

Georgia Department of Natural Resources

Environmental Protection Division Laboratory

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SOP 1-001 Rev. 2

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Georgia EPD Laboratory Standard Operating Procedure (SOP): Organic Laboratory Receipt Procedure – pH and Residual Chlorine Check for 608.3 and 625.1 Samples

Access to this SOP shall be available within the laboratory for reference purposes; the official copy of this SOP resides on the official Georgia EPD website at <https://epd.georgia.gov/about-us/epd-laboratory-operations>. Printed copies of this SOP will contain a watermark indicating the copy is an uncontrolled copy.

1 Scope and Application

- 1.1 Samples to be analyzed by EPA methods 608.3 and 625.1 must have pH and residual chlorine checked within 72 hours of collection. Samples are to be checked immediately upon receipt at the Laboratory. If samples are received late in the afternoon, they may be checked the following morning or the next business day provided the check could be performed within 72 hours of collection.
- 1.2 IDCs are not required for this pH and chlorine check. Any staff member of the organics laboratory may perform this check.

2 Definitions

- 2.1 Refer to Section 3 and Section 4 of the Georgia EPD Laboratory Quality Assurance Manual for Quality Control definitions.
- 2.2 Refer to GA EPD Laboratory SOP – Organics Data Validation, SOP 1-052, online revision.

3 Interferences

- 3.1 To prevent contamination of samples, never dip pH or chlorine test strips directly into sample bottles. Use a clean glass rod or disposable pipette to transfer a small aliquot of a sample to the test strips or into a small beaker into which a test strip can be dipped.

4 Safety

- 4.1 Refer to Georgia EPD Laboratory Chemical Hygiene Plan, online revision.

5 Apparatus and Equipment

- 5.1 pH strips with a range of 1-14 pH units
- 5.2 Residual chlorine test strips with a range of 0-2mg/L
- 5.3 Disposable pipettes, borosilicate glass, 1mL with bulb
- 5.4 Mini plastic sample cup, 12mL or glass beaker, 50mL

6 Reagents and Standards

- 6.1 Sodium hydroxide (NaOH) solution: 10N, reagent grade
- 6.2 Sulfuric acid solution (H₂SO₄), 1:1 v/v
- 6.2.1 Measure 4mL reagent or DI water in a glass container and slowly add 4mL reagent grade concentrated sulfuric acid using reagent pump and mix thoroughly and allow the solution to cool.
- 6.3 Sodium thiosulfate, reagent grade

7 Sample Collection

- 7.1 Refer to EPA Methods 608.3 and 625.1.

8 Calibration

- 8.1 Not Applicable

9 Quality Control

- 9.1 Not Applicable

10 Procedure

- 10.1 Samples are to be checked, using appropriate test strips within 72 hours of sample collection. Numeric values are to be recorded on the log sheet (see Reference Form 13.3). Check marks are not sufficient.
- 10.2 Each sample may have multiple bottles associated with it. It is only required that one bottle be checked, however, if the tested bottle is out of acceptable range, all bottles must be checked and adjusted accordingly.
- 10.3 It is not necessary to fill out a Corrective Action for pH or residual chlorine adjustment.
- 10.4 Test strips should never be inserted directly into the original sample. A small aliquot should be transferred to the test strip by means of a clean disposable pipette. If a test strip must be dipped into sample for measurement, an aliquot of appropriate size is transferred to a small container. Once tested, aliquots in containers are discarded in an appropriate manner.
- 10.5 After appropriate exposure to a sample, the test strip is compared to the test chart supplied with the test strip. The color of the test strip is compared to the chart and a value or range of values is determined for the sample. These values are then recorded on the log sheet (see Reference Form 13.3)

- 10.6 The manufacturer and the manufacturer's lot number are recorded on the log sheet.
- 10.7 The pH of each sample should be between 5 and 9 pH units.
- 10.8 If the pH is less than 5, the sample is adjusted with 10N NaOH. Add the 10N NaOH in 0.5 mL increments, capping and shaking after each addition. Recheck the pH after each addition. Repeat until pH is in the correct range. Record the number of aliquots needed, the standard number of the NaOH solution, and the final pH value on the log sheet.
- 10.9 If the pH is greater than 9, the sample is adjusted with 1:1 H₂SO₄. Add the 1:1 H₂SO₄ in 5-drop increments, capping and shaking after each addition. Recheck the pH after each addition. Repeat until the pH is in the correct range. Record the number of aliquots needed, the standard number of the H₂SO₄ solution, and the final pH value on the log sheet.
- 10.10 The residual chlorine should have a value of 0 mg/L.
- 10.11 If residual chlorine is present in the sample, it is neutralized with Sodium Thiosulfate. Add 80 mg increments of sodium thiosulfate per liter of sample, capping, shaking after each addition. Recheck sample residual chlorine after each addition. Repeat until residual chlorine tests as 0 mg/L. Record the number of aliquots needed, the standard number of the Sodium thiosulfate, and the final residual chlorine value on the log sheet.
- 10.12 After the pH and chlorine check is complete, samples should be stored appropriately in a refrigerator at $\leq 6^{\circ}\text{C}$, not frozen and protected from light or prepped for extraction.

11 Calculations

- 11.1 Not Applicable

12 Waste Management

- 12.1 See GA EPD Laboratory SOP-EPD Laboratory Waste Management Standard Operating Procedures, SOP 6-015, online revision.

13 References

- 13.1 EPA Method 608.3 – Organochlorine Pesticides and PCBs by GC/HSD, December 2014
- 13.2 EPA Method 625.1: Base/Neutrals and Acids by GC/MS, December 2016
- 13.3 Reference Form 13.3:

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Updates: Updated for online revision.