



SHALE GAS VOLUNTEER MONITORING PROGRAM

Monitoring Best Practices

Meter Care & Calibration

- Every day that you monitor, calibrate your meter.
- The protocol includes DUAL CALIBRATION.
 - Calibrate with 84 $\mu\text{S}/\text{cm}$ solution first so the meter can perform more accurately when reading low conductivity values.
 - The 1,413 $\mu\text{S}/\text{cm}$ solution calibrates the meter to a middle-range.
 - Check out the [instructions online](#).
- Calibration solution best practices:
 - Make sure it has not expired.
 - Invert solution before calibration.
 - Screw cap on tightly after calibration so that the solution does not evaporate.
 - Dispose of solution after calibration.
 - Contact ALLARM if you need more solution.
- Allow the meter to stabilize in the solution before calibration.
- In cold weather, turn your meter on before testing your sample and allow it to get used to the cold air. This should help the reading stabilize faster.



Testing

- Monitor your stream (conductivity, TDS, stage, and visual assessment) at least once a month, even if the stream is dry or frozen over. It is important to note these conditions.
- Take pictures of your stream, especially in different seasons! This can serve as baseline data in the event of a pollution event.
- Record data at ALLARMwater.org. All of ALLARM's shale gas resources can also be found there.

Measuring Stage

- Take the depth measurement at the same point every time you monitor your stream.
- Stage can also be found by measuring the distance between a bridge and the stream below.
- Always measure stage using the same method in order to be consistent.

Quality Assurance/Quality Control (QA/QC)

- Within one month of your initial training, send a water sample to ALLARM for quality assurance/quality control (QA/QC), then send one approximately 6 months later. Even if you monitor multiple sites, you only need to send in one sample total. Then you should send in a sample once a year.

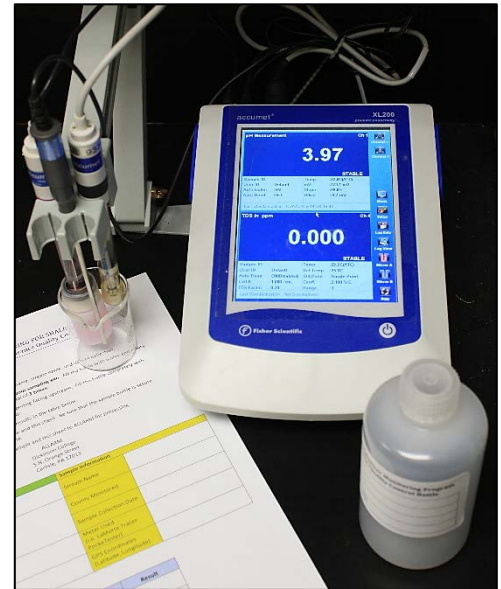


Sending QA/QC Samples to ALLARM

- Collect a water sample and fill out the QA/QC form (found on the [database](#) or in the [Shale Gas Monitoring Manual](#)).
- Mail your water sample and completed QA/QC form to ALLARM in a box, not an envelope.
- If you are sending > 10 water samples, please contact ALLARM so the lab can prepare for a large number of samples.
- Please do not send samples in January, May, August, or December. ALLARM's student lab coordinators do not work during these months, so it takes longer to complete the process.
- Contact ALLARM if you need QA/QC bottles.

What ALLARM Does with QA/QC Samples

- When ALLARM receives a QA/QC sample, we will send out a confirmation e-mail to the monitor.
- Conductivity and TDS are tested with the LaMotte Tracer PockeTester, then the Fisher Scientific Accumet.
- If funding is available, your first sample that you send in is acidified and sent to a nearby certified lab for barium and strontium analysis.
- Results are emailed to volunteers. The QA/QC process up to this point takes about 2 weeks. Then, when the Ba/Sr results are received, we will pass that information on to you as well.



Barium and Strontium Analysis

- Depending on funding, baseline barium and strontium levels are analyzed when the first QA/QC sample is sent to ALLARM
- Ba/Sr analysis helps to determine if a pollution event from flowback water has occurred when you find an elevated conductivity reading.
- If you believe a pollution event has occurred:
 - Collect a sample ASAP and send to a [local, certified lab](#).
 - [Decision trees](#) can help guide you with next steps and help determine if you have found a reportable event.

