# Washing Filters for Algal Assay to Remove Trace Contaminants

1. SCOPE AND APPLICATION

    1.1. This method is based on Miller, W. E., T. E. Maloney, and J. C. Greene. 1978. The *Selenastrum capricornutum* Printz algal assay bottle test. EPA-600/9-78-018. U. S. EPA, Cincinnati, Ohio. 126 p. It is used to remove water soluble contaminants from filters used in AGP tests.

2. SUMMARY OF METHOD

    2.1. A filtering apparatus is set up. A filter is placed on the filter holder. Deionized water is passed through the filter. Washed filters are placed in a container and dried in an oven. Dried filters are stored in a covered container until used.

    2.2. Interferences include: contaminated water, airborne particulates and dirty filtering apparatus.

3. EQUIPMENT AND SUPPLIES

    3.1. Filter apparatus (see Figure 1)

    3.2. Whatman® or Millipore® filter reservoirs (2 ea)

    3.3. Filter clamps (2 ea)

    3.4. Whatman or Millipore fritted-glass filter holders (2 ea)

    3.5. 500-mL Graduated cylinder

    3.6. Unwashed filters (0.45 µm membrane filters and 1.2 µm glass fiber filters).

    3.7. Paper-filter separators for the 0.45 µm filters if available.

    3.8. 8-inch Carolina dish lined with Kimwipes® (1 for each type of filter)

    3.9. Aluminum foil

    3.10. Small forceps, flat tipped

    3.11. *AGP Record of Preparation* logbook

    3.12. Drying oven

4. REAGENTS AND STANDARDS

    4.1. Deionized (DI) water



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## 5. METHOD

5.1. Insert the stem of each filter holder into a blue Millipore plug and place into the 2 L filter flask. Wetting the stem of the filter funnel and the opening in the plug makes it easier to insert the funnel into the plug.

5.2. Connect the filter flask and the waste flask to each other and connect the waste flask to the vacuum line using rubber tubing. Turn the vacuum on at the countertop valve. The vacuum can be turned off and on during filtering using the small stopcocks along the base of the vacuum manifold.

5.3. Using flat-tipped forceps, place the filter to be washed on the filter holder. Wash 20% more filters than you think will be needed. Keep track of the number of filters washed.

5.4. Clamp the filter reservoir onto the top of the filter assembly.

5.5. Use the 500 mL cylinder to pour approximately 100 mL of DI water into the filter funnel.

5.6. Apply vacuum to filter the DI water through the filter. Start the vacuum by opening the stopcock on the vacuum manifold located at the base of the filter assembly.

5.7. After the water has passed through the filter, stop the vacuum by closing the stopcock.

5.8. Remove the clamp and the filter reservoir, then, use the forceps to remove the filter from the filter holder.

5.9. Place the filter in the Carolina dish. The first layer of 0.45 µm filters is placed directly onto the Kimwipes®, and then additional 0.45 µm filters are placed on the blue filter separator papers (one-to-one). 1.2 µm filters are placed onto the Kimwipes® and then layered (offset) on each other. The Kimwipes® help keep the filters from sticking to the Carolina dish.

5.10. Check that the vacuum waste flask is not full. Empty as needed.

5.11. Repeat Steps 5.3–5.9 until all the filters are washed.

5.12. Place the glassware in the dirty glassware area of the wet lab. Ensure that the vacuum system is turned off before you leave the area. Return the stoppers, clamps, and vacuum tubes to their respectively labeled drawers. Empty any water from the waste flask.

5.13. Dry the washed filters for one hour at 70 °C in the drying oven. This speeds the drying process and, most importantly, helps prevent mildew from forming on the stored filters.

5.14. Cover the Carolina dish containing the dried filters with aluminum foil.

5.15. Store the washed and dried filters in the cabinet above the filter apparatus set-up area.



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5.16. Record the lot number and number of filters washed in the *AGP Record of Preparation* logbook. Get filter lot number from the filter package.

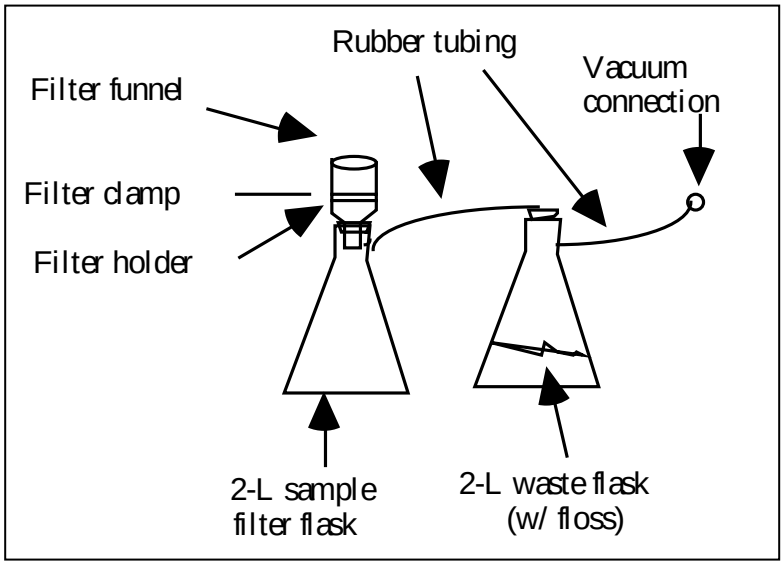



**Figure 1**

6. DATA ARCHIVAL

6.1. Use a black, waterproof pen for all bench sheets and logbooks.

6.2. To correct raw data entries, place a single line through the incorrect or illegible entry, write the corrected entry near the error, date and initial the correction. Do not overwrite entries.

6.2.1. The corrected entry is written as near as possible to the error or in the comment box on the appropriate bench sheet.

6.2.2. If the correction requires an explanation, write a comment and reference the error with a letter. Initial and date the explanation. Do not attempt to put all information (correction and comments) into a small space.

6.3. Use sequential alphabetical annotation to identify errors and corresponding comments (use A for first error and use A for corresponding explanatory comment; use B for second error, etc.).

6.4. If a problem occurs during sample processing, a nonconformance report (NCR) is submitted describing the problem and the corrective action.

7. QUALITY CONTROL

7.1. Refer to Laboratory Quality Manual for corrective action and handling out-of-control data.



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## 8. SAFETY/HAZARDOUS WASTE MANAGEMENT

8.1. Proper laboratory protection, including lab hood or ventilation system, lab coat, gloves and safety glasses, is required when working with chemicals and unprocessed samples.

8.2. Refer to Laboratory Quality Manual for sample disposal

8.3. Refer to the Laboratory Health and Safety Manual and Hazardous Waste Management

8.4. Read MSDS information for reagent handling and disposal.

## 9. REFERENCES

9.1. Miller, W. E., T. E. Maloney, and J. C. Greene. 1978. The *Selenastrum capricornutum* Printz algal assay bottle test. EPA-600/9-78-018. U. S. EPA, Cincinnati, Ohio. 126 p.

9.2. Laboratory Quality Manual https://floridadep.gov/dear/florida-dep-laboratory/content/dep-laboratory-quality-assurance-manual-and-sops

9.3. Laboratory Health and Safety Manual http://publicfiles.dep.state.fl.us/DEAR/DEAR%20Safety/FDEP%20Health%20%20Safety%20Plan%20B%20-%20June%202016.pdf

9.4. Hazardous Waste Management http://publicfiles.dep.state.fl.us/DEAR/DEAR%20Safety/hazardous%20waste%20manual%202016.pdf

**APPENDIX OF CHANGES**

| | |
|---|---|
| 01/04/2008 | Added Scope and Application, Summary of Method and Appendix of Changes |
| 12/30/2008 | Added Interference and Reference Sections |
| 09/05/2013 | Reformatted SOP |
| 02/09/2015 | Formatted for 508 compliance. |
| 08/14/2015 | Updated links. |
| 09/14/2016 | Updated links. Made separate reagent section. |
| 09/14/2017 | Corrected steps referenced in Step 5.11. |
| 08/28/2018 | Updated links and changed font to Calibri. |
| 07/10/2019 | Updated links. |
| 08/26/2020 | Updated data archival section with new universal language. Changed titles to “Equipment and Supplies” and “Reagents and Standards.” Updated equipment section language. |



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