

CASE STUDY

IMPROVED CHLORINE RESIDUALS
AFTER TANK CLEANING WITH TOP ULTRA®



INTRODUCTION

Blue Earth Products is the leader in innovative approaches to water quality standards. Our suite of products reduces chlorine demand and disinfection by-products (DBPs) in water systems by eliminating organic and inorganic scale, enabling utilities to comply with EPA Stage 2 DBP rules.

The town of Dustin, OK, provides drinking water to approximately five hundred customers and produces ~ 45,000 gallons per day (gpd) of treated surface water. Water is stored in a 60,000-gallon clearwell at the plant and a 50,000 gallon elevated tank near the town center. In 2001 chlorine loss in the distribution system triggered repeated boil-water orders. Washing out the clearwell and a regular flushing program improved the situation somewhat, but boil-water orders continued. The Oklahoma Rural Water Association suggested the use of Blue Earth Products' Top Ultra product to clean the tanks to stabilize the chlorine residuals.

In late November of 2001, the elevated tank was flushed conventionally with pressurized water. In December 2001, the package treatment unit and clearwell were chemically cleaned using Top Ultra, and tank cleaning was completed in one day.



Figure 1 - Photographs of the clearwell before and after cleaning

RESULTS

The flushing of the elevated tank resulted in the removal of approximately 18" of sludge. However, this cleaning improved the free chlorine residual in the nearby city hall only slightly (0.54 to 0.62 ppm).

The Top Ultra surface cleaning procedure was effective in removing heavy surface deposits from the clearwell and package treatment unit (see Figure 1). Additionally, the chemical cleaning resulted in significant improvement of chlorine residuals within the distribution system (see Figure 2).

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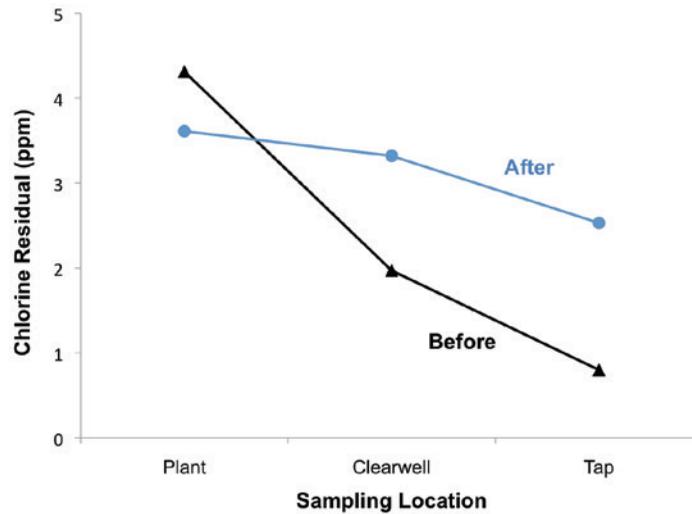


Figure 2 - Free chlorine at the exit of the plant, out of the clearwell, and at the Dustin school cafeteria tap

Additionally, the chlorine demand of the clearwell was directly determined by measuring the chlorine residual before and after an overnight, off-line period. A control water sample was kept in a clean laboratory glass beaker. The decline in the control sample represented the demand of the bulk water and the gassing off of the chlorine.

	Clearwell before	Clearwell after	Glass Beaker after
Free Cl before	3.79 ppm	2.24 ppm	2.24 ppm
Free Cl after	0.22 ppm	1.93 ppm	1.92 ppm
Reduction	94%	14%	14%

Table 1 - The exact same drop in free chlorine occurred in the clearwell after cleaning as in the control sample

DISCUSSION

In this particular system, the severe chlorine demand of the clearwell (94%) was the main cause of poor chlorine residuals in the distribution system. After the Top Ultra cleaning, dramatic, system-wide improvement occurred, eliminating boil orders and allowing the customer to reduce their total chlorination from ≥ 4.0 ppm to ≤ 2.2 ppm.

As can be noted in Table 1, the exact same drop in free chlorine occurred in the clearwell after cleaning as in the laboratory beaker, indicating that the Top Ultra cleaning had completely eliminated the chlorine demand from the tank.

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