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June 25, 2009

James Rainboldt
Manager
PWWSD #20
1989 Quivera RD
Sedan, Kansas 67361

Re: Water Treatment Plant Operations

Dear James;

I wish to thank you for the opportunity to visit and discuss treatment plant operations on June 24. The main topic of discussion was chemical addition.

The plant chemical addition has been good. The use of ferric sulfate is credited with meeting the TOC percentage removal requirements.

The chlorine dioxide has not been added due to poor functioning equipment and high maintenance costs. Even without the chlorine dioxide addition the plant has been in compliance with turbidity requirements and disinfection byproducts maximum contaminant levels. I have evaluated costs at several plants using chlorine dioxide and the chemical costs for the sodium chlorite and chlorine gas have been around 8¢ - 10¢ per 1,000 gallons treated for a dosage of around 1.5 mg/l. Not using the chlorine dioxide has saved on plant chemical costs.

I have calculated the chemical costs using the feed rates at the time of my visit. These costs in cents per 1,000 gallon treated were 11.6¢ for ACH WC 2043; 3.5¢ for ferric sulfate WC 2438; 5.8¢ for 50% sodium hydroxide ("caustic"); 1.5¢ for chlorine; and 1.5¢ for ammonia. The total chemical cost was approximately 23.9¢ per 1,000 gallons treated.

I have seen much data on such and your costs are in the lower in the range of the plants that I have evaluated. As you know, the cost will vary depending on the quality of water entering the plant and especially if a large dosage of powder activated carbon is needed for taste and odors in the water.

As we discussed, you might be able to save some money lowering the ACH coagulant dosage, but some or all of the cost savings might be offset if the dosage of the ferric sulfate had to be increased along with an

increase in the caustic dosage. The only way to determine such is to turn the ACH dosage down and monitor the results. The decrease in dosage should start off very slow, say a reduction of 5% and then monitor for several days or a week before turning the dosage down again by maybe the same amount. You might be able to see a 20 – 50% reduction without having to add more ferric sulfate and caustic.

You should call and possibly visit the plants on the list I gave you. Each plant has a different chlorine dioxide setup and has knowledgeable operators. These operators could give you good information that you could use in determining what type of equipment to purchase in the plant expansion.

If you or John wishes to discuss any matters pertaining to the water supply system, please contact me.

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

Again, thanks for the opportunity to meet with you all.

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Respectfully,

S. Patrick McCool, P.E.
KRWA Consultant

C: John Stewart
Richard Thomas, KDHE