

setup

1. Assemble several of the sample train sets
2. Hand out in the room
3. Have the sampler up and running

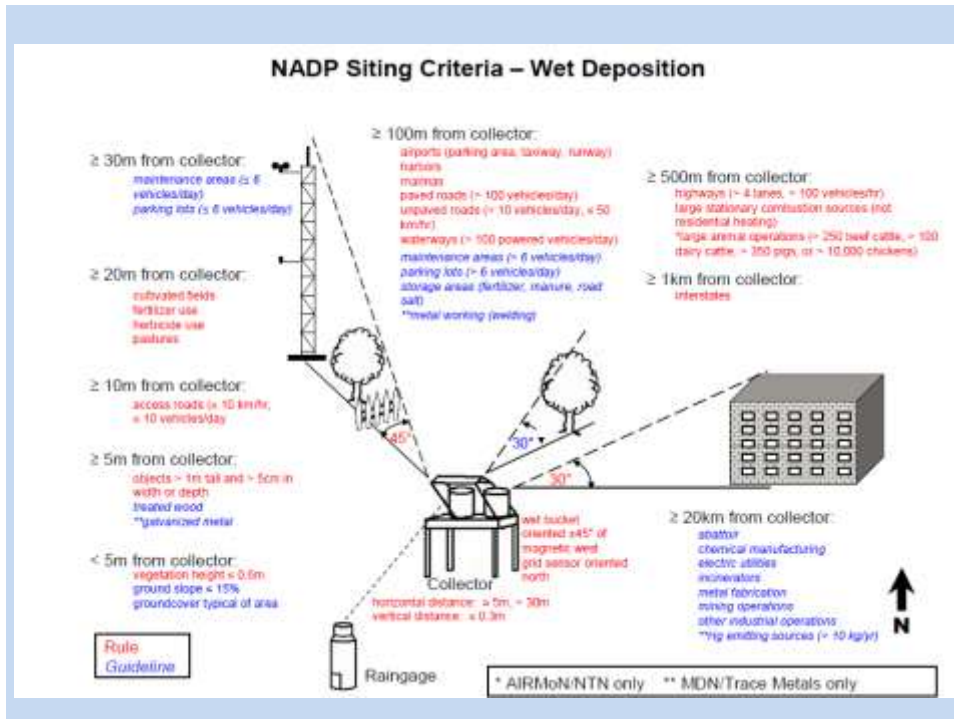
Siting

The Asia Pacific Mercury Monitoring Network

Introduction of the
Mercury Wet Deposition Standard
Operating Procedures
Draft Version #1

Site Location & Goals

1. Where data is needed
2. Site where the scientific validity of the sample is assured
3. Where power is available
4. Convenient for the operation of the site



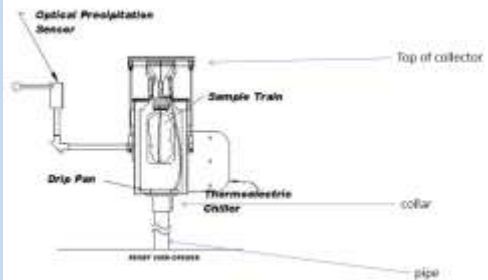
Installation

Installation: Aerochem-style





Installation: NCON-style





Start of Sampling for the APMMN

Pilot Network is ready to begin

1. Thailand
 - Collector is sited
 - Ready to begin
2. Vietnam
 - Collector will be sited in the next week or so
 - Will then be ready
3. Indonesia
 - Collector is in-country
 - Site chosen?
 - Estimated time of sampling start?

Date for Beginning of sampling?

September __, 2014

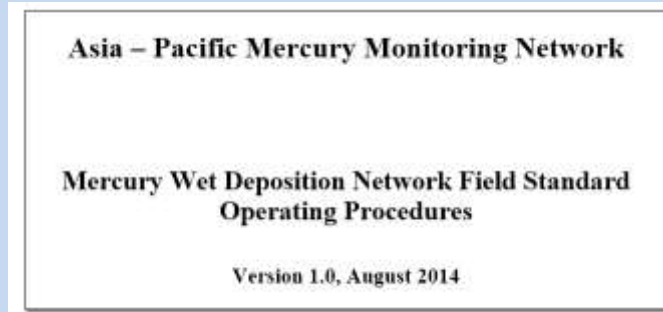
Draft SOP Review

- You received a digital copy
- There are 30 printed copies here

- Based upon the NADP SOP, with adjustments for the needs of the APMMN

SOP

- Presented for your approval here...



- If you have questions, please ask them
- If you would like changes, please ask

also

- If you notice something that needs changing, note it on you SOP
- After this session, we will combine the changes into one document, and make them...
- Does anyone want to be the recorder of change?

SOP, Page 1.

What is this Document for?

- The following **Standard Operating Procedure (SOP)** is designed to give the new site operator the detail necessary to perform sample retrieval and sample glassware deployment for the Asia – Pacific Mercury Monitoring Network (APMMN). This SOP provides step-by-step instructions on how to:
 - **Retrieve** the previous weeks Hg (Mercury) wet deposition **sample**
 - Complete the **Observer Form** for the previous weeks sample
 - **Deploy** the next week's sample glassware
 - Start the next weeks **Observer Form**
 - **Report the Precipitation data from a collocated rain gauge.**
-

SOP, Page 1.

Question: Do all have rain gages on their sites?

- It is best to have an onsite gage to record precipitation independently
- Do we all have one?
- Do we want to require one?

SOP, Page 1.

- Each site operator should carry out these instructions as they cover critical steps for **trace metals clean sample handling**. It is equally critical to follow these instructions consistently each week in order to **standardize the sample and glassware handling** for each sample.
- Note to Operator: There are a **number of different collector designs used in this network**, and care by the site operator should be used in interpreting this manual, which is written to be used with **all collector designs**. Notes appear in this manual when different conditions/steps are necessary for individual designs. The collectors being used in this network are shown in Figure 1.

SOP, Figure 1

Note the color
Associated with each
sampler



SOP, Page 4.

- When to change the sample....

When to Change your sample: All network samples are changed together on Tuesday mornings, between 8 and 10 AM local time. Please note the exact time on the Network Observer Form (NOF).

SOP, Page 4.

Sample Collection from Previous 7 day sample:

1. **Approach collector from downwind** Upon arrival at site, before approaching collector, determine which way the wind is blowing. Rule of thumb is to always approach the collector facing into the wind.



Recording
observations of the
site.

From downwind
As to not contaminate the sample

SOP, Page 4.

2. **NOF Section 10: Remarks** - Make observations as to the condition of the collection site and equipment. Record observations in Section 10: Remarks on Network Observer Form (NOF). Generally, observations should include the following:
- Is the lid in the correct position?
 - Is the lid seal in good condition (no ~~tags~~, dirt etc)?
 - Is rain sensor free of debris?
 - Is the equipment generally in good condition?
 - Are there any unusual conditions near the site (fire near by, construction, heavy snow, etc.)? and
 - Does the collector have debris on it (bird feces, dirt, etc)?

First record your obs on the NOF

SOP, Page 4.

3. **NOF Section 9: Enclosure Temp** - Open the enclosure door on the ACM collector and record the Max/Min temperature in Section 9: Enclosure Temperature of NOF.

If the Max/Min temperature within the collector is out of range (outside of 40-100F), adjust the thermostat to obtain the proper temperature range (increase temp on thermostat if below 40F -decrease cooling fan temperature if above 100F).

4. After recording Enclosure Temperature on the NOF, **reset the Max/Min thermometer** by turning the button on bottom of thermometer clockwise (or appropriate). The max and min indicator needles should both arrest to the same position.

Potential problems with temperatures <32F (0C)
and 100 F (4xC)

Question: does everyone have a min max thermometer?

SOP, Page 4.

5. While wearing a new set of gloves, unscrew the nut connecting the funnel to the sample bottle cap until the bottom of the bottle and cap are free from the funnel.



Lowering jack to
gain access to
sample bottle.

SOP, Page 4.

6. Retrieve the sample bottle cap from zip lock bag, and screw cap onto sample collection bottle. Ensure the cap is firmly in place. Once cap is in place, remove the sample bottle from bottle jack.

Differences here with different samplers

1. AEROChem has a labjack
2. NCON has a wheel "lazy Susan"

SOP, Page 4.

7. **NOF Section 5: Sample Condition** - Make observations of wet deposition (rain) in sample bottle. Identify any debris in sample and check the appropriate box in Section 5: Sample Condition of NOF. If any of the following debris is present in the sample, check yes next to the appropriate category in section 5.
- Bird droppings
 - Cloudy or discolored
 - Soot/Ash/Dirt Particles
 - Insects/Animal matter
 - Leaves/Twigs/Pollen/Plant Matter

After checking the appropriate box in section 5, identify the debris further in Section 10: Remarks, in as much detail as possible. For example: 4 misquotes, 2 large black particles...looks like soot particles; 1 piece of plant matter...looks like a pine needle; etc. If debris is present but does not fit any of the categories above, describe the debris in your own words and record this in section 10. If there is no debris present, check the NO box for each category of Section 5: Sample Condition.

Record on the NOF



Completing the
Network
Observer Form.

SOP, Page 4.

8. Once all observations of sample are complete, **place sample bottle in its original sample bottle bag, and zip lock the bag closed.** Place the sample bottle bag in the back of enclosure.

This is an important step as the Ziplock bag protects the outside of the sample bottle from collecting dirt and particles. Dirt and other particles typically have mercury adsorbed onto their surfaces. If this material was to accidentally get into the sample bottle, it could contaminate the sample.

Although the bottles are wiped clean when they leave the laboratory, our goal is also to minimize bringing outside sources of particles into the laboratory clean rooms.

important

SOP, Page 6.

9. **NOF Section 3: Bottle – Record the sample Off Date and Off Time.** For time please use twenty four hour time (example: 2pm = 1400hrs), and your standard time zone (i.e. Local Standard Time).
10. **NOF Section 8: Overflow** - Check the overflow container on sample bottle jack for overflow. If no overflow is present, check the No box in Section 8: Overflow.

If overflow is present, DO NOT ADD OVERFLOW TO THE SAMPLE, and check the Yes box in Section 8: Overflow. Pour the water from the overflow container into a plastic graduated cylinder. Measure the overflow and note the volume in milliliters and record this in the appropriate place in section 8.

Very important

SOP, Page 6.

Water found in the Overflow Dish should coincide with a full sample bottle:

If overflow is present, the sample bottle should be full to the top. Note if sample bottle is full in Section 10: Remarks. This will help those processing the sample to see if in fact this was an overflow from the sample bottle.

Cases where there is water in the overflow dish but the sample bottle is not full:

In some cases, the overflow dish could have some water in it but this water is not considered to be overflow. If the sample bottle is not full to the rim, it is likely that precipitation has leaked out of the sample bottle connection assembly. Check to ensure that the sample train was connected and that there were not cracks in the glassware where water could have

APM&V Field SOP Version 1

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escaped. Document all of your observations in Section 10: Remarks. Try to determine why this has occurred and be aware and avoid these conditions with the next sample.

SOP, Page 6.

Why Discard the overflow found in the dish?

The water in the overflow dish is contaminated from contact with the dish and is not part of the sample. **This precipitation will contaminate and disqualify your sample.** Once you have measured and recorded the volume of the overflow, pour it out and dry the inside of the overflow container with a paper towel.

Very important

SOP, Page 7.

11. Close enclosure door. Remove old dry side bag from dry side bucket. Observe the condition of the dry side bag (dirt, bird droppings, etc). Record any observations in Section 10, Remarks.



a. Removing old dry-side bag and
b. Securing new dry-side bag.

12. While wearing a new set of clean gloves, retrieve the new dry side bag from supplies. Open the bag and place into bucket. Pull top of bag over edges of bucket and pull bag down so it is firmly in place.

AEROChem Sampler Only (RED)

SOP, Page 7.

13. **Cleaning the Lid Seal:** Take the bottle of distilled water from enclosure and wet a clean paper towel.



Cleaning lid seal as it cycles to cover the dry-side bag.

14. **Clean the lid Seal:** As collector lid cycles to cover dry side, wipe the lid seal with the wet paper towel. Holding the wet paper towel in one hand, signal the sensor to open the sampler (apply a few drops of water to rain sensor, apply a few drops of water to rain sensor, wave your fingers in the sensor opening to trigger the sampler. As the lid opens, use the on/off switch inside the collector to turn off the motor at a convenient lid position for cleaning). While wiping down the lid seal observe the condition of seal and record any observations in Section 10: Remarks. If lid seal is torn, punctured, or looks discolored, please replace if possible.

SOP, Page 8.

15. **Removing old sample train:** by removing the funnel out of the top of the collector.

16. **Pull the bottle and connector assembly from below.** Observe the condition of assembly and funnel (dirt, debris, etc) and record any observations in section 10: Remarks.



NCON: Removing funnel/sample train from chimney. (Notice how they are being carefully lifted straight up out of the collector.)

Every sampler here

SOP, Page 8.

17. **Use the sample bottle cap to secure the sampler by removing the connector assembly, and securing the cap (from the old sample plastic bag.** Keep all used sample train components outside of enclosure. Be sure not to mix the used sample train from the previous week with the new sample train for the week to come. Always keep the sample trains separated and closed in their plastic bags.
18. **Return the collected sample back to its sample plastic bag.** Return the sample to the lab for shipping and analysis.
19. **Return sample funnel and collector assembly back to the lab for cleaning.**

Every sampler here

SOP, Page 8.

20. **Complete Section 6 part 1 “Site Operations” on the NOF.**

The questions in this section are designed to ensure that the site operator has checked that the ACM collector is working properly.

If problems are discovered during the weekly check of the equipment, the site operator should check the “No” box adjacent to the piece of equipment they are having problems with. You should note in Section 10: Remarks, the problems you are discovering. **IMPORTANT: Your job**

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does not end here! You must immediately begin to troubleshoot the problem in order to correct any problems found.

SOP, Page 8.

Precipitation Collectors: If the lid is in the open position, and it is not raining (or it is raining and the lid is not open), this is an indication that something is wrong with the collector.

- The site operator is principally responsible for determining when a piece of equipment is not working properly. Your collector must be assessed each Tuesday to ensure they are working properly.
- If a problem is discovered, the site operator should begin troubleshooting. This means referring to the troubleshooting guides above to help in correcting the problem.
- If the site is down and not working properly, valuable data is lost which is not recoverable.
- The goal for operating the site is to always have a fully operating collector and rain gauge in order to catch each week's sample.
- In order to minimize down time due to collector malfunction etc, the site operator should attempt to diagnose the problem.

This is just to remind the site operator of the importance of reporting a problem.

SOP, Page 9.

21. Cleaning The Equipment:

Special Cleaning Note: At this point in the process, now is the best time to perform routine "house cleaning" of your collector. The previous week's sample is capped and bagged and the new sample train is still in the bag and protected, so you cannot contaminate either one. Use paper towels and water or "409" glass cleaner:

- a) Wipe down the top of the lid and surrounding sides.
- b) Wipe down the 4 "arms" of the lid.
- c) **Clean off the rubber boots at the base of each arm.**
- d) Wipe down the top of the collector.
- e) Check the sides of the enclosure; if needed, wipe down the sides down with DI water.
- f) Clean any debris off the sensor. Stubborn debris can be removed by using a toothbrush.
- g) Inside the enclosure, clean the floor of the collector so it is dirt and bug free.
- h) Clean any other surfaces or areas which are beginning to build up dirt and other debris.



Cleaning the lid.



Cleaning the boots



Wiping down chimneys

SOP, Page 9.

Deployment of New Sample Gear:

1. Change your gloves.
2. Remove new sample bottle from supplies.
3. Remove new sample bottle from zip-lock bag and place into overflow container inside the sampler. Leave the bottle cap in place.



This is soooooo important

SOP, Page 9.

4. **Start a new NOF** for the week, by record the date and time the new sample glassware is deployed. Complete Sections 1& 2 of NOF and place NOF into a zip lock to protect from water damage. Place bagged NOF into collector enclosure for next week's sample retrieval.

Q. Do we want to move this to before we put on a new pair of gloves?.

SOP, Page 9.

5. Retrieve the new glass funnel and connector assembly. Open the Ziplock bag containing the glass funnel, holding the bag away from your body. Hold the glass funnel through the bag.
6. While still holding funnel through Ziplock bag, insert the funnel-assembly down through the chimney of the collector. Be sure to take care and not scrape the bottom of the connector tube down the inside of the chimney.



Bag covering
new funnel.

SOP, Page 9.

7. The funnel should now be resting on the lip of the chimney. Carefully remove the Ziplock bag covering the funnel and connector assembly.
8. Raise the sample bottle on the bottle jack up to just below the connector assembly, remove the sample bottle cap and connect the funnel connector to the sample bottle tube.
9. Put the sample bottle cap into the plastic bag, and seal the Ziplock bag that now contains the sample bottle cap. Store this bag and cap for the next week.

@@

SOP, Page 9.

10. Adjust the height of the sample bottle and funnel to ensure that the laboratory jack or bottle supports are supporting the weight of the bottle and any sample, and that it will not weigh down the funnel and pull the funnel free from the sample connector assembly. This is done by adjusting the bottle jack upwards such that the bottle, being raised, begins to raise the thistle-funnel upwards. You can observe the funnel rising above the rim of the chimney cap or the aluminum chimney. Adjust the funnel height such that it is just barely resting on the chimney cap or the rim of the chimney.

@@

SOP, Page 9.

11. From inside enclosure, look to make sure the sample bottle, thistle tube, and funnel are connected.
12. Stand on the North side of the sampler, (remember that each sampler rain sensor is pointed magnetic North). Facing away from the sample chimneys with your back to the open funnel, cup the rain sensor on the right side with one hand and blow off any remaining water. The lid should cycle back and come to rest on top of the funnel. turn the sample on/off switch back to on, and the lid should cycle back to the closed position. Check to make sure the lid seal makes a good seal with the top of the glass funnel.



Notice he is facing away from the exposed new sample train.

SOP, Page 9.

13. Place the sample from the previous week, used thistle tube and funnel, and NOF from previous week into shipping cooler.
14. Close enclosure door and clean up the site (used gloves, paper towels etc).

@@

SOP, Page 10.

Complete the NOF and Interpret Rain Gauge Chart:

1. Review the NOF for any missing information and add this information at this time. Note anything that you think might be of help interpreting the mercury deposition results. Add any of this information to the notes section.
2. Remember to collect new supplies for your next sample change-out, including any Field Forms, Gloves, Lid Seal Pads, DI Water, etc.
3. Place completed NOF with the sample, and return the NOF, sample, and dirty sample train back to your lab.
4. Ship the cooler to the following address within 48 hours of collecting sample. We suggest using 2 day UPS or FedEx service if possible, but longer times (3-4 days are also acceptable):

Dr. Guey-Rong Sheu
 APMMN
 Department of Atmospheric Sciences
 National Central University
 300 Jhong-Da Road
 Jhong-Li 320, Taiwan

Remember to copy the NOF for your own records and later data interpretation.

SOP, Page 10.

Precipitation Data

This network requires that data from an accurate precipitation gage also be collected for accurate determination of precipitation depth. Choose a rain gauge that is onsite (best), or as close as possible to the collector (within 5 kilometers).

1. Obtain the precipitation information from your precipitation gage.
2. Add the daily sums of precipitation (in millimeters) to the NOF.

Is this doable for all sites?

Need this value for QA and for calculating deposition

OBSERVER FORM
Send Completed Form With Each Shipping

Counters/Stacking # _____ LAB # _____

1. STATION
Name _____

2. OBSERVER
Print name _____
Initials _____

3. BOTTLE
ON OFF

4. OBSERVATIONS: Check yes or no if samples were observed to have any of the following. Describe all observations in Block 10.

YES	NO	YES	NO
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1. Bird droppings	4. Insect/dust/matter		
2. Cloudy or obscured	5. Leaves/leaves/branches/matter		
3. Suspended particles	6. Handing contamination		

5. SITE OPERATIONS: Check yes or no for all samples.

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>
1. Sample bottle not water free and assembly properly. Etc. to record parties.	

7. PRECIPITATION RECORD

Time	A - Rain Only (includes melt)							B - Snow Only							C - Mixture							WIND
	MON	TUES	WED	THURS	FRI	SAT	SUN	MON	TUES	WED	THURS	FRI	SAT	SUN	MON	TUES	WED	THURS	FRI	SAT	SUN	
0.5																						
1.0																						
1.5																						
2.0																						
2.5																						
3.0																						
3.5																						
4.0																						
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10.5																						
11.0																						
11.5																						
12.0																						

8. OVERFLOW: YES NO
 (check one)
 Overflow mL

9. ENCLOSURE TEMPERATURE: YES NO
 MIN/MAX °C

10. REMARKS: For example, equipment instructions, contamination, leaking, freezing, fogging, fogging, etc.

Use Daily

Observer Use Only

Observer Name _____

Observer Initials _____

Observer Title _____

Observer Date _____

Observer Station # _____

Observer Lab # _____

Observer Counters/Stacking # _____

Do we want Daily precipitation?
 Design a new form?
 Change anything that is obvious
 GR: anything new in the lab section?

Glassware Cleaning Procedure

All components of the sample train (funnel, sample bottle, connection apparatus and parts, sample bottle cap), and sample shipping bottles (and caps) should be thoroughly cleaned using the following method, following from Landis et al., 2002 (see below). All cleaning should be in a negative pressure vent hood in good working order.

Use 10% reagent-grade hydrochloric acid as the rinsing solution for all acid-rinsing steps.

Deionized Water (DIW): should have a maximum resistivity of 18.2M/cm. If stored, this water should be stored in acid rinsed glassware using appropriate laboratory practice.

Using powder free nitrile laboratory gloves, eye protection and appropriate laboratory safety clothing.

1. Rinse each component thoroughly three (3) times with fresh rinsing solution.
2. Then rinse thoroughly each component with DIW to ensure no Hydrochloric acid remains.
3. As a final rinse, rinse each component laboratory-grade methanol.
4. Air dry each component briefly in the vent hood, and store in "ziplock" plastic bags until used.
5. For the sample collection bottle, pre-weigh the bottle.
6. put 20 ml of 0.2 N Hydrochloric Acid into the sample collection bottle and cap the bottle.

- Do we want to add anything here about how often to send in cleaned glassware?
- i.e. QA checks on the cleaning procedures?

SOP, Page 10.

Precipitation Data

This network requires that data from an accurate precipitation gage also be collected for accurate determination of precipitation depth. Choose a rain gauge that is onsite (best), or as close as possible to the collector (within 5 kilometers).

1. Obtain the precipitation information from your precipitation gage.
2. Add the daily sums of precipitation (in millimeters) to the NOF.

Is this doable for all sites?

Need this value for QA and for calculating deposition

SOP, Page 13.

Sample Transfer to sample shipping bottles

1. Weigh the sample bottle to the nearest 1/10 gram. Record post-weight on the NOF
2. Put on a new pair of nitrile gloves.
3. Obtain the sample collection bottle, and place in the fume hood.
4. Obtain a acid-cleaned sample shipping bottle, and place in the fume hood.
5. Gently swirl the collection bottle to ensure that all surfaces in the bottle are washed by the sample liquid.
6. Uncap the sample shipping bottle, then the collection bottle. Pour up to 150 ml of sample into the shipping bottle. Cap the shipping bottle. Cap the sample bottle.
7. At this point, the remaining sample in the collection bottle can be used for additional measurement (duplicates, QA samples, etc.).

Any problems here?

Fume hood?

Sampling Supply List and Part Numbers, etc.

1. Plastic Bags: large enough for the 2-L sample bottle, and the funnel.
2. Plastic graduated cylinder: 100 ml or 250 ml for measuring overflow.
3. Dry-side plastic bags for buckets
4. Deionized Distilled Water (D/W) with a resistivity of 18.2M/cm or lower, made onsite or supplied from a reputable supplier.
5. "Squeeze bottle" for dispensing onsite and for cleaning the sampler. 500 ml per sample change out should be enough.
6. large "Kleenwipes" or alternative for cleaning sampler surfaces.
7. Sample Shipping Bottles (3-5, 150 ml) PETG bottles, used at a rate of 1 bottle per week.
8. Sample collection bottles with caps
Nalgene® Square Media Bottles, PETG, Sterile, Graduated; \$166/12 bottles,
9. for the Funnel-to-Bottle connection assembly; Teflon Compression Fitting (must decide on diameter; stem diameters
3/8" (9.7mm))
10. Five (5) "T" shape 3/4 ID Teflon tubing approximately 12 cm (OD to fit compression fitting above).
11. Five (5) borosilicate funnels sized to fit your sampler opening
12. Nitrile powderless gloves.
13. Carrying Case to move equipment to the field and retrieve samples
14. 10% reagent-grade hydrochloric acid purchased from a reliable supplier. Keep 2 liters on hand.
15. laboratory-grade methanol keep 2 liters on hand.
16. "Lab jack" or other support mechanism to support sample bottle in sampler. Sized appropriately and adjustable for your sampler.
17. 0.2 N Hydrochloric Acid for sample collection bottle pre-charge. Keep 2 liters on hand.
18. overflow container

SOP, Page 17.

List of Analytical Flags for assigning to Data.

Table 2. NADP/MDN Notes Codes			
Code	Description	HAL Database condition	Quality Rating Code
e	extended sample	duration of sample exceeds 194 hours	B
d	debris present	At least one of the six debris checkboxes is positive	B
m	missing information	<u>noEventRecorder</u> = true or <u>precip</u> = null or <u>ignoreRG</u> = true or <u>minTemp</u> = null or <u>maxTemp</u> = null	B
z	site operations problem	<u>HMworks</u> = false or <u>minTemp</u> < 32 or <u>maxTemp</u> > 100 or manual	B

Quality Rating A: no sample problems
 B: some, but sample still valid
 C: invalid sample

SOP, Page 17.

h	sample handling problem	bag = true or leak = true or shipping = true	B
b	bulk sample	(manual) bulk = true	C
v	rain gage/sample volume discrepancy	((RG ≥ 0.03 inches) and (bottlecatch < 1.5 ml)) or (bottlecatch/rg < 0.10)	C
u	undefined	(manual) undefined = true	C
f	serious field problem, data integrity compromised	(manual) field protocol = True	C
l	lab error	(manual) labprotocol = true	C
c	contaminated	(manual) contaminated = true	C
p	no precipitation from rain gauge or sample volume	(rgppt is null or ignoreRG = true) AND (bottlecatch is null or ignoreBC)	C

Yellow here means decisions we need to make

SOP, Page 17.

h	sample handling problem	bag = true or leak = true or shipping = true	B
b	bulk sample	(manual) bulk = true	C
v	rain gage/sample volume discrepancy	((RG ≥ 0.03 inches) and (bottlecatch < 1.5 ml)) or (bottlecatch/rg < 0.10)	C
u	undefined	(manual) undefined = true	C
f	serious field problem, data integrity compromised	(manual) field protocol = True	C
l	lab error	(manual) labprotocol = true	C
c	contaminated	(manual) contaminated = true	C
p	no precipitation from rain gauge or sample volume	(rgppt is null or ignoreRG = true) AND (bottlecatch is null or ignoreBC)	C
n	no sample	fullmass is null or emptymass is null	--

Yellow here means decisions we need to make

Example of Output Data Format

SiteID	Date On	Date Off	RGFFT	SVOL	SUBPPT	HgConc	HgDetp	Sample Type	QR	Notes
			mm	ml	mm	ng/L	ngm ³			
IND4	10/27/2000 18:00	11/01/2000 14:30	0.00	0.00	0.00	--	0.00	D	B	meth
IND4	11/01/2000 14:30	11/07/2000 14:30	5.84	66.80	5.84	12.84	75.05	W	B	rn
IND4	11/07/2000 14:30	11/14/2000 14:30	--	446.80	37.25	4.67	174.48	W	B	dash
IND4	11/14/2000 14:30	11/21/2000 14:30	--	1.80	0.15	22.03	3.30	W	B	rn
IND4	11/21/2000 14:30	11/28/2000 14:30	7.62	79.80	7.62	4.48	24.17	W	B	rn
IND4	11/28/2000 14:30	12/05/2000 18:00	11.62	138.30	11.62	7.06	62.04	W	B	dash
IND4	12/05/2000 18:00	12/12/2000 18:00	30.23	204.90	30.23	5.33	103.28	W	B	dash
IND4	12/12/2000 18:00	12/19/2000 15:00	17.02	366.00	17.02	4.88	84.74	W	B	dash
IND4	12/19/2000 15:00	12/26/2000 15:00	8.38	40.50	8.38	8.88	82.92	W	B	rn
IND4	12/26/2000 15:00	01/03/2001 18:00	17.87	44.50	17.87	8.89	158.07	W	B	dash
IND4	01/03/2001 18:00	01/09/2001 15:00	1.78	122.40	1.78	--	--	W	C	dash
IND4	01/09/2001 15:00	01/16/2001 14:30	3.11	42.50	3.11	2.44	7.60	W	B	rn
IND4	01/16/2001 14:30	01/23/2001 14:30	0.25	0.10	0.25	--	--	W	C	dash
IND4	01/23/2001 14:30	01/30/2001 14:30	16.51	204.90	16.51	8.67	158.00	W	B	dash
IND4	01/30/2001 14:30	02/06/2001 14:00	8.38	38.20	8.38	9.74	61.70	W	B	dash
IND4	02/06/2001 14:00	02/13/2001 14:00	26.67	325.80	26.67	11.48	306.38	W	B	rn
IND4	02/13/2001 14:00	02/20/2001 14:00	3.80	45.80	3.80	10.98	41.84	W	B	rn
IND4	02/20/2001 14:00	02/27/2001 14:00	51.31	539.30	51.31	7.04	261.41	W	B	dash

Any changes here?
 More/less?
 Different units?
 Other?

SOP

- That is it
- Problems?
- Additions?
- Subtractions?
- Editorial changes?