Atmospheric Deposition Project—Bulk Deposition Funnel Collector Protocol (7/2009)

Samples are collected along with ADP wet buckets. If there has been no precipitation during the month, then the funnel and sample bottle should be inspected for damage and if necessary, replaced with clean ones when the ADP dry bucket is collected. During periods of heavy rainfall, the sample bottle should be collected before it overflows.

Funnels are acid washed with 10% HCl prior to installation. Sample collection bottles are 1 gal bottles that have been acid washed with 10% HCl. The collected sample is routed through tygon tubing between the funnel and bottle and forms a vapor trap to prevent evaporation of the sample. A tube running from the sample bottle to a 4 oz bottle containing nanopure water provides a second vapor trap but allows the sample bottle to breathe during precipitation collection.

In order to prevent bird droppings or insects from entering the funnel and contaminating the sample, a 17”x17” piece of HCl-washed fiberglass screen is tied to the top of the funnel using thin wire. Additionally, a small 2 cm square of HCl-washed blue aquarium filter is placed in the bottom of the funnel on top of the stopper.

Clean funnels are placed in plastic bags and stored with ADP buckets. Clean 1 gal sample bottles are stored in the same area. Other supplies (4 oz bottles, tubing, stoppers, cable ties, Velcro, nanopure rinse bottle, spare quick connects, screens, and aquarium filters) are stored in a sweater box in the cabinet where the ADP blue backpack is kept.

The funnel collector is located on the roof of LSA ‘A’ Wing. Access is via a locked gate. The key to the lock is kept in the top right-hand drawer of CK’s desk in LSA 311. The key is an ASU-style key stamped with ‘CGB 11’ on it.

Sample Collection

1. Inspect funnel for contamination (bird droppings, insects). If present, continue with the sample collection procedure, but discard the contaminated sample, do not prep it for analysis.
2. Replace screen-covered funnel with a clean one that has been acid washed. Wear nitrile gloves when handling replacement funnels to minimize Na contamination. Also replace the aquarium filter and rubber stopper in the neck of the funnel with ones that have been acid washed.
3. Disconnect the tubing from the funnel at the quick connect (on 1 gal bottle lid) and pour about 250ml of nanopure water into the funnel to rinse the tubing. Reconnect the tubing when finished.
4. Unscrew lid of replacement 1 gal bottle; put lid from this bottle on the sample bottle. Put new bottle on stand and replace cap. The easiest way to do this is to screw the bottle on to the lid, making sure the seal is tight. Record sample bottle number and tare weight on ADP field sheet under ‘Buckets’ under site ‘FUN’. The ‘Lid’ portion of the sheet will not be used. Note any contaminants on the
funnel (e.g. bird feces, insects) under ‘Contaminants’ on the field sheet. Remember to discard contaminated samples.

5. Inspect 4 oz bottle and replace with a new one half-filled with nanopure if necessary. Re-use the holed cap. Make sure tubing extends down into the water.

6. When replacing tubing, bring 1 18” long piece to connect from funnel to 1 gal bottle, and another 23” long piece to connect from 1 gal bottle to 4 oz bottle. Make sure the tubing that connects the funnel and 1 gal bottle is looped to form a vapor trap. Secure both pieces of tubing to the PVC frame.

7. Weigh the capped 1 gal sample bottle on the 12 kg balance in GWC 681 and record the weight on the ADP data sheet.

8. Samples should be refrigerated if not processed right away.

9. Process samples the same as an ADP wet bucket sample.

**Maintenance**

Funnels and bottles may become brittle and crack due to repeated acid washings and exposure to the heat. They should be discarded and replaced with new ones.

Tygon tubing will become yellowed and start to break down from heat exposure. Dirt may accumulate along the walls of the tubing and algae may also start to grow and discolor the tubing. Replace the tubing at the first sign of any of the above.

**Ordering Info**

311mm dia LDPE funnels, Fisher # 10-349B

One-hole No 1 rubber stoppers, Fisher # 14-135C

Tygon tubing 3/16”ID x 1/16” wall, Fisher # 15-315-6a

1 gal bottle, Fisher # 02-911-992

4 oz bottle, Fisher # 02-911-958

Pure-flo 18x24” bonded blue & white pre-filter (coarse), Pets Inc.

Roll of grey fiberglass screen, Home Depot