

## CCT Testing & Field Results Using SeaQuest in the City of Atlanta

The City of Atlanta performed two laboratory tests to evaluate SeaQuest against the baseline treatment of zinc ortho-phosphate. A pipe loop test using copper pipe & lead solder was performed in addition to a 30 day corrosion coupon loop test.

The baseline treatment was 2.0 ppm of zinc-orthophosphate at a pH of 7.5. The SeaQuest treatment was 0.45 ppm of SeaQuest at the natural pH of 6.4. The total hardness was 25 ppm.



Image 1: Atlanta Pipe Loop Testing Apparatus

The pipe loop test was performed in two phases. Phase 1 was a 7-day test at the baseline conditions. Phase 2 was a 21 day test of the SeaQuest conditions. During the test the loop was rotated between running and stagnant conditions to simulate typical home use. Lead and copper results were measured in the water each day.

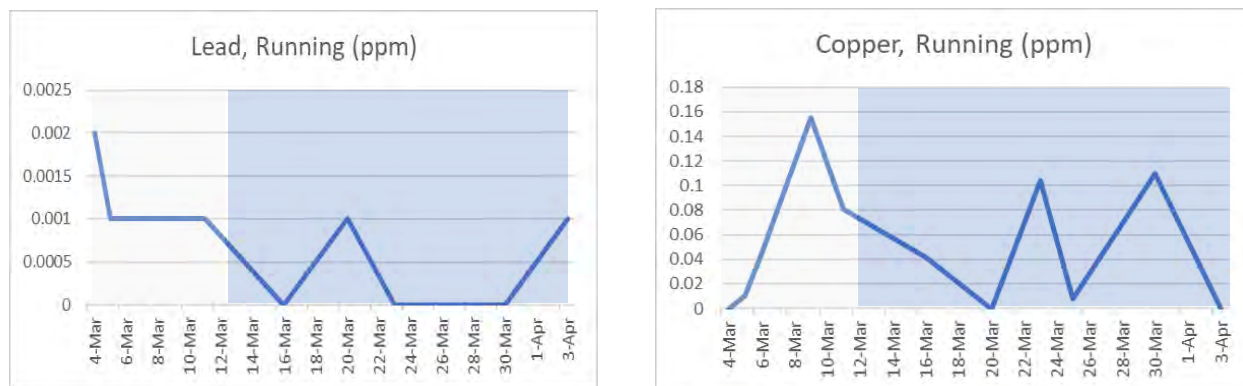


Figure 1&2: Running Pipe Loop Results; shaded blue = SeaQuest conditions

A slight improvement in both lead and copper release was observed in the running loop portion of the test, however both conditions yielded results well below the regulatory limits of 0.015 ppm and 1.5 ppm for lead and copper, respectively.

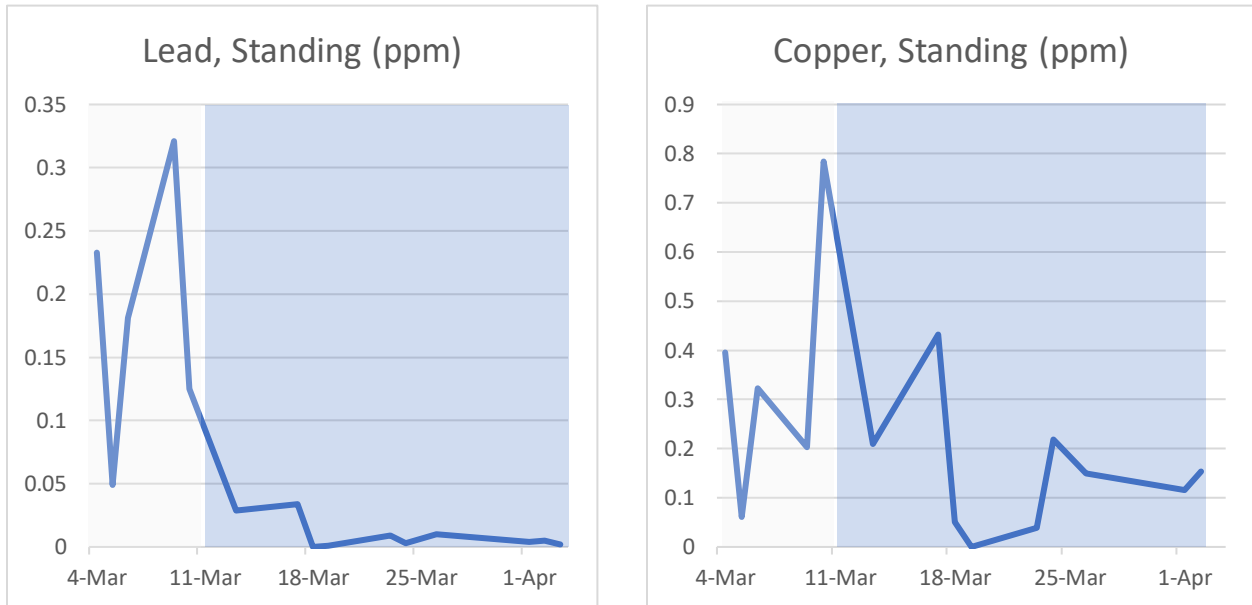


Figure 3&4: Stagnant Pipe Loop Results; shaded blue = SeaQuest conditions

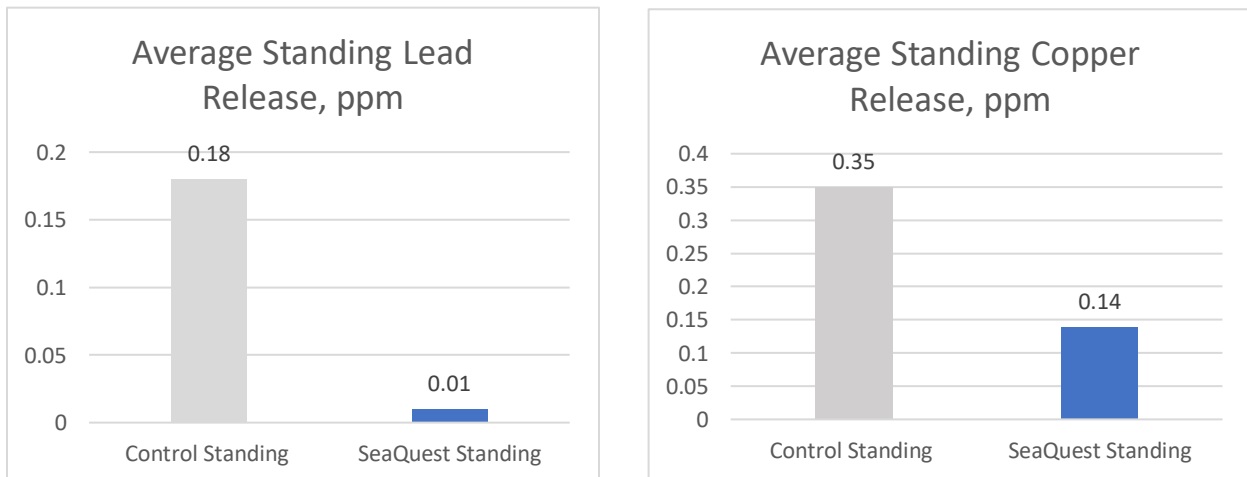


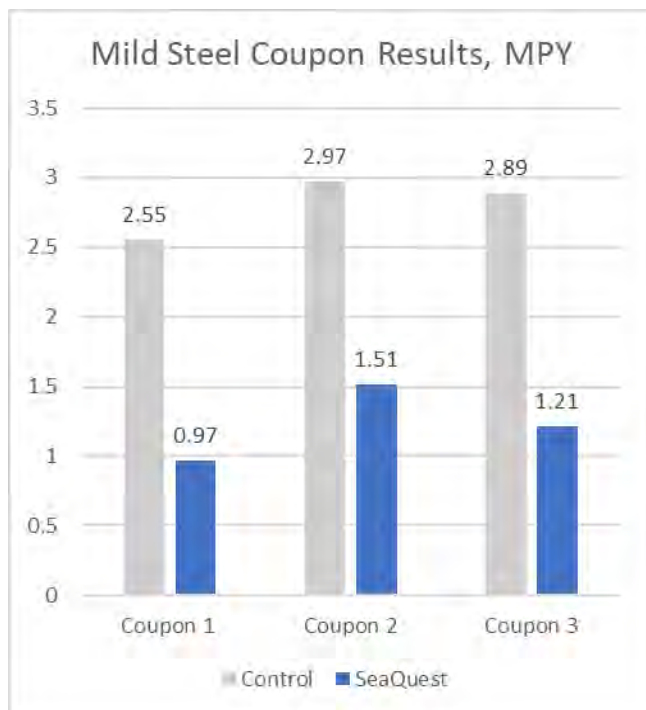
Figure 5&6: Stagnant Pipe Loop Average Lead Release

As observed in Figures 3-6, during the stagnant loop portion of the test there was a severe contrast between the SeaQuest and control condition. In particular, the SeaQuest conditions resulted in stagnant lead release below the EPA threshold of 0.015 ppm. By contrast, the stagnant lead release of the zinc-ortho phosphate condition was well above the limit, at 0.18 ppm.

The second test performed was a single pass corrosion coupon loop. The loop was constructed from PVC and water was released into the lab sink. The baseline treatment was 2.0 ppm of zinc-orthophosphate at a pH of 7.5. The SeaQuest treatment was 0.45 ppm of SeaQuest at the natural pH of 6.4. The total hardness was 25 ppm. Each condition was tested for 30 days.



Image 2: Atlanta Coupon Loop Testing Apparatus



Similar to the results in the stagnant pipe loop, the results in the corrosion coupon test show significant performance differences between the SeaQuest and zinc ortho phosphate conditions. Three different coupons were used and all show consistent results. The average zinc ortho phosphate corrosion rate is 2.8 MPY. The average SeaQuest corrosion rate is 0.9 MPY.

Figure 7: Corrosion Coupon Results



Image 3: Cleanup of Manganese Deposits in the Lab Sink

Towards the end of the test, a visible cleanup of the drain line in the lab sink was observed, as seen in Image 3. Based on this visual evidence and the positive test results showing the potential performance of the SeaQuest, a field trial was initiated.