

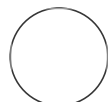


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Water sample collection and processing

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ABSTRACT

This protocol includes the guidelines for water sample collection and processing (CEAP samples)

MATERIALS

15-mL centrifuge tubes, polypropylene, conical bottom w/ CentriStar cap, sterile, natural;
 0.45 µm pore size, hydrophilic PVDF membrane filter;
 30-mL sterile syringes;
 0.45 µm syringe filters;
 60-mL Nalgene Square wide-mouth HDPE bottles;
 2-L HDPE bottles;
 Sampling pole;
 Disposable covered 50 mm petri dishes
 Magnetic stirring bar
 250-mL volumetric flask
 Turkey baster
 Filtration manifold
 Magnetic cylinders

OPEN ACCESS

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Protocol status: Working
 We use this protocol and it's working

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PROTOCOL integer ID:
 69746

SCOPE




- 1 This standard operating procedure (SOP) describes the procedure for the collection and processing of water samples in the Snake River Basin. Water samples are collected often for assessing water quality in the irrigation return flows to the Snake River. The samples are analyzed for pH, electrical conductivity (EC), total suspended solids (TSS), total Kjeldahl nitrogen (N), FIA-analyzed nitrate, ammonia and chloride, and digested for ICP analysis of Al, Ca, Fe, K, Mg, Na, P, S, and Zn.

- 2


Labelling bottles:
- 2.1

Label 2-L bottles and 60-mL bottles with sample location and sample number
- 2.2

Label 15-mL centrifuge tubes with the sample location, sample number ,date and initials.
- 3

Pipette  150 µL of  1 Molarity (M) or  6.2 mg/mL boric acid solution into centrifuge tubes
- 4

Petri dishes and filter membranes:

Equipment	
OHAUS™ Explorer™ Semi-Micro Balance or equivalent	NAME
Semi-Micro Balance	TYPE
Ohaus	BRAND
01-919-370	SKU
https://www.fishersci.com/shop/products/ohaus-explorer-semi-micro-balances/p-6541003#	LINK
0.01 mg to 52 gm capacity	SPECIFICATIONS
	

Equipment

Oven

NAME

Oven forced-air convection

TYPE

Fisher Isotemp

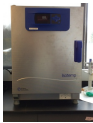
BRAND

15-103-0510

SKU

<http://www.fishersci.ca/shop/products/fisher-scientific-isotemp-general-purpose-heating-drying-ovens/151030510?keyword=true>

LINK



Equipment

Vacuum Desiccator

NAME

Ted Pella

BRAND

2246

SKU

https://www.tedpella.com/desiccat_html/vacpoly.htm



LINK

Any vacuum desiccator that will fit your samples will work

SPECIFICATIONS




4.1 Lay out petri dishes and add one membrane filter to each dish. Place then

in the oven at  60 °C  Overnight

4.2 Place petri dishes in the desiccator. Apply vacuum until it stops hissing, and disconnect

1h

vacuum tubing. Turn the valve to maintain vacuum. Keep the dishes in the desiccator for

 01:00:00 .

- 4.3 Weigh petri dishes + filter. Record weights in the worksheet.

Sample processing: filtering for FIA analysis

- 5 Sample filtering will depend on the number of sampling locations to be visited. If samples are collecting in one location only (e.g., water quality ponds), samples are to be filtered on site. If more sampling locations are to be visited (e.g. CEAP samples), all 2-L samples are brought into the lab and filtering will occur on the day or day after of collection. Unfiltered samples need to be stored in walk-in cooler if not filtered on the same day of collection. The steps for filtering are described below:
- 5.1 Transfer a 15-mL aliquot of water sample from the 2-L bottle using a syringe.
- 5.2 Attach a 0.45 μm syringe filter and filter the water into a 15-mL centrifuge tube containing boric acid.
- 5.3 Filtered samples are to be stored in the refrigerator in Room 119 until analysis.

Sample processing: unfiltered samples





- 6 Transfer a 50-mL aliquot of water sample from the 2-L bottle to the 50-mL bottles and store them in the refrigerator in Room 119 until TKN analysis. This step can also be conducted during the TSS analysis, if preferred.

Sample processing: pH end EC measurements

- 7 When 2-L water samples are at room temperature, measure pH and EC using the pH and EC meters in the Annex.

- 7.1 pH and EC meters must be calibrated before measuring. For EC, use 84 and 1413 $\mu\text{S}/\text{cm}$ calibrators. For pH, use the 7 and 10 calibrators.

Sample processing: TSS analysis

- 8 Place blank 0.45 μm membrane filters on each of the cylinder attachments on the filtration manifold using tweezers. Cover with the plastic cylinders.
- 8.1 Place water sample on stirrer and stir until vortex is formed and the sediment is in suspension.
- 8.2 Collect a  150 mL aliquot using the turkey baster into the volumetric flask and transfer it to the vacuum cylinder. The final amount of water that is filtered for TSS determination will depend on the amount of sediment in the sample. If there's little sediment, the volume filtered should be increased (i.e., if the volume added of water sample is filtered in less than ~2 minutes, add another  150 mL of sample to cylinder). For high-sediment samples, the volume to be filtered will need to be reduced to  50 mL or  100 mL.
- 8.3 Rinse the graduated cylinder with DI water and add that volume to the vacuum cylinder to account for the residual sediment.
- 8.4 Apply vacuum to manifold by opening the valves for the cylinders being used.
- 8.5 Once sample filtering is complete, remove the cylinders, and place the membrane filters back onto the Petri dishes using the tweezers.
- 8.6 Rinse cylinders, turkey baster, magnetic stirrer, and volumetric flask before moving to the next



sample.