

NATIONAL ATMOSPHERIC DEPOSITION PROGRAM/MERCURY DEPOSITION NETWORK

INSTRUCTIONS FOR SUBMISSION OF THE SYSTEM BLANK SAMPLE

PLEASE READ ALL INSTRUCTIONS CAREFULLY BEFORE PROCEEDING

Your site has been selected to participate in the system blank program, one of the external quality-assurance programs operated by the U.S. Geological Survey for the National Atmospheric Deposition Program/Mercury Deposition Network (NADP/MDN). The system blank program is designed to measure the effects of field exposure, handling and processing on the chemistry of NADP/MDN precipitation samples. This program is vital in maintaining high data quality produced by the NADP.

PLEASE DO NOT SUBMIT A SYSTEM BLANK SAMPLE UNTIL A WEEK WITHOUT PRECIPITATION OCCURS AT YOUR SITE

The sample you have been sent should be submitted within six months (the last day of sample submission is stated on the sample bottle you received), after the first standard Tuesday-to-Tuesday sampling week without precipitation. If this time period passes without a full dry week, please mail the sample to Frontier Geosciences Inc. in the original box in which it was sent and mail the enclosed post card to the U.S. Geological Survey explaining that there were no dry weeks prior to the deadline date.

Verify ahead of time that you have all necessary supplies

ENCLOSED PLEASE FIND THE FOLLOWING SUPPLIES:

- One – system blank sample
- Two – MDN Observer Forms for the system sample and bottle sample
- One – postage paid post card addressed to the U.S. Geological Survey for recording the site ID and date the system blank sample is shipped to Frontier Geosciences Inc.

If you did not receive any of these items or these instructions are unclear, please call Natalie Latysh at (303)236-1874.

OTHER SUPPLIES YOU WILL NEED (ITEMS PROVIDED BY FRONTIER GEOSCIENCES INC. THAT YOU NORMALLY USE TO PROCESS WEEKLY PRECIPITATION SAMPLES):

- A standard cooler for shipping samples to Frontier Geosciences Inc.

OVERVIEW: The system blank sample must be processed on a Tuesday, when you visit your MDN site. If no precipitation occurred during the preceding week, 50% of the system blank sample will be poured through the precipitation collection funnel of the MDN collector into the “sample collection bottle” that spent the previous week installed in the collector. After the transfer, the “sample collection bottle” will be handled in the same manner as an actual precipitation sample and sent to Frontier Geosciences Inc. The remaining 50% of the system blank sample will be shipped to Frontier Geosciences Inc. in its original bottle. There are many detailed steps that need to be correctly completed, so please read all of the instructions carefully and follow them in the order listed.

STEP BY STEP INSTRUCTIONS

Procedures for submitting the system blank sample from your site to Frontier Geosciences Inc.:

A) Verify that no precipitation occurred during the preceding week

Process and submit a system blank sample only if you have a standard Tuesday-to-Tuesday period when no precipitation occurred. Check the rain gage chart, making sure the collector lid did not open and uncover the sample train. Any event pen marks indicating that the sensor was activated must not have been accompanied by even the slightest rise on the precipitation record pen trace. If you are in an area with high humidity that results in lid openings during the week without precipitation, please note this in the comments section of the observer form (example: “collector opened due to heavy fog/humidity, but no precipitation occurred”). The precipitation trace must be absolutely flat even if there were lid openings in response to periods of high humidity. Verify the record is complete and there were no clock stoppages or pen skips on the event recorder chart. If equipment malfunctioned during the preceding week, please do not process the system blank sample. Once you have verified that: 1) the wet deposition collector was working properly during the week; 2) there was no precipitation; and 3) any lid openings were caused by high humidity, proceed to step B to begin processing the system blank sample.

B) Transfer the system blank sample into the collection bottle

Wet the sensor with MilliQ water to expose the sample train.

Please pour 50% of the system blank sample (down to the line marked on the bottle) into the collection funnel of the MDN collector. The sample will pass through the funnel and thistle tube, into the “sample collection” bottle. Please wear clean gloves and be careful not to contaminate the sample in any way! Once 50% of the system blank sample has been transferred into the “sample collection bottle”, replace the cap on the system blank bottle and seal it in its original ziploc bag. Screw the cap onto the “sample collection bottle” (which contains 50% of the transferred system blank sample and preservative), ensure the bottle is sealed and remove the “sample collection bottle” from the overflow bucket. Place this sample bottle into a sample bottle bag. Place the bagged 2-L “sample collection bottle” and the bagged system blank bottle inside the cooler. Once both of the samples are capped and bagged you can begin the normal Tuesday field sampling procedures.

C) Fill out the 2 MDN Observer Forms (MOF) for the System Blank samples

1) MOF for system blank sample bottle containing 50% of the original solution. The remarks section of this MOF is already labeled “System Blank Sample Bottle”

Most of the sections on this form have already been completed by the USGS. Please fill in the following sections:

- 1) Station
- 2) Observer
- 3) Bottle-Off Date and Time when you poured the system blank sample into the collection bottle (it is the off date because the pouring occurs the day you are taking the sample off the collector)
- 6) Site Operations- (all equipment should have worked properly during the previous dry week in order to process the system blank sample)
- 9) Enclosure Temperature

2) MOF for the “sample collection bottle” that was installed in the collector for a full dry week. The remarks section of this MOF is already labeled “Sample Collection Bottle”

Please fill in the following sections:

- 1) Station
- 2) Observer
- 3) Bottle- Sample Bottle Id; the On and Off Dates and Times the collection bottle spent installed in the collector (the On Date should be previous Tuesday’s date and Off Date should be Tuesday’s date when you process the system blank sample)
- 4) Analysis Type-please check the ‘System Blank’ box
- 5) Observations –all should be checked ‘No’ since the bottle was covered by the lid all week and should not have been exposed to contamination
- 6) Site operations -all equipment should have worked properly during the previous dry week in order to process the system blank sample
- 7) Precipitation Record- please check the rain gage chart. Precipitation values should all be zero.
- 8) Overflow- should be ‘no’
- 9) Temperature
- 10) Please state the following in the Remarks section:
No precipitation the previous week.
Poured system blank sample into the sample collection bottle on ‘date’.

D) Fill out the enclosed pre-addressed post card and mail it to the U.S. Geological Survey.

Fill in the blanks with the requested information.

- 1) Four-character MDN site ID and site name
- 2) Observer name and initials
- 3) Date that the system blank was poured into the sample train and processed
- 4) Date that the system blank samples are to be shipped to Frontier Geosciences, Inc.

E) Ship the system blank samples to Frontier Geosciences Inc.

You will send 2 MOFs with the system blank samples: one form for the sample remaining in the original bottle and one form for the “sample collection bottle” that was installed in the collector. Please send the following items to Frontier Geosciences Inc. in the standard 3-hole shipping cooler:

- The 2-L sample collection bottle containing the preservative and 50% of the system blank sample
- The system blank bottle containing the remaining 50% of the solution
- Observer form for the sample collection bottle
- Observer form for the system blank bottle
- Rain gage chart
- The dirty funnel and thistle tube

ANSWERS TO FREQUENTLY ASKED QUESTIONS:

- 1. Q** If there was some precipitation at my site during the past week, do I still submit the sample?
- A** No, you will not submit the system blank sample in this case. The system blank sample is to be poured into the collection bottle that was installed in the collector only if there was a week with no precipitation.
- 2. Q** There was some precipitation at my site during the past week, but the collector malfunctioned and never opened. Do I still submit the system blank sample?
- A** No, you will not submit the system blank sample in this case. If the collector did not open due to a malfunction, please wait to submit the system blank sample until a dry week occurs when all equipment operates correctly. **Please notify the HAL of equipment malfunction ASAP so no other samples are compromised!**
- 3. Q** There was no precipitation during the week, but it was very hot and most of the preservative in the bottle has disappeared. Do I submit the system blank sample in this case?
- A** Yes, you will submit the system blank sample in this case. Please verify that absolutely no precipitation occurred during the preceding week.
- 4. Q** Do I need to write anything on the bottles for identification purposes?
- A** No, please seal the original system blank sample in the ziploc bag in which it was sent. This bag has a label listing information about the sample useful to Frontier Geosciences Inc. Please place the 2-L sample collection bottle in a ziploc bag, as you would with a standard precipitation sample. Please enclose two MDN observer forms with the samples.
- 5. Q** The collector opened during the preceding week, but I am sure it was due to high humidity. Should I submit the system blank sample?
- A** Yes, you should submit the sample after checking the rain gage chart, making sure the pen marks did not record wet deposition. Please note in the comments why you think the collector opened (in this case please note the high humidity). This is very important since Frontier Geosciences Inc. might not know the reason for the opening and invalidate the sample.
- 6. Q** How should I package all of the items in the cooler?
- A** Before processing the system blank sample, please check your inventory and make sure you have a 3-hole cooler for mailing all items to Frontier Geosciences Inc. If you do not have a 3-hole cooler, please contact Gerard Van der Jagt at Frontier Geosciences Inc. (toll free: 877-622-6960). Please place the used funnel and thistle tube into the designated spot in the cooler; place the 2-L sample collection bottle in its spot and the 1-L system blank sample into the smaller opening normally used for trace metal samples. Please place the 2 MOFs into a ziploc bag and lay it on top of the samples, inside the cooler.

We greatly appreciate your participation in the System Blank Program.

If you have questions please contact Natalie Latysh at (303) 236-1874 or E-mail address: nlatysh@usgs.gov
