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June 29, 2010

Jon McReynolds, Camp Director
Camp Hyde
26201 W. 71st South
Viola, KS 67149

Dear Jon,

This letter is in follow-up to my on-site visit with you last week to review water supply operations at Camp Hyde. Specifically, the primary concern is the system's inability to maintain the minimum chlorine residual throughout the system. During my visit chlorine residual tests were conducted at the office and in the building to the west of the office. The residual at the office at 11:00 AM was 0.96 mg/L. The residual at the building to the west of the office at about 1:30 PM was 0.54 mg/L. These are very adequate results and are in compliance with the Kansas Department of Health and Environment (KDHE) minimum requirement of 0.2 mg/L. However, you stated that you manually turned the chlorine pump on to run while the well pump was shut off. Even though these residuals were in compliance, they were not obtained as a result of normal operation. There are obviously one or more issues that need to be further investigated to provide assurance that the system can meet the minimum disinfection requirement during normal operation.

You are currently using sodium hypochlorite as the disinfectant. At the time of purchase, the strength of the sodium hypochlorite solution was 10% chlorine. Sodium hypochlorite degrades over time and since you stated that a drum lasts up to a year, the strength of the chlorine may only be about 50% of its original strength. Normally the speed of the solution pump could be increased to compensate for the decrease in chlorine concentration but your pump is already at its maximum speed.

The integrity of the peristaltic pump needs to be confirmed. For example, can the pump operate against your current system pressure of 68 psi? Since you increased the chlorine residual in the system by manually operating the solution pump when the well pump was shut down, it appears that the solution pump can deliver chlorine to the system. The problem might be that the solution pump may not have adequate capacity to keep up with the pumping rate of the well, especially since you installed a new well pump with a higher discharge rate about one year ago. Your maintenance person stated that the problem with low chlorine residuals in the system seemed to start about that time.

The HACH CN-66 color comparator test kit that you have is generally acceptable for chlorine residual testing. It does require some judgment on the part of the operator when matching up colors whereas digital test kits do not. However, your Hanna digital test kit appears to be defective as the results with this kit did not match those on both my kit and your HACH kit.

One last issue that you might want to consider is to change the plumbing in the building so that all well water is pumped directly to the pressure tanks before going to the buildings. The present arrangement with such a long chlorine solution feed line is not very desirable, especially from a maintenance perspective. By rerouting the well pump discharge line directly to the pressure tanks, all water could be disinfected at this point. The chlorine feed line would be much shorter

and it would be much easier to check when problems develop. Also, an adequate sampling tap could be installed on the discharge side of the pressure tanks to allow for quick feed back when chlorine feed rates are adjusted. I realize you might not want to enter into this type of project with the camp so busy during the summer but this is a project that could be planned for a time when the camp is not so busy.

Funding for the above assistance was provided through a contractual arrangement between the Kansas Department of Health and Environment (State Revolving Loan Program set-aside) and the Kansas Rural Water Association (KRWA). Please call the KRWA if we can be of further assistance. Also, visit the KRWA website www.krwa.net for news and information concerning water utilities, training opportunities, and other KRWA programs.

Sincerely,

Delbert C. Zerr
Consultant

C: Cathy Tucker-Vogel, KDHE, Topeka
J. P. Goetz, KDHE, Wichita