

SOP_TUN1.0 Field Standard Operating Procedure
Field SOP for Use of Turbidimeter TUN-CCWI-1

Meter description

ID# TUN-CCWI-1

Hach 2100P portable turbidimeter

Range 0 to 1000 NTU (nephelometric turbidity units)

Resolution 0.00 to 0, depending on low, medium or high range

Not waterproof

Measures light scatter property of water, a measure of suspended solids

How to Measure Turbidity

1. Wade into the stream and face upstream. Never grab a sample where bottom sediments have been stirred up. If your stream is fast moving, reaching out to take your sample upstream will avoid bottom sediment. If the water is slow, you may need to wait for settling or avoid entering the stream at all. Be aware of other people or pets upstream of you stirring up the bottom.
2. Rinse a vial or "cell" with the stream water twice.
3. Collect sample by inserting the vial upside down into the stream. Slowly turn the vial right-side up towards upstream. This collects a sample from the entire water column, rather than just surface water.
4. Use a lint-free cloth to wipe the outside of the vial. The vial must be dry, fingerprint and lint free. Be sure not to handle the vial below the line where the light will pass when it is placed in the meter. ***Do Not Scratch Tubes!***
5. Turn the meter on by pressing the POWER button.
6. Be sure that the SIG AVG and AUTO RNG functions are showing on the screen. If they are not, turn them on by pressing the respective button on the meter.
7. Invert the cell several times to re-suspend solids that may have settled to the bottom.
8. Lift the lid and insert the vial into the space provided. Be sure that the white diamond is facing the screen on the front of the meter. There is a raised tab indicating the correct direction. Close the lid.
9. Press the READ button. A light bulb appears on the screen and the meter begins to take numerous readings, flashing as it goes.
10. Once the screen has stopped flashing and the light bulb disappears, record the final reading on your data sheet.

ALTERNATIVE: Grabbing a turbidity sample directly from the stream is best. However a bucket or pole method may be used as well. Be sure to pour sample into the turbidity cell as quickly as possible. Stir or swirl the sample bucket as needed to keep the solids suspended before pouring.

IMPORTANT: If it is raining or you wish to carry less with you to the sampling site, the meter can be left in the box or car. Take just the sampling cell to the site. For transport, place the cell into the blue pouch for protection, do not place the cell directly in a clothing pocket, this may scratch the cell.

Trouble-shooting

Batteries: Takes 8 AA batteries, compartment on the bottom of the meter. A "bat" message will flash on the screen during a sample reading as batteries get low.

Error message: Make sure the lid is closed.

OR message: Over range, send sample back to lab for a dilution.

Check Instrument function in the field: If you suspect the turbidimeter is malfunctioning or your result is unbelievable, there are two actions to take. One is to take another sample (duplicate) and run this to see if it similar to the first. Record this second sample result on the data sheet as a DUP or duplicate. A second action is use of gelex secondary standards included in the turbidity carrying case. These known standards have a value written on their lid that was found by the instrument immediately after the last calibration. Read the two standards closest to (bracket) your sample value in the machine just like a sample, and record the result in the "comments" section of the datasheet. The results should be within 5% of the value written on the lid. If it is more than 5%, note this on the datasheet and send a sample back to CCWI lab.

REMEMBER: If the meter malfunctions or you get a suspicious result, tell staff and note it on the datasheet. Turbidity can be measured from grab sample up to 48 hours after a sampling event if it is kept on ice or refrigerated. If you have trouble in the field, bring a sample back to the CCWI lab for follow up analysis.

What to expect

- Low (<5) levels naturally outside of rainy periods.
- Storm events can greatly increase turbidity, into the 100's NTU.
- Summer algae growth can increase turbidity.
- High velocity, eroding soil, and heavy storms can increase turbidity.

Natural Levels

- Recreation: 5 NTU
- Drinking: 0-5 NTU
- General Aquatic Life: under 25 NTU

Calibrating the Turbidimeter:

Calibration Solution: StablCal sealed vials, Formazen liquid, at <1, 20, 100 and 800 NTU
Calibration frequency: Calibrated in lab, not field, quarterly or as needed per manufacturer's recommendation. Accuracy checks with Gelex Secondary Standards are preformed bi-weekly or as needed.

Take care to keep standards in their cases protected from scratches and breakage, and away from light to prevent damage.

1. Follow manufacturer (Hach) booklet on calibration every three months.
2. Reread the Gelex secondary standards immediately following calibration. Affix a label with the new value to each secondary standard.
3. Record actions in calibration log.

Disposal of used solution: Not OK to pour down drain. NEVER OPEN SEALED VIALS. Call the County Hazardous Waste Management Department for instructions on where to take expired standards. The standards are good for reuse up to their expiration date. They are OK to leave on the shelf as long as they remain undamaged and sealed.