Arikaree Environmental Laboratory
Revision 1
Date: Feb. 11, 2020

Specific Conductance

1) Applicable Matrices

a) pH analysis is applicable for surface water, ground water, and wastewater analysis.

2) Scope and Application

a) pH analysis is performed using a conductivity electrode which measures the ability of a sample to conduct electricity.

b) This analysis can be performed in combination with pH analysis by using the same poured sample for each analysis. Perform conductivity first, then pH.

3) Interferences

a) Samples containing fats and oils can coat the electrode. Be sure to clean the electrode well between each sample

4) Equipment and Supplies

a) Mettler Toledo SevenEasy Conductivity Meter

b) 15mL Falcon centrifuge tubes

c) Ultrapure water squirt bottle

d) KimWipes

e) Warm water bath if samples are cold

5) Reagents and Standards

a) 84.0 µS/cm Conductivity Calibration Standard

6) Sample Collection, Preservation, Shipment, and Storage

a) Collect samples in clean plastic bottles. Store at 0-4^{o}C. Analyze ASAP.

7) Quality Control

a) A duplicate sample shall be analyzed once for every 20 samples. Control limits shall be calculated using the data obtained from these duplicates. Any duplicate falling outside of these control limits shall be reanalyzed.

8) Calibration

a) **Conductivity Meter Calibration Procedure**

(1) Turn on Conductivity meter

(2) Remove the electrode from the water storage solution, and rinse it with ultrapure water. Blot dry with a Kim® Wipe.

(3) Rinse a falcon centrifuge tube with 84.0 µS/cm Calibration Standard, then fill the tube half way with the standard.

(4) Dip electrode into tube multiple times (3+) to thoroughly coat the electrode.

(5) Press the "Cal" button.

(6) Allow the meter to stabilize. The meter will recalibrate itself.

(7) Record the conductivity value of the standard on the benchsheet.

(8) Remove the electrode from the tube, and triple rinse the electrode and tube with ultrapure water. Dry the electrode with a KimWipe.

9) Procedure

a) Make a list of samples requiring conductivity analysis. Locate and collect samples. Unpreserved samples are used for conductivity analysis.

b) Allow samples to warm to room temperature, by either allowing to warm on the bench, or placing in a warm water bath. If using a water bath, be sure samples are capped tightly, and are not floating.

c) Print a pH/Conductivity benchsheet located on the Arikaree Shared drive.

d) Record the sample ID #'s to be analyzed on the benchsheet.

e) Locate a falcon tube (triple rinsed w/ ultrapure water) and rinse the tube with a few mL's of sample. Be sure the sample coats all inside surfaces of the tube.

f) Fill tube half way with sample. Dip electrode into tube multiple times (3+) to thoroughly coat the electrode. Place the electrode into the tube so the sample covers the electrode.

g) Press the big green "Read" button.

h) Allow the meter to stabilize. Once the decimal point in the number stops flashing and the line over the A in the bottom right corner of the screen returns, the meter is stable. Record the value in the correct field on the benchsheet.

i) Remove the electrode from the tube. Triple rinse the electrode and tube with ultrapure water.

j) Repeat from step e) for all remaining samples recorded on benchsheet.

k) After all samples have been analyzed, rinse electrode with ultrapure water and dry with a KimWipe. Place electrode in tube with ultrapure water for storage.

l) Turn off conductivity meter, and wipe up any spills on the surrounding bench. Make the work station cleaner than when you started.

m) Record sample results on data sheets in office. Be sure to record the date analyzed at the top of the pH column, and write your initials under the pH data. Write legibly!

10) Corrective Action for Out-of-Control Data

a) Any duplicate outside of the control limits will be reanalyzed. If this does not correct the issue, meter will be recalibrated, and all samples will be reanalyzed.

11) Contingencies for Handling Out-of-Control Data

a) Samples with a failed duplicate unable to be rectified will be qualified back to the last sample with a controlled duplicate.

12) Waste Management

a) All waste produced from conductivity analysis is considered non-hazardous and can be disposed of down the sink.

13) References

a) Standard Methods for the Examination of Water and Wastewater, 22nd ed. Clesceri, L.S.; Greenberg, A.