment and Precautions for Firefighters	In the event of fire and/or explosion do not breathe fumes.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions	Ensure adequate ventilation..
Environmental precautions	Contain any spill with dikes or absorbents to prevent migration and entry into sewers or streams. Large spills should be collected mechanically (remove by pumping) for disposal. May require excavation of contaminated soil. Take up small spills by first diluting with water and then using a dehalogenating agent such as sodium thiosulfate solution.
Methods for Clean-up	Soak up with inert absorbent material (e.g. sand, silica gel, universal binder, sawdust).

7. HANDLING AND STORAGE

Handling	Avoid contact with skin, eyes and clothing.
Storage	Avoid freezing, excessive heat or exposure to light, especially direct sunlight. If heating is necessary to prevent freezing, care must be taken to prevent overheating. Precautions should be taken to ensure that the average product temperature is maintained below 110°F. Temperature monitoring is recommended. At elevated temperatures, self-heating can lead to vigorous gas generation and over-pressurization of storage containers if appropriate controls are not in place. Avoid exposure of this product to incompatible materials/chemicals (see Reactivity Data section). Use of incompatible materials can promote the exothermic decomposition of the product. In extreme cases, this could result in vigorous gas formation and over-pressurization of the storage container. STORAGE CONTAINER: Vented and opaque containers: As the product ages, activity is gradually lost and pressure can build-up in the headspace (nitrogen); therefore, the product should be stored in vented containers. Product should also be stored in opaque containers to prevent exposure to light. To maximize product shelf life, store the product in an opaque container, in a cool, dry, well-ventilated area.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component	CAS-No	Weight %	ACGIH TLV (TWA)	ACGIH (STEL or Ceiling)	OSHA PEL (TWA)	OSHA (STEL or Ceiling)
Sodium hydroxide	1310-73-2	<10		2mg/m ³ (Ceiling)	2mg/m ³	2mg/m ³ (Ceiling)

Engineering Controls Use only in well-ventilated areas.

Personal Protective Equipment

Eye/face Protection	Chemical goggles or face shield with safety glasses.
Skin Protection	Wear protective gloves/clothing.
Hand protection	Gloves resistant to chemical permeation.
Other information	Wear suitable protective clothing.

9. PHYSICAL AND CHEMICAL PROPERTIES

Flash point	Not applicable.	Flammable limits (LEL, UEL)	No data available
Form	Liquid	Vapor pressure	19 mmHg(25°C)
Color	Yellow.	Density	1.29-1.37 g/ml(25°C)
Odor	Mld. Sweet.	Vapor density	No data available
pH	12.4(min.)	Water Solubility	Miscible.
Boiling Point	106°C	Melting/freezing point	0 °C / 32°F
Viscosity, dynamic	~2.7cPs(25°C)	Viscosity, kinematic	~2cSt(25°C)
Oxidizing Properties	Oxidizer		

10. STABILITY AND REACTIVITY

Stability	Stable.
Conditions to Avoid	Protect from light. Extremes of temperature and direct sunlight. Keep away from heat. Freezing.
Materials to avoid	This product is strongly basic and an oxidizing agent. Avoid contact with alcohols, aldehydes, strong reducing agents, strong oxidizers, acids, ammonia-containing products, and common metals such as steel, aluminum, iron and copper. Use of incompatible materials can promote the exothermic decomposition of the product.
Hazardous decomposition products	None under normal use.
Hazardous Polymerization	None under normal processing.

11. TOXICOLOGICAL INFORMATION**Acute Effects**

Eye contact	Possible risks of irreversible effects.
Skin contact	Causes burns.
Ingestion	Harmful if swallowed.
LD50 Oral:	2491 mg/kg
LD50 Dermal:	>2000 mg/kg
Inhalation LC50	> 20.37mg/l

12. ECOLOGICAL INFORMATION

Ecotoxicity	
LC50	3.8 mg whole material/L; 96-hour; Bluegill Sunfish <i>Lepomis Macrochirus</i>
Ecotoxicity effects	No information available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method	Dispose in a safe manner in accordance with local/national regulations.
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14. TRANSPORT INFORMATION

DOT

Proper Shipping Name Corrosive Liquids, Basic, Inorganic, N.O.S. (Halogenated Complex, Sodium Hydroxide)
Hazard Class 8
UN No. 3266
Packing Group III
Description UN 3266 Corrosive liquid, Basic, Inorganic, N.O.S. (Halogenated complex, Sodium hydroxide), 8, III

IMDG/IMO

IMO Class 8
Packing Group III
UN-No 3266
IMO Labelling and Marking 8
Proper Shipping Name Corrosive liquid, Basic, Inorganic, N.O.S. (Halogenated complex, Sodium hydroxide)
EmS F-A, S-B
Marpol - Annex II Not determined
Marpol - Annex III Unregulated
Transport Description UN 3266 Corrosive liquid, Basic, Inorganic, N.O.S. (Halogenated complex, Sodium hydroxide), 8, III

IATA/ICAO

IATA/ICAO Class 8
Packing Group III
UN-No 3266
IATA/ICAO Labelling 8
Passenger Aircraft Forbidden
Cargo aircraft only Forbidden
Proper shipping name Corrosive liquid, Basic, Inorganic, N.O.S. (Halogenated complex, Sodium hydroxide)
Transport Description UN 3266 Corrosive liquid, Basic, Inorganic, N.O.S. (Halogenated complex, Sodium hydroxide), 8, III

15. REGULATORY INFORMATION

International Inventories	TSCA	DSL	NDSL	AICS	BNECS	ELINCS	ENCS	KECL	PICCS	CHINA	NZIoC
STABROM® 909 Biocide	-	-	-	X	-	-	-	X	X	X	X

(X) Complies (-) Does not Comply

TSCA Statement
 THIS MATERIAL IS EXEMPT FROM THE TOXIC SUBSTANCES CONTROL ACT (15 USC 2601-2629)..

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

SARA 311/312 Hazardous Categorization

Chronic Health Hazard	No
Acute Health Hazard	Yes
Fire Hazard	No
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

Reportable and Threshold Planning Quantities
 The following components have RQs and/or TPQs under SARA and/or CERCLA

FIN00246 - STABROM® 909 Biocide

Revision Date: 20-Nov-2009

Component	CAS-No	Weight %	SARA 302 RQ, lbs	CERCLA RQ, lbs	SARA 302 TPQ, lbs
Sodium hydroxide	1310-73-2	<10		1000	

State Regulations

This product contains the following chemicals regulated in the states listed below.

Component	CAS-No	California Prop. 65	Massachusetts	New Jersey	Pennsylvania
Sodium hydroxide	1310-73-2		Listed.	Listed.	Listed.

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

WHMIS Hazards

E Corrosive material
D2B Toxic materials

16. OTHER INFORMATION

Prepared By

Health & Environment Department
Albemarle Corporation

FOR ADDITIONAL NONEMERGENCY PRODUCT INFORMATION, CONTACT:

HEALTH AND ENVIRONMENT DEPARTMENT
ALBEMARLE CORPORATION
451 FLORIDA ST.
BATON ROUGE, LA. 70801
(800) 535-3030

The information contained herein is accurate to the best of our knowledge. The Company makes no warranty of any kind, express or implied, concerning the safe use of this material in your process or in combination with other substances.

**Material Safety Data Sheet
CTT 20S**

KING SOFT WATERCO. 1425 EAST HOUSTON AVE. SPOKANE, WA 99217 (509) 487-5464	DATE PREPARED: MAR 1, 2006 REVISION NUMBER: ... MAR 1, 2008 24 HOUR EMERGENCY PHONE NUMBER CHEMTREC: 800-424-9300
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SECTION I – IDENTIFICATION

PRODUCT NAME:..... CTT 20S
CHEMICAL FAMILY:..... MODERATELY ALKALINE MATERIAL
FORMULA:..... N/A
CAS NUMBER:..... N/A

SECTION II – HAZARDOUS IDENTIFICATION

EMERGENCY OVERVIEW
EYES: May cause sever eye irritation with possible permanent eye damage and impairment of vision.
SKIN (DERMAL): Skin contact may cause irritation while prolonged exposure may cause chemical burns.
SWALLOWING (INGESTION): May cause severe gastrointestinal irritation and/or ulceration of the mouth and throat. Single dose oral LD50 has not been detemined.
INHALATION: Vapors and mist may cause respiratory tract irritation.
MEDICAL CONDITION AGGRAVATED
BY EXPOSURE: Existing skin and/or respiratory disorders may be aggravated by exposure.
CHRONIC OVEREXPOSURE: . None known
OSHA REGULATORY STATUS: Since this product is a mixture, there is no definded PEL's (Personal Exposure Limits) established by OSHA. ACGIH TLV's (Threshold Limit Values) for hazardous components are listed in the Hazardous Ingredients Section of this MSDS.

SECTION III – COMPOSITION INFORMATION ON INGREDIENTS

THRESHOLD LIMIT VALUE: . The TLV in section in section III is the ACGIH/TLV-TWA (threshold limit value/time weighted average concentration for an eight hour work day). The STEL is the short term exposure limit and the (Ceil) is the ceiling limit.

HAZARDOUS INGREDIENT	PERCENT	CAS NO.	ACGIH/TWA	STEL/TLV
Potassium hydroxide	< 2	1310-58-3	NOT EST.	2 mg/M ³ (Ceil)

(Also contains water treatment polymers and corrosion inhibitors.)

SECTION IV – FIRST AID DATA

EYES: In case of contact, immediately flush eyes with lots of running water for at least 15 minutes. Call for medical assistance.

**Material Safety Data Sheet
CTT 20S**

SKIN (DERMAL): Immediately flush skin with lots of cool running water for at least 15 minutes while removing contaminated clothing and/or shoes. Wash contaminated clothing and/or shoes before reuse.

SWALLOWING (INGESTION): NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. (If available, give several glasses of milk) If vomiting occurs spontaneously, keep airway clean and give more water. GET MEDICAL ATTENTION IMMEDIATELY.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen as directed by physician or medical personnel.

SECTION V – FIRE FIGHTING MEASURES

FLASHPOINT:..... Non flammable, non combustible
LOWER EXPLOSIVE LIMIT: .. N/A
UPPER EXPLOSIVE LIMIT: N/A
EXTINGUISHING MEDIA: Use extinguishing media appropriate to primary cause of fire.

SECTION XVI – OTHER INFORMATION

SPECIAL FIRE FIGHTING PROCEDURES: Avoid contact with fire fighting personnel as burns may result from contact with skin. when fighting a fire near or involving this product, wear a self-contained breathing apparatus. (SCBA)

UNUSUAL FIRE AND EXPLOSION HAZARDS: None known

SECTION VI – ACCIDENTAL RELEASE MEASURES

SPILL/ LEAK PROCEDURES: . Appropriate protective clothing must be worn by trained cleanup personnel. Dike the area to contain spill. Dilute with large quantities of water and neutralize with dilute acids such as acetic or phosphoric acid. Properly neutralized liquid (pH 6-9) may be disposed of in waste water treatment facilities. Check with local authorities first.

SECTION VII – HANDLING AND STORAGE

HANDLING INFORMATION:.. Store away from acids, oxidizing compounds and other incompatible materials. Keep container tightly closed when not in use. KEEP OUT OF REACH OF CHILDREN.

STORAGE REQUIREMENTS:.. Keep containers tightly closed when not in use. Empty container completely and dispose of in accordance with applicable regulations. SPILLS: Contain spill. Absorb with inert material and dispose in accordance with applicable regulations. Store away from food products.

SECTION VIII – EXPOSURE CONTROLS / PERSONAL PROTECTION

Material Safety Data Sheet
CTT 20S

EYE PROTECTION:..... Chemical safety goggles and full face shield (8null min.) to protect against splashing in compliance with OSHA regulations are advised. OSHA regulations also permit other type safety glasses. (Consult your industrial hygienist) Contact lenses should not be worn when working with any chemicals.

RESPIRATORY PROTECTION:Respiratory protection should be worn if levels exceed defined PEL's for this product or any hazardous component listed in the Hazardous Ingredient Section of this MSDS.

OTHER PROTECTIVE

EQUIPMENT:..... Impervious protective clothing and chemical resistant safety shoes should be worn to minimize contact. Emergency shower and eyewash facility should be in close proximity. (ANSIZ358.1)

VENTILATION: Local exhaust sufficient to maintain TLV below permissible exposure limits.

SECTION IX – PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Clear amber liquid with mild odor.

BOILING POINT:..... Approx. 212° F.

VAPOR PRESSURE:..... NOT EST.

VAPOR DENSITY (AIR=1):..... NOT EST.

SPECIFIC GRAVITY: 1.11

pH: 11.3 - 11.9 AS IS

SOLUBILITY IN WATER:..... Completely soluble in water.

SECTION X – STABILITY AND REACTIVITY DATA

STABILITY:..... Stable

HAZARDOUS

POLYMERIZATION: Will not occur

INCOMPATIBILITY: Strong oxidizing agent, strong acids.

HAZARDOUS

DECOMPOSITION:..... Carbon monoxide and carbon dioxide upon thermal decomposition.

SECTION XI – TOXICOLOGICAL INFORMATION

TOXICOLOGICAL

INFORMATION:..... **POTASSIUM HYDROXIDE:** Toxicity Data: This material will affect all tissues with which it comes in contact. The severity of the tissue damage is a function of concentration, the length of tissue contact time, and local tissue conditions. After exposure there may be a time delay before irritation and other effects occur. This material is a strong irritant and is corrosive to the skin, eyes, and mucous membranes. This material may cause severe burns and permanent damage to any tissue with which it comes into contact. Inhalation will cause severe irritation, possible burns with pulmonary edema, which may lead to pneumonitis. Skin contact with this material may cause severe irritation and corrosion with possible corneal damage and blindness.

SECTION XII – ECOLOGICAL INFORMATION

Material Safety Data Sheet
CTT 20S

ECOLOGICAL

INFORMATION:..... **POTASSIUM HYDROXIDE:** Fish Toxicity: This material has exhibited moderate toxicity to aquatic organisms. for Potassium Hydroxide: 80 mg/L (96hr) LC50 Mosquito fish: 165 mg/L (24hr) LC50 Guppy. **PERSISTENCE:** This material is alkaline and may raise the pH of surface waters with low buffering capacity. This material is believed to exist in the disassociated state in the environment.

SECTION XIII – DISPOSAL CONSIDERATIONS

WASTE DISPOSAL: Consult all LOCAL, STATE, and FEDERAL regulations with regard to proper and suitable disposal methods.

SECTION XIV – TRANSPORTATION INFORMATION

PROPER SHIPPING NAME:..... N/A
HAZARD CLASS AND LABEL: NON HAZARDOUS
UN NUMBER:..... N/A
PACKAGING GROUP:..... N/A

SECTION XV – REGULATORY INFORMATION

LISTED CARCINOGEN:..... None known
TSCA STATUS:..... All components in this product are listed on the TSCA inventory.
SARA SECTION 313:..... This product does not contain any EPCRA section 313 chemicals subject to the reporting requirements of section 313 of the Emergency Planning Community Right-To-Know Act of 1986 (40CFR 372):
NFPA HEALTH:..... 2
NFPA FLAMMABILITY:..... 0
NFPA REACTIVITY:..... 0

SECTION XVI – OTHER INFORMATION

REFERENCES:..... The information contained herein has been compiled from sources believed to be reliable and accurate to the best of our knowledge at this date. It is provided without warranty, expressed or implied, as to the results of use of this information or to the product to which it relates. Wesmar Co. assumes no responsibility for injury to any person or property resulting from any use of the material. Each user assumes the risk in their use of this product and should review the data and recommendations in the specific context of their intended use.
FOOT NOTES:..... NOT EST. = Not Established, N/A = Not Applicable, (Ceil) = TLV ceiling limit.

C.8

Spill Control Plan

Slug Discharge Control Plan



SGL

AUTOMOTIVE CARBON FIBERS

A BMW Group and
SGL Group Joint Venture

Spill Control Plan

8781 Randolph Road NE
Moses Lake, WA 98837

SPILL CONTROL PLAN

Revised: December 4, 2013

Table of Contents

1.0	Purpose	3
2.0	Scope	3
3.0	References	3
4.0	Responsibilities	3
5.0	Spill Prevention Procedure	3
5.1.	Container Management	3
5.2.	Housekeeping	5
5.3.	Spill Containment	5
5.4.	Training	6
6.0	Reporting	6

1.0 Purpose

This plan establishes proper spill control plan for the prevention, containment, and control of spills or unplanned releases of pollutants and the spill notification procedures at the SGL Automotive Carbon Fiber LLC, Moses Lake Facility (SGL ACF).

2.0 Scope

This procedure applies to all SGL ACF employees, contractors, vendors, and associates working at the SGL ACF.

3.0 References

SGL ACF State Waste Discharge Permit Number ST-0501273; Special Condition S11 Spill Control Plan.

4.0 Responsibilities

The SGL ACF Environmental Health & Safety Emergency Coordinator has primary responsibility for response to emergencies including chemical spill. It is the Emergency Coordinator's responsibility to ensure effective implementation of this procedure. Supervisors should ensure that team members are familiar with these procedures. Furthermore all team members should follow these procedures in the event of chemical spill.

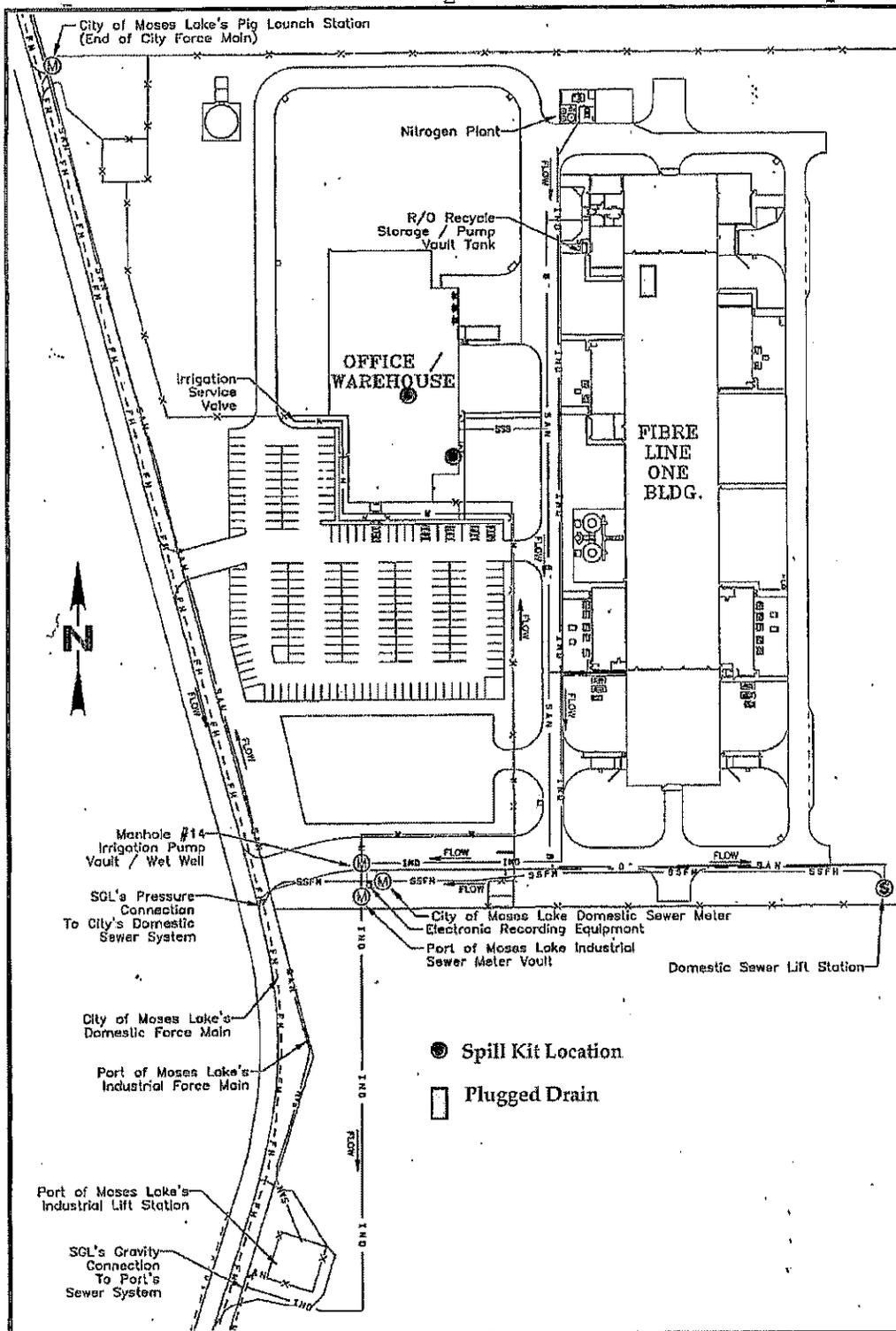
5.0 Spill Prevention Procedure

SGL Automotive Carbon Fiber LLC will ensure that all hazardous substances in the facility are properly stored, dispensed, and/or used in a way that prevents release. Good housekeeping practices will be maintained for all chemical materials at the facility. Generally, Figure.1 shows the overall facilities and drainage patterns.

5.1. Container Management

- All hazardous substance containers will be in good condition and compatible with the materials stored within.
- All hazardous substance containers will be accessible and spacing between containers will provide sufficient access to perform periodic Safety Sweep inspections and respond to releases.
- All empty hazardous substance containers will be disposed of according to applicable local, state and federal regulations.
- Any spills on the exterior of the container will be cleaned immediately.
- Flammable material waste will be collected in drums that are grounded to prevent static spark.
- The waste drums will not be overfilled. A 4" of headspace must remain to allow for expansion.

Figure.1 SGL ACF facilities and drainage patterns



- All hazardous substances, including chemical wastes, will be properly marked and labeled in accordance with all federal, state and local regulations.
- All hazardous substances that are transferred into smaller containers will be marked with the chemical's name.

5.2. Housekeeping

- All hazardous substances will be stored inside buildings or under cover.
- Hazardous substances not used daily will be stored in cabinets, or in designated areas.
- All chemicals that are transferred from larger to smaller containers will be transferred by use of a funnel or spigot.
- All hazardous substance containers will be closed while not in use.
- Drip pans or other collection devices will be used to contain drips or leaks from dispensing containers or equipment.
- All small spills or leaks will be cleaned up and properly disposed of in accordance with local, state and federal regulations.
- Equipment and hazardous substance storage areas will be periodically inspected to ensure leaks or spills are not occurring.
- Signs will be used to identify hazardous substance storage or waste collection areas.
- All work areas and hazardous substance storage areas will be kept clean and in good general condition.

5.3. Spill Containment

The most likely spills to occur in this facility are small or incidental spills (less than 42 gallons). Small spills will be contained by site personnel if they are able to do so without risking injury. Spill kits are located in the warehouse and in the laboratory as shown on Figure 1. Spill cleanup materials will be properly characterized before disposal.

When there is a small chemical spill, the discoverer will:

- Stop the source of the spill
- Contain the spill using the spill kits
- Notify the supervisor and the supervisor will notify the Emergency Coordinator.
- If at any time the spill will be unattended, mark off the area with a cone or caution tape to prevent other personnel from entering.

Trained personnel will clean up the spill utilizing proper Personal Protective Equipment (see MSDS). A leaking drum will be placed in an overpack/salvage drum.

An MSDS binder that contains all of the chemicals that are used at the facility is kept by the break room in the production building and is available for all personnel, as required under Condition S11.B.1. The laboratory chemicals' MSDSs are kept in the laboratory and in the test engineer's office. A copy of the whole facility MSDS binder is also kept in the maintenance department and in the environmental health and safety office.

When there is a large chemical spill:

- The discoverer of the spill will immediately notify the supervisor in charge and the supervisor will notify the Emergency Coordinator and the EHS department.
- The spill will be contained with available equipment (e.g. absorbent pads, Ultrasorb, etc.).

- The spill area will be secured with tape and/or cones and other site personnel will be alerted.
- If site personnel are unable to contain the spill, a cleanup contractor such as Emerald Services will be contracted to manage the spill.
- The Emergency Coordinator and EHS department will determine whether the building should be evacuated and/or outside emergency response personnel should be called.

5.4. Training

All team members will receive initial training on spill prevention and response practices, and emergency response procedures within the first week of starting at SGL ACF. Training will include a review of the spill prevention and emergency response plan, and a review of location and use of emergency response equipment. Periodic refresher training will be provided...???? Team member who receive the training will sign the SGL ACF training sheet, and the training sheets will be uploaded to the compliance management software..

6.0 Reporting

All chemical spills, regardless of size, should be reported to the EHS Emergency Coordinator. The Emergency Coordinator will determine whether the spill has the potential to effect the environment outside the facility and must be reported to 911 and/ or to local, state, and federal authorities. Table.1 below shows the emergency contacts' phone numbers.

Table.1 Emergency Contacts

SGL ACF Emergency Coordinator: Ronald Roth	509-989-8675
Emergency Services	911
Fire Department Direct Number	509-765-2204
Police	509-762-1160
Department of Ecology (weekdays/daytime): Pat Hallinan	509-329-3500
Department of Ecology (24 hrs)	509-329-3400
Public Works Department	509-764-3951
POML: Rich Mueller	509-762-5054

SGL

AUTOMOTIVE CARBON FIBERS

A BMW Group and
SGL Group Joint Venture

Slug Discharge Control Plan

8781 Randolph Road NE
Moses Lake, WA 98837

SLUG DISCHARGE CONTROL PLAN

Table of Contents

1.0	Purpose	3
2.0	Scope.....	3
3.0	References.....	3
4.0	Responsibilities	3
5.0	Slug Discharge Control Plan Components	3
6.0	Reporting and Recordkeeping	6

1.0 Purpose

The purpose of this document is to minimize the potential of non routine, non customary batch discharges to the City of Moses Lake Larson Publicly Owned Treatment Works (POTW) and to the Port of Moses Lake Water treatment system (POML).

2.0 Scope

This procedure applies to all discharges to the industrial and sanitary sewer system at the SGL Automotive Carbon Fibers LLC (SGL ACF) Moses Lake facility.

3.0 References

SGL ACF State Waste Discharge Permit Number ST-0501273.

4.0 Responsibilities

The SGL ACF Emergency Coordinator has primary responsibility for response to emergencies. Supervisors should ensure that team members are familiar with these procedures. Furthermore all team members should follow these procedures in the event of slug discharge. It is the Emergency Coordinator's responsibility to ensure effective implementation of this procedure.

5.0 Slug Discharge Control Plan Components

Special Condition 12 of the discharge permit ST-0501273 requires that the following information and procedures relating to the prevention of unauthorized slug discharges be included in the slug discharge control plan.

1. In the event of a hazardous material incident that results in an unpermitted release into the domestic or industrial sewers, the team member who discovers the release must immediately report it to the supervisor in charge and supervisor in charge will notify the Emergency Coordinator. The Emergency Coordinator will contact appropriate state or local officials at:

Department of Ecology (weekdays/daytime): Pat

Hallinan	509-329-3500
Department of Ecology (24 hrs)	509-329-3400
Sewer discharge (POTW)	509-764-3951
Industrial discharge (POML)	509-762-5054

The supervisor in charge will fill out the SGL ACF Environmental Incident Report Form documenting the spill as soon as possible, no later than 8 hrs of the incident, and forward it to the Emergency Coordinator and to the SGL ACF Environmental Health and Safety (EHS) engineer. The EHS engineer will send a written report to DOE and

POML or POTW within 5 days of the incident. The report will include an analysis of the cause of the release and corrective actions to reduce the risk of incident reoccurring.

2. The SGL ACF industrial waste water may consist of including but not limited to reverse osmosis reject water, periodic discharges from bicarbonate rinse bath, boiler blow downs, and onsite nitrogen plant's condensate. All the waste water created at the SGL ACF is either discharged to the POTW or to the POML using separate pipelines. The facility's domestic waste water from the office and the production buildings gravitationally flows to the domestic sewer lift station at the SE corner of the property before being discharged into the POTW system. The SGL ACF's process building floor drains and the industrial waste water gravitationally flows towards south, into a wet well, Manhole# 14, before it is being discharged to the POML's lift station. Figure.1 Shows the SGL ACF waste water flow diagram. There is no waste water treatment and storage capacity at the SGL ACF facility.

No chemicals, raw materials, or products are stored outside that can come into contact with rain or storm water. All storm water at the SGL ACF facility flows into the drywells that are staggered throughout the facility. The drywells prohibit any storm water runoff from the site.

All team members will be trained at hire, periodically, or as necessary on the emergency notification procedures, spill and slug discharge plan. Also each team member will participate relevant training before operating equipment.

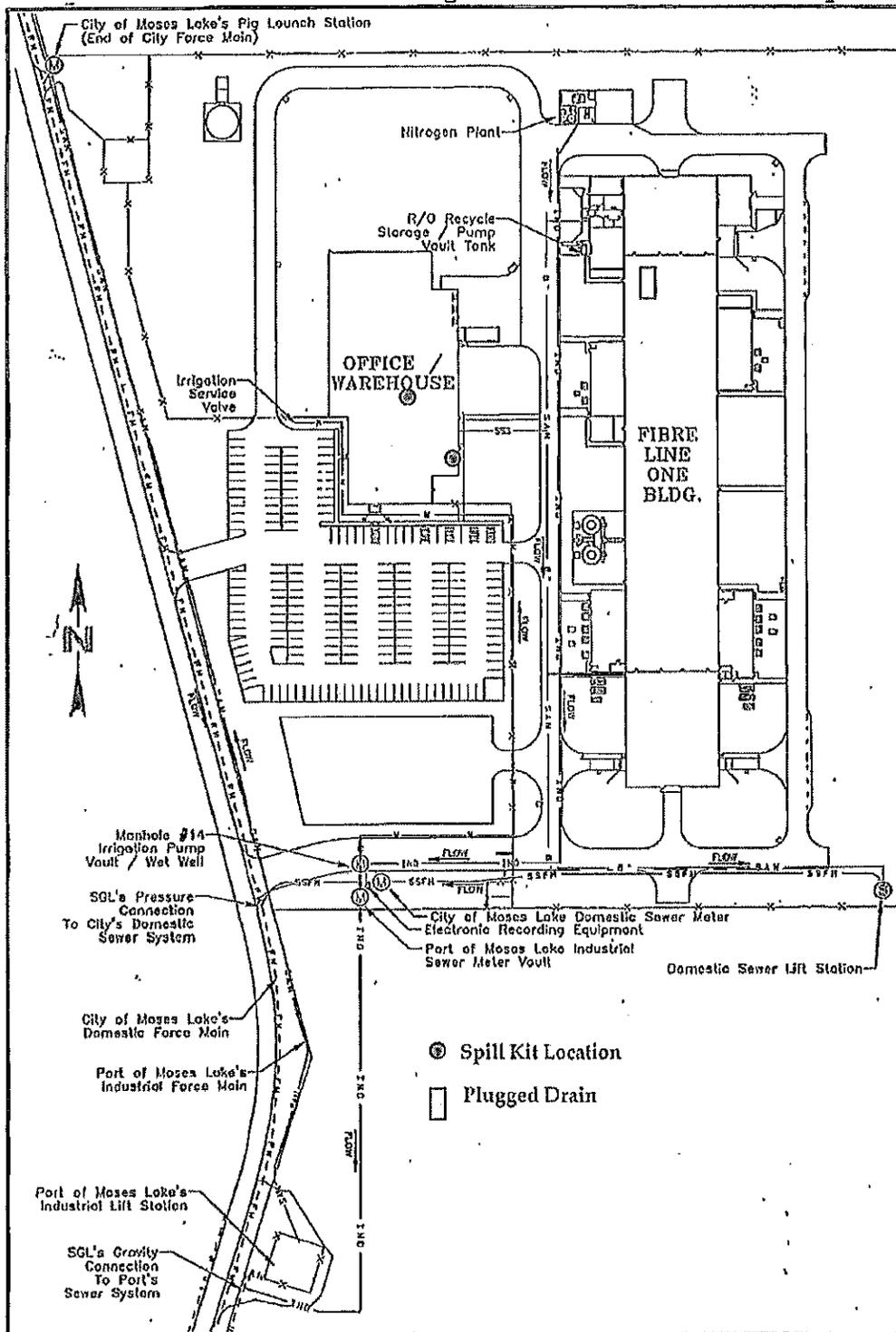
3. To prevent adverse impact from accidental spills, the following procedures will be implemented.

a. Each chemical storage area will be inspected during Safety Sweep inspections. Good housekeeping practices will be maintained for all chemical materials at the facility. No hazardous chemical will be stored in the sinks.

b. All hazardous substances in the facility will be properly stored, dispensed, and/or used in a way that prevents release.

- All hazardous substance containers will be in good condition and compatible with the materials stored within.
- Open container use of hazardous chemicals near sinks and floor drains will be avoided.
- If open container use of chemicals near floor drains is unavoidable the floor drains will be plugged.

Figure.1 SGL ACF waste water flow diagram



- Chemicals will be stored on pallets, in cabinets, or on a secondary containment.
 - To minimize the storage quantities, hazardous chemicals will be ordered as needed.
 - Unwanted chemicals and hazardous waste will be disposed properly.
- c.** Any slug discharge that may occur at the shipping and receiving docks that flows into to the dry well will be cleaned properly.
- d.** Plant site storm water is collected in the dry wells that are located within the property.
- e.** Worker training will be provided periodically and as necessary on proper handling of spill and slug discharges and emergency action plan.
- f.** Chemicals will be stored inside the buildings or under cover.
- g.** Solvent absorbent pads will be kept in the laboratory where solvents are used.
- h.** Spill kit materials and overpack/salvage drums will be kept on hand for quick response to contain any leaked material.

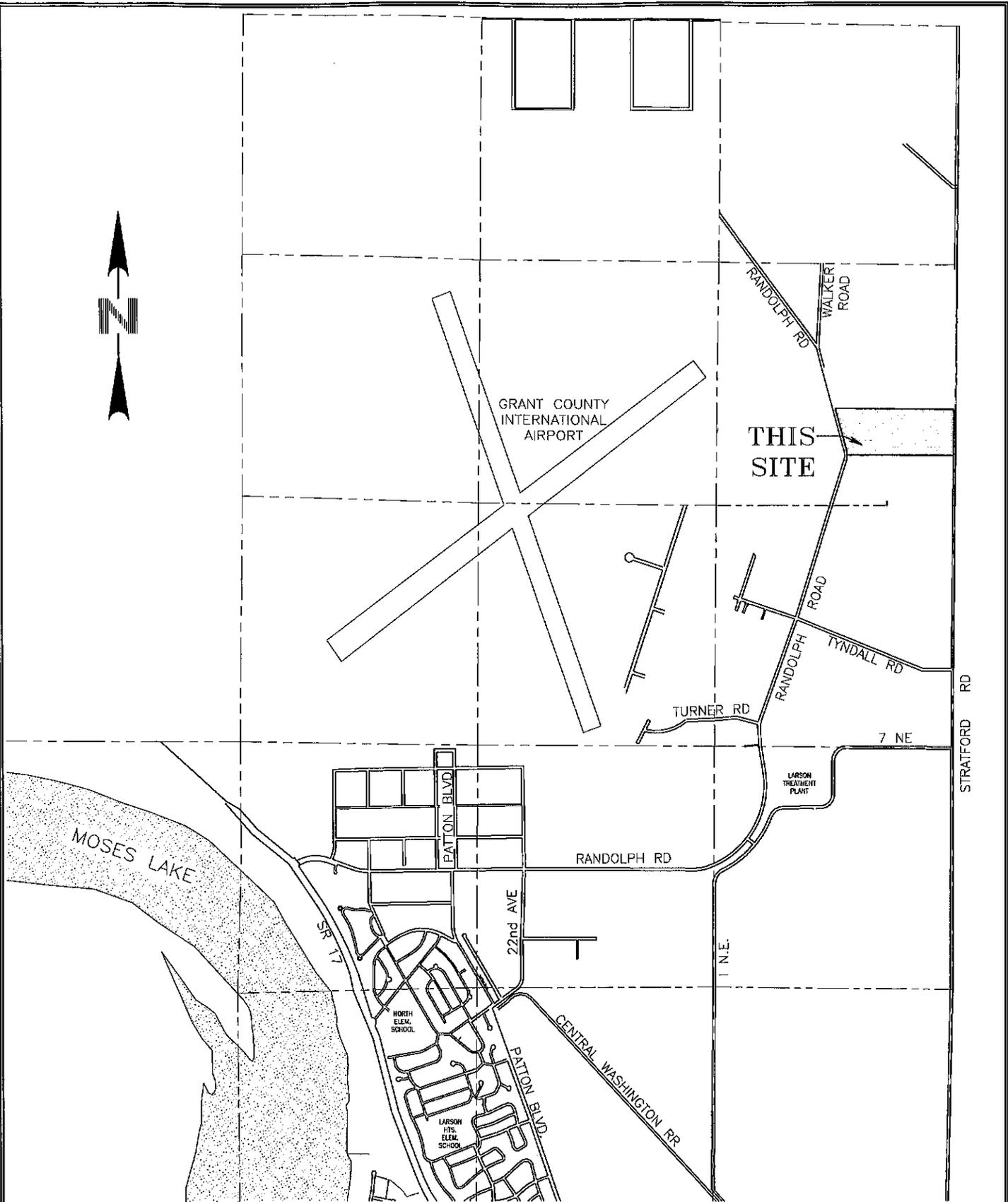
4. The SGL ACF facility processes Polyacrylonitrile to produce automotive carbon fibers. Epoxy and sodium bicarbonate solutions are used during this process. The off gasses that are created during the carbon fiber manufacturing process are controlled by the air quality permit. Dozens of other chemicals are stored and used throughout the plant for production, maintenance, laboratory, and other necessary operations. An inventory of all chemicals that are used, stored, produced at the SGL ACF facility is maintained in the Material Safety Data Sheet (MSDS) binder. The team members have 24/7 access to the MSDSs. Due to the safety sensitive information, the full list and locations of these chemicals are not included in this plan.

5. There is no batch discharges under normal operating process. Batch discharges might occur due to equipment failure or maintenance operations. Under normal operating conditions SGL ACF expected to discharge around 3000 gallon a day, based on available historical data, of industrial waste water into the POML.

6. All equipment and facilities are in place. Team members have been trained on the SGL ACF emergency action plan.

6.0 Reporting and Recordkeeping

All slug discharge incidents that effect the POML or POTW systems will be reported to the DOE and either POML or POTW and followed up with a written report within 5 days of the incident. If a spill possesses a threat to human health or the environment the Emergency Coordinator must immediately report it to 911. All slug discharge incident reports will be kept in the EHS engineer's office. All team members training records will be kept in the Human Resources Team Member Training binder.



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SGL ACF, LLC
Moses Lake Washington
Vicinity Map

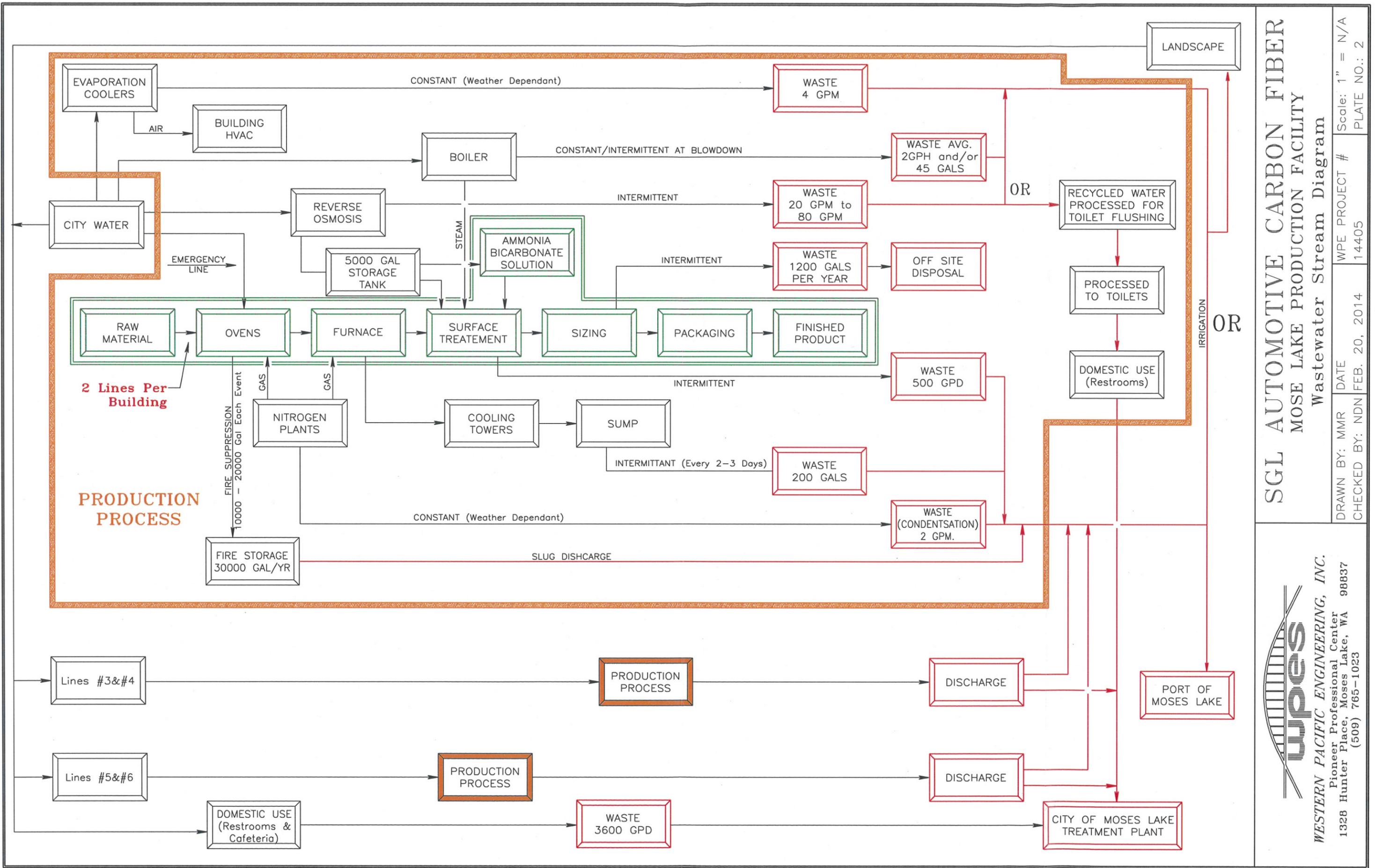


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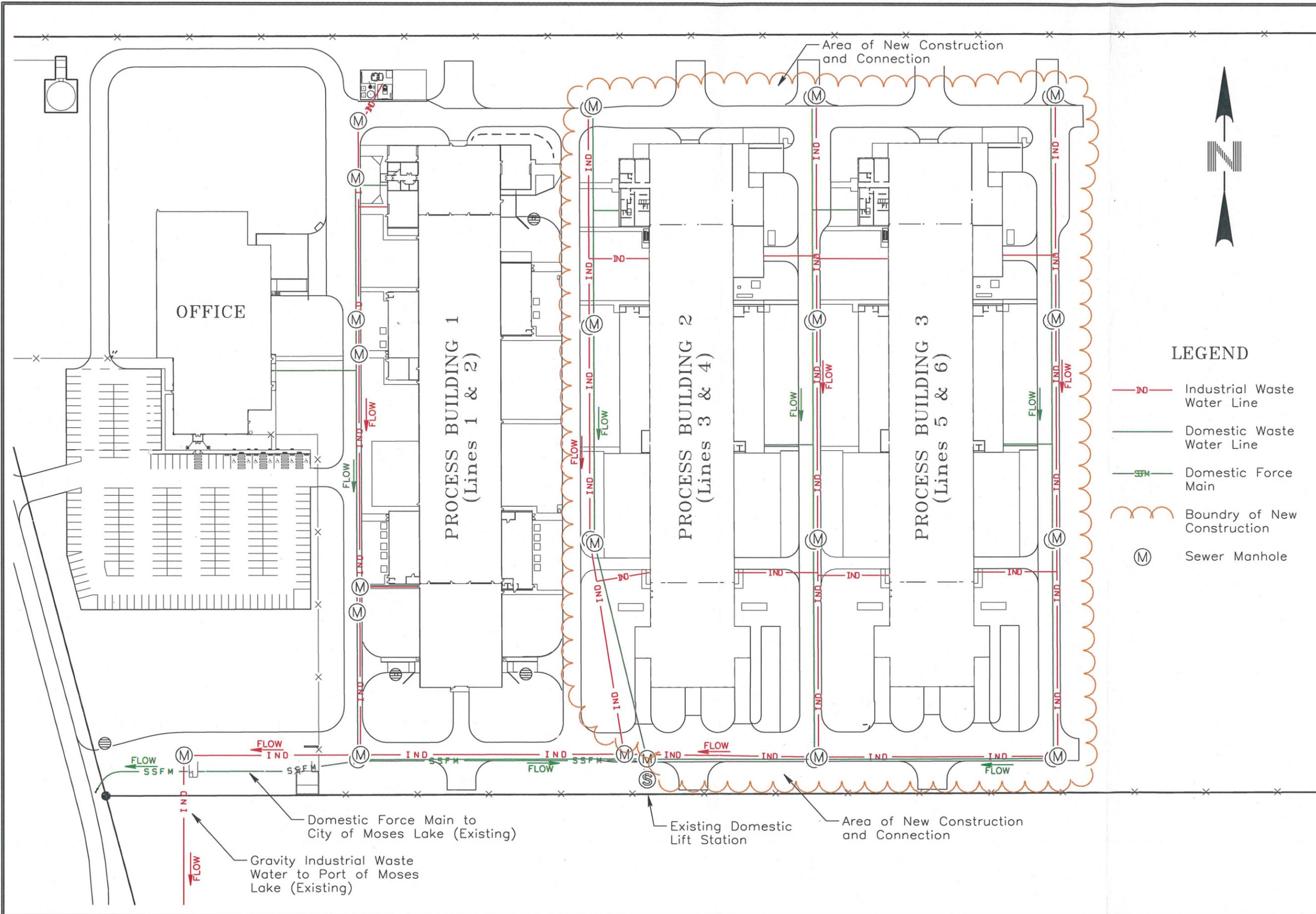
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SGL AUTOMOTIVE CARBON FIBER
MOOSE LAKE PRODUCTION FACILITY
Wastewater Stream Diagram

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LEGEND

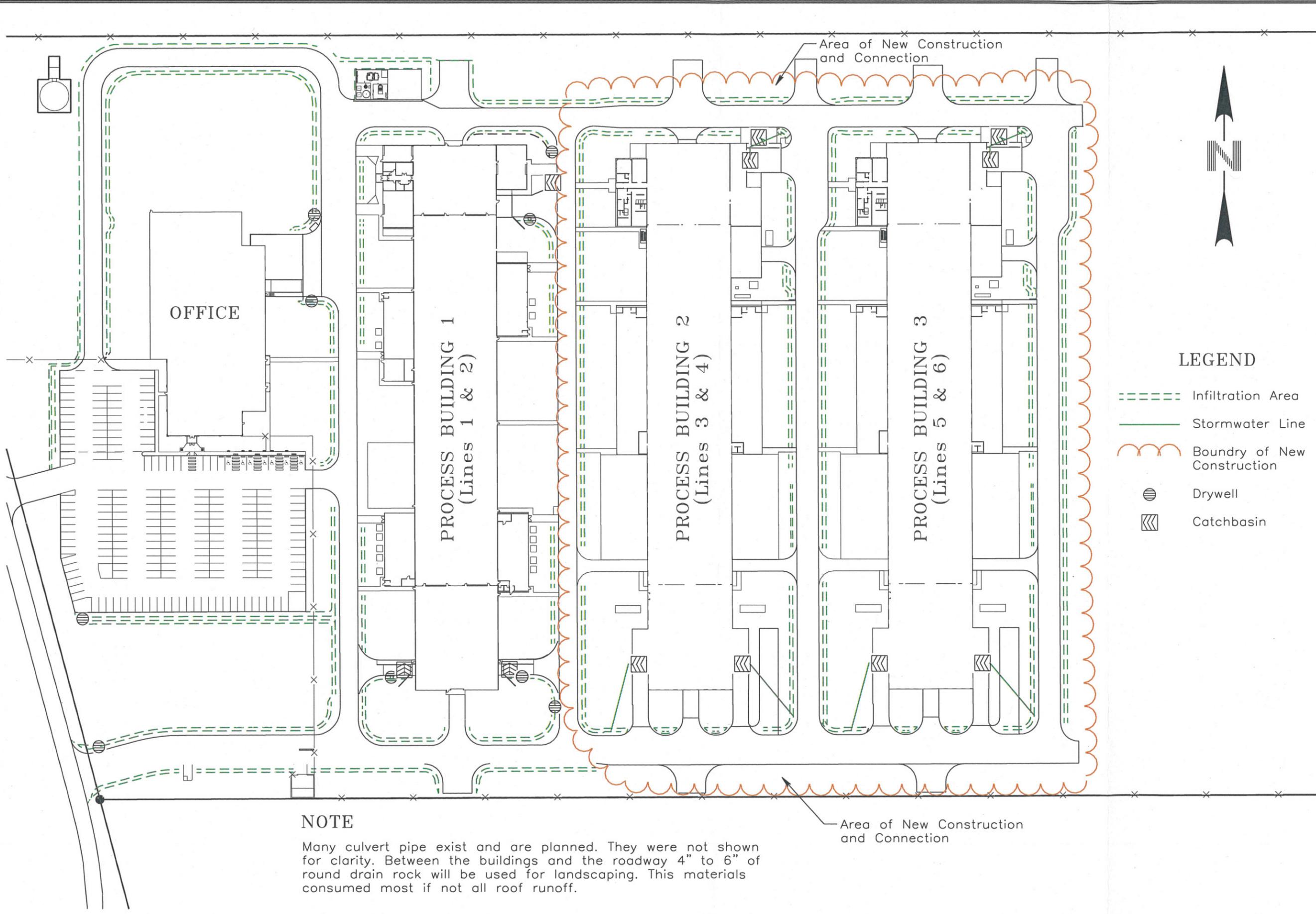
- Industrial Waste Water Line
- Domestic Waste Water Line
- Domestic Force Main
- Boundry of New Construction
- Sewer Manhole

SGC ACF, LLC
MOSES LAKE FACILITY
Wastewater Map

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Area of New Construction and Connection

LEGEND

-  Infiltration Area
-  Stormwater Line
-  Boundry of New Construction
-  Drywell
-  Catchbasin

NOTE

Many culvert pipe exist and are planned. They were not shown for clarity. Between the buildings and the roadway 4" to 6" of round drain rock will be used for landscaping. This materials consumed most if not all roof runoff.

Area of New Construction and Connection

SGC ACF, LLC
MOSES LAKE FACILITY
Stormwater Map


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