

REPORT

A QUARTERLY BRIEFING FOR WATER & WASTE WATER TREATMENT PROFESSIONALS • OCTOBER 2012 – VOLUME 3,

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For Wastewater Treatment Operations

Cal Hypo Provides Effective Disinfection

Option

Calcium hypochlorite offers many municipalities an effective alternative for gaining consistently accurate wastewater disinfection

Disinfection followed by dechlorination are typically the final stages of treatment at wastewater facilities before effluent is discharged. Gaseous chlorine (Cl_2) and sodium hypochlorite ($NaOCl$, or liquid bleach) have long been the conventional methods for disinfection.

But tough regulatory requirements and greater need for process optimization and safety are now pressuring plant management to reconsider their facilities' disinfection strategies. Many plants are searching for an alternative to gas or liquid bleach to further enhance the efficiency, reliability, safety and performance of their plants.

Many plants are actively searching for an alternative to gas or liquid chlorine.

Dry chlorine in the form of calcium hypochlorite briquettes from Arch Chemicals, Inc., now a part of Lonza, is becoming the alternative disinfection option of choice for a growing number of wastewater treatment plants. Good examples of these facilities include a Texas wastewater plant that provides reuse water for local use and, in Maine, a small wastewater facility that experienced an event that

Dry chlorine in the form of calcium hypochlorite briquettes from Arch Chemicals, Inc., now a part of Lonza, is



For many small to medium sized wastewater treatment plants and water reclamation facilities, Constant Chlor™ calcium hypochlorite feed systems are ideal for gaining reliable and efficient chlorination.

South Berwick WWTP

The South Berwick Sewer District in South Berwick, Maine, operates a modern tertiary wastewater treatment plant that uses a SBR system for secondary treatment and biological removal of ammonia and phosphorus. The district has approximately 1,200 service connections

and 20 miles of sewer line serving a population of more than 7,000.

Before treated wastewater is discharged to the plant's receiving stream, the Salmon Falls River, the plant must comply with a stringent

fecal coliform limit, which is accomplished through chlorine disinfection followed by dechlorination.

Tank Rupture Prompts Changes

Up until less than two years ago, the plant had been using sodium hypochlorite for disinfection. But a potentially hazardous event at the treatment facility prompted plant management to reconsider its use.

"Our 2800 gallon sodium hypochlorite storage tank ruptured inside our building and started to leak," says South Berwick Wastewater Treatment Plant Superintendent Harold "Skip" Clough. "Luckily the tank wasn't very full, and it had secondary containment, otherwise the problem would

have been a lot worse."

Clough says that, following the rupture and leak event, the plant could not find anyone who would fix the tank and guarantee the repair.

"After learning that, I didn't want to take a chance on getting a full load of sodium hypochlorite to find out if an unguaranteed repair would hold up. That's when I started looking for a reliable alternative to using commercial bleach."

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PLUS...



finally convinced it that it had to get away from using bleach.

Cal Hypo Provides Effective Disinfection Option

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After reviewing alternatives, the South Berwick wastewater treatment plant ultimately decided to remove its sodium hypochlorite system and replace it with an Arch Constant Chlor™ calcium hypochlorite feed system. The system was purchased through Constant Chlor™ dealer and New England regional manufacturers representative firm, WESCOR Associates.

Patented Spray Technology

The Constant Chlor™ MC4-50 unit is designed to supply up to 50 pounds of AvCl/day and uses a patented spray technology to produce fresh liquid chlorine solution as needed. The system uses Constant Chlor® Plus dry calcium hypochlorite briquettes containing a minimum of 65 percent available chlorine by weight.

The system uses Constant Chlor® Plus dry calcium hypochlorite briquettes containing a minimum of 65% AVCL by weight.

The highly soluble briquettes are loaded into the unit's hopper. Supply water is injected into the chlorinator and sprays upward into the bed of briquettes.

A short intermittent spray cycle produces an approximate 1.0 percent available chlorine solution, which is stored in a lower solution tank. The reservoir is filled and volume maintained via an electronically controlled spray manifold, where it is continually circulated to maintain solution consistency. The calcium hypochlorite solution is then pumped on demand through a chemical metering pump.

Smooth Operations

Since the installation of the Constant Chlor™ calcium hypochlorite feed system about a year and a half ago, disinfection operations at the South Berwick wastewater treatment plant have proceeded very smoothly, according to Clough.



The Constant Chlor™ MC4-50 arrives re-plumbed and skid mounted for ease of installation.



After an 2800 gallon sodium hypochlorite storage tank ruptured and began leaking at the South Berwick wastewater treatment plant, the plant switched to calcium hypochlorite for its final disinfection operations.

“Our new disinfection unit has been operating basically trouble free. We just load more cal hypo briquettes in its hopper every couple of weeks and we're good to go. It's been great to get away from using bleach,” Clough says. “Even without the tank rupture, using sodium hypochlorite had always been a huge pain, plus it would start losing strength after 30 days.” A two-year storage life for the calcium hypochlorite briquettes has eliminated wasted chemical and costly bulk liquid chemical storage for the treatment plant.

Wastewater Reuse in Texas

Beginning operation in February of 2012, the Bull Hide Creek Wastewater Treatment Plant is owned by the seven member cities that make up the Waco Metropolitan Area Regional Sewer System (WMARSS) and is operated by the City of Waco. The 1.5 MGD tertiary treatment plant disinfects treated wastewater via UV prior to discharge into Bull Hide Creek.

In conjunction with the new plant project, an integrated reuse system has been designed to deliver Type 1 reuse water from the plant to industrial and municipal sectors in Hewitt and Lorena, Texas.

A construction company is currently the sole customer for the plant's non-potable water, using approximately 100,000 gallons per day for washing equipment and vehicles. In the future, however, the district anticipates that Type 1 reuse water from the plant will be utilized for landscape irrigation at existing or future parks, schools, ball fields, and other green spaces, and may potentially supply existing or future industrial customers in the area.

Disinfection is a critical component in many reuse water applications, especially where irrigation is provided in areas accessible to the

public. As the district's wastewater reuse program grows as the area grows, it will be increasingly critical that proper chlorine residual levels in the reuse water leaving the plant be maintained at all times.

Constant Chlor™ the Answer

When it came to selecting the type of disinfection to serve the wastewater reuse system, WMARSS went with a Constant Chlor™ MC4-50 calcium

hypochlorite feed system, which was ordered through Macaulay Controls Company, a manufacturers representative firm and Constant Chlor® dealer serving primarily the water/wastewater industry in Texas and Oklahoma.

The Bull Hide Creek plant serves as a satellite system to the district's Central Wastewater Treatment Plant and often operates unmanned. Therefore, the district wanted a chlorination unit for the reuse system that requires minimum day-to-day attention. By generating calcium hypochlorite

solution on site, the Constant Chlor™ unit produces it only as the system demands it, thereby eliminating the need for bulk solution storage.

According to Dale Dennis, Utilities Operator for WMARSS, the Constant Chlor™ unit has operated quite well since startup and the only regular duty required for the calcium hypochlorite feeder has been to periodically check and make sure the hopper is loaded with briquettes.

Remote Monitoring & Control

The fact that the Constant Chlor™ unit is SCADA compatible also played a role in its selection. The new plant is instrumented to a fairly high level, allowing for remote monitoring and control from the Central WWTP. Operators can remotely see the chlorine residual, check the circulation pump on the unit, and also view and control the setpoint, dictating when the unit goes on and off. ■



Up to two-year storage life for Constant Chlor® Plus briquettes eliminates wasted chemical and costly bulk chemical storage.

THE DRY CHLORINE ADVANTAGE

Next Generation Cal Hypo Feeders by Dave Stark

Keeping up with the demands of compliant wastewater disinfection poses significant challenges for plant personnel. A solid chemical combined with a highly accurate delivery system can provide numerous advantages.

Today, meeting the requirements for accurate, consistent chlorination in wastewater applications is of paramount importance. But this often is not an easy task. In addition to maintaining proper chlorine residual levels in the face of ever-fluctuating organic loads, many plants have to deal with the problems associated with sodium hypochlorite (NaOCl, or bleach) when used for disinfection. NaOCl degradation over time, air-bound metering pumps due to off-gassing, excessive corrosion, expensive up-front cost and continuous maintenance of liquid chemical delivery, storage and containment systems, can all add up to plant inefficiencies.

Ultraviolet (UV) disinfection systems may provide the answer for some wastewater plants, but these systems have high up-front costs and are often expensive to maintain. Gaseous chlorine is becoming less and less of an option for wastewater treatment facilities, due to growing public health and safety concerns.

New Generation MC-Series Chlorinators

A number of treatment plants are now looking at dry chlorine in the form of calcium hypochlorite briquettes as an alternative to liquid and gaseous chlorine. Arch Chemicals, Inc., now a part of Lonza, has been at the forefront of calcium hypochlorite disinfection research and product development for more than 50 years.

Our largest Constant Chlor™ MC-Series feeder and Rapid Rate™ Technology can accommodate WWTPs up to 30 MGD, depending upon dosage requirements.

We recently introduced the Constant Chlor™ MC-Series, a new generation of Constant Chlor™ calcium hypochlorite feed systems specifically designed to meet the growing demand for reliable, robust chlorination at water and wastewater treatment



For many wastewater treatment plants and water reclamation facilities, Constant Chlor™ calcium hypochlorite feed systems are ideal for gaining reliable and efficient chlorination.

facilities. Our largest MC-Series feeder and Rapid

Rate™ technology can accommodate wastewater treatment plants up to 30 MGD, depending upon dosage requirements.

Compared to sodium hypochlorite use, users have reported they much prefer using our new MC-Series units and cal hypo briquettes for a number of reasons. Some of these include:

- Low cost of ownership
- Pre-plumbed and skid mounted for ease of installation
- Up to two-year shelf-life for Constant Chlor® Plus calcium hypochlorite briquettes
- Chlorinating solution is made only when needed
- Consistent and reliable chlorine solutions
- Customizable, convenient and easy to use
- Eliminates metering pump air locks due to off-gassing
- Reduced regulatory compliance required for dry chemical storage and transport

A High-Rate System

Calcium hypochlorite systems must have the capacity to quickly produce a continuous supply of

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Constant Chlor® REPORT is a publication of Arch Chemicals, Inc., now a part of Lonza. For more information regarding technologies and products discussed in this publication, please contact:

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Meeting Today's Wastewater Disinfection Challenges

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hypochlorite disinfection solution during peak demand periods. Meeting this need plus meeting the growing demand for effective calcium hypochlorite use in treatment plants requiring higher feed rate capacities, were the two primary reasons for designing the MC-Series. MC-Series systems have a very small footprint, but our largest unit can supply up to 1,000 lbs AvCl/day.

A lengthy record of historical data shows that chlorine is the best and most successful means of disinfecting water and wastewater. However, liquid and gaseous chlorine use come with an ever-increasing laundry list of regulatory issues, risks, unscheduled costs, and hassles.

Switching to Constant Chlor™ calcium hypochlorite feed systems can alleviate much of this burden for wastewater plants. Chlorination operations can become more effective and efficient. Most importantly, a steady, constant dose of hypochlorite disinfection solution is always there when your plant needs it. ■

Arch Chemicals, Inc., now a part of Lonza, operates six geographic territories to best serve our customers within an established framework of professional sales rep organizations throughout the country. **Please feel free to call or email your Territory Sales Manager with your chlorination challenge.**



Dave Stark is IC & M Business Manager for Arch Chemicals, Inc., now a part of Lonza.

Constant Chlor™ Plus MC4-400 supplies up to 400 lbs. of AvCL/day



Constant Chlor® Plus MC4-50 supplies up to 50 lbs. of AvCL/day



Constant Chlor® Plus MC4-150 supplies up to 150 lbs. of AvCL/day

Welcome to this edition of Constant Chlor® REPORT. As maintaining water quality and public safety become even more specialized and complex, useful and timely information about critical municipal water sanitation operations becomes increasingly valuable. That's why we produce this quarterly publication. In every issue, we look at the science behind these operations and apply it to "real world" situations, with reference items, case histories, system details and more good, practical information. ■