Water Resources
Environmental Quality

ROY COOPER
Governor
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Secretary
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Interim Director

July 5, 2018

Mr. Jim Sumner
Environmental Testing Solutions, Inc.
P.O. Box 7565
Asheville, NC 28802-7565

Dear Mr. Sumner,

Results of the 2018 Performance Evaluation toxicity test series have been reviewed by Aquatic Toxicology Branch staff. Our Branch was also a participant in the chronic and acute *Ceriodaphnia dubia* tests, acute *Pimephales promelas* test, and the pH, conductivity, and hardness analyses. Following the summary of overall results, test results generated by your laboratory are discussed.

***Ceriodaphnia dubia* chronic**

There were nine chronic *Ceriodaphnia* tests performed using Solution A. The mean IC25 was 8.17% with a standard deviation of 2.45 (Figure 1). All nine laboratories met minimum quality control criteria and reported results that were within the allowable two standard deviations from the mean IC25.

***Ceriodaphnia dubia* acute**

There were eight acute *Ceriodaphnia* tests conducted using Solution B following the methods described in *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms,* (Fifth Edition), EPA-821-R-02-012, October 2002. The mean LC50 value was 4.91% with a standard deviation of 0.52 (Figure 2). All eight laboratories reported results that met minimum quality control criteria and were within two standard deviations of the mean LC50 value.

***Pimephales promelas* acute**

Eight laboratories conducted acute *Pimephales promelas* tests using Solution C following the methods described in *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms* (Fifth Edition), EPA 821-R-02-012, October 2002. The mean LC50 value was 19.42% with a standard deviation of 1.82 (Figure 3). All eight laboratories reported results that met minimum quality control criteria and were within two standard deviations of the mean LC50 value.

pH

There were nine pH results reported for each of Solutions D and E. The mean pH calculated for Solution D was 6.91 with a standard deviation of 0.03 (Figure 4). For the 2018 performance evaluation, an upper and lower range of +/- 0.2 pH units were used to be more consistent with NELAC PT standards. All nine laboratories reported results that were within 0.2 pH units of the mean pH.

For Solution E, the mean pH was 7.46 with a standard deviation of 0.05 (Figure 5). For the 2018 performance evaluation, an upper and lower range of +/- 0.2 pH units were used to be more consistent with NELAC PT standards. All nine laboratories reported results that were within 0.2 pH units of the mean pH.

Conductivity

There were nine conductivity results reported for each of Solutions F and G. The mean conductivity for Solution F was 394.1 µmhos/cm, with a standard deviation of 17.35 (Figure 6). Eight laboratories reported results that were within two standard deviations of the mean conductivity. One laboratory reported a result that was below the allowable two standard deviations from the mean.

For Solution G the mean was 1413.7 µmhos/cm with a standard deviation of 57.3 (Figure 7). Eight laboratories reported results that were within two standard deviations of the mean conductivity. One laboratory reported a result that was below the allowable two standard deviations from the mean conductivity value.

Hardness

There were nine total hardness results reported for each of Solutions H and I. The mean total hardness for Solution H was 31.9 mg/L with a standard deviation of 8.51 (Figure 8). Eight laboratories reported results that were within two standard deviations of the mean hardness. One laboratory reported a result that was above the allowable two standard deviations from the mean.

For Solution I, the mean was 43.3 mg/L with a standard deviation of 9.19 (Figure 9). Eight laboratories reported results that were within two standard deviations of the mean hardness. One laboratory reported a result that was above the allowable two standard deviations from the mean.

Figure 1: 2018 Performance Evaluation
Chronic *Ceriodaphnia dubia* IC25 Results Solution A

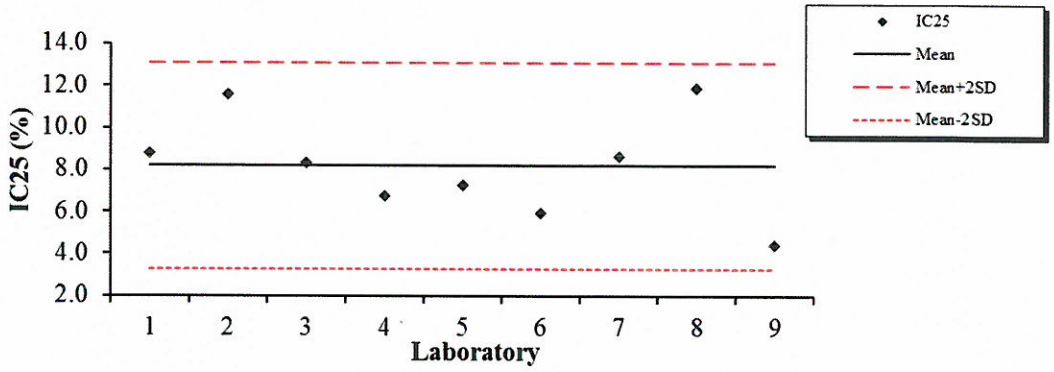


Figure 2: 2018 Performance Evaluation
Acute 48hr *Ceriodaphnia dubia* LC50 Results Solution B

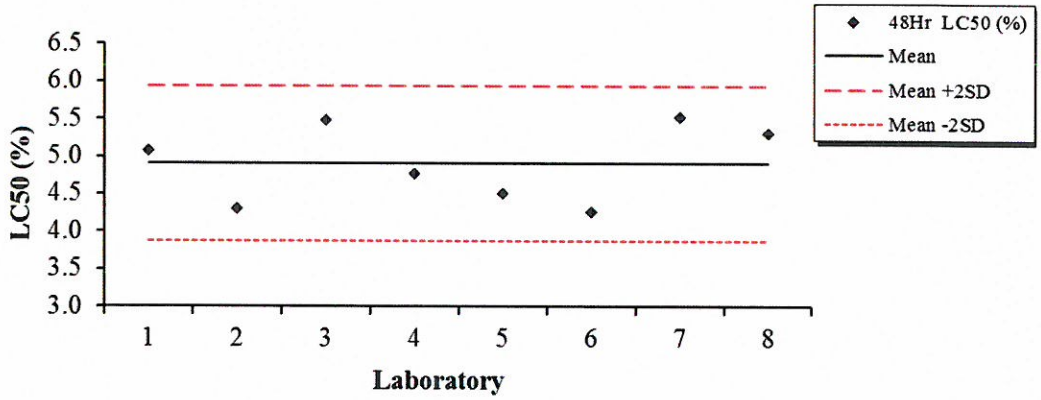


Figure 3: 2018 Performance Evaluation
Acute 48 hr *Pimephales promelas* LC50 Results Solution C

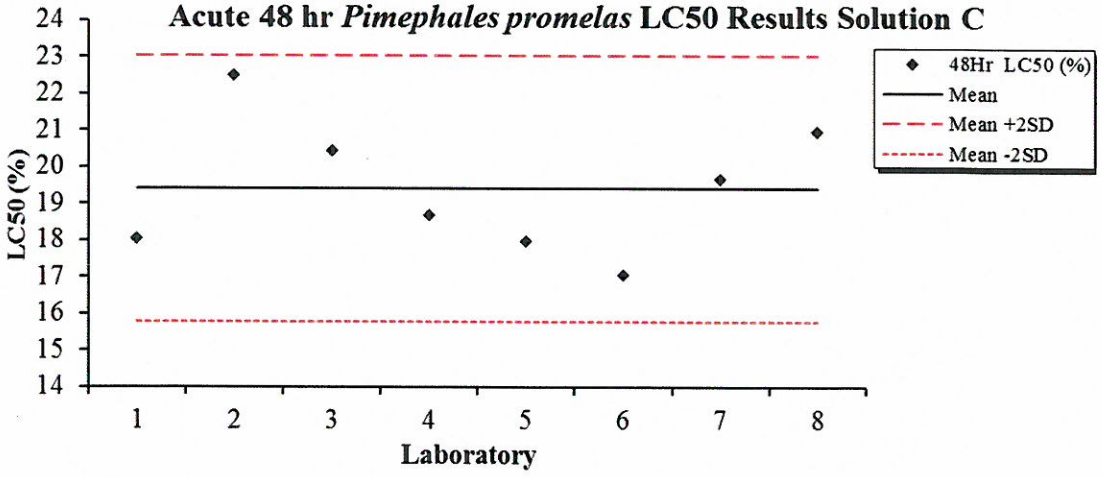


Figure 4: 2018 Performance Evaluation pH Results Solution D

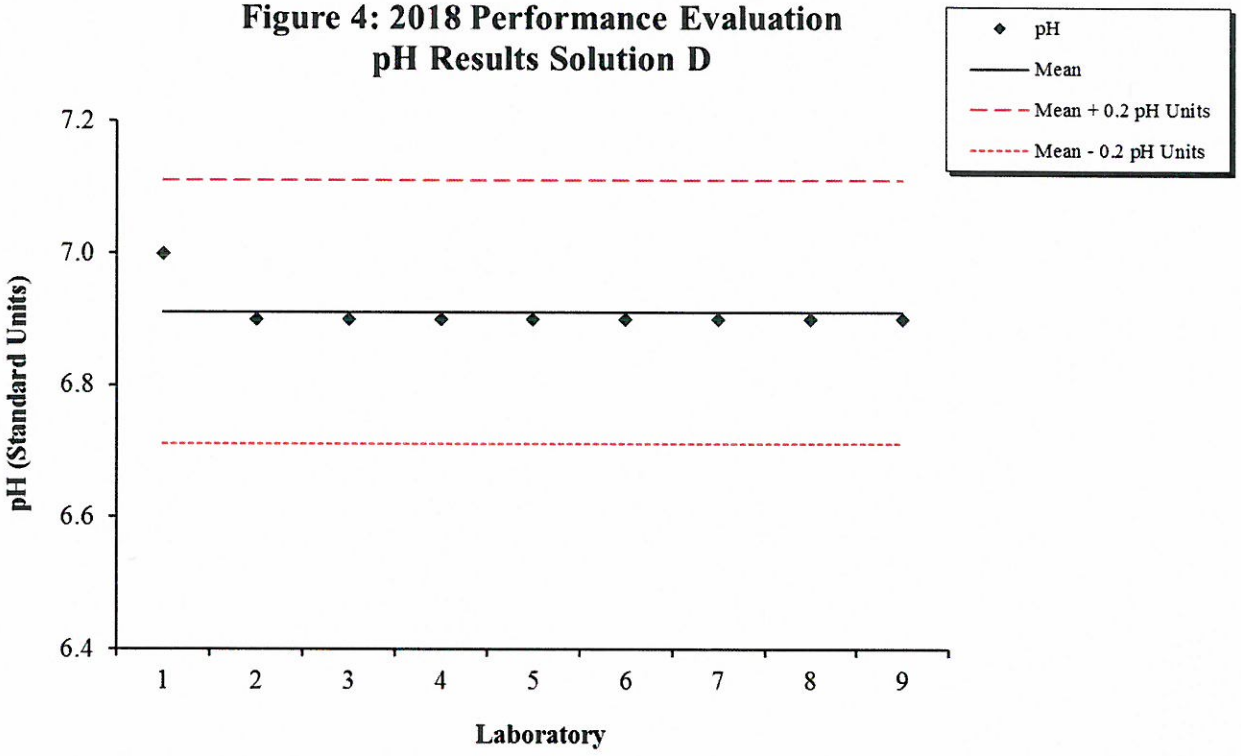


Figure 5: 2018 Performance Evaluation pH Results Solution E

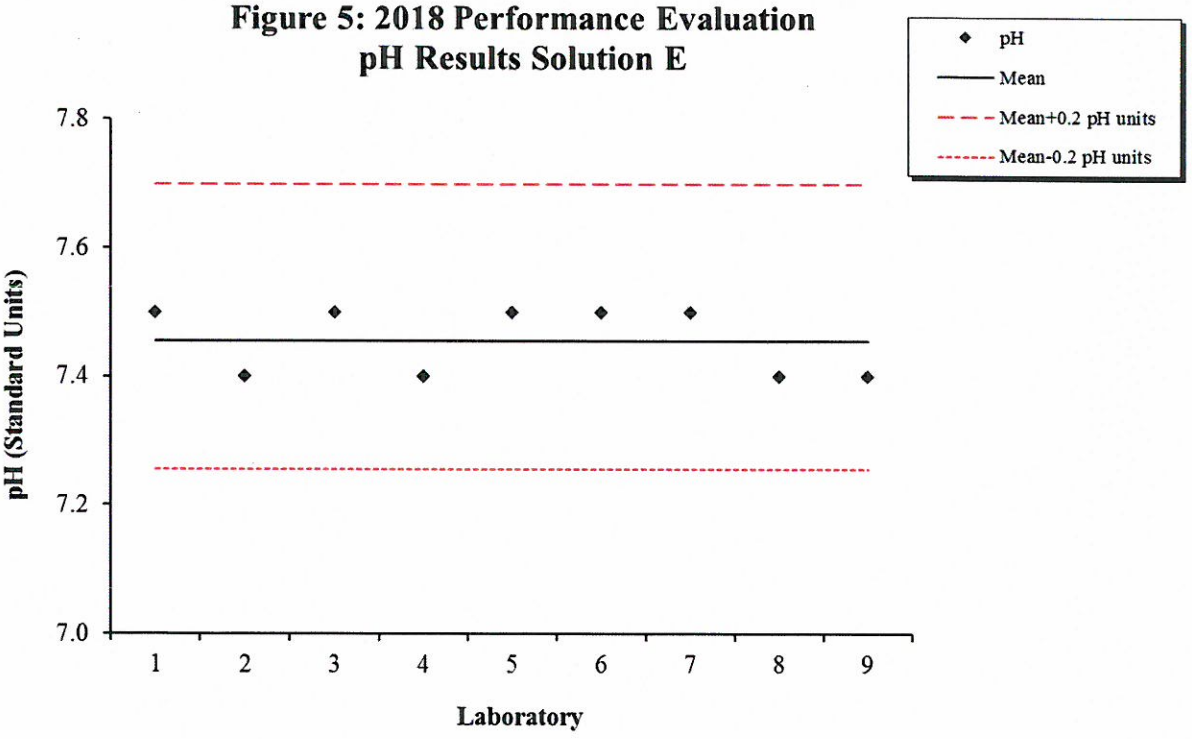


Figure 6: 2018 Performance Evaluation
Conductivity Results Solution F

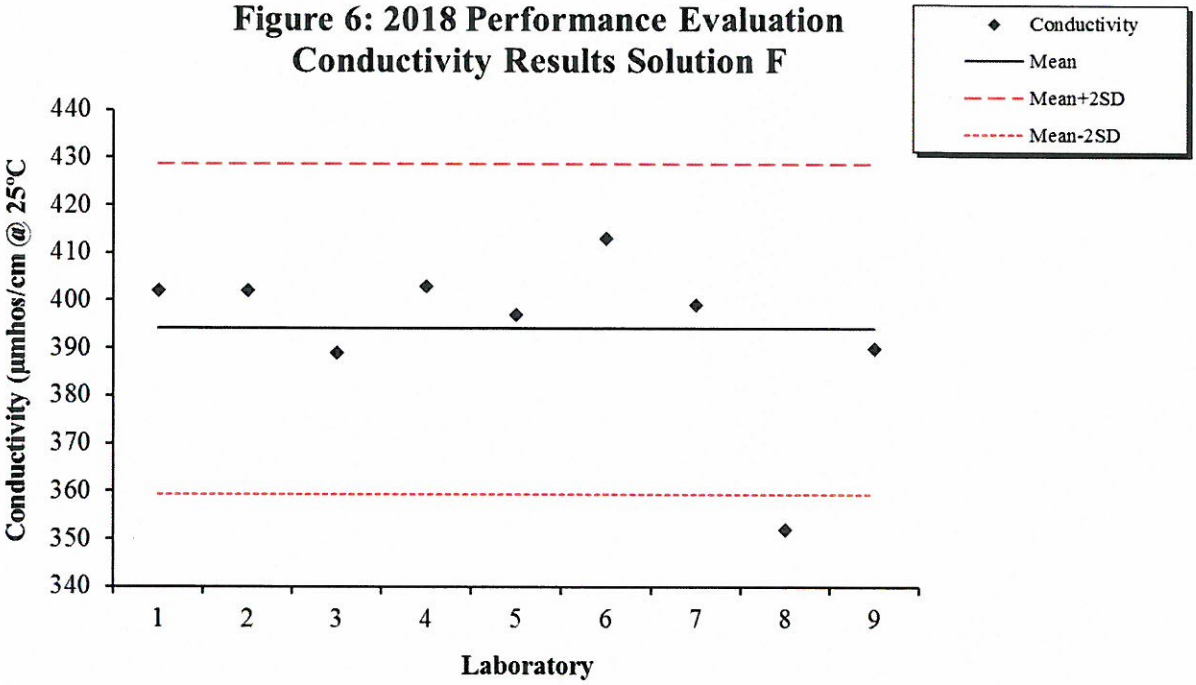


Figure 7: 2018 Performance Evaluation
Conductivity Results Solution G

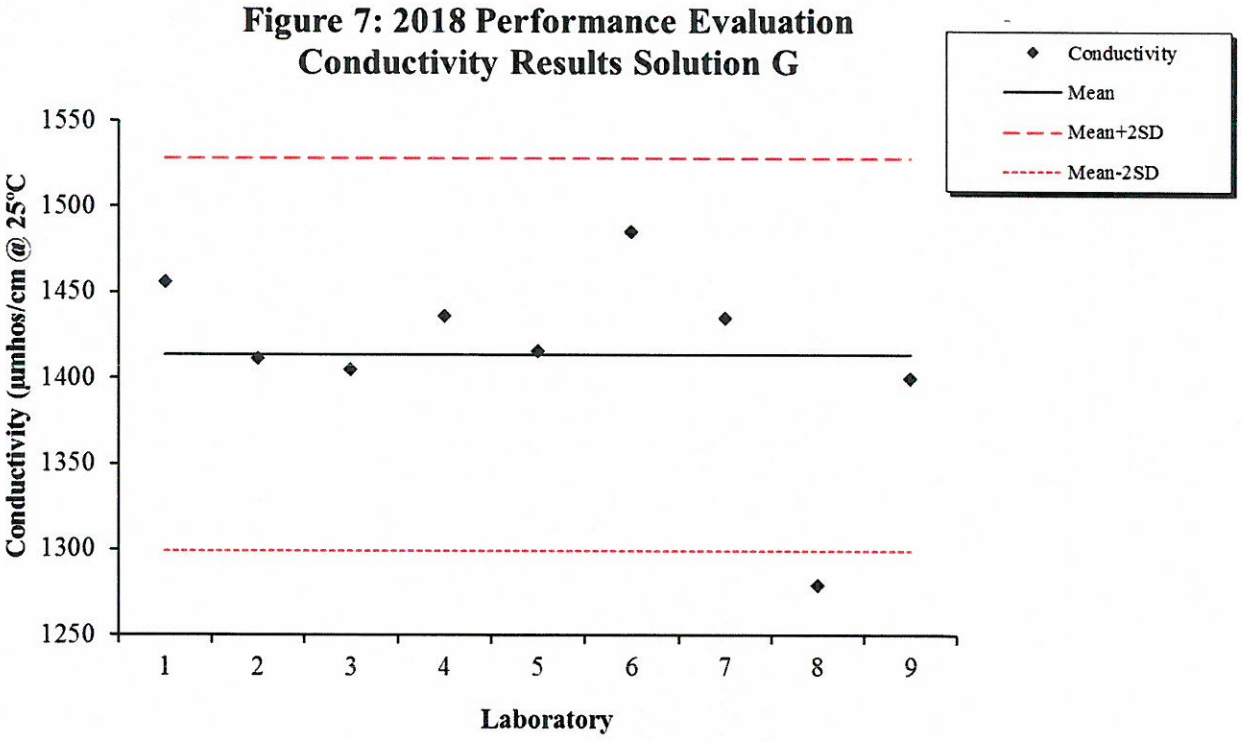


Figure 8: 2018 Performance Evaluation
Hardness Results Solution H

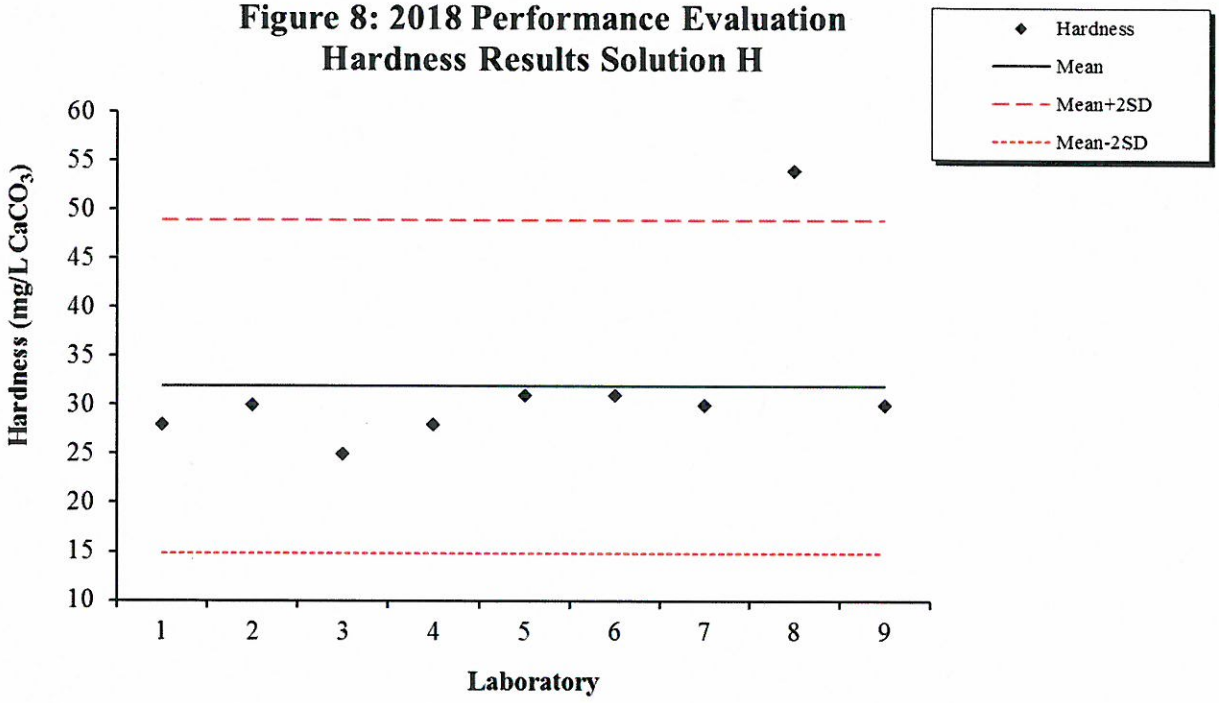
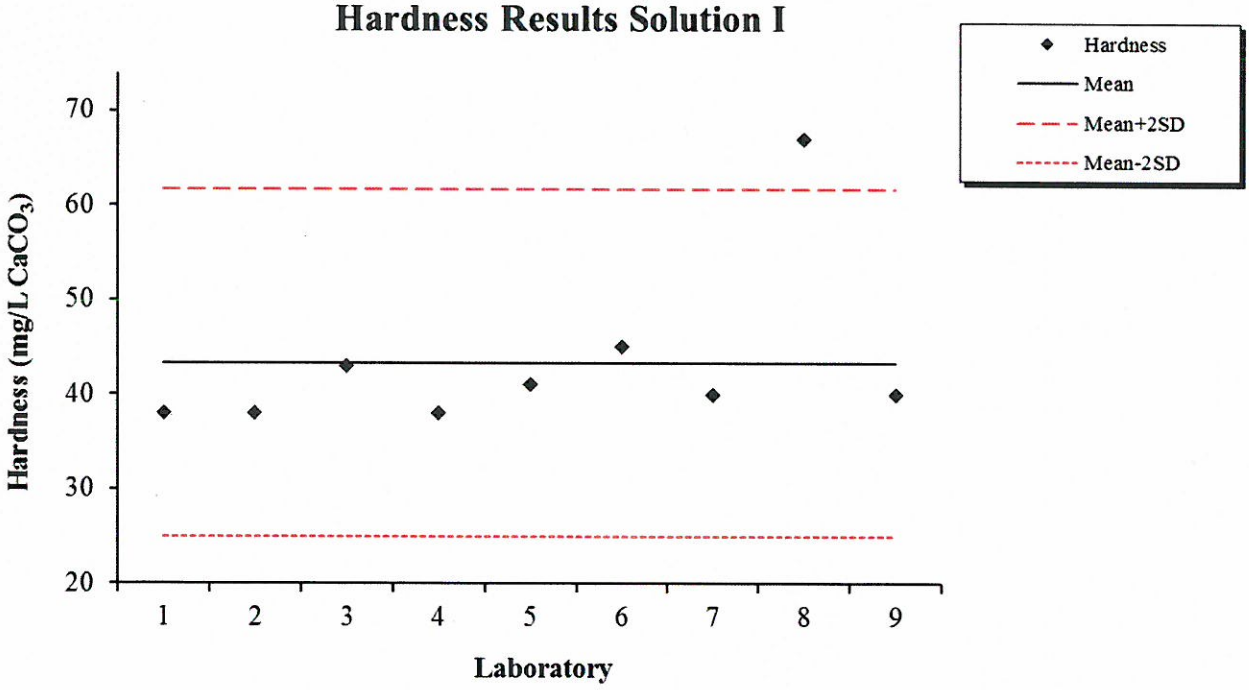


Figure 9: 2018 Performance Evaluation
Hardness Results Solution I



Individual Lab Discussion
Environmental Testing Solutions, Inc.

The results of the chronic and acute *Ceriodaphnia dubia*, acute *Pimephales promelas*, pH, conductivity, and hardness solution analyses test results have been reviewed and are enclosed. Environmental Testing Solutions, Inc.'s test results were all found to be within acceptable ranges.

Please refer to the following list to determine your respective Lab # for each enclosure.

Figure 1	*Ceriodaphnia* Chronic Solution A	Lab # 5
Figure 2	*Ceriodaphnia* Acute Solution B	Lab # 8
Figure 3	*Pimephales promelas* Acute Solution C	Lab # 5
Figures 4-9	pH, Conductivity, Hardness	Lab # 9

Thank you for your cooperation in this study. We appreciate your commitment to maintaining certification with the State of North Carolina. If you have any questions, please contact Carol Hollenkamp or me at (919) 743-8401.

Sincerely,

Cindy Moore, Supervisor
Aquatic Toxicology Branch

Enclosures