

FOR FURTHER INFORMATION  
Please respond to: Denise Stuckless  
(416) 338-5636

October 3, 2012

Mr. Henrik Bechmann  
177 Westmoreland Avenue  
Toronto, Ontario M6H 3A1

Dear Mr. Bechmann:

**Subject: City of Toronto Access Request Number 2012-1487**

Further to our letter dated September 11, 2012, you have decided to narrow your request under the *Municipal Freedom of Information and Protection of Privacy Act*. You are seeking readily accessible records that address the reasons for the use of Tyvek suits in cleaning and disinfecting wading pools.

We asked staff of Parks, Forestry and Recreation to conduct a search for records responsive to your request. This decision reflects the results of that search.

Access is granted in full to the following information provided by Parks, Forestry and Recreation.

**Materials Safety Data Sheet:**

Calcium Hypochlorite is a product used in all our wading pools. The Material Safety Data Sheet (MSDS) are available at our wading pool locations. The MSDS provides information regarding the product, the hazards, its use and the personal protective equipment required for safe use. Please see attached.

**Cost of Tyvek Coveralls:**

The City of Toronto stores referenced the cost of Tyvek suits to range from **\$0.01 to \$6.41** per Tyvek coverall. The Aquatics Supervisor clarified:

Tyvek suits cost \$8.33 each (XXL \$8.82/ea) in 2012. These suits are shared (based on size) and are re-used. If stored carefully and kept clean and dry they

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can last more than one season. Due to use and storage issues we do replace many within the season.

### **Reports of Chemical Related Exposure to Skin:**

In terms of chemical exposures to the skins of wading pool staffs, while cleaning and disinfecting wading pools, no incident for the period of January 1, 2006 to September 14, 2012 was identified.

### **Procedures for Handling Calcium Hypochlorite:**

The aquatics unit uses the "Safe use of Calcium Hypochlorite Procedures – SOP #: PFR-REC-001" (please see attached) for all their wading pool operations. The date of review was May 16, 2012. Tyvek coveralls are referenced under the following sections:

- "Personal Protective Equipment":
  - Tyvek Coverall is required for use.
- "Procedure for Safety Use of Calcium Hypochlorite":
  - Step 5 - all employees must wear required PPE, which includes the Tyvek coveralls.

### **Reasons for Using Tyvek Suits:**

The Aquatics Unit has initiated the use of the Tyvek coverall for the following reasons:

- Standardization for all wading pool operations

*As a part of our standardization of workplace procedures across the districts it was determined that we were providing varying levels of PPE for the same task of adding Calcium Hypochlorite. Aquatic supervisors agreed a consistent standard was necessary. MSDS was used to determine what PPE should be required.*

- Reducing overall potential of skin contact with staff skin.

*While the MSDS sheets reference an apron as part of the PPE. It was decided that the tyvek suits provided better protection for our young staff. With an apron their arms and legs were exposed to the chemical and any splash while mixing. As they are working at a wading pool in the summer, staff are dressed in shorts and T-shirts with bare skin exposed on their arms and legs. This standard of a tyvek suit was applied consistently across aquatics staff that handle Calcium Hypochlorite (Wading pool staff, indoor pool staff and outdoor pool staff).*

Mr. Henrik Bechmann

October 3, 2012

**Right to appeal our decision**

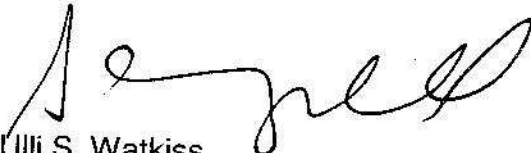
You may ask for a review of this decision within 30 days of receiving this letter by contacting: The Registrar, Information and Privacy Commissioner/Ontario, 2 Bloor Street East, Suite 1400, Toronto, Ontario, M4W 1A8, telephone: (416) 326-3333 or toll free 1-800-387-0073. If you choose to appeal, please provide the Commissioner with the following:

- the request number assigned to your request;
- a copy of this decision letter;
- a copy of your original request;
- the appeal fee for general records of \$25.00, payable by cheque or money order to the Minister of Finance.

For more information, you may wish to visit the IPC's website:  
<http://www.ipc.on.ca/english/Home-Page/>.

Should you have any questions, please contact **Denise Stuckless** at (416) 338-5636.

Yours truly,

  
Ulli S. Watkiss  
City Clerk

## MATERIAL SAFETY DATA SHEET

CALCIUM HYPOCHLORITE, SOLID

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Brenntag Canada Inc.  
43 Jutland Rd.  
Toronto, ON  
M8Z 2G6  
(416) 259-8231

WHMIS#: 00020005  
Index: GCD0313/10A  
Effective Date: 2010 January 04  
Date of Revision: 2010 January 04

Website: <http://www.brenntag.ca>

## EMERGENCY TELEPHONE NUMBERS (FOR EMERGENCIES INVOLVING CHEMICAL SPILLS OR RELEASE)

Toronto, ON (416) 226-6117  
Edmonton, AB (780) 424-1754

Montreal, QC (514) 861-1211  
Calgary, AB (403) 263-8660

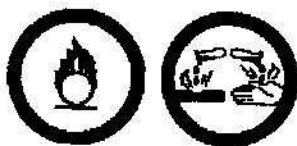
Winnipeg, MB (204) 943-8827  
Vancouver, BC (604) 685-5036

## PRODUCT IDENTIFICATION

Product Name: Calcium Hypochlorite, Solid.  
Chemical Name: Hypochlorous acid, calcium salt.  
Synonyms: HTH Dry Chlorine Granular; Calcium Hypochlorite Granular; Calcium Hypo;  
Calcium Hypo Pitchl Gran 65%; Cal Hypo Comm 65% Tabs; Calcium Hypo PPG 3" Tabs;  
Accu-Tab White, Blue, SI, Blue SI, White SI Tabs.  
Chemical Family: Hypochlorous acid salt.  
Molecular Formula: Ca (ClO) 2.  
Product Use: Swimming pool water disinfectant. Water treatment. Oxidizing agent. Chemical intermediate.

## WHMIS Classification / Symbol:

C: Oxidizer  
E: Corrosive



READ THE ENTIRE MSDS FOR THE COMPLETE HAZARD EVALUATION OF THIS PRODUCT.

## 2. COMPOSITION, INFORMATION ON INGREDIENTS (Not Intended As Specifications)

<i>Ingredient</i>	<i>CAS#</i>	<i>ACGIH TLV</i>	<i>% Concentration</i>
Calcium Hypochlorite	7778-54-3	---	60 - 80
Calcium Hydroxide	1305-62-0	5 mg/m <sup>3</sup>	1 - 5
Calcium Chlorate	10137-74-3	---	1 - 5
Calcium Carbonate	471-34-1	10 mg/m <sup>3</sup> (E)	1 - 5

## 3. HAZARDS IDENTIFICATION

## EMERGENCY OVERVIEW:

Corrosive! Causes severe skin and eye burns. Dust is extremely irritating to respiratory tract. See "Other Health Effects" Section. Can decompose at high temperatures forming toxic gases. Oxidizing material. Contact with other combustible material can cause fire. This material is a strong oxidizer which is stable under normal conditions, but can decompose if contaminated. Contact with other combustible material can cause fire. Do not store indoors on wooden pallets or near combustible materials (eg. wood, paper and organic materials such as solvents and carbon based chemicals).

## POTENTIAL HEALTH EFFECTS

Inhalation:	<p>Corrosive! If mixed with acids or warmed, hypochlorite solutions release Chlorine gas. This gas can cause severe irritation of the nose and throat. Exposure to high levels of Chlorine gas may result in severe lung damage. (3)</p> <p>Calcium Hydroxide: Dusts or mists of concentrated solutions are likely to be very irritating to the nose, throat and upper respiratory tract, based on information for Calcium Oxide. (Calcium Oxide reacts with moisture to form Calcium Hydroxide). (4)</p>
Skin Contact:	<p>This product may cause irritation due to abrasive action. May cause defatting, drying and cracking of the skin. Calcium Hypochlorite may cause symptoms of skin irritation such as reddening, swelling, rash, scaling, or blistering. Brief contact with the dust causes irritation. Greater exposure causes severe burns. In the presence of moisture (perspiration, humidity, tears), the dust dissolves to form a corrosive solution which may cause burns. (3)</p> <p>Calcium Hydroxide: Many cases of chemical burns to the skin have been reported after exposure to wet (Calcium Oxide-containing) cement for as little as half an hour. The Calcium Oxide in the cement reacts with water forming calcium hydroxide. Often, no pain is experienced immediately, so the exposure (skin contact) is allowed to continue. (4)</p>
Skin Absorption:	<p>Not likely to be absorbed through the skin. Skin absorption is a secondary concern to the continual destruction of tissue while the product is in contact with the skin.</p>
Eye Contact:	<p>Extremely corrosive! This product causes corneal scarring and clouding. Glaucoma, cataracts and permanent blindness may occur.</p> <p>Calcium Hydroxide: Many case reports have been written about severe chemical burns of the eye caused by Calcium Oxide or Calcium Hydroxide, commonly known as "lime burns". These burns are reportedly caused most commonly by a splash of a thick, moist, pasty material (plaster, mortar or cement), less commonly by a splash or milky fluid, and rarely by a clear solution of calcium hydroxide. Solid particles react with moisture in the eye to form clumps of moist compound which are difficult to remove, resulting in a similar effect. In severe cases, the injury may be permanent and blindness may result. (4)</p>
Ingestion:	<p>Corrosive! This product causes severe burning and pain in the mouth, throat and abdomen. Vomiting, diarrhea and perforation of the esophagus and stomach lining may occur. May be fatal if swallowed.</p>
Other Health Effects:	<p>Corrosive effects on the skin and eyes may be delayed, and damage may occur without the sensation or onset of pain. Strict adherence to first aid measures following any exposure is essential.</p> <p>In general, long-term exposure to high concentrations of dust may cause increased mucous flow in the nose and respiratory system airways. This condition usually disappears after exposure stops. (4)</p> <p>Controversy exists as to the role exposure to dust has in the development of chronic bronchitis (inflammation of the air passages into the lungs). Other factors such as smoking and general air pollution are more important, but dust exposure may contribute. (4)</p>

## 4. FIRST AID MEASURES

### FIRST AID PROCEDURES

General Guidelines:	<p>Prompt removal of the material and obtaining medical attention are essential for all contact. Remove all contaminated clothing and immediately wash the exposed areas with copious amounts of water. Continue the flushing during transportation to the emergency department. Corrosive effects may be delayed (up to 72 hours), and damage may occur without the sensation or onset of pain. Contact local poison control centre for further guidance.</p>
Inhalation:	<p>Move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is no breathing AND no pulse. Obtain medical attention IMMEDIATELY.</p>
Skin Contact:	<p>Prompt removal of the material from the skin is essential. Remove all contaminated clothing and immediately wash the exposed areas with copious amounts of water for a minimum of 30 minutes or up to 60 minutes for critical body areas. Obtain medical attention IMMEDIATELY.</p>
Eye Contact:	<p>Immediately flush eyes with running water for a minimum of 30 minutes, preferably up to 60 minutes. Hold eyelids open during flushing. If irritation persists, repeat flushing. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.</p>
Ingestion:	<p>Do not attempt to give anything by mouth to an unconscious person. If victim is alert and not convulsing, rinse mouth out and give 1/2 to 1 glass of water to dilute material. IMMEDIATELY contact local Poison Control Centre. Vomiting should only be induced under the direction of a physician or a poison control centre. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. IMMEDIATELY transport victim to an emergency facility.</p> <p>Calcium Hydroxide: Dilute by giving two glasses of water or milk, followed by fruit juice or diluted vinegar. (3)</p>

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**Note to Physicians:**

Immediate consultation with the local Poison Control Centre should be initiated. Severe and sometimes delayed (up to 72 hours) local and systemic reactions can occur.

Due to the severely irritating or corrosive nature of the material, swallowing may lead to ulceration and inflammation of the upper alimentary tract with hemorrhage and fluid loss. Also, perforation of the esophagus or stomach may occur, leading to mediastinitis or peritonitis and the resultant complications. (3) Mucosal injury following ingestion of this corrosive material may contraindicate the induction of vomiting in the treatment of possible intoxication. Similarly, if gastric lavage is performed, intubation should be done with great care. If oral burns are present or a corrosive ingestion is suspected by the patient's history, perform esophagoscopy as soon as possible. Scope should not be passed beyond the first burn because of the risk of perforation.

Medical conditions that may be aggravated by exposure to this product include neurological, cardiovascular and skin disorders.

## 5. FIRE-FIGHTING MEASURES

Flashpoint (°C)	Autolgnition Temperature (°C)	Flammability Limits in Air (%):	
		LEL	UEL
Non-combustible (does not burn).	Not applicable.	Not applicable.	Not applicable.
Flammability Class (WHMIS):	Not regulated.		
Hazardous Combustion Products:	Thermal decomposition products are toxic and may include corrosive chlorine gas, oxides of calcium, sodium and chlorine.		
Unusual Fire or Explosion Hazards:	Strong oxidizers can cause ignition of combustible or oxidizable materials. May decompose violently on contact with metals, or their salts, dusts or other contaminants. Damp material may decompose exothermically and may cause combustion of organic material. Oxygen release due to exothermic decomposition may support combustion.  Under certain conditions Hypochlorites decompose to form chlorine gas. Periodic monitoring for chlorine may be necessary. (4) Contamination of Hypochlorites could ignite foreign material and create sufficient heat to cause product decomposition. (3) Hypochlorites may increase the burning rate of combustible materials with which it comes into contact. (4) Hypochlorites may react with primary amines to form nitrogen trichloride which explodes spontaneously in air. Minimize air borne spreading of dust. Spilled material may cause floors and contact surfaces to become slippery. Product becomes slippery when mixed with water. Enforce NO SMOKING rules in area of use.		
Sensitivity to Mechanical Impact:	Not expected to be sensitive to mechanical impact.		
Rate of Burning:	Not available.		
Explosive Power:	Not available.		
Sensitivity to Static Discharge:	Not expected to be sensitive to static discharge.		
<b>EXTINGUISHING MEDIA</b>			
Fire Extinguishing Media:	Water in large quantity is an effective extinguishing agent for decomposition reactions and fires. Do not use dry extinguishers containing ammonium compounds. Do not use carbon dioxide or dry chemical. Use media appropriate for surrounding fire and/or materials.		
<b>FIRE FIGHTING INSTRUCTIONS</b>			
Instructions to the Fire Fighters:	Spilled material may cause floors and contact surfaces to become slippery. Product becomes slippery when mixed with water.		
Fire Fighting Protective Equipment:	Use self-contained breathing apparatus and protective clothing.		

## 6. ACCIDENTAL RELEASE MEASURES

Information in this section is for responding to spills, leaks or releases in order to prevent or minimize the adverse effects on persons, property and the environment. There may be specific reporting requirements associated with spills, leaks or releases, which change from region to region.



**Containment and Clean-Up Procedures:**

See Section 13, "Deactivating Chemicals". In all cases of leak or spill contact vendor at Emergency Number shown on the front page of this MSDS. Keep away from combustibles and incompatible materials. Minimize air borne spreading of dust. Wear respirator, protective clothing and gloves. Avoid dry sweeping. Do not use compressed air to clean surfaces. Vacuuming is preferred. Return all material possible to container for proper disposal.

Any recovered product can be used for the usual purpose, depending on the extent and kind of contamination. Where a package (drum or bag) is damaged and / or leaking, repair it, or place it into an over-pack drum immediately so as to avoid or minimize material loss and contamination of surrounding environment. Replace damaged containers immediately to avoid loss of material and contamination of surrounding atmosphere.

Collect product for recovery or disposal. For release to land, or storm water runoff, contain discharge by constructing dykes or applying inert absorbent; for release to water, utilize damming and/or water diversion to minimize the spread of contamination. Ventilate enclosed spaces. Notify applicable government authority if release is reportable or could adversely affect the environment.

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## 7. HANDLING AND STORAGE

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### HANDLING

- Handling Practices:** Use normal "good" industrial hygiene and housekeeping practices. Clean up immediately to eliminate slipping hazard. Avoid moisture contamination. Keep away from combustibles and incompatible materials. Product becomes slippery when mixed with water.
- Ventilation Requirements:** See Section 8, "Engineering Controls".
- Other Precautions:** Use only with adequate ventilation and avoid breathing dusts. Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling. Wash contaminated clothing thoroughly before re-use. Immerse contaminated clothing in water immediately and KEEP WET until discarded or laundered.

### STORAGE

- Storage Temperature (°C):** Do not expose sealed containers to temperatures above 52 °C. (3)
- Ventilation Requirements:** Ventilation should be corrosion proof.
- Storage Requirements:** Store in a cool, dry and well-ventilated area. Keep away from heat, sparks and flames. Keep containers closed. Avoid moisture contamination. Prolonged storage may result in lumping or caking. Do not store on wooden floors or wooden pallets. Avoid moisture contamination. Damp material may decompose exothermically and may cause combustion of organic material. Oxygen release due to exothermic decomposition may support combustion. Protect from direct sunlight. Protect against physical damage.
- Special Materials to be Used for Packaging or Containers:** Confirm suitability of any material before using. Attacks some types of rubber, plastics and coatings.

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## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

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Recommendations listed in this section indicate the type of equipment, which will provide protection against overexposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

### ENGINEERING CONTROLS

- Engineering Controls:** Local exhaust ventilation required. Ventilation should be corrosion proof. Make up air should be supplied to balance air that is removed by local or general exhaust ventilation. Ventilate low lying areas such as sumps or pits where dense dust may collect.

### PERSONAL PROTECTIVE EQUIPMENT (PPE)

- Eye Protection:** Safety glasses with side shields are recommended to prevent eye contact. Use full face-shield or chemical safety goggles when there is potential for contact. Contact lenses should not be worn when working with this material.
- Skin Protection:** Gloves and protective clothing made from butyl rubber, nitrile rubber or neoprene should be impervious under conditions of use. Prior to use, user should confirm impermeability. Discard contaminated gloves. Attacks some types of rubber, plastics and coatings.

**Respiratory Protection:** No specific guidelines available. DO NOT USE chemical cartridge respirators with oxidizable sorbents (charcoal). A NIOSH/MSHA-approved air-purifying respirator equipped with dust, mist, fume filter and chlorine cartridges for concentrations up to 5 ppm for Chlorine vapours or 50 mg/m<sup>3</sup> ( Calcium Hydroxide ). A NIOSH/MSHA-approved self-contained breathing apparatus if concentrations are higher or unknown.

If while wearing a respiratory protection, you can smell, taste or otherwise detect anything unusual, or in the case of a full facepiece respirator you experience eye irritation, leave the area immediately. Check to make sure the respirator to face seal is still good. If it is, replace the filter, cartridge or canister. If the seal is no longer good, you may need a new respirator. (4)

**Other Personal Protective Equipment:** Wear an impermeable apron and boots. Locate safety shower and eyewash station close to chemical handling area. Take all precautions to avoid personal contact.

#### EXPOSURE GUIDELINES

SUBSTANCE	ACGIH TLV (STEL)	OSHA PEL		NIOSH REL (TWA)	(STEL)
		(TWA)	(STEL)		
Calcium Hydroxide	—	5 mg/m <sup>3</sup> (Respirable dust)	—	5 mg/m <sup>3</sup>	—
Calcium Carbonate	—	15 mg/m <sup>3</sup>	—	10 mg/m <sup>3</sup>	—
Particulate Not Otherwise Classified:					
ACGIH		OSHA			
10 mg/m <sup>3</sup> - Inhalable particulate		50 mppcf* or 15 mg/m <sup>3</sup> - Total Dust			
3 mg/m <sup>3</sup> - Respirable particulate		15 mppcf* or 5 mg/m <sup>3</sup> - Respirable Fraction			

\* mppcf = million particles per cubic foot

## 9. PHYSICAL AND CHEMICAL PROPERTIES (Not intended as Specifications)

Physical State:	Solid.
Appearance:	Dry, white granules: fine sized, beads, pucks, or powder.
Odour:	Slight chlorine odour.
Odour Threshold (ppm):	Not applicable.
Boiling Range (°C):	Not available.
Melting/Freezing Point (°C):	Not available.
Vapour Pressure (mm Hg at 20° C):	Not applicable.
Vapour Density (Air = 1.0):	Not applicable.
Relative Density (g/cc):	2.35, (3)
Bulk Density:	800 kg/m <sup>3</sup> , (3)
Viscosity:	Not applicable.
Evaporation Rate (Butyl Acetate = 1.0):	Not applicable.
Solubility:	Soluble in water.
% Volatile by Volume:	Not applicable.
pH:	10.8 (10% solution), (3)
Coefficient of Water/Oil Distribution:	Not available.
Volatile Organic Compounds (VOC):	Not applicable.
Flashpoint (°C):	Non-combustible (does not burn).

## 10. STABILITY AND REACTIVITY

### CHEMICAL STABILITY

Under Normal Conditions:	Stable.
Under Fire Conditions:	Not flammable. Damp material may decompose exothermically and may cause combustion of organic material. Oxygen release due to exothermic decomposition may support combustion. Decomposition will occur above 170 °C.
Hazardous Polymerization:	Will not occur.



Conditions to Avoid:	High temperatures, sparks, open flames and all other sources of ignition. Moisture and heat sensitive. Damp material may decompose exothermically and may cause combustion of organic material. Oxygen release due to exothermic decomposition may support combustion. Minimize air borne spreading of dust. Clean up immediately to eliminate slipping hazard.
Materials to Avoid:	This product is a strong oxidizer. Strong oxidizers can cause ignition of combustible or oxidizable materials. May decompose violently on contact with metals, or their salts, dusts or other contaminants.  Reducing agents. Lewis or mineral acids. Organic materials. Combustibles. Nitrogen containing compounds. Nitrates. Reducing agents. Hydroxyl bearing compounds. Metal Oxides. Metals. Sulphur containing materials. Isocyanurates. Hypochlorites may react with primary amines to form nitrogen trichloride which explodes spontaneously in air. Fluorines will react with calcium hydroxide to evolve much heat and some light. Aldehydes. Turpentine.
Decomposition or Combustion Products:	Thermal decomposition products are toxic and may include corrosive chlorine gas, oxides of calcium, sodium and chlorine.

## 11. TOXICOLOGICAL INFORMATION

### TOXICOLOGICAL DATA:

SUBSTANCE	LD50 (Oral, Rat)	LD50 (Dermal, Rabbit)	LC50 (Inhalation, Rat, 4h)
Calcium Hypochlorite	850 mg/kg (1,3)	> 1 000 mg/kg (3)	875 mg/m3 (3)
Calcium Hydroxide	7 340 mg/kg (1)	---	---
Calcium Carbonate	6 450 mg/kg (1)	---	---

**Carcinogenicity Data:** IARC reviewed studies conducted with several hypochlorite salts. IARC has classified hypochlorite salts as having inadequate evidence for carcinogenicity to humans and animals. IARC therefore considered hypochlorite salts to be not classifiable as to their carcinogenicity to humans. (3)

**Reproductive Data:** No adverse reproductive effects are anticipated.

**Mutagenicity Data:** No adverse mutagenic effects are anticipated. See "Other Studies Relevant to Material".

**Teratogenicity Data:** No adverse teratogenic effects are anticipated. See "Other Studies Relevant to Material".

**Respiratory / Skin Sensitization Data:** None known.

**Synergistic Materials:** None known.

**Other Studies Relevant to Material:** Calcium Hypochlorite is corrosive to the eyes. Application of finely ground Calcium Hypochlorite produced corrosive injury in rabbits. Superficial injury was observed in rabbits when a 5 % Calcium Hypochlorite solution in water (pH 11.5) was applied for 30 seconds and then rinsed off with water. (4)

Calcium Hypochlorite is corrosive to the skin. Application of 0.5 g finely ground Calcium Hypochlorite moistened with water for 24 hours produced corrosive injury in rabbits. Healing did not occur within 21 days. (4)

Calcium Hypochlorite has been tested for teratogenicity in laboratory animals. Results of this study have shown that Calcium Hypochlorite is not a teratogen. (3)

Calcium Hypochlorite has been tested in the dominant lethal assay in male mice, and it did not induce a dominant lethal response. (3)

Calcium Hypochlorite has been reported to produce mutagenic activity in two in vitro assays. It has, however, been shown to lack the capability to produce mutations in animals based on results from the micronucleus assay. In vitro assays frequently are inappropriate to judge the mutagenic potential of bactericidal chemicals due to a high degree of cellular toxicity. The concentration which produces mutations in these in vitro assays is significantly greater than the concentrations used for disinfection. Based on high cellular toxicity in in vitro assays and the lack of mutagenicity in animals, the risk of genetic damage to humans is judged not significant. (3)

One hundred mice were exposed dermally 3 times a week for 18 months to a solution of Calcium Hypochlorite. Histopathological examination failed to show an increased incidence of tumours. (3)

Calcium Hydroxide: Application of 10 mg (0.01 g) of solid Calcium Hydroxide caused severe eye irritation or corrosion in a modified Draize test. Healing did not occur within 21 days. Injury to the cornea resulted from exposure to a paste of Calcium Hydroxide for 1 minute, followed by cleaning and rinsing with a physiological salt solution. This injury reached a maximum at 24 hours after exposure and the eye had not returned to normal after 3 months. (4)

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## 12. ECOLOGICAL INFORMATION

Ecotoxicity: Not available. May be harmful to aquatic life.

Calcium Hypochlorite:

96-hour LC50 (Bluegill Sunfish) = 0.088 mg/L (3)

96-hour LC50 (Rainbow Trout) = 0.16 mg/L (3)

48-hour LC50 (Daphnia Magna) = 0.11 mg/L (3)

LC50 (Bobwhite Quail) = Above 5,000 ppm (3)

LC50 (Mallard Ducklings) = Above 5,000 ppm (3)

LD50 (Oral, Bobwhite Quail) = 3,474 mg/Kg (3)

Environmental Fate: Not available. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers.

## 13. DISPOSAL CONSIDERATIONS

Deactivating Chemicals: Carefully neutralize by adding hydrogen peroxide: one US pint of 35 % hydrogen peroxide solution per pound of hypochlorite to be neutralized. Dilute the neutralized residue with water. (3) Neutralization is expected to be exothermic. Effervescence may result. Oxygen released on exothermic decomposition may support combustion.

Waste Disposal Methods: This information applies to the material as manufactured. Reevaluation of the product may be required by the user at the time of disposal since the product uses, transformations, mixtures and processes may influence waste classification. Dispose of waste material at an approved (hazardous) waste treatment/disposal facility in accordance with applicable local, provincial and federal regulations. Do not dispose of waste with normal garbage, or to sewer systems.

Safe Handling of Residues: See "Waste Disposal Methods".

Disposal of Packaging: Empty containers retain product residue and can be dangerous. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. Treat package in the same manner as the product. Dispose of waste material at an approved (hazardous) waste treatment/disposal facility in accordance with applicable local, provincial and federal regulations.

## 14. TRANSPORTATION INFORMATION

### CANADIAN TDG ACT SHIPPING DESCRIPTION:

CALCIUM HYPOCHLORITE, HYDRATED, Class 5.1, UN2880, PG II.

Label(s): Oxidizing Substances. Placard: Oxidizing Substances.

ERAP Index: -----, Exemptions: None known.

### US DOT CLASSIFICATION (49CFR 172.101, 172.102):

CALCIUM HYPOCHLORITE, HYDRATED, Class 5.1, UN2880, PG II.

Label(s): Oxidizer. Placard: Oxidizer.

CERCLA-RQ: 100 lbs / 45.5 kg Exemptions: None known.

## 15. REGULATORY INFORMATION

### CANADA

CEPA - NSNR: All constituents of this product are included on the DSL.

CEPA - NPRI: Not included.

Controlled Products Regulations Classification (WHMIS):

C: Oxidizer

E: Corrosive

### USA

Environmental Protection Act: All constituents of this product are included on the TSCA inventory.

OSHA HCS (29CFR 1910.1200): Oxidizer. Corrosive.

NFPA: 3 Health, 0 Fire, 1 Reactivity (3)

HMIS: 3 Health, 0 Fire, 1 Reactivity (3)

#### INTERNATIONAL

All components of this product are found on the following inventories: EINECS (European Inventory of Existing Commercial Chemical Substances), Australia (ACQIN), Korea (ECL), China Inventory (IECS), Japan (MITI) and Philippines Inventory of Chemicals and Chemical Substances (PICCS).

## 16. OTHER INFORMATION

#### REFERENCES

1. RTECS-Registry of Toxic Effects of Chemical Substances, Canadian Centre for Occupational Health and Safety RTECS database.
2. Clayton, G.D. and Clayton, F.E., Eds., Patty's Industrial Hygiene and Toxicology, 3rd ed., Vol. IIA,B,C, John Wiley and Sons, New York, 1981.
3. Supplier's Material Safety Data Sheet(s).
4. CHEMINFO, through "CCINFOdisc", Canadian Centre for Occupational Health and Safety, Hamilton, Ontario, Canada.
5. Guide to Occupational Exposure Values, 2008, American Conference of Governmental Industrial Hygienists, Cincinnati, 2008.
6. Regulatory Affairs Group, Brenntag Canada Inc.
7. The British Columbia Drug and Poison Information Centre, Poison Managements Manual, Canadian Pharmaceutical Association, Ottawa, 1981.

The information contained herein is offered only as a guide to the handling of this specific material and has been prepared in good faith by technically knowledgeable personnel. It is not intended to be all-inclusive and the manner and conditions of use and handling may involve other and additional considerations. No warranty of any kind is given or implied and Brenntag Canada Inc. will not be liable for any damages, losses, injuries or consequential damages which may result from the use of or reliance on any information contained herein. This Material Safety Data Sheet is valid for three years.

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British Columbia: 20333-102B Avenue, Langley, BC, V1M 3H1  
Phone: (604) 513-9009 Facsimile: (604) 513-9010

Alberta: 6628 - 45 th. Street, Leduc, AB, T9E 7C9  
Phone: (780) 986-4544 Facsimile: (780) 986-1070

Manitoba: 681 Plinquet Street, Winnipeg, MB, R2J 2X2  
Phone: (204) 233-3416 Facsimile: (204) 233-7005

Ontario: 43 Jutland Road, Toronto, ON, M8Z 2G6  
Phone: (416) 259-8231 Facsimile: (416) 259-5333

Quebec: 2900 Jean Baptiste Des., Lachine, PQ, H8T 1C8  
Phone: (514) 636-9230 Facsimile: (514) 636-0877

Atlantic: A-105 Akerley Boulevard, Dartmouth, NS, B3B 1R7  
Phone: (902) 468-9690 Facsimile: (902) 468-3085

Prepared By: Regulatory Affairs Group, Brenntag Canada Inc., (416) 259-8231.

**Safe use of Calcium Hypochlorite Procedures**

**SOP #: PFR- Rec-001**

The purpose of this operating procedure is to ensure the safe handling and use of Calcium Hypochlorite for the wading pool operations.

The following procedures *must* be followed by *all* staff operating a wading pool.

**Definitions:**

**Calcium Hypochlorite:** Chemical used to sanitize pool water. It is supplied in granular form in 2 kg containers. Calcium hypochlorite is premixed with water then added to the pool basin prior to allowing bathers in the pool and periodically throughout the day to maintain sanitation. Calcium Hypochlorite raises pH. The handling of calcium hypochlorite requires the use of personal protective equipment.

**Pour and scoop method:** while walking pour some of the chlorine mixture into the pool water, then dip the bucket into the pool scooping up some fresh water. Continue pouring and scooping until all chlorine mixture has been added to the pool basin. Caution: ensure proper lifting and bending technique.

**Hazards and Controls:**

**Hazards:** Respiratory, eye and skin irritation. Calcium hypochlorite is incompatible with acids, oxidizers and combustible/flammables. Use only 2 kilogram containers of calcium hypochlorite. Larger containers may require the use of a fit-tested respirator.

**Use of personal protective equipment is mandatory.**

**Personal Protective Equipment**

Gauntlet gloves (rubber/nitrile), Steel toed rubber safety boots, tyvek coveralls, Face shield or Goggles.

**Required Tools/ Supplies/Materials**

Calcium Hypochlorite

Long stir stick (i.e. broom handle) used exclusively for mixing Calcium Hypochlorite

Large Bucket used exclusively for mixing Calcium Hypochlorite

**Procedure for Safe use of Calcium Hypochlorite**

Steps:

1. Obtain access to storage shed or storage trunk.

2. Gather all materials needed to perform procedure. (T – Bars/Water keys to operate fill and drain valves.  
Wading Pool Pit Access Lifter (Wading Pool PAL)

Personal Socks, Steel toed rubber safety boots, Tyvek Coveralls, Face shield or Safety Goggles, Long stir stick,  
Calcium Hypochlorite 2kg container, large bucket used for mixing.

3. Fill wading pool half full with water. (pool may already be full if only adding supplementary amounts of chlorine through the day). Refer to Pit cover SOP # **PFR-Rec-002** before opening/closing pit covers.

4. Fill mixing bucket 2/3 full with fresh potable water.

5. Don required P.P.E. (Tyvek coveralls, Steel toed rubber safety boots, Face shield or Goggles, Gauntlet gloves.  
**ALL employees must wear required PPE**

6. At ground level, upwind (back to the wind) proceed to open 2 kg Calcium Hypochlorite container, pour calcium hypochlorite into cap of container and dispense into mixing bucket. Repeat, adding a second capful to the mixing bucket. Replace the lid on to the Calcium Hypochlorite container.

7. Using long stir stick, mix thoroughly until fully dissolved. (This may take a few minutes)

8. Enter Wading pool basin with chlorine mixture, and dispense evenly throughout water using a pour and scoop method (see definition). Empty the remaining contents of the bucket into the pool basin. Steps 6 – 8 may need to be repeated (adding additional doses of Calcium Hypochlorite) to ensure minimum Free Available Chlorine (FAC) levels are reached.

9. Continue filling wading pool, and ensure ALL Calcium Hypochlorite granular has been dissolved.

10. Thoroughly rinse and clean mixing bucket.

11. Once desired water level is met, turn off water.

12. Sample water for Chlorine level. (Must be at least 5ppm FAC). If FAC level is correct. Return all PPE and other equipment to storage area or designated area until needed. Open wading pool for operation.

13. If additional Calcium Hypochlorite is needed, repeat steps 5-11.

These steps must be taken by all staff when operating a wading pool. This includes wading pool attendants, wading pool coordinators, community recreation programmers and aquatic supervisors. All tools and personal protective equipment will be supplied to each location to ensure the proper steps can be taken. Failure to follow these steps may lead to disciplinary action.

Also refer to:

The Wading Pool Manual      Section 4.8 – WHMIS & Safety Equipment  
   Section 4.9 – Confined Spaces  
   Section 4.10 – Use of Protective Equipment

City of Toronto Human Resources Policy – Confined Space

The Occupational Health & Safety Act, R.S.O. 1990, Confined Space Regulation 632/05

MSDS sheet for Calcium Hypochlorite

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To be reviewed annually by the Aquatic Supervisor team and Corporate Occupational Health & Safety.