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Environmental Information and Monitoring Programme (EIMP). Air Quality Monitoring Component

Mission 15 Report

Bjarne Sivertsen, Ove Hermansen, Leif Marsteen and Rolf Dreiem

Norwegian Institute for Air Research
P.O. Box 100
NO-2027 Kjeller, Norway

EIMP Environmental Information and Monitoring Programme
EEAA Building, 30 Misr Helwan St.
Maadi, Cairo, Egypt

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1 Introduction

The 15th mission to Egypt was undertaken in October to December 1999. The EIMP project is funded by Danida and headed by COWI.

The work undertaken during the autumn of 1999 included training, final preparations of stations, data retrieval and data base testing, QA/QC developments and reporting of various kind.

A comprehensive amount of time was spent with the Monitoring Institutions to undertake training in data retrieval, data evaluation, data statistics and reporting.

One site study was performed in Alexandria to identify a new site for the measurements originally started at AbuQuir.
Continuous training of our new counterpart Mr. Haytham Ahmed was undertaken, as well as selection of a second air quality counterpart Hebatalla Fathy.

The Air Quality Monitoring Team consisted of Bjarne Sivertsen, Haytham Ahmed, Leif Marsteen, Ove Hermansen and Rolf Dreiem. Hebatalla Fathy joined the team during the last week of November 1999.

Leif Marsteen finalised the SOP procedures and undertook further training including auditing for the Reference Laboratory at NIS. Rolf Dreiem finalised the monitoring stations and undertook calibrations and checks of instruments. Ove Hermansen started training the staff at CEHM in collecting and analysing VOC samples. Problems with the staff, however, terminated this training, which will have to be repeated during the spring 2000.

The following tasks are being undertaken, referring to the work programme activities:

A. Institutional support
   Define databases and undertake training of counterpart and Monitoring Laboratories.
B. Design of monitoring programme
   Finalise site studies in the Delta and in Upper Egypt.
C. Procurement
   Specifications for additional equipment needed and discussion of the use of $PM_{10}/PM_{2,5}$ AIRmetrics samplers.
D. Data management
   Discuss data retrieval, data bases, data availability, data quality and data transfer to EEAA.
E. Training

Perform on-the-job training at the Monitoring Laboratories including data retrieval, data interpretation, reporting, calibrations, operation and chemical analyses.

F. QA/QC
Continue implementation of the QA/QC procedures at all levels. Finalise standard operational procedures. Undertake training for Reference Laboratory on auditing.

G. Monitoring
Train the monitoring institutions in maintenance, service and repair. Evaluate data, develop reports at Monitoring Laboratories and at EEAA.

H. Reference Laboratory
Calibrate monitors and samplers, start to re-calibrate after one year in field, take the responsibility for standard gases. Continue training in auditing.

I. Component Co-ordination
Prepare reports, describe episodes, present memos, monthly status reports, meetings etc. Prepare a status of the air quality in Egypt for the Environment 99 Conference.

The responsible personnel at the various institutions involved, as well as some of the persons we met during mission 15 are presented in Appendix A.

2 A. Institutional support

2.1 Activity A.2.2 Assist in describing work functions for new experts

Training of the EEAA counterpart staff and continued training of the Monitoring Laboratories continued during the fall 1999. Up-grading of software applications, consolidation of developed procedures for contract management.

A new counterpart for Air Quality was considered and Hebatalla Fathy joined the team during the last week of November 1999. Her CV is presented in Appendix A2.

Tasks to be undertaken by the Counterparts were also discussed, and a summary is presented in Appendix A3.

The staff at the Chemical laboratory at CEHM was changed during the Mission. Training on VOC sampling and analyses was given to the existing staff, but during October it turned out that this staff was about to move to other jobs outside the University (CEHM). New staff members were appointed and a list of these are presented in Appendix A4. Training has to be resumed in March 2000.

Revision and renewal of contracts with monitoring institutions was discussed both with CEHM and with IGSR.

The remaining input from NILU to the EIMP project was discussed and is presented in Appendix A5. The remaining work will concentrate on finalising the QA/QC procedures, data retrieval procedures related to QA/QC, reporting and in the training in the understanding of air quality data.

3 B. Design of monitoring programme

The air quality monitoring programme was assessed during the mission.

A complete list of sampling sites for VOC and PM_{10} was selected as presented in Appendix B1. The AIRmetrics samplers for PM_{10} measurements were added to the already installed PM_{10} samplers, the PM_{10} monitors and the TSP samplers to form a complete suspended particle sampling and monitoring programme.

A complete list of parameters included in the EIMP monitoring programme was updated for the data retrieval and base programme. (see Appendix B.3)

3.1 Activity B.2.1 Select representative monitoring sites for air quality measurements

One of the sites in Alexandria was reconsidered and the measurements here will be simplified to the use of passive samplers. The instruments originally located at AbuQuir east of Alexandria will be moved to the city centre. A site report is presented in Appendix B.3. A new site for particle measurements was selected in the Amryia District south of Alexandria, close to the Carbon Black factory.

VOC and HC monitoring as well as training in preparations and analyses were started and will be repeated and finalised next year. A total of 14 sites are located in the greater Cairo area, 6 sites in Alexandria, 10 sites in the Delta and Canal area, 9 sites in upper Egypt and 1 site in Sinai.

4 C. Procurement of equipment, hardware and software

Procurement activities will largely be finalised by the end of the Commissioning Phase. It is envisaged, however, that there will be some need for ad-hoc procurement to replace broken-down equipment as well as continued procurement of consumables and spare parts.

4.1 Activity C.2.1 Procure instruments and equipment

A system for purchasing spare parts and consumables has been discussed, and a procedure has been outlined as shown in Appendix C.1. Requests for equipment such as permeation tubes, filters, extra filter holders and dust fall buckets had been placed during the summer 1999 (Appendix C.2.). The equipment arrived in Cairo several months after the request was placed, which indicated to the Monitoring Institutions that all consumables have to be requested long before they are actually needed.

To release equipment from the EEAA storage a special request form was developed (Appendix C.2.1).

Upgrading of the computers at CEHM is needed for many reasons. The existing system was too slow, a new main server was thus needed together with an extra client. This was also needed to enable daily reporting of data to EEAA. The final list of equipment, based on utilising all existing equipment is shown in Appendix C.3.

CTS/Kontram has been very late in responding to the ordering of spare parts, standard gases and permeation tubes. Direct contact has been taken to another supplier of gases. Also when repair and spare parts are concerned, discussions started to find alternative solutions. CEHM was trained to do most of the repair at their own laboratories. A final solution for obtaining the spare parts has to be found.

5 D. Data management

The development of the air quality database and data handling and presentation tools continued during the autumn 1999. The databases were tested on real data. The first version seems to be working adequately. Data management including training in the use of new software at the Monitoring Laboratories started during the visits.

Data base operations and responsibilities had been discussed with the EIMP/EEAA experts as indicated in the memo from M Zaki (Appendix D1).

5.1 Activity D.1.2 Specify data retrieval and local data base at Monitoring Laboratory

Data collection procedures have been specified for data collected by passive samplers, sequential samplers and for automatic monitors. Procedures for use of high-volume samplers for TSP and PM_{10} have also been specified and established at the monitoring institutions.

The data retrieval and data storage at the Monitoring Laboratory is based upon the use of the System Manager. Much of the time spent at CEHM and at IGSR was used to train the personnel in using the tools available. Both institutions faced problems by the fact that new Station Managers had been installed during a visit by EMC. (When the System Manager had been installed at IGSR). Both institutions had to go back to use the old version (5,3) of the Station Manager, to manage to transfer the data into the database. These problems were not fully solved at the end of the Mission.

The preliminary database and scaling tool developed during the first phase of the project included simple graphical and statistical tools. This was developed based upon Excel. During Mission 15 the objective was to leave these tools and move into using the System Manager and the newly developed EIMP Air Quality Database.

Data retrieval, data scaling, data storage, data quality control was part of the training of expert personnel based upon System Manager specifications.

5.2 Activity D.1.3 Specify data quality check and control procedures

Data quality controls apply both to the automatic monitoring data and to semi automatic and manually collected data. The automatic data retrieval system includes a specified data quality control procedure, which was presented and trained to the operators at the Monitoring Institutions.

The procedures presented in Appendix D.2, apply to both data retrieved via telephone lines and for monitoring stations without telephone connections.

Data retrieval via telephone lines
The data retrieval from monitoring stations, which are equipped with modems and telephone lines, may be performed by the Computer centre using the following procedures:

- The Computer centre System Manager asks for data automatically once a day (normally during night hours, at 02:00 hrs).
- The Computer centre operator initiates download (manually) which requires that the modem is functioning.

Monitoring stations without telephone lines
If telephone lines are not available at a monitoring station, data have to be collected manually via diskettes. Calibration values should follow the diskettes, as there is no procedure for retrieving this information automatically on the diskette. The data from diskettes should be imported to the System Manager directly and checked. Reports should be printed daily or as a minimum on a weekly basis.

The procedures for QA/QC control at the System Manager as well as cleaning and filtering of data for import to the final database was described and trained both at CEHM and at IGSR during Mission 15. A daily data validation log was also given to the institutions for routine follow up. The technical tools have been supported by quality control descriptions, manuals and reporting procedures. Logbooks are established for each instrument.

5.3 Activity D.1.5 Telecommunication lines

Telephone lines have been made available at

- Cairo centre, Quolaly
- Abbasyia
- Tabbin
- Shoubra el Kheima
- Giza, Cairo University.

At Maadi (EEAA) a preliminary line was installed, bat this will have to be changed to a permanent dedicated line. At Fum AlKhalig the possibility for installing a mobile telephone line is being discussed. At Suez, Assyut and Aswan the formalities are confirmed and the lines have to be connected.

At IGSR and Alexandria Regional direct data lines have been tested. Due to problems in the data import to the System Manager, local internal telephone lines are being considered as an alternative. At Kafr Zayat and ElMansoura telephone lines have been installed. It remains only to get them connected and start data

retrieval. At ElMahalla no lines are available from the Company. The problem will have to be solved soon. The goal is to equip all monitoring sites with telephone lines to enable the daily quality control on the stations.

5.4 Activity D.2.1 Prepare database for manually analysed data

A laboratory database for manually collected samples was prepared during Mission 10. This was updated during Mission 11.
During Mission 15 another updating started by introducing data for Black Smoke (BS, soot) and for VOC. This database is used to store and convert for chemical analyses data into air pollution concentrations. Preliminary data will be entered into this database for manual check and control before the data are transferred to the Monitoring Laboratory database for statistical treatment and presentation.
The last part of this manual database will be finalised during March 2000, when the VOC data and AIRmetrics data will be tested.

5.5 Activity D.2.2 Local database for monitor data at the Monitoring Laboratories

The local database for monitoring data is part of the System Manager and the EIMP database, which has been installed at the Monitoring Institutions. These databases contain all one-hour average data; concentrations of gases and particles as well as all meteorological data. QA/QC procedures have been part of the procedures given for data retrieval and include data adjustments and cleaning in the System Manager and data selection and filtering in the EIMP database.
The final approved data (by the QA manager) will represent the basis for the development of quarterly reports and aggregated data and these data will be transferred to the EEAA database on a weekly or a monthly basis.

5.6 Activity D.3.1 EIMP/EEAA data base

The database for air quality data is being developed by use of local consultants under the supervision of EIMP expatriate and Egyptian staff. This work started at the beginning of 1999.

The first version of this EIMP database was tested during Mission 15. Data manipulation, data selection and a simple data presentation worked adequately. The database was used to generate data presentations and to import data into Excel for further evaluations.

Routines for frequency distributions, wind roses and Breuer diagrams still have to be developed. For reporting purposes the graphical data resulting from the data selection and manipulation procedures, have to be imported to Excel or other programs for further presentations.

6 E. Training

Training is a major activity in the Consolidation Phase. The development of a basic understanding of air pollution science and understanding of QA/QC has to be continued both at the Monitoring Laboratories and at EEAA. Most of this training is undertaken as on-the-job training.

A list of training undertaken and needed for the EEAA counterparts and for the Monitoring Institutions is presented in Appendix E1.

6.1 Activity E.2.2 Training programme for instrument operation and maintenance.

The measurement teams at the Monitoring Institutions have received training in the generation of data, QA/QC, calibration, maintenance, and repair of monitors and samplers. All activities at the stations and in the laboratories are done according to the activity plan. The activity plan shows what Standard Operations Procedures must be performed and when. The plan is specific for each kind of instrument. Instrument operators have been trained to perform according to schedules as shown in one small example in Appendix E2.

Training was also given to CEHM to undertake maintenance and simple repair work. They selves will establish a repair laboratory at the CEHM to enable the Monitoring Institution to undertake repair and calibrations. The establishment of this laboratory was finalised during Mission 15. Training for undertaking repair and calibrations was also finished. The reason for this new establishment is to avoid long delays caused by spare part deliveries and priorities given to the EIMP programme by CTS.

6.2 Activity E.2.3 On-the-job training at the Monitoring Laboratories

Training at the monitoring institutions is an ongoing activity. Several seminars and workshops have been undertaken since the beginning of the programme. The monitoring institutions as well as the EEAA counterpart have received training in interpreting and understanding the air quality data collected.
Training has been given for preparation of filters and analyses of various filters for sequential samplers, passive samplers and high-volume samplers. During Mission 15 training was started for VOC sampling and for analyses of Black Smoke (soot). Also preparation and analyses of AIRmetrics measurements of PM_{10} started during the autumn 1999.

6.3 Activity E.2.4 Support training to Reference Laboratory personnel

Training in performing station audits by the Reference Laboratory was continued during the autumn 1999.
Audit basics and theory was presented during the last Mission and some of this was repeated. Final procedures for sampling and handling of samples was given to the Reference Laboratory. Further Audit training was planned but was postponed due to the coming of Ramadan. Further training will be performed at NIS for sequential samplers, dust fall collectors, high volume samplers and passive samplers during March 2000.

6.4 Activity E.5.1 Use of data base at System Manager

Several training sessions have been performed on the use of the System Manager. Steve Gersch at EMC undertook training at IGSR during installation there. He also upgraded the System Manager at CEHM in August 1999, and performed some limited training of the personnel.

The main part of the System Manager training during Mission 15 included practical use of the system. The operational experts should undertake remote calibrations, data quality controls, cleaning of data, data plots and storage of raw data. Several discussions were carried out concerning the transfer of data from the Station Managers, via the System Manager into the EIMP data base. Different experts were involved in these discussions.

At the end of Mission 15 it was agreed that the complete system were supposed to be operated as designed from 1 December 1999. Further refinement of the local EIMP database may, however, be needed. Also the data retrieval by telephone lines had to be further developed.

6.5 Activity E.5.2 Training in use of EIMP/EEAA data base

Basic training in the use and understanding of some of this statistics was briefly undertaken during Mission 15. The use of the EIMP/EEAA database will be trained during the evaluation of data. The new counterpart, Hebatalla Fathy participated in the development of the database, and knows the details in the system.

6.6 Activity E.6.1 Sample preparations

Training in the use of the VOC samplers started in October 1999. Due to change of personnel, described in Chapter 2, this training will have to be repeated. Several items necessary to perform the sampling and analyses of data were missing, and will have to be purchased and prepared before March 2000, as specified in Appendix E.3.

6.7 Activity E.6.2 Chemical analyses of various filters

The procedures for analyses and data evaluation concerning SO_2 and NO_2 samples were discussed during Mission 15. Problems in understanding some of the very high concentrations of SO_2 and NO_2 and some low levels recorded in Alexandria were discussed again. All procedures were repeated, some filters were collected and brought back to NILU. The conclusions were that randomly recorded low and very high concentrations might have been due to power problems at some of the sites. Most of these problems have been solved at the end of Mission 15.

The consistently low SO_2 concentrations in Alexandria seem to be real. The exact reasons have to be found in the total atmospheric chemistry of the area. Also sulphate analyses on filters did not show extremely high concentrations. Analyses of Black Smoke (soot) was started during the Mission.

7 F. QA/QC

Much of the fieldwork and training described above has been related to quality assurance and quality control procedures. Updating and verification of the QA/QC system with relevant documentation and procedures as well as auditing of the systems has been included in the work.

7.1 Activity F.2.1 Instrument calibration procedures

Instrument calibration procedures, SOPs and logbooks were developed for manually collected samples and for sequential samplers during Mission 15. Training was performed for 6 different sampling methods, as shown in Appendix F.1.These procedures represented the final development of SOPs.

Quality control procedures at field and laboratory level were finalised during the spring 1999 (see Mission Report 12 Appendix F). The procedures have been tested and seem to be working satisfactorily. Some discussion concerning the calibration of ozone monitors (Appendix F.2.) lead to a final conclusion on this matter.

7.2 Activity F.2.2 Design QA/QC procedures at Monitoring Laboratory

The documentation material for all QA/QC procedures is now available at the Monitoring Institutions. The QA/QC responsible officers have prepared General QA/QC procedures at a top level at CEHM and IGSR. The Reference Laboratory experts head this work, and details can be found in the Mission reports from the Reference Laboratory Component.

All monitoring and sampling sites are equipped with logbooks and the necessary material to adequately operate the stations.
A control of the QA/QC procedures was developed as part of the Audit Programme, to be undertaken by the Reference Laboratory.

7.3 Activity F.3.1 QC and calibration routines as part of the on-the-job training

The Monitoring Laboratory personnel is now operating monitors and samplers using all the SOPs and manuals developed throughout the development of the programme. On-the-job training in the use of these routines has been an ongoing process through the installation until the completion in June 1999.

7.4 Activity F.4.1 Input from Reference Laboratory- Air

The air quality monitoring staff has, in collaboration with the Reference Laboratory sub-component staff, develop procedures for undertaking audits at the Monitoring Institutions. Training in Sampling procedures was given to the Reference Laboratory in November 1999, and training will continue in 2000. Since the first audits were undertaken in March 1999, the Reference Laboratory has developed an Audit programme for the whole air pollution monitoring programme.

The Reference Laboratory Air is also supporting the Monitoring Institutions in designing the total QA/QC programme to cover all procedures of the air quality monitoring programme.

8 G. Monitoring

Air quality monitoring on a routine basis started in June 1999. The Monitoring Laboratories have adapted to the standard operation and maintenance of the network. A follow up procedure has been developed through the Audit programme operated by NIS. Further training, development of reporting formats as well as adjustment of procedures and registration of the performance was initiated during Mission 15, and will continue throughout the programme lifetime.

8.1 Activity G.2.3 Monitoring programme updated

The operation and status of the Monitoring Programme has been evaluated and reported in Appendix G.2.3. The monitoring station at Gomhoryia Street suffered from hot weather during the summer season. The station was redesigned and all instruments were moved into another room constructed for the purpose at the base floor. This room is being air-conditioned.

The status of the measurement programme in Alexandria and in the Delta can be found in Appendix G.2.3.2. The monitoring site at Abu Quir was redesigned, and a new site was found in the city centre of Alexandria. (See Appendix B.3.) Measurements at Abu Quir will in the future be undertaken by use of passive samplers.

The sampling programme for VOC, PM_{10} and passive sampling was redesigned, and the complete programme is presented in Appendix G.2.3.3.
The air quality measurement programme is undergoing a continuous check and control. a status is being made up every second week, as can be seen in the examples presented in Appendix G.2.3.4. The status reports given in this Appendix are based upon reports given by the station operators in weekly meetings held at CEHM and biweekly meetings held at IGSR.

8.2 Activity G.3.2 Install monitors

Most of the installations in the basic programme planned for and completed by mid-1999. Modifications and some further installations were undertaken during Mission 15 as presented in the presented in Appendix G.3.2.1.

Installation of AIRmetrics samplers started during Mission 15. Most of these are samplers will be used intermittently, and a plan for sampling was given to the Monitoring Institutions. Also sampling of organic compounds was planned to start

during the fall 1999. Due to changes at the CEHM laboratory, this was postponed till March 2000.

8.3 Activity G.4.1 Maintenance and calibrations at the monitoring stations

Monitors and samplers have to be taken to the laboratory for repair when ever necessary. Already during the first year of measurements several monitors broke down due to different types of malfunctioning. A list of equipment delivered to CTS for repair is presented in Appendix G.4.1.1.

Many of the instruments delivered to CTS had been delayed by several months, mainly due to "waiting for spare parts". After a meeting with Dr ElSoueini at CTS in October, it was promised that the instruments would be finalised within weeks. As this turned out not to be the case the EIMP programme can not accept these kind of delays, and it was decided to start undertaking simple maintenance and repair tasks at CEHM.

Maintenance and calibration is needed at all monitoring sites in the programme. Weekly visits are being paid to all sites from the Monitoring Institutions. The instrument experts will evaluate the need for maintenance and service based upon information collected during these weekly visits to the stations.
Procedures for instrument and site maintenance was developed and discussed with the monitoring institutions in February 1999. The importance of good maintenance was stressed through follow up and training through the whole installation phase.

8.4 Activity G.4.2 Service and repair

The field station operators and instrument experts have been trained to evaluate the need for repair and service on a routine basis. Preventive maintenance and repair is stated as part of the contractual agreement with the Monitoring Institutions. Repairs will be undertaken either by the Monitoring Institutions. In exceptional cases it is envisaged that equipment may have to be shipped abroad for repair.

An Excel workbook for tracking the use of spareparts in the air monitoring component was prepared in March 1999, as shown in Appendix G.4.2.2. The workbook includes one sheet for each group of instruments, e.g. monitors, samplers, meteorology etc.

8.5 Activity G.5.1 Data retrieval and data evaluation

As part of the daily data retrieval a QA/QC procedure was developed and presented to the Monitoring Laboratories. (see Appendix D.2.). For data collected continuously with monitors the System Manager is used daily for control of calibration factors and span checkpoints, errors, peak values, false data and other peculiarities in the retrieved data. Errors in the data will have to be corrected. Data from monitoring stations with telephone lines are being polled daily and the following procedure has to be followed:

1. Poll the data (automatic or manual) from the station
2. Poll calibration data (zero/span), evaluate levels, and report to operators.
3. Check the data in the data editor (it is possible to print the screen to save all original values)

4. Identify flags, change concentrations only if necessary (normally very seldom if ever!)
5. Check the concentration during the calibration hour, and compare with concentration recorded in the hour before and after. Verify validity of the calibration hour.
6. In case of errors or questions notify the station operator
7. Every week after station visits get the final calibration results, and corrects zero line (from zero correction) and trend using the calibration data.
8. In case calibration has been performed with travelling gas standards, get standard gas concentrations as well as reading on the monitor from station operators.
9. If (readings-gas standard) is more than 15% , adjust trend on data prior to calibration.
10. Verify remarks and comments in the System Manager

Following these procedures the data may be transferred into the DATAbase programme installed at the Monitoring Institution. In the DATAbase the operator has to:

1. View data, one parameter at the time
2. Go to “parameter analyses” filter the data
3. Select data in “data selection” Take away negative invalid data
4. Go to “manipulation”,
5. Accept only data points >0
6. Go back to the System Manager, change the flag, keep the raw data
7. Take out invalid hours
8. Study graph

The graph has to be printed every week, and quality controlled by the QA officer. Time plots of the data were produced on a routine basis from November 1999 at CEHM. Instructions were also given to IGSR. These data were used to verify data quality and to perform further corrections of errors. After control and a final correction the data can be transferred to EEAA (weekly).

Manually collected sampling data are imported to the local database at the laboratory. These data will also be transferred weekly to the DATAbase for controls, and further to the DATAbase at EEAA .

Evaluation of the data requires some training and experience in judging air quality, sources and meteorology. This work started during the spring 1999,continued during Mission 15 and will continue during the Consolidations Phase of the project. Examples of graphical data controls are shown in Appendix G.5.1.

8.6 Activity G.5.2 Data presentation

Air quality data have been presented in various forms and for various purposes during Mission 15. Several Memos were produced describing air pollution episodes as well as summary monthly data “newsletter”.
During the Mission, a request from the Minister led to daily reporting of data. The system was not really ready for this service, but a procedure was forced through the system. A description of the procedure, including the way it should work is presented in Appendix G.5.2.1.

As a special service during the air pollution episodes in Cairo, data were collected

manually from a number of measuring sites and transferred via Excel sheets produced at Cairo University (CEHM) to EEAA. This work was very resource intensive, and was never meant to be the normal procedure in the programme. The transfer of all one-hour average data from CEHM to EEAA on a daily basis has also conflicted with the tasks and obligations that were originally assigned to the data retrieval and quality assurance personnel. The procedures designed for the EIMP programme was aimed at transferring data to EIMP on a weekly basis.

Even if several telephone lines were still not in operation the operators at CEHM managed to collect most of the data on a daily basis from November 1999. An example of a daily report can be seen in Appendix G.7.0.2.

8.7 Activity G.6.2 Sampling programme

Passive sampling became a routine part of the EIMP programme during the summer 1999. Results from the passive sampling programme have been reported in the Quarterly Reports as well as in the Summary reports on Air Quality in Egypt (NILU OR 33/99 and NILU F 1/2000).

Filters were selected for lead analyses during Mission 15. The first list of selected filters is presented in Appendix G.6.2.1.

The sampling of VOC was about to be started during Mission 15, but due to changes at CEHM, as mentioned several times in this report, this work was postponed till March 2000. A brief statement concerning the status is presented in Appendix G.6.2.2.

Analyses of soot (Black Smoke) concentrations based upon filters from the sequential SO_2 sampling stations, were set in routine operation during Mission 15. A procedure for import of data to the local database at the CEHM laboratory, as well as procedures for estimating air concentrations was given to CEHM. (See Appendix G.6.2.3.)

8.8 Activity G.7.1 Reports

A variety of different reports have been designed for the EIMP/EEAA air quality monitoring programme. During Mission 15 it was required that daily reports should be presented to the Minister (see above). In addition we have produced special reports on Air Pollution Episodes, Monthly reports for EEAA, Quarterly reports from the Monitoring Institutions as well as Annual Reports and Summary reports presented at Seminars and Conferences. (See List of References)

Daily reporting

From 1 November 1999 EEAA has required daily air pollution reports to be presented to the Management of the Agency. These efforts strongly affected the development and the progress of the EIMP project at several levels.

A Memo on these reports was produced for the Management (Appendix G.7.0.1), and the reports produced by CEHM was designed (Appendix G.7.0.2.)

Reporting Smog Episodes

Air pollution episodes occur occasionally in Cairo, especially during the autumn season. Episodes on 23 October 1999 and on 20 November 1999 were described in several memos. See Appendix G.7.0.3-5.

Monthly Reports

The first monthly report was produced for March 1999 based on preliminary data from CEHM and IGSR. A short version of the monthly report for September 1999 was produced as a model for a series of "Newsletters", that could be based upon monthly reporting. The procedure was not followed up during October and November. (See Appendix G.7.1.1.)

The complete monthly reports are being produced every month, and will be the responsibility of the new counterpart. The September report is presented in Appendix G.7.1.2. as an example.

Quarterly Reports

Quarterly reports were produced by the Monitoring Institutions. Both the paper bound reports and the hourly data have also been filed in electronic form on CD discs. Training and discussions of the data quality and data interpretations have been an important part of the preparation of these quarterly reports. The interpretation and understanding of relationships between sources, meteorology and air quality will have to be followed up during the Consolidation Phase of the project.

Newsletters and articles

A schedule for Newsletters and articles was produced by EIMP in June 1999. (Appendix G.7.1.3.). One newsletter on air quality was produced in 1999 as shown in Appendix G.7.1.4.

Two articles have been produced in 1999; one for the Seminar at Sofitel hotel on 13 May 1999 (NILU OR 33/99), and another paper for the Environment99 Conference in Cairo November 1999 (NILU F 1/2000).

A second newsletter was prepared at the end of the Mission and will be presented in the beginning of year 2000.

9 H. Reference Laboratory

9.1 Activity H.3.1 Training

Training of the personnel at the Reference Laboratory Air at NIS (National Institute for Standardisation) was continued during Mission 15, and is reported in Mission report 17.

9.2 Activity H.3.1 Check field monitors

Monitors and samplers are being brought to the Reference Laboratory for check and calibration on a routine basis. These procedures are now being operated adequately. It will, however, be important to keep the time period for instruments out of field operations down to a minimum.

9.3 Activity H. 3.2 Audit programme

The operation of the Audit programme continued. As mentioned in Chapter 7.4. the training programme was not finalised during this Mission, and further work has to be undertaken in March 2000. The Reference Laboratory participated in a workshop concerning the Audit programme. A summary of some of the statements is presented in Appendix H.3.2.1.

10 I. Component Co-ordination

Component co-ordination includes internal and external activities, meetings, and preparation of annual action plans, annual reports and service of the EIMP project management.

During Mission 15 this activity included meetings with EEAA officials, instrument suppliers (Thermoenvironment), local instrument agents (CTS) and meetings with relevant institutions such as Egyptian Meteorological Authority. Several meetings included discussions with other donor programmes such as USAID Cairo Air Improvement Programme (CAIP).

Meetings with the EEAA staff included activities and results of the sub-component as well as planning the air pollution work in Egypt. One such meeting was concerning the Air Pollution Episodes in Cairo. The meeting was called by the Minister of Environmental Affairs, and resulted in daily reporting of air quality data, as presented in Ch. 8.8. The air pollution episodes were covered in the media, and the need for on-line information became very evident. Some of the articles, which were printed in the English spoken newspapers, are presented in Appendix I.1.

Another question discussed at meetings called by EEAA was the very high concentrations of suspended particles measured in Egypt, compared to the air quality limit values given in Law no. 4. We were asked to present a project proposal to EEAA to discuss an evaluation of these limit values. The proposal is presented in Appendix I.2.

A number of meetings were held during Mission 15 to Egypt. Weekly staff meetings and weekly air quality project meetings are reported in other chapters of the report. Examples of Minutes from some of these meetings are presented in Appendix I.3.

The EIMP/EEAA air quality monitoring programme was also presented at the International Conference Environment99 in Cairo on 26-28 November 1999. The written material is found in report NILU F 1/2000. (See also Appendix I.5.)

At the end of the Mission a statement was presented concerning tasks to be covered by the two counterparts. An agenda for a “Meeting at departure” including a list of tasks to be covered by the counterparts is presented in Appendix I.4.

11 References

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Appendix A

People and colleagues - Job descriptions

A.1 People met and colleagues(Autumn 1999)

A.2 New counterpart

A.3 Tasks for counterparts

A.4 New staff for organic chemistry at CEHM

A.5 Remaining input in man months from NILU

Appendix B

Design of monitoring programme

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B.2 Parameter list

B.3 Site reports

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Procurement of equipment, hardware and software

C.1 Spare parts and consumables

C.2 Request consumables

C.2.1 Equipment Release Request

C.3 Computer upgrading at CEHM

Appendix D

Data management

D.1 Data base operation
D.2 Data quality assurance

D.1 Data base operation

D.2 Data quality assurance

Appendix E

Training activities

E.1 Training needs for the Air Pollution Component
E.2 Training activities for station operators
E.3 VOC method, preparations before training

E.1 Training needs for the Air Pollution Component

E.2 Training activities for station operators

E.3 VOC method, preparations before training

Appendix F

QA/QC

F.1 Procedures for QA/QC for manually collected samples
F.2 QA/QC ozone monitors

F.1 Procedures for QA/QC for manually collected samples

F.2 QA/QC ozone monitors

Appendix G

Monitoring

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G.2.3.2 Status Monitoring Programme Alex and Delta
G.2.3.3 Sampling Programme VOC, PM_{10}, passive
G.2.3.4 Programme Status, CEHM & IGSR

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G.3.2.2 Work plan November

G.4.1.1 Equipment at CTS for maintenance & repair

G.4.2.1 Spare part list

G.5.1.1 Data evaluation
G.5.1.2 Example of data evaluation at retrieval
G.5.2.1 Procedure for data reporting

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G.6.2.2 Status VOC-method
G.6.2.3 Estimate soot concentrations

G.7.0.1 Daily reporting of AQ data
G.7.0.2 Example daily report, 10 November '99
G.7.0.3 Smog Episode 23 Oct. '99
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G.7.1.1 Monthly report short version
G.7.1.2 Monthly report September 1999
G.7.1.3 Newsletters and articles
G.7.1.4 Air quality component newsletter

G.2.3.1 Operation of Monitoring Programme

G.2.3.2 Status Monitoring Programme Alex and Delta

G.2.3.3 Sampling Programme VOC, PM_{10}, passive

G.2.3.4 Programme Status, CEHM & IGSR

G.3.2.1 Work Notes, installation

G.3.2.2 Work plan November

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G.5.1.1 Data evaluation

G.5.1.2 Example of data evaluation at retrieval

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G.6.2.3 Estimate soot concentrations

G.7.0.1 Daily reporting of AQ data

G.7.0.2 Example daily report, 10 November '99

G.7.0.3 Smog Episode 23 Oct. '99

G.7.0.4 What caused the smog episode 23 Oct. '99?

G.7.0.5 Another smog episode over Cairo, 20 Nov. '99

G.7.1.1 Monthly report short version

G.7.1.2 Monthly report September 1999

G.7.1.3 Newsletters and articles

G.7.1.4 Air quality component newsletter

Appendix H

Reference laboratory

H.3.2.1 From Audit Training Seminar
H.3.2.2 Flow rate conversion tables

H.3.2.1 From Audit Training Seminar

H.3.2.2 Flow rate conversion tables

Appendix I

Coordination and meetings

I.1 Air pollution episodes as presented in the Press
I.2 Project proposal: PM_{10} air quality limit values for Egypt
I.3 Minutes from meetings (examples)
I.4 Meeting at departure

I.1 Air pollution episodes as presented in the Press

I.2 Project proposal: PM_{10} air quality limit values for Egypt

I.3 Minutes from meetings (examples)

I.4 Meeting at departure

Norwegian Institute for Air Research (NILU)
P.O. Box 100, N-2027 Kjeller – Norway

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Maadi, Cairo, Egypt

ABSTRACT
The fifteenth mission to Egypt on the DANIDA EIMP programme included monitoring programme updating, QA/QC procedures, training and reporting. Air pollution episodes resulted in daily reporting procedures. Monthly and Quarterly air quality data reports were produced and presented. Training in QA/QC operations was given to the Monitoring Laboratories. Audits to the monitoring stations was performed as part of training given to the Reference Laboratory. Results were reported in Newsletters, Memos and in a paper presented at the international conference Environment '99.

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