

52374-12

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

19

04-05-2004

April 5, 2004

Greg Cunningham  
Regulatory Compliance Coordinator  
Brenntag Southwest, Inc.  
610 Fisher Road  
Longview, TX 75604

Subject: Chlorine  
EPA Registration No. 52374-12  
Application Date: January 8, 2004  
Receipt Date: January 9, 2004

Dear Mr. Cunningham:

The following amendments, submitted in connection with registration under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended, are acceptable:

- revisions in response to Agency letter dated 9/10/2003

**General Comments**

A stamped copy of the accepted labeling is enclosed. Submit 1 copy of your final printed label before distributing or selling the product bearing the revised labeling.

Should you have any questions or comments concerning this letter, please contact Wanda Mitchell at 703-308-6345.

Sincerely,

Emily H. Mitchell  
Acting Product Manager 32  
Regulatory Management Branch II  
Antimicrobials Division (7510C)

CONCURRENCES							
SYMBOL	7510C	7510C					
SURNAME	E. Berg	E. Mitchell					
DATE	4/5/04	4/6/04					

# DANGER POISON

FATAL IF INHALED.  
LIQUID CAUSES SEVERE BURNS

EPA Reg. No. 52374-12 Net Weight: 100 lbs. □  
□ EPA Est. No. 052374-OK-001 150 lbs. □  
□ EPA Est. No. 052374-OK-002 2000 lbs. □

**BRENTAG SOUTHWEST, INC.**  
610 Fisher Road, Longview, TX 75604

## PRECAUTIONARY STATEMENTS

### FIRST AID

Have the product container or label with you when calling a poison control center or doctor, or going for treatment.

**IF INHALED:** Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferable mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

**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.

**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.

**IF SWALLOWED:** Call a poison control center or doctor immediately for treatment advice. Have person sip from a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything by mouth to an unconscious person.

**PHYSICIAN'S NOTE:** Probable mucosal damage contraindicates the use of gastric lavage.

## HAZARD TO HUMANS & ANIMALS

**DANGER.** Highly Corrosive. Causes irreversible eye damage and skin burns. Fatal if swallowed, inhaled, or absorbed through skin. Do not breathe vapor or get in eyes, on skin, or on clothing. Wear goggles, protective clothing, and rubber gloves. Wash thoroughly with soap and water after handling and before eating, drinking, and using tobacco. Remove contaminated clothing and wash before reuse. Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals.

## PERSONAL PROTECTIVE EQUIPMENT

Applicators and other handlers must wear long-sleeved shirts, long pants, shoes, and socks.

## IN CASE OF LEAKAGE

Under normal use-conditions, no protective eyewear, respirator, or gloves are required. However, in case of a leak, handlers must wear chemical-resistant gloves (such as any waterproof material) and a full-face canister-style (gas mask) respirator with a canister approved for chlorine (MSHA/NIOSH approval number prefix TC-14G). Since there is always the possibility of a leak, gloves and a respirator of a type specified above must be available. Gloves and a respirator are required for anyone entering into an affected area in the event of a leak.

## ENVIRONMENTAL HAZARDS

This pesticide is toxic or highly toxic to fish and aquatic invertebrates. Do not discharge effluent containing this product into lakes, 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.

## PHYSICAL & CHEMICAL HAZARDS

Chlorine is a non-flammable gas, liquefied, under pressure. Do not drop container. Do not heat container. Keep away from intense heat or open sunlight. Corrosive to most metals in the presence of moisture.

**FOR CHEMICAL EMERGENCY  
SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT  
CALL CHEMTREC DAY OR NIGHT  
800424-9300**

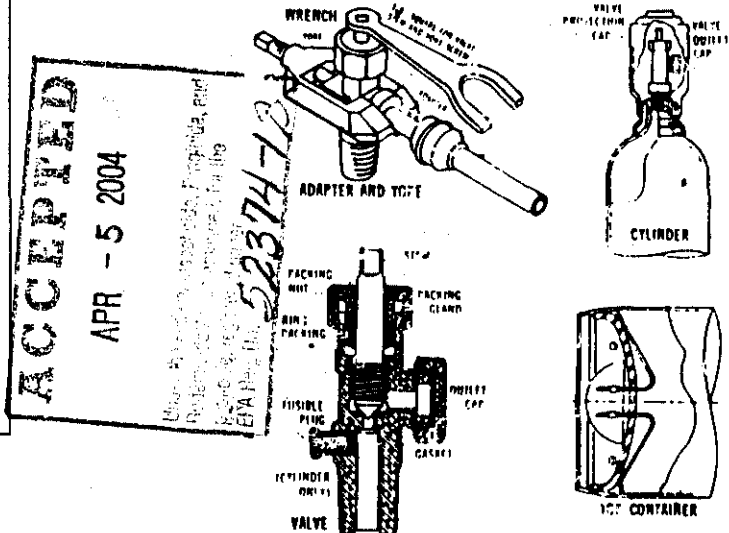
Additional Directions: For Use are located in Supplemental Label.

**DIRECTIONS FOR USE: CHLORINE IN CONTAINERS**  
(See Diagrams Below)

**CONNECTING:** Use 500 psig copper tubing fitted with special adapter to connect container to piping system. To connect line to container, remove valve protection cap and valve outlet cap. Then use wrench shown to attach tubing to valve with yoke. Use new gasket supplied with container each time connection is made. Make sure connections are tight. Check for leaks with ammonia vapor. Never use standard pipefitting.

**VALVE OPERATION:** Turn stem one full turn counter-clockwise to open valve. Don't use container valve to regulate the chlorine flow. Use of valve for flow-control may wear valve stem. **NEVER USE A HAMMER OR OTHER IMPLEMENTS FOR THIS PURPOSE.** Packing nut may be loosened slightly to relieve tight stem, but retighten promptly to avoid leak.

**DISCONNECTING:** Close valve, test valve for leaks, apply valve outlet cap with gasket and protection hood. Plug or cap the open end of the chlorine line immediately to keep out moisture.



## STORAGE & DISPOSAL

**STORAGE:** Store cylinders and ton containers in a dry area away from sources of heat and protected from direct sunlight and precipitation. Do not store in excessive heat. Segregate chlorine containers from other compressed gases, and never store near hydrocarbons, finely divided metals such as filings or granules, turpentine, ether, anhydrous ammonia, or other flammable materials. All storage containers and cylinders must have a weather resistant label and must not be accessible to the general public. Do not drop container. If container is damaged or leaking, refer to procedures in Chlorine Institute publications and/or notify supplier immediately. Do not contaminate water, food, or feed by storage or disposal. Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law.

**LEAK PROCEDURES:** Make daily inspections for leaks. Stop a leak at once, since it will become worse with time.

In case of a leak, evacuate everyone from the immediate area. For entry into the affected area to correct problem, wear personal protective equipment (including prescribed respirators) specified in the Hazards to Humans section of this labeling. When possible, move leaking or damaged cylinders outdoors or to an isolated location. Observe strict safety precautions. Work upwind, if possible. Allow any liquid chlorine to evaporate. Only correctly trained and PPE-equipped handlers are permitted to perform such cleanup. Do not permit entry into the leak area by any other person until the chlorine has completely dispersed.

**DISPOSAL OF CONTAINERS:** Container is returnable and must be properly identified with return tag and returned as promptly as possible to supplier according to prescribed instructions and practices in Chlorine Institute publications. All valves must be closed tight and closures or caps secured. It is illegal to ship a leaking chlorine container.



Certified to  
NSF / ANSI 60

**BRENNTAG SOUTHWEST, INC.**

**BRENNTAG**  
Stinnes Logistics



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**CHLORINE**  
EPA Registration Number 52374-12

**Directions For Use**

Brenntag Southwest, Inc.

610 Fisher Road

Longview, Texas 75604

ABBEVILLE, LA • ABILENE, TX • ADA, OK • BORGER, TX • CATOOSA, OK  
DALLAS, TX • ELMENDORF, TX • FT. WORTH, TX • HOUSTON, TX • IOLA, KS  
LONGVIEW, TX • MOBILE, AL • NOWATA, OK • ODESSA, TX • OKLAHOMA CITY, OK  
SAND SPRINGS, OK • ST. GABRIEL, LA • SHREVEPORT, LA • WICHITA, KS



# CHLORINE – Additional Directions for Use

EPA Registration Number 52374-12

Brenntag Southwest, Inc.

NOTE: See container label for Precautionary Statements, First Aid instructions and complete directions. The container label, appropriate Chlorine institute publications, and these "Additional Directions for Use" must be in the users possession and are required to safely and effectively apply this product.

Users of this product should have the following Chlorine Institute publications as indicated.

CI Pamphlet #1, "Chlorine Manual" – All users

CI Pamphlet #97, "Safety Guidelines for Swimming Pool Applicators" – Swimming pool applications

CI Pamphlet #155, "Water and Wastewater Operators Chlorine Handbook" – Drinking water and wastewater treatment applications.

CI Pamphlet #65, "Personal Protective Equipment" – All users

CI Pamphlet #64, "Emergency Response" – All users

THE FOLLOWING CHLORINE DOSAGE CHART IS PROVIDED TO AID IN PREPARING DIFFERENT TREATMENT SOLUTIONS.

GALS WATER	Ounces of CHLORINE REQUIRED TO YIELD AVAILABLE CHLORINE							
	1 ppm	3 ppm	5 ppm	10 ppm	25 ppm	50 ppm	200 ppm	600 ppm
50	0.01 oz	0.02 oz	0.03 oz	0.07 oz	0.17 oz	0.33 oz	1.33 oz	3.34 oz
100	0.01 oz	0.04 oz	0.07 oz	0.13 oz	0.33 oz	0.67 oz	2.67 oz	8.01 oz
200	0.03 oz	0.08 oz	0.13 oz	0.27 oz	0.67 oz	1.33 oz	5.34 oz	13.34 oz
500	0.07 oz	0.20 oz	0.33 oz	0.67 oz	1.67 oz	3.34 oz	13.34 oz	33.36 oz
1,000	0.13 oz	0.40 oz	0.67 oz	1.33 oz	3.34 oz	6.67 oz	26.69 oz	66.72 oz
10,000	1.33 oz	4.00 oz	6.67 oz	13.34 oz	33.36 oz	66.72 oz	266.88 oz	667.20 oz

THE FOLLOWING CHLORINE DOSAGE IN CONTINUOUS FLOW SYTEMS CHART IS PROVIDED TO AID IN DETERMINING THE WEIGHT OF CHLORINE GAS REQUIRED PER DAY.

WATER FLOW		DESIRED LEVEL OF AVAILABLE CHLORINE							
G/MIN	G/DAY	0.5 ppm	1.0 ppm	2.0 ppm	3.0 ppm	4.0 ppm	5.0 ppm	6.0 ppm	7.0 ppm
10	14,400	1 oz	2 oz	4 oz	6 oz	8 oz	10 oz	12 oz	16 oz
15	21,600	1.5 oz	3 oz	6 oz	9 oz	12 oz	15 oz	18 oz	21 oz
20	28,800	2 oz	4 oz	8 oz	12 oz	16 oz	20 oz	24 oz	32 oz
30	43,200	3 oz	6 oz	12 oz	18 oz	24 oz	30 oz	36 oz	48 oz
40	57,600	4 oz	8 oz	16 oz	24 oz	32 oz	40 oz	48 oz	64 oz
50	72,000	5 oz	10 oz	20 oz	30 oz	40 oz	50 oz	60 oz	80 oz
60	86,400	6 oz	12 oz	24 oz	36 oz	48 oz	60 oz	72 oz	96 oz
70	100,800	7 oz	14 oz	28 oz	42 oz	56 oz	70 oz	84 oz	112 oz
80	115,200	8 oz	16 oz	32 oz	48 oz	64 oz	80 oz	96 oz	128 oz
90	129,600	9 oz	18 oz	36 oz	54 oz	72 oz	90 oz	108 oz	144 oz
100	144,400	10 oz	20 oz	40 oz	60 oz	80 oz	100 oz	120 oz	160 oz
150	216,000	15 oz	30 oz	60 oz	90 oz	120 oz	150 oz	180 oz	240 oz
200	288,000	20oz	30 oz	80 oz	120 oz	160 oz	200 oz	240 oz	320 oz
300	432,000	30 oz	60 oz	120 oz	180 oz	240 oz	300 oz	360 oz	480 oz

1 lb. = 16 oz

To obtain a desired chlorine level for a known water flow rate, find the desired chlorine level in ppm at the top of the chart. Follow the column down until you are opposite the flow rate for your equipment. The figure in that column is the weight of chlorine that must be added daily. If the desired chlorine level is not shown on the chart, multiply the chart values to get the correct dosage level.

Example: To obtain 4 ppm at a flow rate of 100 gallons per minute, add 80 oz or  $80/16 = 5$  lb. of chlorine per day. To obtain 100 ppm at a flow rate of 60 gallons per minute, use  $12 \text{ oz} \times 100 = 1200 \text{ oz}$  or  $1200/16 = 75$  lb. of chlorine per day.

## CHLORINE – Additional Directions for Use

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Brenntag Southwest, Inc.

### SWIMMING POOL DISINFECTION

This product is an efficient source of chlorine for routine sanitation or for periodic super chlorination of swimming pools. When used regularly as part of a complete maintenance program, it will help prevent the growth of harmful algae and microorganisms.

This product is to be added by trained personnel only, familiar with specific application and water balancing procedures associated with this product. Sunlight, rainfall, temperature, filter efficiency, number of swimmers and frequency of pool use affect the amount of chlorine loss. It is imperative that users of chlorine gas use a calorimetric or titrimetric test kit to accurately determine residual chlorine levels. Flow meter set points must be adjusted continuously to compensate for sunlight, rainfall, and temperature to the degradation and changing chlorine demands for any water flow rate.

**NEW POOL OR SPRING START UP.** Using an appropriate chlorinator and following the manufacturer's directions, super chlorinate the pool with 5 to 10 ppm available chlorine by weight. Check the level of available chlorine with a test kit. Adjust and maintain pool water pH between 7.2 and 7.6. Adjust and maintain the alkalinity of the pool to between 50 and 100 ppm. Do not enter pool until the chlorine residual is between 1.0 to 3.0 ppm.

**POOL MAINTENANCE.** Using an appropriate chlorinator and following the manufacturer's directions, add chlorine to obtain 0.6 to 1.0 ppm available chlorine by weight. Stabilized pools should maintain a residual of 1.0 to 1.5 ppm available chlorine. Test the pH, available chlorine residual and alkalinity of the water frequently with appropriate test kits. Frequency of water treatment will depend upon temperature and number of swimmers.

Every 7 days, or as necessary, using an appropriate chlorinator and following manufacturer's directions, super chlorinate the pool water by raising the available chlorine to 5 to 10 ppm available chlorine by weight. Check the level of available chlorine with a test kit. Do not reenter pool until the chlorine residual is between 1.0 to 3.0 ppm.

At the end of the swimming pool season or when water is to be drained from the pool chlorine must be allowed to dissipate from treated pool water before discharge. Do not chlorinate the pool within 24 hours prior to discharge.

**WINTERIZING POOLS.** While water is still clear & clean, using an appropriate chlorinator and following manufacturer's directions, apply sufficient chlorine, while the filter is running, to obtain a 3 ppm available chlorine residual, as determined by a suitable test kit. Cover pool, prepare heater, filter and heater components for winter by following manufacturers' instructions.

### SEWAGE and WASTEWATER TREATMENT

The amount of chlorine delivered to treat sewage and wastewater effluent will depend on the flow rate of the water being treated, the number and placement of deed tubes and the outlet weir size opening.

The disinfection of sewage and effluent must be evaluated by determining that the total number of coliform bacteria and/or fecal coliform bacteria, as determined by the Most Probable Number (MPN) procedure, of the chlorinated effluent has been reduced to or below the maximum permitted by the controlling regulatory jurisdiction.

On the average, satisfactory disinfection of secondary wastewater effluent can be obtained when the chlorine residual is 0.5 ppm after 15 minutes contact. Although the chlorine residual is the critical factor in disinfection, the importance of correlating chlorine residual with bacterial kill must be emphasized. The MPN of the effluent, which is directly related to the water quality standards requirement, should be the

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final and primary stand, and the chlorine residual should be considered an operating standard valid only to the extent verified by the coliform quality of the effluent.

The following are critical factors affecting wastewater disinfection.

1. **Mixing:** It is imperative that the product and the wastewater be instantaneously and completely flash mixed to assure reaction with every chemically active, soluble and particulate component of the wastewater.
2. **Contacting:** Upon flash mixing, the flow through the system must be maintained.
3. **Dosage/Residual Control:** Successful disinfection is extremely dependent on response to fluctuating chlorine demand to maintain a predetermined, desirable chlorine level. Secondary effluent should contain 0.2 to 1.0 ppm chlorine residual after a 15 to 30 minute contact time. A reasonable average of residual chlorine is 0.5 ppm after 15 minutes contact time.

**EFFLUENT SLIME CONTROL** – Apply a 100 to 1000 ppm available chlorine solution at a location that will allow complete mixing. Once control has become evident apply a 15 ppm available chlorine solution.

**FILTER BEDS AND SLIME CONTROL** – Remove filter from service and drain. Prepare a 100 to 1000 ppm available chlorine solution and fill to a depth of 1 foot above filter sand. Wait 30 minutes before draining water to a level that is even with the top of the filter. Wait for 4 to 6 hours before completely draining and backwashing filter.

### DISINFECTION OF DRINKING WATER

Chlorine is used as both an oxidant and as a primary and secondary disinfectant in treatment of human drinking water. The use of chlorine for treatment of drinking water must be in accordance with the Safe Drinking Water Act (42 U.S.C. 300f). The required dosages will vary with source water conditions, the degree of contamination present and the length and quality of the distribution system. Chlorine must be applied at a sufficient residual concentration for sufficient time (CT Value) to achieve the required disinfection. The concentration of residual free chlorine must be monitored such that it does not exceed 4.0 ppm at any consumer's tap.

**PUBLIC SYSTEMS** – Prepare a 100 ppm available chlorine solution. Begin feeding this solution with a hypochlorinator until a free available chlorine residual of at least 0.2 ppm and no more than 0.6 ppm is attained throughout the distribution system. Check water frequently with a chlorine test kit. Bacteriological sampling must be conducted at a frequency no less than that prescribed by the National Interim Primary Drinking Water Regulations. Contact your local Health Department for further details.

**INDIVIDUAL SYSTEMS – DUG WELLS** – Upon completion of the casing (lining) wash the interior of casing (lining) with a 100 ppm available chlorine solution using a stiff brush. After covering the well, pour the sanitizing solution into the well through both the pipe sleeve opening and the pipeline. Wash the exterior of the pump cylinder also with the sanitizing solution. Start pump and pump water until strong odor of chlorine in water is noted. Stop pump and wait at least 24 hours. After 24 hours flush well until all traces of chlorine have been removed from the water. Consult your local Health Department for further details.

**INDIVIDUAL SYSTEMS – DRILLED, DRIVEN, and BORED WELLS** – Run pump until water is as free from turbidity as possible. Pour a 100 ppm available chlorine sanitizing solution into the well. Add 5 to 10 gallons of clean chlorinated water to the well in order to force the sanitizer into the rock formation. Wash the exterior of pump cylinder with the sanitizer. Drop pipeline into well, start pump and pump water until strong odor of chlorine in water is noted. Stop pump and wait at least 24 hours. After 24 hours flush well until all traces of chlorine have been removed from the water. Deep wells with high water levels may necessitate the use of special methods for introduction of the sanitizer into the well. Consult your local Health Department for further details.

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INDIVIDUAL SYSTEMS – FLOWING ARTESIAN WELLS – Artesian wells generally do not require disinfection. If analyses indicate persistent contamination, the well should be disinfected. Consult your local Health Department for further details.

EMERGENCY DISINFECTION – When boiling of water for 1 minute is not practical, water can be made potable by using this product. Prior to addition of the sanitizer, remove all suspended material by filtration or by allowing it to settle to the bottom. Decant the clarified, contaminated water to a clean container and add sufficient chlorine to obtain 0.5 ppm. Allow the treated water to stand for 30 minutes. Properly treated water should have a slight chlorine odor, if not, repeat dosage and allow the water to stand an additional 15 minutes. The treated water can then be made palatable by pouring it between clean containers several times.

## PUBLIC WATER SYSTEMS

ALGAE CONTROL IN RESERVOIRS – Hypochlorinate streams feeding the reservoir. Suitable feeding points should be selected on each stream at least 50 yards upstream from the points of entry into the reservoir.

MAINS – Thoroughly flush section to be sanitized by discharging from hydrants. Permit a water flow of at least 2.5 feet per minute to continue under pressure while injecting this product by means of a hypochlorinator. Stop water flow when a chlorine residual test of 50 ppm is obtained at the low pressure end of the new main section after a 24 hour retention time. When chlorination is completed, the system must be flushed free of all heavily chlorinated water.

NEW TANKS, BASINS, ETC – Remove all physical soil from surfaces. Prepare a 500 ppm available chlorine solution. Fill to working capacity and allow solution to stand for at least 4 hours. Drain and flush with potable water and place in service.

NEW FILTER SAND – Before placing filter in service, prepare a 100 to 10000 ppm available chlorine solution and fill to a depth of 1 foot above filter sand. Wait 30 minutes before draining water to a level that is even with the top of the filter. Wait for 4 to 6 hours before completely draining and backwashing filter.

NEW WELLS – Flush the casing with a 50 ppm available chlorine solution. The solution should be pumped or fed by gravity into the well after thorough mixing with agitation. The well should stand for several hours or overnight under chlorination. It may then be pumped until a representative raw water sample is obtained. Bacterial examination of the water will indicate whether further treatment is necessary.

EXISTING EQUIPMENT – Remove equipment from service and thoroughly clean surfaces of all physical soil. Sanitize with a 500 ppm available chlorine solution. Fill to working capacity and let stand at least 4 hours. Drain and return to service. If the previous treatment is not practical, surfaces may be sprayed with a solution containing 1000 ppm available chlorine. After drying, flush with water and return to service.

## EMERGENCY DISINFECTION AFTER FLOODS

WELLS – Thoroughly flush contaminated casing with a 500 ppm available chlorine solution. Backwash the well to increase yield and reduce turbidity, adding sufficient chlorination solution to the backwash to produce 10 ppm available chlorine residual as determined by a chlorine test kit. After the turbidity has been reduced and the casing has been treated, add sufficient chlorinating solution to produce 50 ppm available chlorine residual. Agitate the well water for several hours and take a representative water sample. Re-treat well if water samples are biologically unacceptable.

RESERVOIRS – In case of contamination by overflowing streams, establish hypochlorinating stations upstream of the reservoir. Chlorinate the inlet water until the entire reservoir obtains 0.2 ppm available

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chlorine residual, as determined by a suitable chlorine test kit. In case of contamination from surface drainage, apply sufficient product directly to the reservoir to obtain 0.2 ppm available chlorine residual in all parts of the reservoir.

**BASINS, TANKS AND FLUMES, ETC** – Thoroughly clean all equipment, then prepare 500 ppm available chlorine solution, as determined by a suitable test kit. After 24 hours, drain, flush, and return to service. If the previous method is not suitable, spray or flush the equipment with a solution containing 1000 ppm available chlorine. Allow to stand for 2 to 4 hours, flush and return to service.

**FILTERS** – Remove filter from service and drain. Prepare a 100 to 10000 ppm available chlorine solution and fill to a depth of 1 foot above filter sand. Wait 30 minutes before draining water to a level that is even with the top of the filter. Wait for 4 to 6 hours before completely draining and backwashing filter.

**DISTRIBUTION SYSTEM** – Flush repaired or replaced section with water. Establish a hypochlorinating station and apply sufficient product until a consistent available chlorine residual of at least 10 ppm remains after a 24 hour retention time. Use a chlorine test kit.

## EMERGENCY DISINFECTION AFTER FIRES

**CROSS CONNECTIONS OR EMERGENCY CONNECTIONS** – Hypochlorination or gravity feed equipment should be set up near the intake of the untreated water supply. Apply sufficient product to give a chlorine residual of at least 0.1 to 0.2 ppm at the point where the untreated supply enters the regular distribution system. Use a chlorine test kit.

## EMERGENCY DISINFECTION AFTER DROUGHTS

**SUPPLEMENTARY WATER SUPPLIES** – Gravity or mechanical Hypochlorite feeders should be set up on a supplementary line to dose the water to a minimum chlorine residual of 0.2 ppm after a 20 minute contact time. Use a chlorine test kit.

**WATER SHIPPED IN BY TANKS, TANK CARS, TRUCKS, ETC** – Thoroughly clean all containers and equipment. Spray a 500 ppm available chlorine solution and rinse with potable water after 5 minutes. During the filling of the containers, dose with sufficient amounts of this product to provide at least a 0.2 ppm chlorine residual. Use a chlorine test kit.

## EMERGENCY DISINFECTION AFTER MAIN BREAKS

**MAINS** – Before assembly of the repaired section, flush out mud and soil. Permit a water flow at least 2.5 feet per minute to continue under pressure while injecting this product by means of a hypochlorinator. Stop water flow when a chlorine residual test of 50 ppm is obtained at the low pressure end of the new main section after a 24 hour retention time. When chlorination is completed, the system must be flushed free of all heavily chlorinated water.

## PULP AND PAPER MILL PROCESS WATER SYSTEMS

**SLUG FEED METHOD** – Initial Dose: When system is noticeably fouled apply sufficient chlorine to obtain from 5 to 10 ppm available chlorine. Repeat until control is achieved. Badly fouled systems must be cleaned before initial treatment.

Subsequent Doses: When microbial control becomes evident, test daily and maintain a 1 ppm residual.

**INTERMITTENT FEED METHOD** – Initial Dose: When system is noticeably fouled, apply sufficient chlorine to obtain 5 to 10 ppm available chlorine. Apply half (or 1/3, 1/4, or 1/5) of this initial dose when



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half (or 1/3, 1/4, or 1/5) of the water in the system has been lost by blowdown. Badly fouled systems must be cleaned before initial treatment.

**Subsequent Doses:** When microbial control becomes evident, test daily and maintain a 1 ppm residual. Apply half (or 1/3, 1/4, or 1/5) of this initial dose when half (or 1/3, 1/4, or 1/5) of the water in the system has been lost by blowdown.

**CONTINUOUS FEED METHOD – Initial Dose:** When system is noticeably fouled apply sufficient chlorine to obtain from 5 to 10 ppm available chlorine. Repeat until control is achieved. Badly fouled systems must be cleaned before initial treatment.

**Subsequent Doses:** When microbial control becomes evident, start a continuous feed and test daily to maintain a 1 ppm residual.

### COOLING TOWER, AIR WASHER AND EVAPORATIVE CONDENSER WATER

**SLUG FEED METHOD – Initial Dose:** When system is noticeably fouled apply sufficient chlorine to obtain from 5 to 10 ppm available chlorine. Repeat until control is achieved. Badly fouled systems must be cleaned before initial treatment.

**Subsequent Doses:** When microbial control becomes evident, test daily and maintain a 1 ppm residual.

**INTERMITTENT FEED METHOD – Initial Dose:** When system is noticeably fouled, apply sufficient chlorine to obtain 5 to 10 ppm available chlorine. Apply half (or 1/3, 1/4, or 1/5) of this initial dose when half (or 1/3, 1/4, or 1/5) of the water in the system has been lost by blowdown. Badly fouled systems must be cleaned before initial treatment.

**Subsequent Doses:** When microbial control becomes evident, test daily and maintain a 1 ppm residual. Apply half (or 1/3, 1/4, or 1/5) of this initial dose when half (or 1/3, 1/4, or 1/5) of the water in the system has been lost by blowdown.

**CONTINUOUS FEED METHOD -- Initial Dose:** When system is noticeable fouled apply sufficient chlorine to obtain from 5 to 10 ppm available chlorine. Repeat until control is achieved. Badly fouled systems must be cleaned before initial treatment.

**Subsequent Doses:** When microbial control becomes evident, start a continuous feed and test daily to maintain a 1 ppm residual.