

The Ninth Senior Technical Managers' Meeting
of the Acid Deposition Monitoring Network in East Asia
27-29 August 2008, Niigata, Japan

Report on the activities of the Task Force on Monitoring Instrumentation

Network Center for EANET

1. Date of the 1st Meeting

Date: 26 August 2008

Venue: Large Meeting Room, Acid Deposition and Oxidant Research Center,
Niigata, Japan

2. Terms of reference (TOR)

- Review acid deposition monitoring instrumentation and laboratory equipment including their operation;
- Recommend suitable monitoring methodologies for EANET;
- To conduct studies on the performance of instruments and methodologies to ensure data comparability;
- Review current QA/QC procedures and recommend improvements; and
- Develop monitoring manuals and guidelines in cooperation with other subsidiary groups under SAC.

3. Members

- | | | |
|---------------|--|---|
| - Chairperson | : Prof. Wang Ruibin | China National Environmental Monitoring Center, China |
| - Members | : Mr. Chhek Roth | Ministry of the Environment, Cambodia |
| | : Mr. Zheng Haohao | China National Environmental Monitoring Center, China |
| | : Ms. Novy Farhani | Environment Management Center, Indonesia |
| | : Ms. Setouvanh
Phanthavongsa | Environmental Research Institute (ERI), Lao PDR |
| | : Ms. Siniarovina Urban/
Ms. Wong Fook Lian | Malaysian Meteorological Department (MMD)/
Department of Chemistry (DOC), Malaysia |

	: Mr. Barkhasragchaa Baldorj	Central Laboratory of Environment & Metrology, Mongolia
	: Ms. Htwe Htwe Win	Department of Meteorology and Hydrology, Myanmar
	: Engr. Arturo Bongco/ Engr. Robert Co	Environmental Management Bureau (EMB), Philippines
	: Dr. Han Jin Seok	National Institute of Environmental Research, Republic of Korea
	: Dr. Sergey Paramonov	Institute of Global Climate and Ecology, Roshydromet and RAS, Russia
	: Ms. Wassana Toruksa	Pollution Control Department, Thailand
	: Mr. Tran Son	National Institute of Meteorology, Hydrology and Environmental, Viet Nam
	: Dr. Hiroaki Yago	ADORC
Secretariat: Head	: Dr. Hiroaki Yago	NC
	: Mr. Hirokazu Taniguchi	NC
	: Ms. Tomomi Endo	NC

The provisional agenda and list of participants are shown in Annex 1.

4. Questionnaire Survey on Monitoring Instrumentation

A questionnaire survey on the status of monitoring instrument in the participating countries of EANET was conducted by the NC in July – August 2008 and the results were reported according to the following:

- (1) Summary of wet sampler and meteorological instruments;
- (2) Summary of dry deposition sampling;
- (3) Summary of laboratory equipments; and
- (4) Summary of problems reported by countries.

The participants discussed the summarized results.

5. Presentation

Presentations were made by some participants on the following topics:

- (1) Issues on sampling instrumentation and their operation;
- (2) Issues on laboratory equipment and their operation; and
- (3) Issues on QA/QC and data management.

6. Identification of activities to improve current monitoring

In accordance to the issues identified in the questionnaire survey, the presentations by some participants and the discussions at the meeting, the meeting identified several activities that could be undertaken by NC and participating countries to improve current monitoring. The list of recommended activities is attached as Annex 2.

7. Implementation plan for the EANET priority research project

The Concept paper of the implementation plan for the EANET priority project, “Studies on suitability of various low cost methodologies, such as passive samplers, for monitoring air concentrations” planned for implementation in 2009 using EANET budget was discussed. The revised paper is attached as Annex 3.

8. Next steps and schedule

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|--|-----------------------|
| - The First Meeting of Task Force on Monitoring Instrumentation | 26 August, 2008 |
| - Secretariat will report the activities of the Task Force on Monitoring Instrumentation at STM9 | 27-29 August 2008 |
| - Circulation of the Report of the Task Force meeting to participants and members of TFMI (including the revised project proposal) | by 30 September, 2008 |
| - Chairman of the Task Force will report its activities to SAC8 | 15-17 October, 2008 |
| - IG10 to consider project proposal | 20-21 November, 2008 |
| - NC will inform the members of TFMI and discuss the proposal with Chairman on Project Implementation | end of November, 2008 |
| - Start implementation of the Project | January, 2009 |

ACID DEPOSITION MONITORING NETWORK IN EAST ASIA (EANET)

FIRST MEETING OF THE TASK FORCE ON MONITORING INSTRUMENTATION SCIENTIFIC ADVISORY COMMITTEE (SAC) OF EANET

(Niigata, 26 August 2008)

PROVISIONAL AGENDA

August 26

09:00-09:10

1. Introduction

09:10-09:30

2. Draft terms of reference and membership of the Task Force Discussion

09:30-10:00

3. Results of the questionnaire survey Discussion

10:00-10:30 Coffee Break

10:30-12:00

4. Issues on sampling instrumentation and their operation
Presentation by Ms. Leonita Baetiong (Philippines) (15 min)
Presentation by Mr. Barkhasragchaa Baldorj (Mongolia) (15 min) Discussion

12:00-13:00 Lunch

13:00-14:30

5. Issues on laboratory equipment and their operation
Presentation by Ms. Wong Fook Lian (Malaysia) (15 min)
Presentation by Mr. Zheng Haohao (China) (15 min) Discussion

14:30-15:30

6. Issues on QA/QC and data management
Presentation by Mr. Phunsak Theramongkol (Thailand) (15 min)
Presentation by Dr. Sergey Gromov (Russia) (15 min) Discussion

15:30- 16:00 Coffee Break

16:00-17:00

7. Identification of activities to improve current monitoring Discussion

17:00-17:30

8. Implementation Plans for the EANET Priority Research Project:
- Studies on suitability of various low cost methodologies, such as passive samplers,
for monitoring air concentrations

17:30-18:00

9. Next steps and schedule

Discussion

18:00 Close

LIST OF PARTICIPANTS

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Activities to improve current monitoring

➤ **Sampling instrumentation**

1. Countries have different climatic conditions and other specific problems.
Collaboration with manufacturers to modify the design and customize according to specific requirements of countries may be necessary.
2. Countries should implement regular maintenance and keep sufficient spares as back-up to minimize downtime
3. In the case of countries with very low temperatures and/or low precipitation in winter, manual sampling may be the only option. In remote sites, bulk sampling may be considered (to consult the Expert Group on Revision of Technical Manual on Wet Deposition Monitoring)
4. NC may assist countries to purchase spares if suppliers are not available in their country
5. It is important to check performance of equipment periodically
6. Sampling manual for some standard instruments and guidelines on operation and maintenance are necessary
7. Countries should ensure that their staff have sufficient training to operate the instruments
8. Representatives of instrument manufacturers to be invited to attend future STM and TFMI meetings so that they are aware of the problems
9. NC to conduct a survey on maintenance and cost. A compilation of common problems encountered according to instrument models may be useful reference to the national monitoring centers
10. NC to put the summarized information from the questionnaire survey on the EANET website

➤ **Laboratory instrumentation**

1. Preventive maintenance and calibration (using CRM) is important
2. Laboratories recommended to have a service contract with a reliable company
3. Invite suppliers of equipment to attend future TFMI and STM meetings to have dialog with the representatives from participating countries
4. To explore the possibility of manufacturers providing training on principles of the instrument, maintenance including trouble-shooting
5. Joint sampling and analysis program may be conducted involving several laboratories in one country or several countries

6. An advanced training course on IC may be considered for smaller groups, but held more frequently. However they are costly to organize
7. Attachment training for personnel at suitable laboratories that have the capability
8. Laboratories should keep sufficient spares for minimize downtime
9. Laboratories should try to keep their trained personnel. Personnel that attended EANET training courses should train other staff within the country
10. Availability of good after-sales service from supplier is important
11. Power stabilizer and/or UPS are useful to reduce instrument breakdowns due to power failure
12. Need SOPs for laboratory analysis of precipitation beside the technical specifications
13. Participating countries are encouraged to conduct training programs on operation of equipment

➤ **QA/QC and Data Management**

1. Beside the QA/QC documents included with the technical manuals, an integrated EANET QA/QC Manual may be useful. The manual may include methods to identify problems, troubleshoot etc

EANET Priority Research Project

Concept Paper

Title of Project	Studies on suitability of various low cost methodologies, such as passive samplers, for monitoring air concentrations
Purpose/Objectives	<p>This project aims to establish a distributed network of sites to monitor air concentrations of gaseous and particulate species using various monitoring methodologies, including the low cost methodologies, over a period of one year. The purpose of the monitoring is to acquire a complete dataset from the monitoring activities conducted under various types of climatic conditions for comparison. The study is expected to determine the suitability of using the low cost methodologies for monitoring of air concentrations in the East Asian region.</p> <p>The low cost methodologies which have been proposed for monitoring of gaseous and particulates species in EANET are the filter pack, passive sampler and denuder methods. These samplers which will be operated side by side with existing automatic instruments, which are expected to produce the most accurate set of results, during the test period.</p> <p>The main activities of this project are as follows: (1) Planning of the project (2) Preparations for the monitoring (3) Countries carry out the monitoring for one year (4) Chemical analysis of the samples collected (5) Assessment of the data and information (6) Reporting the results to the Scientific Advisory Committee of EANET</p> <p>The project will be implemented as an activity of the Task Force on Monitoring Instrumentation under the Scientific Advisory Committee of EANET. The Network Center (NC) as secretariat of the Task Force will coordinate all the tasks.</p>
Background Information	High quality, long-term data on wet and dry deposition from a dense network of sites in the East Asian region are required before a comprehensive assessment of the state of acid deposition in East Asia could be performed. Presently, the number of monitoring sites in the region is limited, mainly due to the high cost of establishing, operating and maintaining monitoring stations, including the purchase of expensive automatic monitoring instruments.

	<p>One of the solutions proposed to overcome this problem is to adopt low cost methodologies such as filter packs, passive samplers and denuders which have been used in some other monitoring networks. However, such methods have not been extensively tested in the East Asian region which has diverse ecosystems, various types climatic conditions and other unique features.</p> <p>The Strategy on EANET Development (2006-2010) included an activity to improve implementation of all required monitoring items with necessary data completeness and accuracy. One of the outputs expected from this activity is a recommendation on use of less expensive methods to reduce monitoring cost and increase number of monitoring sites.</p> <p>The Task Force on Research Coordination at its first meeting in June 2008 discussed the need to carry out a study to determine the suitability of various low cost methodologies, such as passive samplers, for monitoring air concentrations in EANET. It was felt that a comprehensive study on a regional scale is necessary to identify all the factors that could affect their performance before these methods could be applied throughout the region. It was recommended that this be a priority project for implementation by the Task Force on Monitoring Instrumentation using EANET funds. The NC was requested to coordinate with the Chair of the Task Force to develop the proposal and request for funding at the next IG session.</p>
<p>Scope/Activities</p>	<p>EANET countries will be invited to participate on a voluntary basis through the members of the Task Force. One of the criteria for selection of a monitoring site would be that it should be located near to automatic analyzers that are currently operated by the participating countries. Data from the automatic instruments will be used for comparison with the data from using the low cost methodologies. Countries that are currently operating automatic instruments at or near their EANET sites are China, Indonesia, Japan, Malaysia, Mongolia, Philippines, Republic of Korea, Russia, Thailand and Viet Nam.</p> <p>The following steps will be followed:</p> <ol style="list-style-type: none"> (1) 10 sites will be selected in the region. (2) The NC will coordinate the purchase of equipment and consumables. (3) The NC will provide each site with 2 sets of Ogawa passive samplers each month for monitoring O₃, SO₂, NO_x, NO₂ and NH₄ together with operating instructions. (4) The NC will provide each site with a 4-stage filter pack set for monitoring of gas species and particulates together with operating instructions. A set of impregnated filters will be

	<p>sent to each site every month.</p> <p>(5) All the exposed samples will be returned periodically to ADORC where they will be split for chemical analysis by ADORC and another assigned analytical laboratory.</p> <p>(6) The NC will compile all the necessary data and information for assessment by the Task Force.</p> <p>(7) The NC will prepare the final report to SAC.</p>														
Cost Estimate	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%;">Travel Cost</td> <td style="text-align: right;">7,000</td> </tr> <tr> <td>Communication</td> <td style="text-align: right;">3,000</td> </tr> <tr> <td>Equipment</td> <td style="text-align: right;">50,000</td> </tr> <tr> <td>Consumables</td> <td style="text-align: right;">20,000</td> </tr> <tr> <td>Expenses of participating countries</td> <td style="text-align: right;">20,000</td> </tr> <tr> <td></td> <td style="text-align: right;">-----</td> </tr> <tr> <td></td> <td style="text-align: right;">Total US\$ 100,000</td> </tr> </table> <p>Equipment will consist of 10 sets of filter pack kits, an automatic ozone generator and calibrator (as a traveling standard). The passive samplers are considered as consumables.</p>	Travel Cost	7,000	Communication	3,000	Equipment	50,000	Consumables	20,000	Expenses of participating countries	20,000		-----		Total US\$ 100,000
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	Total US\$ 100,000														
Timeframe/Schedule	<p>The project will start on 1 January and the monitoring is expected to be completed by 31 December 2009. Monitoring will be conducted at the sites during the first 2 weeks (1 to 14th day) of each month. The passive filters, filters from the filter packs will be posted to ADORC for analysis periodically after sampling. Other information including the data from the automatic analyzers will be submitted by the countries via the Internet.</p>														
Output	<p>(1) A set of data from 10 sites in the EANET region using various monitoring methodologies, including the low cost methodologies.</p> <p>(2) Results of assessment of the data by the Task Force on Monitoring Instrumentation and the NC.</p> <p>(3) Discussion of the results at the meeting of the Task Force</p> <p>(4) A final report submitted to SAC. The report will include the recommendation on future dry deposition monitoring methodologies, if possible.</p>														
Proposed Funding Source	EANET budget														