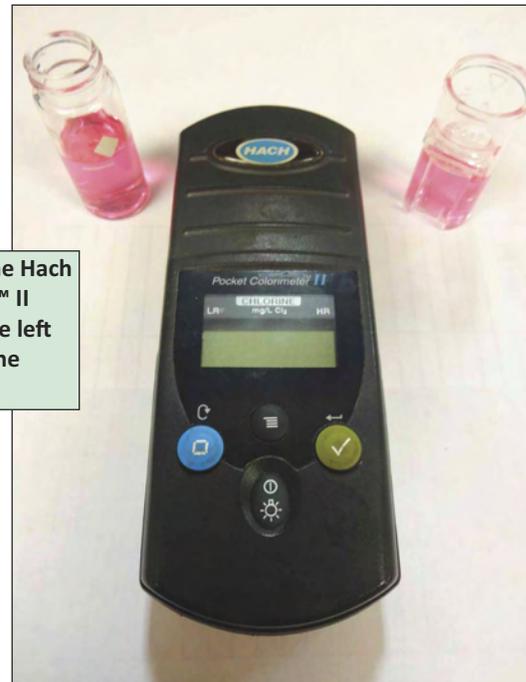


# Accuracy of Testing Equipment and Procedures Necessary to Verify Water Quality

**R**ecently, the Kansas Rural Water Association sponsored three days of training at Iola. KRWA contracted with Hach Company for the instruction. Earlier this summer, KRWA also hosted three days of similar training at Salina, also conducted by Hach Company. It was excellent training and while I helped facilitate the sessions at Iola, I learned a great deal also. The discussions and presentations of the various pieces of monitoring equipment by Jim Schuth were second to none. There was also great hands-on training; attendees learned the different ways to test chlorine residuals using the Pocket Colorimeter™ II. Also, I learned more about the CL17 Analyzer and its many capabilities.

Many water systems have been using the Pocket Colorimeter™ II to test chlorine residuals. The operator or person doing the tests needs to know what chlorine is being tested for – exactly, is it Free or Total and also, high



This photo shows the Hach Pocket Colorimeter™ II with glass vial on the left and plastic vial on the right.

**Operators or those running the tests should note the appearance of the plastic bottle. The plastic bottle is much thinner on the bottom than the glass bottle.**

or low range? When testing in low range, the operator should be using the glass bottle and one DPD packet. When the operator is testing in high range, the operator should use the plastic bottle with two DPD packets. Many operators have had some difficulty with the testing. If the operator uses the wrong bottles, the results will not be accurate.

For example, if the plastic bottle is used on low range, the reading will appear twice as high as the residual actually is. Operators or those running the tests should note the appearance of the plastic bottle. The plastic bottle is much thinner on the bottom than the glass bottle. On high range using the DPD method, the operator should add two packets, Free or Total, depending on which chlorine is being tested for. Cap the cell and shake gently for twenty seconds. Place the prepared sample in the cell holder and cover with the instrument cap. Then wait three to six minutes after adding the DPD total pillows. If it's Free chlorine, the operator should wait one minute after adding the pillows, then proceed immediately to read the results. When using this instrument, consult with the instrumentation manual and be sure to use the right bottles for the right sample.



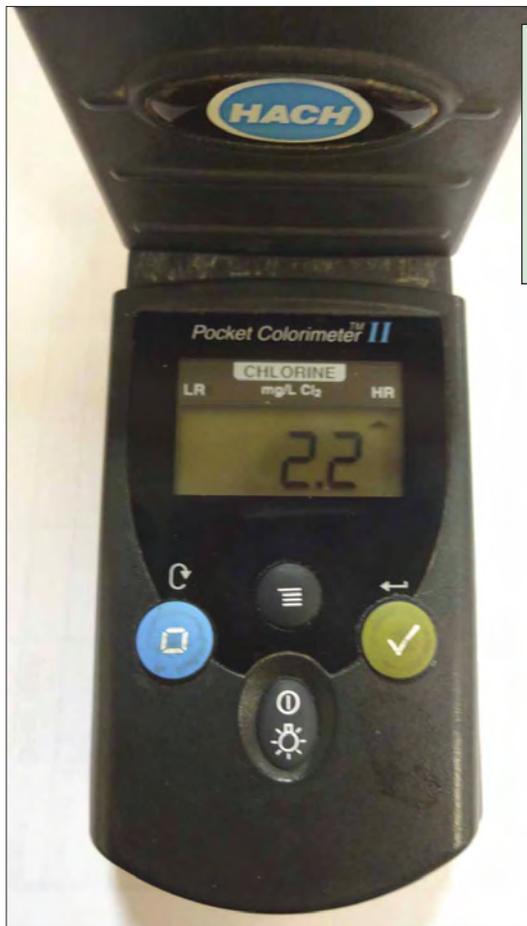
The plastic vial is only used in High Range. The vial is filled to the 5-ml mark. Also note the raised triangle near the top of the vial. This triangle should be facing away from the keypad before covering with the instrument cap and taking readings.

Many water system personnel have asked for assistance in calibrating the Colorimeter. It is not recommended by the HACH Company to calibrate this equipment. Instead, by using a known standard of chlorine, we can verify that the instrument is working properly. If the verification does not meet the plus or minus 10 percent accuracy limit, then it is recommended to send the equipment to the HACH company to be calibrated and/or repaired.

The CL17 Analyzer is a microprocessor-controlled, process analyzer designed to monitor a sample stream continuously for chlorine content. Either Free or Total chlorine, in the range of 0 to 5 mg/L, can be monitored.

Many systems are using the online CL17 Analyzer. The analyzer can be linked to a chart recorder or computer system so chlorine residuals can be better monitored. The analyzer is designed to capture and analyze a portion of the sample every 2.5 minutes. The sample portion is captured in the Colorimeter measuring cell where the blank absorbance is measured. Measurement of sample blank absorbance allows compensation for any turbidity or natural color in the sample, and provides an automatic zero reference point. Reagents are added at this time to develop the magenta color, which is measured and compared to the reference.

Systems also have requested KRWA to calibrate their CL17 Analyzer. Hach does not recommend calibrating this instrument. Periodically, the unit's accuracy should be verified with standard solutions or standard editions. The accuracy of the CL17 is also plus or minus ten percent. If the unit doesn't meet accuracy standards, the instrument will have to be sent to the Hach Company for repair. Standards can be purchased from Hach Company to help verify the CL17 or the Colorimetric tube instrument. Running these tests should help verify accuracy.



Note the reading of 2.2 mg/L is taken in High Range (note arrowhead below HR). Consequently, the readout would not be flashing. However if this reading were taken in Low Range, it would be flashing, indicating the reading is 2.2 mg/L or higher and that it should be analyzed in High

Whether a water system is using combined chlorine, free chlorine, or purchasing water, or re-chlorinating, good chlorine measurements are necessary to verify the quality of the water. It's the public health that is most important and quality drinking water is a critical part of that effort.

Lonnie Boller is a Technical Assistant at KRWA. He has been employed by KRWA since 2001. Lonnie is a Class II certified operator; he previously was Water Plant Supervisor for the City of Horton. He has also attended and completed training at the University of Kansas Law Enforcement Training Center.



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