

**National Atmospheric Deposition Program
Spring Meeting
Asilomar Conference Center
Pacific Grove, CA
May 6 – 8, 2002**

Minutes of the Meeting of the Subcommittee on Network Operations

Monday May 6, 2002

Kristi Morris called the NOS meeting to order at 1:00 p.m.

The meeting agenda is provided in Attachment 1. List of meeting attendees is provided in Attachment 2.

Motion 1: Approve NOS meeting minutes-August 2001 (Champaign, IL, August 27-30) as summarized on the NADP website (<http://nadp.sws.uiuc.edu/meetings/>).

Motion passed.

AGENDA ITEM 1 – CAL Review 2002: Report and Response, Karen Harlin, ISWS

Central Analytical Laboratory (CAL) Report
National Atmospheric Deposition Program
Illinois State Water Survey
2204 Griffith Dr., Champaign, IL 61820

Updated from last report to NADP, August 2001

Site Operations:

- New NTN sites since Fall 2001 meeting: MO43, CAN5 (replaced CAN4), CA50, WI97, SC07, TX39, SC11, MI29, WI32, SC99, ME04
- Supply inventories: Total sites for inventory 240 NTN, 10 AIRMoN; equivalent to 270 sites/week.
 - Inventory target is **290 buckets, lids, and bottles per week** to allow for supplying new sites.
 - Conducting a mailer inventory from sites to evaluate reducing the number of mailers in circulation.
 - Bucket/lid bag update: continuing to work with manufacturers to eliminate chemical background
- 2002 Field Operations Training Course
 - 32nd Field Operations Training Course held at CAL on April 9-11, 2002
28 operators and 2 NADP staff enrolled

AL99, AR16, AZ03, CA42, CO02, CO94, CO91, CO96, DE02 (AIRMoN only), FL05 (NTN & MDN), GA98, ME02 (NTN & MDN), ME04, ME96 (NTN & MDN), MI29, MI48, MN01, MN28, MO43, MT97, ND00, NE15, SC07, TX39, VT99 (NTN & AIRMoN), WA98, WI32 (NTN & MDN), WI99 (NTN & MDN)

Information and pictures @ nadp.sws.uiuc.edu/cal (under “Training” or “What’s New”)

- 2003 Field Operations Training Course scheduled for April 8-10, 2003. Mark your calendars.
- *NTN Site Operation Manual* revisions
 - Fully revised Appendix B (*Troubleshooting pH and Conductivity Measurements*) is undergoing the final ISWS editorial review.
 - Appendix C (*Precipitation Collector Troubleshooting Guide*) and Appendix D (*Recording Raingage Troubleshooting Guide*) have been digitized and updated as needed.
 - Updated manual with all Appendices will be available on-line @ nadp.sws.uiuc.edu and nadp.sws.uiuc.edu/cal soon.
- Lid seal change scheduled for June 4, 2003. New instructional labels added.
- 2003 CALendar in preparation and will go to the printers by July 15 to meet the fall meeting delivery deadline. The focus this year will be on 20-year anniversary sites (21 sites which have not been previously pictured in a CALendar will be featured). A memo was sent to the following sites April 16, requesting pictures and an informational paragraph: MI99, MD13, OK17, GA20, OR97, PA15, IN20, OR09, FL41, KY35, AL10, WV04, TX56, NY68, NC36, KY03, ND11, UT01, OK00, PA72, AR03.
- “Sites” database updates:
 - All NTN information is loaded.
 - Data validation checks and output report generation programs are being written or refined.
 - Now maintaining 2 databases. When complete, we will discontinue the Rbase “Sites” database.

Laboratory Operations:

- Samples received as of 4/30/02
 - NTN: NW4100 sample ID = 224,100 samples logged in
 - AIRMoN: AB3383 sample ID = 13,383 samples logged in
- *NEW*: Computerized transfer of contamination codes, pH, and conductivity to CAL database began Oct 2001 for AIRMoN and February 2002 for NTN! This eliminates the double manual entry of pH and specific conductance results and sample contamination comments.
- *NEW*: LIMS system for laboratory data transfer. Allows rapid reporting and ion balance checks for samples not entered into the NTN and AIRMoN databases (external QA samples such as the USGS Interlaboratory Comparison Samples, Internal QA samples, Research samples).

- Investigating new instrument for major cations (sodium, potassium, calcium, & magnesium)
- NTN and AIRMoN archive samples that were approved for distribution have been sent (see Program Office report for details).
- NTN active archive samples that were approved for distribution have been sent (see Program Office report for details).

Data Operations:

- NTN Data to Program Office is still on schedule! Data to PO through Dec. 2001
- AIRMoN Data to PO is on schedule! Data to PO through February 2002.
- *NEW:* Additional computerized data validation checks for NTN to reduce manual checks
 - Are the field chemistry calibration check solutions for pH and specific conductance within acceptable ranges?
 - Are “Yes/No” checks in the Site Operations block of the FORF (FOBs) for collector and raingage operation consistent with the precipitation record and CAL assigned sampling protocol (SP) code for a “Bulk” or “Undefined” sample?
 - Is the 3rd item in the Site Operations block of the FORF (“the collector opened and closed at least once during the week”) checked “Yes” if the sample is coded “Wet” or “Wet add”?
 - An error check will be made to ensure that Field Blank, Blind Audit, and CAL internal QA sample types have been given an SP code of “Q”.
- Data Retention: Color-coding scheme implemented for the three networks. Kathy Douglas coordinating this effort.

QA/QC:

- March 2002, NOS Review of CAL operations. Review team: Brooke Connor, Leader (USGS Branch of Quality Systems, Denver, CO), Bob Brunette (Frontier Geosciences, Seattle, WA), and Nancy Lance (Environment Canada, CAPMoN, Toronto, Ontario, CAN).
- 2000 CAL Quality Assurance Report. Preparing for technical review.
- 2001 CAL Quality Assurance Report. In preparation by Jane Rotherth.
 - CAL Quality Assurance Plan status
 - Final ISWS editorial review completed. Updates in progress.
- 3-day internal Data Operations review was conducted in December 2001.
 - NTN Team: Bowersox, Harlin, Peden, Rotherth
 - AIRMoN Team: Bowersox, Harlin, Peden, Douglas
- Yearly SOP revisions completed, reviewed, and copies distributed.

- Interlaboratory Comparison samples received since August 2001.
 - USGS Interlaboratory Comparison Samples
26 sets/year, 4 samples/set
 - World Meteorological Organization (WMO)/Global Atmospheric Watch (GAW) Interlaboratory QA Program
Two sets per year, 3 samples per set. CAL participated in Fall 2001 and Spring 2002 sample sets.
 - National Water Research Institute, Ecosystem Interlaboratory QA Program (Rain and Soft Waters), Burlington, ON, Canada; 2 sample sets/yr, 10 per set. CAL participated in Oct 2001 and April 2002 sample sets.

Research:

- The second set of 2001 and the first set of 2002 World Meteorological Organization/Global Atmospheric Watch Intercomparison Study samples were prepared at the Central Analytical Laboratory and shipped to the Atmospheric Sciences Research Center, Albany, NY. The Albany laboratory distributes these intercomparison samples to approximately 100 laboratories worldwide. The WMO/GAW coordinates international atmospheric deposition monitoring and quality assurance for the participating laboratories. Jane Rothert coordinates this effort for the CAL.
- The CAL recently purchased one new Alltech ion chromatography suppressor system for IC. We anticipate improved detection limits with early eluting compounds and plan to develop its use to measure organic acids (such as formate and acetate) in refrigerated AIRMoN samples. Organic acids are believed to have a short-lived, yet important role, in the acidity of atmospheric deposition. Since AIRMoN samples are refrigerated continuously after collection in the field, organic acids may be present in high enough concentrations to make measurement possible without further sample stabilization. An investigation into the amount of organic acids, specifically acetate and formate, in AIRMoN samples could result in important, yet currently missing, atmospheric deposition information.
- The AIRMoN research study to measure SO₃ and SO₄ in PA15 samples is in progress. (See Rothert report at NOS). Sulfite (SO₃²⁻) and nitrite (NO₂⁻) are unstable in unpreserved atmospheric deposition samples as well as organic acids. In the summer sulfite is converted to sulfate and nitrite quickly in rain samples. In the winter, however, this is not always true. It is common to qualitatively observe sulfite and nitrite in winter AIRMoN samples. Since this source of sulfur and nitrogen is not quantitatively measured during the winter months, the amount of sulfur and nitrogen for winter samples for AIRMoN is underestimated.
- Organic and total nitrogen in NADP precipitation samples: Karen Harlin visited the University of Maryland's Center for Environmental Science Appalachian Laboratory (AL) at Frostburg University on January 23rd. She met with Dr. Mark Castro, a member of the faculty and a researcher who is measuring acid rain species, nutrients, mercury, and trace metals in precipitation samples collected at a research site near the University. Karen discussed possible collaboration

between the AL lab and the CAL, and discussed methods and equipment used by the two labs. This research will involve measurements of total nitrogen (organic and inorganic) found in precipitation samples. The CAL has purchased equipment necessary to do total nitrogen measurements and are now installing equipment and developing the procedures. The NADP measures inorganic nitrogen (as nitrate and ammonium) in precipitation. Currently, there is interest in determining the amount of organic nitrogen in precipitation. Methods to determine organic nitrogen require a total nitrogen analysis; the organic nitrogen fraction is then determined by subtracting the inorganic nitrogen from the total amount. The project will involve the development of sampling and analysis protocols that minimize the degradation of the labile organic nitrogen component of the samples. We are collaborating with Bill Keene's graduate student, Kristina Russell, at the University of Virginia, Charlottesville, VA, for analytical procedures. The study will be conducted in 2002-2003.

- Biohazards and microbes in precipitation: Karen Harlin attended a Water Quality Workshop held at Univ. of Illinois College of Veterinary Medicine, January 31-February 1. She will collaborate with Dr. Carol Maddox, a microbiologist at Veterinary Medicine, to look at microbial agents in precipitation. They have submitted an abstract to DOD to determine the agencies interest in funding this research.
- Evaluation of bag liners for NADP sampling vs. unlined buckets: The NADP invests considerable effort in washing and shipping buckets to sites. The capital investment in buckets and mailers limits the ability of the network to investigate sampler designs that could improve the collection efficiency of blowing precipitation. The Canadian Precipitation Monitoring Network, CAPMON, uses specially formulated bags as liners for their sample collectors. A collaborative arrangement with CAPMON and the NADP/CAL allowed for a special production run of 100 CAPMON style bags, specially sized for the NADP 3.5 gallon buckets, to be provided to us for testing. Samples are being collected at the Bondville site using these bags where data will be compared to the IL11 site. Other bags will also be investigated.
- ASTM updates: Mark Peden, Jane Rothert, and Loretta Skowron attended the ASTM committee on Sampling and Analysis of Atmospheres, D22, meeting held Oct. 22 - 24, 2001, in Dallas, TX. The main topic at the subcommittee on Atmospheric Deposition was the "Standard Guide for Preparation of Materials Used for the Collection and Preservation of Atmospheric Wet Deposition", which was up for reapproval by ASTM. ASTM Committee D-22 on Sampling and Analysis of Atmospheres met the week of April 14, 2002, in Pittsburgh, PA. The subcommittee on Atmospheric Deposition, chaired by Jane Rothert, met during this week and reviewed the status of two test methods that had been balloted within the subcommittee for reapproval. Both methods, one on **ion chromatography for anions in wet deposition** and the second, **pH of wet deposition**, received no negative votes and now move on to main committee ballots with a Society review. The subcommittee also discussed a new work item on verifying pipettor performance, which is being jointly developed with the ISWS Quality Assurance Committee. Test methods to be balloted for reapproval in 2003 include the determination of hydrogen

peroxide in wet deposition and the guide for quality assurance practices for laboratories analyzing wet deposition.

Motion 2. LeRoy Schroder suggested forming ad hoc committee to explore options for archiving samples and draw up policies concerning sample costs, archiving procedures and sample distribution.

Scott Dossett seconded motion.

Motion passed.

Committee members include: Karen Harlin (chair), Preston Lewis, Mark Nilles, and Rick Artz.

AGENDA ITEM 2 – NTN & AIRMoN Archive Sample, Karen Harlin, ISWS

Archival Samples (status as of May 1, 2002)

(1) Archival Samples (NTN > 5yrs old, AIRMoN > 2yrs old)

(a) Pending Shipment: This summer the CAL will send 1996 NTN **archival samples** from 8 sites (IA08, LA12, MT07, NE15, NY52, NC03, WI25, PR20) to **Dr. Emi Ito**, University of Minnesota. Dr. Ito seeks to obtain a modern calibration of the hydrogen and oxygen isotopic ratios of meteoric water at selected NADP sites over a 5-year period. By constructing time series records of the data at these sites, she hopes to establish the relationship between isotopic ratios in precipitation and in lacustrine carbonates, soil carbonates, aquatic cellulose, etc. Previously, Dr. Ito has received 1993 archival samples from 24 sites and 1994-1995 archival samples from these 8 sites. Dr. Ito has received approval for up to 25 stations through 1997.

(b) **Tyler Coplen**, US Geological Survey, received approval for **AIRMoN archival samples** collected at NTN & AIRMoN collocated sites (OH09, PA15) during 1997 and 1998. AIRMoN archive samples from 1997 and 1998 were sent to Dr. Coplen in January 2002. Dr. Coplen has previously received AIRMoN archive samples from these same stations. He is testing whether daily and weekly precipitation samples result in a $^{18}\text{O}/^2\text{H}$ signal that is physically consistent.

(c) Pending Shipment: **Brian Scott** (Environment Canada, National Water Research Laboratories, Burlington, Ontario) received approval for **AIRMoN archival samples** from 1997-1998 for DE02 and MD15 by an email vote of the executive committee in February 2002. Brian wants to analyze samples from these sites for haloacetic acids (such as trifluoroacetic acid, monochloroacetic acid, dichloroacetic acid and trichloroacetic acid). He has published results from Canadian lake water and precipitation, in

Environmental Science and Technology, 34:4266-4272. He requested samples close to urban sites. These samples will be shipped in May 2002.

(d) In April 2002, the CAL sent all remaining 1997-1998 **AIRMoN archival samples** to **Dr. Jeffrey Welker** (Natural Resource Ecology Laboratory, Colorado State University, Fort Collins, CO). Dr. Welker received approval for these samples via an email vote of the executive committee this spring. Jeff will quantify the isotopic ^{18}O and ^2H characteristics of individual rainfall events (daily samples) in relation to temperature, storm track, and relative humidity. These studies will be linked to his ongoing studies of the weekly isotopic characteristics of NADP samples at similar or nearby sites. These comparisons will provide a basic calibration of how well the integrated weekly samples reflect any within week variance in the characteristics of precipitation.

(2) Active Archival Samples (NTN < 5 yrs old; AIRMoN < 2 yrs old)

(a) Pending Shipment: **Dr. Ed Harvey**, School of Natural Resource Sciences, Univ. of Nebraska-Lincoln, previously received approval for **NTN archival samples** from NE99 (N. Platte) and CO22 (Pawnee) through 1998. Last August, the executive committee approved the subsampling of NE15 (Mead) through 2000. Ed will combine the samples to make monthly or seasonal tritium measurements. Dr. Harvey has previously received samples from this site for 1993-1998. The CAL will ship 1999-2000 samples this summer.

(b) At the April 2001 meeting, **Dr. Madhav Machavaram** of the Lawrence Berkeley National Laboratory received approval for receiving **active archival samples from eight NTN sites** (AR03, CA42, KS32, LA30, OK29, TX10, TX56, & UT99). He received approval for an additional site, OK00, via email vote of the executive committee last October. He will use ^{18}O and ^2H measurements to identify water body or land surface sources of water vapor producing the clouds and precipitation at these sites. By determining water vapor sources over space and time, Dr. Machavaram hopes to improve our understanding of hydrologic cycling in the southern Great Plains and how changes in the cycle influence climate. The CAL has sent Dr. Machavaram subsamples for Jan. 1999-Sept. 2000 archival samples. When the required one-year holding period ends additional samples will be shipped.

(c) At the April 2001 meeting, **Dr. Deborah Neher**, Assistant Professor of Ecology at the University of Toledo, received approval for samples from four Midwestern **NTN sites** (IN20, MI26, MI52, & OH15) for the period May 2001 to April 2002. The CAL is collecting **current samples in excess** of the ~150 milliliters required for analysis and archival purposes. The CAL will send her this "excess" volume in bottles she has provided and will pool samples by site and by month of collection per her request. The CAL has shipped monthly pooled samples for May 2001-Sept. 2001. The Oct. 2001-April 2002 samples are pending shipment. She will incur special handling charges for pulling, storing, and pooling these samples. Dr. Neher is studying the nitrogen budget in temperate oak savanna forests. She wants to measure $^{15}\text{N}/^{14}\text{N}$ in precipitation to assess the role of atmospheric nitrogen inputs to microbiotic crusts, such as lichens and algae.

She will use isotopic ratios to trace the origin of the nitrogen. Dr. Neher will be visiting the CAL in June 2002.

(d) **Tyler Coplen**, US Geological Survey, received approval for **NTN** samples collected at NTN & AIRMoN collocated sites (OH09, PA15) during 1997 and 1998. Dr. Coplen previously received portions of 1994 through 1996 NTN archival samples from OH09 and PA15. He is testing whether daily and weekly precipitation samples result in a $^{18}\text{O}/^2\text{H}$ signal that is physically consistent. The NTN subsamples for these sites from 1997 & 1998 were sent to Dr. Coplen in November 2001 after executive committee approval was given in August.

(e) **Jeff Welker** (Natural Resource Ecology Laboratory, Colorado State University, Fort Collins, CO) received approval for **NTN subsamples** from WI36, Trout Lake, for June-August 2001 and subsamples from three Oregon sites (02-Alea, 10-Andrews Forest, and 18-Starkey) from June-September for 1996 and 1997 for all of 2000 and July-August 2001. Welker (CSU), Ehleringer (U-Utah), Berry (Stanford), Bowling (U-Utah), McDowell (Oregon State), and Bond (Oregon State) are conducting studies in N. Wisconsin and across Oregon addressing carbon and water cycling in deciduous and evergreen forests and are interested in documenting the isotopic relationship between the oxygen of precipitation and the oxygen of CO_2 . These measurements will help partition the net flux of CO_2 and understand the fundamental linkages between the water and carbon cycle. The 1996, 1997, and 2000 subsamples for the three Oregon sites were shipped in January 2002. The remaining sample shipments are pending the 1 year holding period prior to shipment.

(3) Archival Samples Requests for Executive Committee Approval

(a) **Brian Scott** (Environment Canada, National Water Research Laboratories, Burlington, Ontario) received approval for AIRMoN archival samples from 1997-1998 for two sites, DE02 and MD15 by an email vote of the executive committee in February 2002. Brian wants to analyze samples from these sites for haloacetic acids (such as trifluoroacetic acid, monochloroacetic acid, dichloroacetic acid and trichloroacetic acid). He has published previous results in Canadian lake water and precipitation, in *Environmental Science and Technology*, 34:4266-4272. **He has also requested samples from the AIRMoN site NY67 Ithaca (Tomkins County)**. He is also interested in samples from NTN sites near urban areas (suggestions?).

(b) **Dr. Eugene Perry** (Professor of Geology, Northern Illinois University, DeKalb, IL) requested **excess samples from current sample processing operations for IL46 and MO43 (downwind and upwind respectively of St. Louis)**. Dr. Perry wants to check the feasibility of a newly discovered isotopic parameter that may help make it possible to distinguish sources of sulfate pollution. This research is based on a recent report that atmospheric oxidation of sulfur produces sulfate with an oxygen isotope signature that distinguishes it from virtually all mineral sulfate. This signature (non mass-dependent isotope fractionation) can only be determined by measuring the relative abundance of all

three stable isotopes of oxygen (^{16}O , ^{17}O , and ^{18}O). He may need pooled samples to obtain 10 samples from each of these sites of >800 mL.

(c) **Dr. Mark Castro** (Associate Professor, Appalachian Laboratory, University of Maryland Center for Environmental Science, Frostburg, MD) has requested **excess samples from current sample processing operations for MD03 and MD13**. Dr. Castro is interested in measuring total nitrogen (organic and inorganic) found in precipitation samples in the Chesapeake Bay watershed. He is also interested in MD15 (Smith Island), but this is an AIRMoN site and we currently have no policy for subsampling AIRMoN samples prior to the end of the 2 year holding period.

(d) The following researchers have expressed interest in NTN archival samples or subsamples. No details of sites or dates of samples requested have been received, therefore, no formal requests are pending at this time. Proposals that provide details on dates and sites are necessary before these requests can be considered further. Interest has been expressed by **Simon Poulson** (Department of Geological Sciences, Univ. of Nevada-Reno) and **Mark Lyford** (Department of Renewable Resources, Univ. of Wyoming). Poulson is interested in looking at stable isotopes in precipitation. He may submit a request prior to the July executive committee meeting. Lyford is interested in doing isotopic analyses. He is part of Welker's project and is interested primarily in April 2001 samples.

Motion 3. Scott Dossett moved for approval of current requests for archival samples for Brian Scott, Dr. Eugene Perry, Dr. Mark Castro, Simon Poulson, and Mark Lyford (requests summarized in Karen Harlin's report of archival samples).

LeRoy Schroder seconded motion and presented a friendly amendment to motion: modify Dr. Perry's request from current request stating: "excess samples from current sample processing operations for IL46 and MO43" to "excess samples for one year from current sample processing operations for IL46 and MO43" (this prohibits opening the door for relinquishing all future samples to Dr. Perry without further approval).

Motion passed.

AGENDA ITEM 3 – Electronic Data Collection in the CAL, Karen Harlin, ISWS

Please see Attachment 3 for slide presentation.

Synopsis:

- Defined goals of the project including: collecting data electronically from instruments for pH and specific conductance measurements, improve data transmission and storage.
- Presented system design requirements including: ease of use and aiding analyst performing the analysis.

-Described data collection, QC features, data export and other features.

AGENDA ITEM 4 – ATS External Site Survey/Audit Reports, John Shimshock, ATS Inc.

Background

- January 2002 - ATS awarded contract to conduct systems and performance survey services (herein after referred as surveys) of NADP sites (includes NTN, MDN and AIRMoN)
- Approximately 100 NADP sites will be surveyed each calendar year, thus yielding an approximate surveying frequency of one visit to each site every three years. ATS will select the sites to be surveyed during each trip based on the following criteria (listed in order of importance):
 - Select sites that have not been visited as part of this program for at least two years
 - Select sites in geographic proximity to one another
 - Select sites in the northern and mountainous parts of the networks to be visited during the spring, summer and autumn months (to help facilitate travel and surveying operations)
 - Select sites such that approximately one-third of the 100 sites surveyed during each calendar year will be from each of the three NADP networks
- Project Kick-off: Orientations workshop at NADP Program Office – January 30 through February 1, 2002 – Developed the templates for the surveys
 - Site Performance Survey Report (spreadsheet questionnaire)
 - Exit Letter
- Site Performance Survey Report
 - Station Information
 - Siting Criteria
 - Electrical Power
 - Precipitation Collector
 - Sensor and Motorbox
 - Rain Gauges – Belfort and Stick
 - Field Laboratory / Records and Field Supplies
 - Comments, Action Taken, Recommendations
- Exit Letter

- Cover sheet – Thank-you for your assistance
- “ATS recommends the following immediate action by the Site Operator:”
- “The following supplies and / or documentation were requested to be sent to you from the NADP Program Office (no further action by the Site Operator is required):”
- “Please contact Mr. Scotty R. Dossett, NTN Site Liaison, at (800) 952-7353 to discuss replacement items:”
- “The NADP Program Office will contact you to discuss the following site items:”
- “Other pertinent survey findings (no further action by the Site Operator is required):”
- Draft QAPP submitted to U.S. EPA in February 2002 -
Comments to the draft QAPP were received in March 2002

U.S. EPA provided interim approval to ATS to begin site visitations after the 90-day base period (i.e., after March 31, 2002), conditional on the inclusion of the U.S. EPA’s comments in a revised QAPP (due June 7, 2002)

Recent and Near-Future Activities

- April 2002 – Visited 6 NTN sites located in CA, HI and NV
- May 2002 – Visit 9 NTN sites and 1 MDN site located in CA and NV
- May 2002 – Continue efforts to revise draft QAPP
- Map of target sites

AGENDA ITEM 5 – NED Report, Scott Dossett, ISWS

Please see Attachment 3 for slide presentation.

Synopsis of NED report:

- Component Stati
- Recent Improvements
 - New battery operated rebuild scheme
 - Second repair vendor found
 - Collector Options and components offered through second collector vendor
- Recent Problems
 - ISWS sensor rebuilds (rusted sensors)
 - Raiorage clock gear (non) return
- Summary of Current Operation

- No sample loss due to lack of components
 - Rising motor unit and sensor replacements
 - No new parts coming in
 - Repairs will become more difficult
 - Plans
 - SOP needed
 - Consider data to evaluate equipment
-

AGENDA ITEM 6 – Ad Hoc Committee Report: Recommendations for Current Siting Violations, Joel Frisch, USGS

ASSIGNMENT

To make recommendations on how to facilitate change regarding existing and uncorrected siting violations reported by the numerous field audits. Our working group includes Preston Lewis, N.Y. State, Chris Lehmann, the recently appointed NADP QA manager, and Scott Dossett.

There is another working group led by Gary Stensland that will report a bit later. They are considering whether changes to the siting criteria are needed or appropriate. Chris is also on that work group.

APPROACH

There are several approaches that can be used to facilitate change. These include:

- A) Revise the criteria
- B) Issue an edict requiring full compliance within a fixed time period with a threat of expulsion
- C) Continue to work with and urge site sponsors to bring their sites into compliance
- D) A combination of components of these or other devised variations

Keep in mind that we prefer to collect quality data, not diminish the Network.

AUDITS AND VIOLATIONS

The siting requirements were defined long ago and have not substantially been modified. They address characteristics at the site as well those near and as far as 50 km distant. We also have a QA plan that includes siting criteria guidance and a process for granting “exemptions” to these criteria.

What is an exemption? It is a Network decision to permit a site with a violation(s) to continue operation as if there was no violation. In many instances reported violations were and are being corrected by site sponsors and operators, and the Network has caused site relocations a number of times. However there are numerous situations beyond sponsor control such as development-roads, industries, community development-and natural occurrences such as trees simply growing. Finally we have, after almost a 5-year

absence, a NADP QA manager, and now are in compliance with this element of our QA plan. We also had a QA steering committee which was abolished in 1997; this activity is a requirement of the QA plan.

But what we have not complied with, as required in our QA plan, is to record in the database any indication or reference to the existence of violation(s) or the granting of exemptions for siting infractions. We do believe this to be an important omission.

CONSIDERATIONS

Last fall a NOS proposal resulted in a minor change to the siting requirements. I am sure that others could be suggested by members of the NADP. Understandably, we will have to wait until decisions are made regarding modification to the siting criteria and possibly the QA plan.

Scott will present a first cut “siting criteria indexing” system that could be applied and recorded in the database for user knowledge. Chris will address the QA plan and its requirements. Preston spent some time on an idea for researching the question of the effects of violations on sample chemistry, but that is being addressed by Gary’s group.

OUR PLAN

Personally, I am very pleased that NOS is addressing these issues because I’ve been harping on them for quite a while.

We would like to hear your views and suggestions following Scott and Chris’s comments and then solicit your approval of several recommendations we will propose to the executive committee. We plan to continue working on a criteria indexing system; there will be much to be done, probably by the data management committee, to actually get the information into the database.

RECOMMENDATIONS

Reestablish the QA steering committee
Only admit new sites that fully meet all siting criteria
Defer granting exceptions
Concur with the proposal to develop a rating index system for reporting violations
Implement the QA plan requirement to report in the database the existence of violations

Motion 4. Notify data users of sites that do not meet Network standards.

Motion passed.

AGENDA ITEM 7 – Site Selection History, Scott Dossett, ISWS

Please see Attachment 4 for slide presentation.

Synopsis:

- This is a draft
- Brief history of the documents used in site selection
- Defining “LOCAL” siting criteria
- Weighing “hits”, applying scores to violations
- Notification system for sites describing violations

AGENDA ITEM 8 – Ad Hoc Committee Report: Review of NADP Siting Criteria,
Chris Lehmann, ISWS

**Siting Criteria from *Instruction Manual: NADP/NTN Site Selection and Installation,*
Section 2.3, 2001**

(Text from *Site Selection and Certification*, Section 2, 1978 is indicated in blue with original numbering sequence.)

A Anthropogenic Emission Sources to Air: Regional Requirements > 10 km (Section 2.3.1)

“The RAINGAGE and COLLECTOR should be located in an area that typifies a region and minimizes the impact of local point or area sources. However, if a region is characterized by a certain type of agricultural land use or industrialization, the COLLECTOR should be located to provide representation of such extensive deposition sources.”

A1 [A1-a]¹ “Industrial operations such as power plants, chemical plants and manufacturing facilities should be at least 10 kilometers (km) away from the collector. **[A1-b]**² If the emission sources are located in the general upwind direction (i.e., the mean annual west-east flow in most cases) from the COLLECTOR, then this distance should be increased to 20 km.”

78-3 [78-3a] “No continuous [stationary] sources of pollution shall be within 50 kilometers in the direction of the mean wind direction for the site, [78-3b] and 30 kilometers in all other directions.”

A2 [A2-a/A2-b]³⁻⁴ “This same [A1] criteria also applies to suburban/urban areas whose population approximates 10,000 people. **[A2-c]**⁵ For larger population centers (i.e., greater than 75,000) the COLLECTOR should be no closer than 20 km. **[A2-d]**⁶ This distance is doubled, to 40 km, if the population is upwind from the COLLECTOR.”

B Anthropogenic Emission Sources to Air: Local Requirements < 10 km (Section 2.3.2)

“Transportation related sources, agricultural operations and surface storage of certain types of products are typically the most troublesome sources to identify and quantify once regional requirements for industrial sources have been met...”

B1 [B1-a]⁷ “No moving sources of pollution, such as air, ground, or water traffic or the medium on which they traverse (e.g., runway, taxiway, road, tracks, or navigable river) should be within 100 meters (m) of the COLLECTOR. **[B1-b]**⁸ The local road net around the site is of particular concern. Traffic volume and type will largely determine the impact of these types of sources on the site.”

78-1 “No moving sources of pollution, such as routine air, ground, or water traffic shall be within 100 meters of the site.”

B2⁹ “Feedlots, dairy barns, etc., in which large concentrations of animals are housed should be no closer than 500 m from the COLLECTOR.”

B3¹⁰ “Grazing animals, and pasture should be no closer than 20 m from the COLLECTOR.”

B4¹¹ “Surface storage of agricultural products, fuels, vehicles, or other source materials should be kept at least 100 m from the COLLECTOR.”

78-2 “No surface storage of agricultural products, fuels, or other foreign materials shall be within 100 meters of the site.”

B5¹² “Parking lots and maintenance yards also need to be kept at least 100 m from the collector.”

C Site Characteristics that Affect Wind Flow and Precipitation Chemistry: On-Site Requirements < 30 m (Section 2.3.3)

“...the COLLECTOR and RAINGAGE should be sited to conform as nearly as possible with the following...”

C1 [C1-a]¹³ “The COLLECTOR should be installed over undisturbed land **[C1-b]**¹⁴ on its standard 1 m high aluminum base. **[C1-c]**¹⁵ Naturally vegetated, level areas are preferred, but grassed areas and slopes up to ±15% will be tolerated. **[C1-d]**¹⁶ Sudden changes in slope within 30 m of the collector should also be avoided.

[C1-e]¹⁷ Ground cover should surround the collector for a distance of approximately 30 m. In farm areas a vegetated buffer strip must surround the collector for at least 30 meters.”

78-4 “Sampler shall be installed over undisturbed land, preferably grass covered with no objects within 5 meters of the sampler.”

C2 ¹⁸ “Annual vegetation within the site should be maintained at less than 2 feet in height.”

C3 [C3-a]¹⁹ “No object or structure shall project onto the COLLECTOR or RAINGAGE with an angle greater than 45° from the horizontal (30° is considered optimal, but 45° is the highest angle acceptable). Therefore the distance from the sampler to the object must be at least equal to the height of the object (preferably twice the height of the object). Residential dwellings must be kept twice their height from the collector (30°). [C3-b]²⁰ Pay particular attention to anemometer towers and overhead wires...”

78-5 “No object shall project onto the sampler with an angle greater than 30° from the horizontal. Give particular attention to overhead wires.”

C4 ²¹ “Residential structures within 30 m of the COLLECTOR should not be within the 30° cone of the mean wind direction.”

C5 [C5-a]²² “The base of the COLLECTOR should not be enclosed. [C5-b]²³ Further, any object over 1 m high with sufficient mass to deflect wind should not be located within 5 meters of the COLLECTOR. Alter wind shields and open fences are excluded from this requirement.”

78-4 “Sampler shall be installed over undisturbed land, preferably grass covered with no objects within 5 meters of the sampler.”

C6 [C6-A]²⁴ “The RAINGAGE should be within 30 m of the COLLECTOR but no closer than 5 m. [C6-b]²⁵ Its orifice should be located within one foot of the same plane as the orifice of the COLLECTOR. In snow accumulation areas this may require a separate platform for the raingage.”

C7 ²⁶ “In areas where more than 20% of annual precipitation is snow, raingages must be equipped with an alter wind shield. This shield should be installed such that the pivot axis of the shield is at the same level as the top of the raingage”

C8 ²⁷ “In areas having an accumulation of over 0.5 m of snow per year, the COLLECTOR and RAINGAGE may be raised off the ground on a platform. The platform should be no higher than the maximum anticipated snow pack. In general, platforms are discouraged. Note: The 5m separation between the raingage and collector must be maintained..[C6]”

C9 ²⁸ “COLLECTORS located in areas which normally receive snow should have a properly counterweighted snow roof installed on the moving lid of the COLLECTOR only if problems with the opening and closing are encountered. If installed, the roof will be left on year round.”

D Other Criteria Affecting Sample Representativeness

D1²⁹ “Beyond 50 km both industrial and urban sources are generally assumed to blend in with the typical characteristics of the region.”

D2³⁰ “Local sources, whether point, line or area sources, will greatly influence the suitability of a site to serve as a long-term regionally representative station. Land development in future years may further compromise the site's usefulness as a station. For these reasons consideration should be given to alternate sites in the event that the original site is no longer representative of the region.”

D3 [**D3-a**]³¹ “The site should be accessible in both summer and winter [**D3-b**]³² and be a low risk to vandalism.”

D4³³ “Changes or modifications to established or approved sites or to its equipment must be submitted to the Program Coordinator's Office prior to implementation. This includes moving the site, siting other equipment in close proximity to the existing collectors (30 m), installation of snow roofs, etc.”

From *Quality Assurance Plan: NADP/NTN Deposition Monitoring, 1991*

2.3.5 Site and Sample Representativeness

The NADP/NTN monitoring program has representativeness objectives for monitoring locations as well as for the samples collected for chemistry. These objectives are (1) to obtain and analyze individual samples which are qualitatively and quantitatively representative of the precipitation that fell (sample representativeness), and 2) to obtain network data that represent broad-scale geographical patterns in concentrations and deposition (spatial representativeness). Specific goals are given below.

Sample Representativeness. The goals are to:

1. Collect a sample for chemical analysis that is representative both in the amount and type (rain, snow, etc.) of the total precipitation that fell.
2. Maintain the integrity of the precipitation sample through all stages of sample handling and chemical analysis.

Spatial Representativeness.

NADP/NTN recognizes that the representativeness of a given site location, or of the distribution of a group of sites, is best determined in the context of the planned application of the data. Nevertheless, general siting criteria have been established for the network in an attempt to obtain samples that are regionally representative, i.e., samples which are indicative of broad geographical patterns of deposition and are not markedly influenced by local emissions. In addition, the program seeks to identify and document any conditions or geographical features

which might compromise the regional representativeness of a site, so that data users can take this information into account in interpreting the data. Specific goals are to:

1. Ensure that sites meet the criteria established in Instruction Manual: Site Selection and Installation (Bigelow, 1984). These criteria are summarized in Figure 2-1.
2. Ensure that all conditions that can potentially compromise the regional representativeness of a site are identified and documented, and that this information is available to data users.

1.5 REMEDIAL ACTION PLAN

1.5.1 Description

The Remedial Action Plan describes the sequence of actions taken to resolve problems of noncompliance with NADP/NTN procedures, protocols, and criteria. The plan applies to violations of sampling protocols and siting criteria by established sites, unacceptable laboratory and data management procedures, and a site's failure to participate in QA programs. A flow chart of the plan is shown in Figure 1-3.

1.5.2 Sequence of Actions

Reports of noncompliance with program procedures, criteria, and protocols are initially referred to the QA manager. Possible sources of such reports are the CAL, external quality assurance programs, the Coordination Office, the NADP subcommittees, and site operators and supervisors. The QA manager determines the cause of the noncompliance and, if possible, rectifies the situation by assisting the noncomplying party in solving the problem that led to violation. Problems addressed in this manner are likely to be minor, such as those involving miscommunication between program participants. The problems and their solutions are summarized by the QA manager in semiannual reports to the Quality Assurance Steering Committee.

Problems not resolved by the QA manager are referred to the Coordinator. The Coordinator and his staff work closely with the noncomplying party in an effort to achieve compliance. Such problems are reported to the Quality Assurance Steering Committee on a semiannual basis. In cases where compliance with program procedures, criteria or protocols cannot be achieved and where a precedent has been established by the QASC for an exemption, the Coordination Office may grant one. The Coordination Office and the QA manager's actions are subject to review by the Quality Assurance Steering Committee, which reports them to the Technical Committee in an annual summary. Moreover, the actions are documented in the site files or laboratory files (Figure 1-3, Path A). The resolution of problems involving site operations are reported to the site supervisors and sponsors by the Coordination Office.

In the event that a problem cannot be resolved by assisting the noncomplying party in conforming to the procedures, criteria, or protocols--or in the event that a precedent for action on the part of the Coordination Office is lacking--the problem is referred to the Quality Assurance Steering Committee (Figure 1-3, Path B). The committee then refers it to the appropriate subcommittee(s). The Coordination Office provides as much information as possible to aid the subcommittee(s) in analyzing the problem and may also recommend a course of action. The subcommittee(s) reviews the problem and recommends a course of action to the Quality Assurance Steering Committee, which has the responsibility to evaluate the recommendations submitted by the subcommittee(s) and to decide on a course of action.

A decision to suspend a participant from the program requires the approval of the Executive Committee. All other remedial actions are determined by the majority vote of the Quality Assurance Steering Committee. Problems requiring remedial action and their resolution are reported to the Technical Committee on an annual basis. Remedial actions by the Quality Assurance Steering Committee and the Executive Committee are documented in the site and laboratory files and reported to the site supervisor or CAL director.

ADJOURN

Day 2 - Tuesday May 7, 2002

AGENDA ITEM 9 – OTT-Pluvio Phase III rain gage testing, Mary Tumbusch, USGS

Phase III-Evaluation of the Ott-Pluvio Rain Gage versus the Belfort 5-780 Rain Gage for Modernizing the National Atmospheric Deposition Program

The National Atmospheric Deposition Program (NADP) was established in 1977 to study atmospheric deposition and its impact on the environment. The NADP operates a rainfall collection network at over 250 sites across the United States, Canada, Puerto Rico, and the Virgin Islands. The rainfall is currently measured by the Belfort 5-780 rain gage, using technology that is over 50 years old. In 1999, a two-phase study was undertaken to investigate several rain gages to find a possible replacement for the current gage being used. One gage that performed consistently well was the Ott-Pluvio (OP) rain gage. Seven OP weighing system rain gages were purchased to evaluate the performance against the older gages. Phase III of the rain gage evaluation study was to determine the accuracy and compatibility of the rainfall collected by the OP gages, the existing Belfort model gages and the NovaLynx National Weather Service (NWS) stick gage as a reference at two sites. The OP gages were deployed at six NADP sites across the country for a data collection period of 18 months.

The data from the OP gages will be statistically compared with the data collected from the Belfort gages. The seven gages are installed at the following six test sites: Bondville, Ill (this site has two gages), Smith Valley, NV, Penn State, PA, Sand Mountain, AL, Marcell, MN, and Brooklyn Lake, Wy.

Results from these data sets were evaluated by running a histogram and normal p-plot to determine normality. A paired t-test was run on all precipitation event data sets. Results were also evaluated using a non-parametric statistical test (Wilcoxon Signed Rank Test) to compare gage performance.

Data from seven OTT Pluvio rain gages, six Belfort rain gages and two NovaLynx NWS type stick gages were compared on a daily basis for each site and set of gages. For the purpose of this study the amounts of precipitation recorded by the NovaLynx NWS type

stick gages were used as a reference against which the gages at IL11 and PA15 were compared.

The null hypothesis for the analysis is that the mean difference between the measurements equal zero. Paired t-test results indicated there was no difference between gages at three sites but when false positives were removed from the data set all sites indicated there were no differences between gages.

AGENDA ITEM 10 – Administrative and Technical Review of the National Atmospheric Deposition Program, Van Bowersox, ISWS

Please see Attachment 5 for slide presentation.

Report is available on website: <http://nadp.sws.uiuc.edu/nrsp3>

Synopsis of the administrative and technical review of the National Atmospheric Deposition Program:

Issue 1: Is the NADP satisfactorily achieving the NRSP goal?

Recommendations:

- Form a study group that will focus on addressing total deposition by collaborating with other collection networks.
- Develop a plan for future network sites, the ideal number and location of sites sufficiently providing required data.
- Consolidate reports of QA/QC activities covering the NTN, AIRMoN and MDN.

Issue 2: Is the NADP organization structure efficient and effective in carrying out the mission of the NADP?

Recommendations:

- Continue efforts to improve communication throughout the organization.
- Simplify the organization by reviewing the present structure and functions of subcommittees.

Issue 3 – Is the NADP long-term monitoring flexible to address future issues?

Recommendations:

- Accept sites for special studies, but do not necessarily include data in national trends.
- Monitor environmental issues for opportunities to apply NADP's expertise in resolution of these problems.
- Consider adding new monitoring capabilities.

- Add research tax to the cost of sample processing to sponsor research by the CAL/HAL and Program Office.

Issue 4: Is the NADP working towards the accomplishment of its vision?

Recommendations:

- Produce a white paper on NADP's future role in environmental research.
- Track implications for chemical analysis of pioneering biological research.
- Monitor technology.

Other issues discussed:

- Status of NADP/NTN precipitation collection sites.
 - Special issue of Atmospheric Environment "NADP2000 – Ten Years After the Clean Air Act Amendments".
 - NADP technical committee fall meeting – 10-13 September, 2002, Seattle, WA.
- Announcement and call for papers for the NADP technical committee meeting abstracts due August 9, 2002.

AGENDA ITEM 11 – Report on N-Con Precipitation Collector, Scott Dossett, ISWS

Please see Attachment 6 for slide presentation.

Synopsis:

- N-Con Sampler Update and data analysis
- Showed photos of N-Con sampler in the field
- Discussed improvements and continuing issues with the N-Con versus Aerochem
- Data presented comparing performance of the N-Con and Aerochem, including the following differences between the collectors: collector exposure times, sample volume, and chemistry

AGENDA ITEM 12 - Report on N-Con Mercury Collector, Mark Nilles, USGS

Please see Attachment 7 for slide presentation.

Mark Nilles presented initial results from the Boston Urban Gradient Mercury Deposition Study.

Objectives included:

- Support the USGS toxics and NAWQA Programs urban gradient study objectives
- Gain knowledge and experience on deploying mercury wet deposition collectors in an urban environment

- Collocate prototype instrument with MDN
- Test a new sampling train design
- Support R&D on new instruments by vendors

Site locations include:

- Laconia, NH (collocated with NH00)
- Manchester, NH
- Beverly Airport, MA
- Blue Hill Observatory, MA

Results during the initial operation (problems for which resolutions have been conducted or proposed):

- Problems with heaters occurred during very cold weather
- Lid arms slipped at two sites, resulting in non-standard positions
- Screw attachments loosened due to the two-arm lid drive system
- Heater drained 4 deep cycle batteries in less than a week at the solar site

Results during the initial operation (unresolved issues):

- Lid openings and closing in high winds at two of the four sites due to small particles activating the optical sensor

Environmental data is not yet available. Blanks that were run through each collector during the first day of operation produced 0.07 ng/L or less total Hg.

AGENDA ITEM 13 – MDN New Sample Train Data, Eric Prestbo, Frontier Geosciences Inc.

Please see Attachment 8 for slide presentation.

Synopsis:

Due to potential sampler changes in the future, time is right to upgrade and improve on the sample train.

Required conditions for new train:

- All plastic materials
- Larger funnel
- Minimal water-air exchange
- Oxidize rain in bottle
- Rugged, field and lab-user friendly.

New Sample train specifications:

- Maximum volume of water = 2400 ml
- Funnel opening = 118 cm²
- Maximum rainfall amount = 20.3 cm
- Maximum flow rate = 10.2 cm rain/min

Presented data on:

- Water evaporation during sample storage
- Bottle blank results
- Method detection limit determination
- Sample volume precision and storage
- Field spike recovery - accuracy

AGENDA ITEM 14 – Report on MDN Chimney Cap Tests at IL11, Clyde Sweet, ISWS

Clyde Sweet presented the results of a sampler intercomparison study that was conducted at IL11 between June, 2001 and March, 2002. Precipitation amount and mercury concentration were evaluated for collocated samplers. The samplers tested were the standard MDN version of the Aerochem 301 (ACM), the ACM fitted with an experimental plastic chimney cap, the MIC-B with the "Keeler" insert, and the N-CON sampler using a plastic sampling train. Precipitation amount was calculated from the bottle catch for each sampler and also measured directly using the NWS stick gauge and the Belfort rain gauge. The precipitation amount measured by the Belfort rain gauge averaged about 5% less than the stick gauge. Both ACM samplers collected about 13% less precipitation than the amount indicated on the stick gauge. This low bias is due to under-sampling snow and light rain. The MIC-B collected 15% more precipitation than the stick gauge. This high bias is due to splash from the Teflon insert during intense rainfall. The mercury concentrations were not significantly different in samples collected by either version of the ACM or the MIC-B sampler. The ACM chimney cap allowed for a better seal with the glass mercury collection funnel and reduced the amount of rain getting into the overflow bucket. Biased on very limited sampling the N-CON had a low bias for bottle catch and a high bias for mercury concentration compared to the ACM.

Motion 5. Scott Dossett suggested for chimney caps to be optionally employed at MDN sites beginning on first Tuesday of 2003.

Mark Nilles seconded motion

Motion passed.

AGENDA ITEM 15 – Tracer Dye Fence Post Proximity Study, Scott Dossett, ISWS

Please see Attachment 9 for slide presentation.

Objective:

- To use Rodamine B dye in a field trial with ambient precipitation to see whether 1 meter and 2 meter posts cause splash onto targets which represent NADP collector wet-side buckets. Schematic illustrations were included to show 1 and 2 meter results.

Results:

- 2 meter pole confirmed splash to 5 meter distant target.
- E, S and SE poles were splashed with Rodamine B during the event. Traces of dye were washed away by the end of the event. Where rain did not hit targets signs of dye splash were present.

AGENDA ITEM 16 – SO₃/SO₄ in AIRMoN Samples, Jane Rothert, ISWS

Please see Attachment 10 for slide presentation (Adobe Acrobat file).

Synopsis:

AIRMoN SO₄²⁻ concentration during winter months is less than NTN SO₄²⁻ concentration due to SO₃²⁻ remaining in the AIRMoN samples. Reanalysis of AIRMoN samples shows changes in SO₄²⁻ concentrations, higher SO₄²⁻ concentrations in the winter months in the reanalysis values with the difference being greatest in samples containing SO₃²⁻. Differences in pH after addition of hydrogen peroxide is not explained completely by the oxidation or elimination of organic acids. NH₄⁺ converts partly NO₃⁻ but it does not appear to be a stoichiometric conversion.

AGENDA ITEM 17 – Update on Experiments with Plastic Bag Liners, Karen Harlin

Central Analytical Laboratory has been experimenting with plastic bag liners in hopes of replacing the current sample collection procedures and reducing shipping costs. The Laboratory is working with vendors to find appropriate bags, taking into account bag size, cost, sample contamination from bag, etc.

A discussion ensued. It was suggested to attempt to employ bags at the NADP/NTN sites on the first Tuesday of 2003. However, because the use of bags for sample collection is still being explored, the CAL did not think this was a reasonable time line.

DISCUSSION

Mark Nilles moved to eliminate field pH and specific conductance measurements and begin bag sampling first Tuesday of 2003. Scott Dossett seconded motion. Vote generated 8 votes for motion, 9 against motion. Motion failed to pass.

A discussion followed addressing usefulness and costs of field measurements. Some of the points made include the following:

- Elimination of field measurements would save costs that can be applied towards other aspects in the Network, such as creating QA programs for MDN
- Laboratory analyses provide more accurate measurements because standard equipment is used in a controlled setting
- The usefulness and reliability of field measurements were questioned
- Field measurements do not provide chemistry of initial precipitation, since samples may have resided in the field for up to 6 days prior to analysis
- Field measurements are sometimes used at the CAL for tracking samples and ensuring they are in the correct order
- Field measurements can help indicate possible sample contamination
- pH differences between field and laboratory analyses are not consistent from sample to sample, varying with pH, site locality and sample size (i.e. one cannot accurately infer the initial precipitation pH by using a correction factor)

Motion 6. Natalie Latysh moved to form ad hoc committee to explore the value of field chemistry measurements, with plans to re-address the issue during the Fall 2002 meeting.

Jane Rothert seconded motion.

Motion passed.

Committee members include: Chris Lehmann (chair), Jane Rothert, Natalie Latysh, Mark Nilles.

AGENDA ITEM 18 – USGS External QA Report, Natalie Latysh, USGS

Blind Audit Program – Preliminary Results

Please see Attachment 11 for slide presentation.

Purpose of Blind Audit Program:

- Assess effects that sample handling, processing and shipping of NADP precipitations samples have on analyte precision and bias

Results:

- Compared with results from 2000, there has been a significant increase in the number of analyses exceeding the MDL for the Ultrapure deionized water samples for magnesium, sodium, potassium, ammonium, nitrate and sulfate, especially for the bucket portion.
- Paired differences between the bucket and bottle portions are small and show little variability for most analytes.
- Variability for the paired differences for most analytes has decreased since 1999.
- With the exception of hydrogen ion and specific conductance, all analytes show a slight positive bias resulting from introduction of additional ions in the bucket portion during sample handling and processing.
- Results from the Kruskal-Wallis test indicate that paired differences are influenced by sample concentration for sulfate and specific conductance; and paired differences are influenced by sample volume for sulfate and nitrate.

Field Blank and Reference Sample Program – Preliminary Results

Please see Attachment 12 for slide presentation.

Purpose of Field Blank and Reference Sample Program:

- To measure the effects of field exposure, handling and processing on the chemistry of the NADP/NTN precipitation samples. Unlike the blind audit, the purpose of the field blank program is to evaluate the contribution of the field exposed sample collection equipment to the sample's chemistry, such as: wind blown dust; dust and debris falling into the bucket.

Results:

- The number of analyses for the bucket and bottle portions exceeding the MDL for Ultrapure deionized water samples has increased significantly for chloride, potassium, and sulfate since 2000.
- Paired differences between the bucket and bottle portions are influenced by sample concentration for sulfate and specific conductance, differences increase with increasing concentration.
- Paired differences between the bucket and bottle portions are influenced by sample volume for magnesium, chloride and sulfate, paired differences increase with volume.

Collocated Sampler Program Study – 2000 – 2001 Results

Please see Attachment 13 for slide presentation.

Purpose of the Collocated Sampler Program:

- To provide an estimate of the overall precision of the precipitation monitoring system. This includes variability from the point of sample collection to input of data in the NADP/NTN database.

Results:

- Two sites, CO08 and NH02, participated in the collocated program from September 28, 1999 through September 26, 2000. Two sites, NH02 (2-year study) and CA99, participated in the program from September 26, 2000 through October 9, 2001.
- CO08 had large median absolute percent differences for deposition for most analytes, reflecting large discrepancies between the collocated raingages.
- K, Mg, Ca had the largest median absolute percent differences for units of concentration and deposition.
- Median absolute percent differences for units of deposition are greater for the first year of the study at NH02.

Interlaboratory Comparison Program – 2001 Preliminary Results

Please see Attachment 14 for slide presentation.

Purpose of the Interlaboratory Comparison Program:

- To estimate the precision and accuracy of participating laboratories.
- Determine if statistically significant differences exist among the analytical results, against which CAL's performance is compared.

Participants in the Interlaboratory Comparison Program in 2001:

- Illinois State Water Survey, Central Analytical Laboratory (CAL)
- Environmental Science and Engineering in Florida
- Shepard Analytical Services in CA
- Meteorological Service of Canada in Ontario
- Ontario Ministry of the Environment
- Acid Deposition and Oxidant Research Center in Japan
- Norwegian Institute for Air Research (NILU) in Kjeller, Norway

Results:

- The CAL did very well in replicate sample analysis in 2001.
- In 6 of 10 analytes the CAL ranked in the top 3 ranks, while for the year 2000's data the CAL ranked in the top 3 for 7 of 10 analytes.
- There were very few outliers in the control charts for the ten analytes.
- The CAL had only analysis that exceeded the MDL for magnesium.
- Most of the laboratories did extremely well in 2001 and the differences between participating laboratories are very small, for most analytes.

Intersite Comparison Program – Results for 2000 – 2001

Please see Attachment 15 for slide presentation.

Purpose of the Intersite Comparison Program:

- Assess the accuracy of field pH and specific conductance measurements.
- Identify site operator error or equipment problems in order to maintain high quality field measurements.

Results:

- Percent of successful pH and specific conductance (SC) measurements:
 - Study 44: pH - 82.9, SC – 93.7
 - Study 45: pH – 82.6, SC – 88.2
 - Study 46: pH – 90.2, SC – 97.1
 - Study 47: pH – 90.1, SC – 99.0
- Percent of successful pH re- measurements in the follow-up studies:
 - Follow up Study 44: 71
 - Follow up Study 45: 65
 - Follow up Study 46: 82
 - Follow up Study 47: 83

AGENDA ITEM 19 – Site Data Relay in the Brave New World, Scott Dossett, ISWS

Please see Attachment 16 for slide presentation.

Synopsis:

- Bad things happen with equipment failure, sometimes resulting from unfavorable weather conditions.
- Options include: remote relay, on-site relay, or a combination of the two.
- Presented equipment options and approximate costs.

Motion 7. An ad hoc committee was formed to explore data relay of future NADP sites.

Motion passed.

Committee members include: Scott Dossett (chair), Scott Archer, and Tom Jones.

ADJOURN