Hach 2100P Turbidity Meter Calibration and Sample Measurement

Reagents and Equipment:
The master sampler kits contain silicone oil.

SAFETY:
Silicone oil may cause eye irritation. Please wear the goggles and gloves provided in your master sampler kit when working with the silicone oil. Please save all used and unused silicone oil for the volunteer coordinator to dispose of properly in accordance with local, regional, and national hazardous waste regulations.

CALIBRATION CHECK

1) Press the POWER key to turn the meter on. Place the instrument on a flat, sturdy surface. Do not hold the instrument while making measurements.

2) Set the range to AUTO RNG by pressing the RANGE key until AUTO RNG is displayed on the screen and the number show two decimal places (i.e. 4.02).

3) Set the signal averaging by pressing the SIGNAL AVERAGING key until SIG AVG is displayed on the screen.

NOTE: Handle the standard vials (and the sample cell) only by the top neck to minimize dirt, scratches and fingerprints, as excessive handling may cause faulty measurements in the future.

4) Thoroughly clean the outside of the Gelex vials (with a Kim wipe) and then apply a thin coating of silicone oil. Use 1 drop of silicon oil per vial. Apply oil uniformly by wiping with the soft cloth (black cloth in the turbidity meter kit). A thin layer of oil fills in and masks minor scratches and other imperfections in the glass.

NOTE: Avoid application of excess oil!! Applying excess oil may retain dirt and contaminate the instrument's cell compartment. Stray light and air bubbles in the samples are other potential sources of incorrect measurement.

5) Place the 0-10 NTU Gelex standard in the cell compartment so that diamond on the vial aligns with the orientation mark on the instrument. Close the sample lid.
6) Press READ. The display will show ‘----- NTU’ and then the turbidity in NTU (Nephelometric Turbidity Units). Record the turbidity after the lamp symbol turns off. Remove the vial from the instrument.

7) Repeat the steps 3 through 6 for the second Gelex standard i.e., 0-100 NTU.

8) If both the Gelex standards read within the 10% of the label value, go to step 10.

9) If any of the Gelex standard readings are not within 10% of the label values try to clean the vials again. Make sure no dust, fingerprints, paper fibers, etc. are present on the vial. If this doesn’t work, go ahead with the sample measurement and report the problem to the Volunteer Monitoring Coordinator.

**SAMPLE MEASUREMENT**

10) Refer to Step 11 on the “Sampling Day Activities” SOP (VM SOP 301) for instruction on sample collection.

11) Make sure the sample has been brought to room temperature before proceeding. Cold samples tend to produce condensation (fogging) on the outside of the sample cell when measuring in relatively warm/humid environments.

12) Invert the sample bottle to mix the particles that might have settled during sample storage and transport.

13) Triple rinse the sample cell with sample water; each time with cap on.

14) Pour the sample into the sample cell to start the measurement.

15) As described in Step #4 wipe the cell with a Kim wipe to remove water spots and fingerprints. Apply a thin film of silicone oil.

16) Turn the power on if you had turned it off after calibration check or if the meter turned itself off (meter turns itself off after 5.5 minutes of no activity).

17) Insert the sample cell in the instrument cell compartment so that the orientation mark on the sample cell (white diamond) aligns with the raised orientation mark in front of the compartment of the meter. Close the lid.

18) Make sure the **AUTO RNG** and **SIG AVG** are still showing on the bottom of screen.

Press **READ**. The display will show ‘----- NTU’ and then the turbidity in NTU. After the lamp symbol turns off, record the turbidity measurement on the turbidity measurement datasheet (Form VM2130).
19) Drain the sample cell; refill the sample cell with the water sample. Follow steps #12 through #19 to obtain three replicate readings in total. **NOTE: Step #13 is not necessary for the 2<sup>nd</sup> and 3<sup>rd</sup> turbidity measurements for the water sample. Only one calibration check per day is necessary. You don’t have to check the calibration before each sample.**

20) After measurement, rinse the used sample cell(s) with tap water (3 times). Follow the sample cell cleaning procedure described below.

**SAMPLE CELL CLEANING**

21) Make the soap solution by adding 3 teaspoons of the concentrated soap solution to about ¼ gallons of tap water.

22) Soak the used sample cell(s) and the cap in soap solution for 15 minutes.

23) Rinse the sample cell and the cap with tap water at least 5-6 times. Then rinse both with DI water 3 times (Both inside and outside of the cell; use the DI water bottle for rinsing).

24) Let the sample cell and cap dry over a paper towel until they are **completely dry**.

25) Store the sample cell in the turbidity meter kit until next measurement.

**NOTE:** Remember to handle the sample cell only by the top neck to minimize dirt, scratches and fingerprints, as these may cause faulty measurements in the future.

**REVISION HISTORY**

<table>
<thead>
<tr>
<th>SOP Revision #</th>
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<th>Section Modified</th>
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<tr>
<td>1</td>
<td>9/7/2016</td>
<td>All</td>
<td>Added header/footer to include program name, SOP number, revision date/number, issue date, and page numbering. Added approval sign offs and revision history sections.</td>
<td>Updating for better document control.</td>
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<tr>
<td></td>
<td></td>
<td>All</td>
<td>Proofreading edits by Christine Ellis</td>
<td>To improve clarity and fix typos.</td>
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