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

Mission 15 Report

B. Sivertsen, O. Hermansen, L. Marsteen and R. Dreiem

EIMP Environmental Information and Monitoring Programme

NILU Norwegian Institute for Air Research

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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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Abdelhady, Y. , El-Araby, T., El-Araby H. (1999) Quarterly report. Air quality in Egypt based upon EIMP data. January-March 1999. Cairo, Cairo University CEHM.

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Abdelhady, Y. , El-Araby, T., El-Araby H. (1999) Quarterly report. Air quality in Egypt based upon EIMP data. July-September 1999. Cairo, Cairo University CEHM.

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Appendix A

People and colleagues - Job descriptions

A.1 People met and colleagues(Autumn 1999)

EIMP office,3 EEAA Building, 30 Helwan Str.Maadi, Cairo (behind Sofitel hotel) ,
Tel. 202 525 6442, Fax: 202 525 6467 ,E-mail: eimp@intouch.com
Staff: Mohammed Fathi,(tel: *0122141759*), Joergen Simonsen (PM) Ahmed AlSeoud (EEAA. *tel: 0123102068, 5721289*Dina, Lydia, Hassan,
Drivers: Mahmoud, Emad, Mahmoud Nasr (0123529446)
Air: B Sivertsen (Task Manager), tel. 351 1615, Dreiem, L Marsten, Haytham Ahmed (p: 320 2078)
CEHM / Cairo Univ, tel 571 9688, Fax; 571 9687: Dr Sharkawi, Dr. Yehia Abd El Hady
Dr Tarek El Arabi (Project Manager) mob: *0123484050*, Dr. Hesham ElArabi (QA)
Staff: Ashraf Saleh (data retrieval), Essam Abdel Hallin (data retrieval), Mahir Sayed
Hafez (Tabbin st.), Ahmed Sayd (Qualaly, Gemhoroya), Yassin Fathi (Giza CU, Fumm al Kahlig),
Kamela (Mon.lab., Shoubra), Ahmed Sulamen (Chem lab head), Ameni Taher (Chem. Anal.).
IGSR Alex Univ, tel:03422 7688, lab: 03 422 5007, Proj. tel: 424 1485,
Fax 203 421 5792
Dr M El-Raey tel: *0123109051 (elraey@cns.sisnet.net)*, Dr. El Sayed Shallaby,
Ashraf A Zahran, Shawkat K. Guirguis (QA) (*aplab@igsrnet.net*),
Mohamed Mamdoua, Mohamed Rashad, Sekri,
Data Management: Jacob Andersen, Mohammed Zaki, Ayman El Maazawy, Dean
Procurement: Anwar Ahmed
Coastal Water: Arne Jensen, Erling, Ole
Reference Lab: Ulla Lund, (Street 13 Maadi) tel: 012 312 0951, Mai EzzEldin Ahmed (counterpart), Fleming Boysen, Kirsten, Suzanne, Jill, Vibecke.
EEAA,Dr. Ibrahim Abdel Gelil (Chairman)
Dr Ahmed Gamal
Mr Ahmed Abou ElSeoud (EIMP PM)
Dr. Abdil Latif Hafez (Air Quality respons.), , (Env. researcher).
Mrs Hoda Hanaffi (head of GIS),
SharmElSheik, EEAA Nat. Park Office, Dr. Omar Hassan,
Wael Roger Karkour (passive sampl.)
Sofitel Hotel: Maadi, Tel: 526 06011, Fax: 202 526 1133
Ambassader:
Norge: Al Gazira al Wusta str.
Amassadør: Mette Ravn, 2.sekr. Siw Boetker, tel.340 3340 , fax: 342 0709
Danmark: 12 Hassan Sabri, Zamalek, John Carstensen 378 2040
COWI: 00 45 45 97 22 11
USAID - CAIP: Jim Howes, Monir Labib, Jennifer Baker (Training) , Kirk Stopenhagen
CTS: Amr ElSoueini, tel: 378 2908, Fax: 350 4977, *Mobile: 012 216 6670*, Ali Hamed,
Thermo: Michael Buckley, mbuckley@thermoei.com
EMC(Env. Monitoring Company inc.): Bill Hayes, Steve Gersh (Vice President),
Fax:805 544 1824, (sgersh@emcslo.com)
Mohammed Nasar (AQ) , tel 351 5174, Canal Street 3, Maadi
Giza Pyramids: Dr. Hawas, Ahmed El Hagar
Sakkara: Mohammed Hagras, Hamdi Amin
Delta Steel Company: Engineer Yussry Ibrahim (Project Director)
Flat: Mahmoud TAHA mob: 0123413899, 5251777, flat BS: 5257444
Leif Marsteen /Rolf Dreiem: 10 street 86, apt. 10, Maadi, Cairo, tel 351 3226,
Magde 351 1359, Maadi contact: Espen Alstad

Oct 99

Michael A. Buckley
International Sales Engineer

Thermo Environmental Instruments Inc.

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Franklin, MA 02038 *Fax: (508) 520-1460*
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Government of Egypt
SOCIAL FUND FOR DEVELOPMENT

012 326 7915

Mohammed El Zarka, Ph.D.
Director
Environment & Development Unit

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Vice - Chairman

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Maadi, Cairo, Egypt
Tel.: 524-7230 (ext. 205)
Fax: 524-7223 / 524-7224
E-Mail: grichard@caip.com.eg
CAIRO AIR IMPROVEMENT PROJECT
Managed by Chemonics Consortium

Gilbert Richard, P.E.
Chief of Party

UNIVERSITY OF CALIFORNIA
RIVERSIDE

DAVID A. GRANTZ, Ph.D.
Director, Kearney Agricultural Center
Environmental Plant Physiologist
Air Pollution CE Specialist

Kearney Agricultural Center
9240 S. Riverbend Ave.
Parlier, CA 93648

Tel: (559) 646-6599
Fax: (559) 646-6593
email: david@uckac.edu

NOSCP
EEAA

Mohammed A. Borhan
National Oil Spill Contingency Plan Coordinator

30 Misr - Helwan Agricultural Road, Maadi, Cairo, Egypt.
Tel/Fax (+ 2) 02 525 6483 , Mobile (+ 2) 012 214 7518
E-Mail : noscp @ intouch.com

undp

Lake Manzala Engineered Wetland Project (LMEWP)

Mohamed N. Bayoumi, Ph.D.
Assistant Project Manager

30, Misr Helwan Agricultural. Rd., Maadi
Cairo, EGYPT
Email:mnb@menanet.net Phone/Fax: (202) 5263155

Mohamed A. Hassan
Senior Environmental Engineer
Operations Manager - Egypt

KOMEX G.T. EGYPT
ENVIRONMENTAL AND ENGINEERING CONSULTANTS

39, Road 83, Maadi 11431
Cairo - Egypt
web: http://www.komex.com
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Fax: (202) 350 0101
e-mail: komex@gega.net
A Joint Venture Between Komex, Globoil and Titan

E.E.T.S.

ENERGY
EQUIPMENT
TESTING
SERVICE
LIMITED

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The Egyptian Metals Co.
Recovery, Recycling & Refining
Of Gold And Silver

Dipl. Chemist
Mustafa El-Fiky
General Manager

3 Kaimmakam Ahmed Farah St.
Heliopolis – Cairo - Egypt **Phone : 2979496**

PLAN D'ACTION POUR LA MÉDITERRANÉE

24/10-99

PNUE

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Domitille VALLÉE
Chargée de mission
Environnement

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want co-operation

International Consulting Bureau

mailing list

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ARADIS S.A.E.

28/11-99
konsulent for NILU
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EGE

FUGRO

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Consulting Manager

Dhaka prosjekt

28/11-99

Golam Mohammad
Counsellor

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Modern Technology for Engineering & Industrial Consulting

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Chairman

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The Engineering Company
For Projects Services

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A.2 New counterpart

Environmental Information and Monitoring Programme
EEAA - Danida - COWI
30 Misr-Helwan Str. Maadi, Cairo, Egypt
Tel: 202 525 6442, Fax: 202 525 6467

Memo

To: Ahmed Abou El Seoud
From Bjarne Sivertsen
Date: 21 November 1999

New Counterpart for EEAA Air Quality Evaluating and Reporting

A new expert may be needed at EEAA for receiving, evaluating and reporting air quality data on a daily, weekly, monthly and annual basis.
The background should be:

- computer applications and software,
- statistical handling of data,
- data bases,
- environmental science and
- experience in reporting in English.

The candidate will have to undergo training in meteorology and air pollution science.

Hebatalla Fathy Ahmed has requested to be considered a new Counterpart for the Air Quality Monitoring programme at EEAA. She was tested in the explanation of existing data from the EIMP/EEAA network and have been asked by self-study to read the air pollution compendium "Air Quality Monitoring Systems and Application", presented at the 5 day seminar in Cairo in 1997.

She passed the tests with good margin. She understand the basics of air pollution, she know the data base in which data are transferred to EEAA from the Monitoring Institutions and she is able to prepare reports.

I thus suggest the Hebatalla Fathy Ahmed will be considered the new Counterpart for EEAA assigned to undertake:

- Data retrieval,
- data evaluation,
- monthly and annual reporting.

Bjarne Sivertsen
Task Manager Air Quality Monitoring

Hebatalla Fathy Ahmed
44-d Khalifa Mamoon st., Heliopolise

Tel. 202-2592283
Mobile 010-1520997
Email: heahmed37@hotmail.com

Education:

* B.Sc. of Engineering, Chemical engineering Dept., Cairo University, Faculty of Engineering. Graduation year: 1996, with a V. Good Grades.
*Postgraduate studies in 1998 with a V. good Grade (Preparing for the Master Degree).
*Preparing MSC. In (Environmental Impact Assessment).

Summer Training:

*Nuclear safety research center, Atomic Energy Authority.
*Arab Organization for Industrialization.

Surveys during 4th year in chemical engineering dept. :

- Survey on Environmental effects of incineration of Hospital Waste, this survey includes about 20 hospital in Great Cairo.
- Survey on Air Pollution caused by cement and fertilizer industry studying the processes used in Toura cement plant and Abu Zabal fertilizer plant.

Professional Experience & Employment History:

- Researcher in the Petroleum Research Institute for 8 months.
- Web & Graphic Designer and Programmer in IDSC for a year.
- System Developer in EIMP (Environmental Information & Monitoring Programme) in EEAA (Egyptian Environmental Affairs Agency)

Honors and Scholarships:

* Received a scholarship from the Information Technology Institute (ITI) - Information and Decision Support Center (IDSC) - The Cabinet, to join the Software Skill Development Program (SSDP9)
(Interval of training: 9 months starting from April 1st , 1997) .

Training Courses:

*** Object Oriented Programming.**
*** Programming Languages** : C, C++, Visual C, MFC, Java, Visual Basic Ver 5 and 6.

* **Networking**	:	Windows NT, Novell NetWare, TCP/IP.
* **UNIX**	:	Shell Scripting, System Programming, System Administration.
* **Database**	:	ORACLE, MS Access.
* **Development tools**	:	Developer2000, Power Builder, Delphi.
* **Web Development**	:	HTML, VRML, CGI Scripting.
* **CASE tool**	:	IEF fundamentals.
* **Software Management**	:	S/W engineering, S/W project management
* **General**	:	Problem Solving Techniques, Management fundamentals, Total quality assurance, Marketing, Finance, Communication skills and technical writing.

All the above courses are within the courses of the ITI.

Projects :

- **Graduation Project: Production of polypropylene from Natural Gas with a very good grade.**

- **Final project at the ITI was a website for the Supreme Council for Islamic Affairs using ORACLE Database, DELPHI, FrontPage98, CGI script using VB5, HTML, JAVA Script.**

  URL: http://www.scofia.gov.eg

- **Participating in a website for the GATT Agreement by doing the Graphical Interface and some of the programming (can be seen on this IP).**

  URL: http://163.121.18.250/gatt/first/first.htm

- **A website for the national postage organization.(In the IDSC)**

  URL: http://www.stamps.npo.gov.eg/
  With all the Graphics and programming.

- **A website for the Non-governmental Organization (For the IDSC). (have no DNS till now)**

- **A website for the General Organization of Exhibits and fairs (For the IDSC). (Have no DNS till now)**

- **A website for the Environmental Information and Monitoring Program (EIMP) in the (Egyptian Environmental Affairs Agency [EEAA]).**

- **Participating in developing of Coastal Water Monitoring Program in EIMP, EEAA.**

Technical Skills:

* **Network O.S.:** Dealing with Novel Server and Windows NT.
* **Database:** Using MS-Access and Oracle.
* **Web Development:** Using Front Page 98, CGI (Common Gateway Interface using Visual Basic 5), Java Applets, Java Script and ASP (Active Server Pages Using Visual Interdev 1).
* **Graphic Designer:** Using Adobe PhotoShop version 4 and 5,Gif Animators, Crystal 3D and 3D Studio Max 2.
* **Developer:** Using Visual Basic Ver 5 and 6.

Languages:

* **Arabic**	:	Mother Tongue.
* **English**	:	Fluent.

Personal Data:

* **Date of Birth**	:	September 17th, 1974.
* **Place of Birth**	:	Cairo.
* **Nationality**	:	Egyptian.
* **Marital Status**	:	Single.

A.3 Tasks for counterparts

Environmental Information
and Monitoring Programme
EEAA - Danida - COWI
30 Misr-Helwan Str. Maadi, Cairo, Egypt
Tel: 202 525 6442, Fax: 202 525 6467

Memo

To: **JFS, AAE, MF**
From **Bjarne Sivertsen**
Date: **28 November 1999**

Tasks to be covered by two counterparts

Two counterparts have been appointed to the Air Pollution Component at EEAA/EIMP. It is important that the different tasks are well defined, and that an agreement is arrived concerning the responsibilities of the two counterparts.

I have in this memo tried to identify the different tasks necessary to undertake the Air Pollution Monitoring programme designed and applied to the EEAA/EIMP programme in order to utilise the experience and skills of the two experts involved.

Haytham Ahmed

Haytham is now experienced in operating the air quality monitoring programme, to contact various institutions, to keep in touch with the monitoring institutions and he has also started reporting data on a daily and a monthly basis. I would suggest that his responsibilities in the future programme will be:

- Follow up the further establishment and the development of the programme,
- Follow up the infrastructure in the Monitoring Programme, such as telephone lines, power, shelters including upgrading,
- Follow up contracts and details in the co-operation between EEAA and the Monitoring Institutions,
- Prepare and undertake status reporting within EEAA/EIMP,
- Co-ordinate and arrange all (weekly and bi-weekly status) meetings with the institutions and see that reporting is undertaken,
- Follow-up Quarterly Reports from the Institutions; correct and approve these,
- Support Heba in developing other reports within EEAA, and work with the database and with the air quality data to secure backup in the programme.

More details concerning tasks to be undertaken during the next weeks are presented in the Appendix.

Hebatalla Fathy Ahmed.

Heba was tested in the evaluation and explaining of air quality data, and has proven that she understands the basics of air pollution, she knows the data base in which data are transferred to EEAA from the Monitoring Institutions and she is able to prepare reports.

I thus suggest the Hebatalla Fathy Ahmed will be responsible for the following tasks in the future EEAA//EIMP Air Quality Monitoring Programme:

- Data retrieval from the Monitoring Institutions to the EEAA server,
- data control and evaluation,
- monthly and annual reporting.

She will also have to support Haytham in the weekly meetings and represent a back-up for the general counterpart tasks.

EIMP Memo work tasks 28/11/99

A.4 New staff for organic chemistry at CEHM

Dr. Ahmed Soliman Abd Ellah
Department of Chemistry,
Faculty of Science,
Cairo university, Giza, Egypt.
E-mail: ahmedsoliman2@hotmail.com
Tel. : 5187785(home)

Nov., 6, 1999

Dear Sir,

This is to inform you that I have not been in charge of the management of the environmental chemistry laboratory of Cairo University Center for Environmental Hazard Mitigation (CEHM) since Thursday 4/11/1999. I will continue as environment consultant to CEHM as well as others.

I hope that we can continue our cooperation in future.

Thank you

Ahmed Soliman Abd Ellah
Ahmed Soliman Abd Ellah

Consultants For the Environmental Chemistry Labs, CEHM

1) **Prof. Dr. Mohamed Zaied**

   Professor of analytical chemistry and inorganic chemistry.

2) **Prof. Dr. Zaghloul El – Shahat Kandeel**

   Professor of chemistry, Cairo University
   Analytical Organic Chemistry

3) **Chemist/ Moustafa Mourad**

   From EEAA labs.

4) **Chemist/ Hany Nabil**

   From EEAA labs.

5) **Biophysist/ Nasser Abdallah**

   For technical support and scientific equipments trainer and maintenance

The DANIDA Team of the Environmental Chemistry Labs. at CEHM

Name	*Task Description and responsibility*
1) Prof. Dr. Mohamed I. El-Anbaawy Geochemist – Full time	*General Supervision of the technical and administrative assignments and performances. *Reviewing and approving the technical reports. *Coordination with the co-manages and the team members the alternatives and following –up
2) Dr. Gehads G. Mohamed Chemist – Full time	*Technical co-managing the team work and trainees. *Reviewing the chemical analysis and controlling the professional tests. * Preparing the technical reports. *Responsible for the quality control and training programs.
3) Dr. Amany G. Taher Geochemist – Full time	* Administrative co- managing the instruments, equipments, consumables, maintenance and repair of the labss equipments. * Reviewing the procedures of receiving, numbering and preparation of samples. * Coordination for training courses.
4) Mr. Mohamed Abdel-Mawgowd Chemist – Full time	* Preparation of samples for chemical analyses. *Analyses of soot, Dust fall, TSP,PM_{10} *Carrying out the chemical analyses on IC, GC,…et. * Sharing in preparation of the technical reports
5) Mr. Sayed Badawy Chemist – Full time	* Preparation of samples for chemical analyses. *Analyses of soot, Dust fall, TSP,PM_{10} *Carrying out the chemical analyses on IC, GC,…et. * Sharing in preparation of the technical reports

6) Mr. Sayed Moustafa Chemist- Part time	* Carrying out the chemical analyses on IC and AA * Training the other chemists on atomic absorption.
7) Miss. Zeinab Hammoda Chemist- Part time	* Carrying out the chemical analyses on IC .
8) Mr. Moustafa Mourad Chemist – Part time	*Analyses of the samples on IC, GC, and ICP *Training the other chemists in the CEHM *Consultancies for professional tests and control technical specifications of the equipments.
9) Mr. Hany Nabil Chemist- part time	*Analyses of the samples on IC, GC, and ICP *Training the other chemists in the CEHM *Consultancies for professional tests and control technical specifications of the equipments.
10) Mrs. Shereen A. Mohamed System administrator- Full time	* Data base analyses *Numbering (labeling) the samples. * Tabulation and presentation of the data. *Sharing in writing of the reports.
11) Mr. Moustafa Nabeel Chemist – part time	*Analyses of samples on GC and HPLC *Training the others on GC . *Sharing in presentation of the data.
12) Mr. Walid S. Hassan Chemist – part time	*Assist in preparation of samples for analyses. *Impregnation, soot and dust fall analyses *Trainee.
13) Mr. Abdalh Mohamed Chemist – part time	*Assist in preparation of samples for analyses. *Impregnation, soot and dust fall analyses *Trainee.
14) Mr. Wael Salah Lab. Assistant – full time	* Assist in receiving and preparation of samples (washing, drying) glasses for analysis. * Trainee.

A.5 Remaining input in manmonths from NILU

EIMP

Note

Subject EIMP

Remaining man-months NILU

Date 30 November 1999

To Bjarne Sivertsen

Copy

From Jorgen F. Simonsen, Project Manager

Environmental Information and Monitoring Programme

EEAA - Danida - COWI

30 Misr-Helwan Street
Maadi, Cairo, Egypt

Tel.: (+202) 525 6439/42/ 47/ 52
Fax: +202 525 6467

E-mail: eimp@intouch.com

Dear Bjarne.

According to COWI's acconuts as per 30 June 1999, the remaining input in man-mmonths from NILU is as follows:

Navn	Remaining mm per 1999.06.30
Bjarne Sivertsen	3,35
Leif Marsteen	1,5
Oddvar Røyset / Ove Hermansen	1,3
Rolf Dreiem	2,7

The time spent until 30 June 1999 according to COWI's accounts includes time spent on the project at home, i.e. the time spent should be in accordance with the invoices forwarded from NILU.

You know yourself how much time that has been used since 01 July 1999.

I look forward to receiving your suggestions for how the remaining time will be used.

Yours sincerely,

Jorgen F. Simonsen
EIMP Project Manager

Appendix B

Design of monitoring programme

B.1 Sampling programme VOC, PM_{10}

EIMP
Environmental Information
and Monitoring Programme
EEAA - Danida - COWI
30 Misr-Helwan Str. Maadi, Cairo, Egypt
Tel: 202 525 6442, Fax: 202 525 6467

Memo

From Bjarne Sivertsen
Updated: 25 October 1999

Sampling Programme for VOC, PM_{10} (AIRmetrics) and Passive samplers

The programme for use of simple samplers for VOC, PM_{10} and SO_2 /NO_2 will be flexible and may be modified as the results from measurements are analysed and evaluated. The following design represents the start up of this sampling at the end of 1999.

VOC samplers

A total of 5 VOC samplers are available for the EIMP programme. The measurement programme at the start of measurements will be as follows.

Site	Bi weekly 1)	Monthly	Comment
El-Gomhoriya	X		Inside new room or at $_{PM10}$ monitor?
Tabbin south	X		VOC in shelter, intake through wall
Shoubra	X		Intake through wall, VOC in room
ElMax	X		VOC in shelter, intake through wall
Damietta	X		VOC in shelter, intake through wall
Next: Fum El-Khalig	X		VOC in shelter, intake through wall, this site should be used while waiting for El-Gomhoriya to be finalised

1) sampling days as PM_{10} or TSP samplers

The programme should start as soon as possible. Due to lack of canisters, samples will only be exposed every second week from the beginning.

PM_{10} sampling with AIRmetrics

The EIMP air quality monitoring programme has presently designed 20 sites for PM_{10} sampling. Eleven of these are using AIRmetrics Minivol air sampler.

A proposed future use of AIRmetrics samplers from Cairo Air Improvement Project (CAIP) initiated an evaluation of the suspended particulate sampling programme

within EIMP. It has been demonstrated that fine particles (PM_{10} and $PM_{2,5}$) may represent a major health hazard to the population in the greater cities and in industrialised areas of Egypt. It may thus improve the quality of the EEEA permanent air quality monitoring programme to extend the PM measurements in the future.

The sampling using the AIRmetrics PM_{10} samplers will start with the following programme:

Site	Weekly 1)	Monthly	Comment
10 Shoubra	x		CAIP box with stand on roof
16 Port Said		x	CAIP box with stand on roof
17 Ismailia		x	CAIP box without stand on roof
19 El Minia	x		? CAIP box with stand on roof
22 Nag Hammadi		x	CAIP box with stand on roof
25 KomOmbo	x		sampler in shelter, intake from roof
27 SharmElSheik		x	CAIP box with stand on roof
31 ElAzafra	x		sampler in shelter, intake from roof
36 Tanta	x		sampler in shelter, intake from roof
39 Domyat	x		sampler in shelter, intake from roof
40 Kafr Dawar	x		sampler in shelter, intake from roof
41 El Amraya district	x		CAIP box with stand on roof
3 Met. Authority	x		site for future measurements, if more samplers are obtained from CAIP
7 Tabbin South	x		for future
15 Suez	x		for future
18 ElFayum		x	for future
23 Luxor	x		for future
26 Aswan	x		for future
33 Alex Regional	x		for future
11 Giza, Cairo Univ	x		for future
			for future

1) sampling days as PM_{10} or TSP samplers

The total particle programme consists of :

- PM_{10} monitors beta gauge, PMB
- PM_{10} high volume samplers, PSH
- PM_{10} sampling with AIRmetrics PAIR
- TSP high volume, TSP
- Soot from sequential samplers, SSS
- Dustfall DUF

In addition $PM_{2,5}$ and PM_{10} is being measured by the CAIP programme

The total measurement programme for particles in air is presented in the Table below.

EIMP \instr\smapl-prog.BS\ 26/10/99

The total particle measurement programme of EIMP/EEAA

			PMB	PSH	PAIR	TSP	SSS	DUF	CAIP
1	Cairo c.Qualaly	Urban centre ☎	X			X			A
2	El Gemhoroya st.	Street canyon	X						
3	Meteorological Inst	Residential. ☎			O				
4	Nasr City	Roadside/Residential		X			X		
5	Maadi EEAA	Residential ☎		X					
6	Tebbin	Industrial ☎	X			X		X	
7	Tebbin south	Industrial			O	X	X	X	A
8	Fum Al-Khalig	Road side/urban	(X)						A
9	Abu Zabel	Industry/res						X	
10	Shoubra	Industrial ☎			X	X		X	
11	Giza, Cairo Univ.	Residential			O				
12	Gizapyramid	Regional							
13	6 October	Res/industrial		X			X		A
14	10 Ramadan	Residential		X			X	X	A
	Canal area								
15	Suez	Res/urban. ☎			O	X		X	
16	Port Said	Residential			X				
17	Ismailia	Residential			X				
	Upper Egypt								
18	El Fayum	Urban			O			X	
19	El Minya	Urban/Res			X			X	
20	Assyut 1	Res/Urban. ☎	X						
21	Assyut 2	Residential						X	
22	Naga Hammadi	Industrial/res			X			X	
23	Luxor	Urban/residential			O		X	X	
24	Edfu	Urban.						X	
25	Kom Ombo	Industrial			X		X		
26	Aswan	Urban/resident. ☎			O			X	
	Sinai Area								
27	Sharm ElSheik	Background			X			X	
	Alexandria								
28	Abu Keir College	Industrial ☎		X				X	
29	El-Max Petrogas	Industrial		X			X	X	
30	IGSR, Alex	Urban/road side☎	X						
31	El-Azafra-	Residential			X		X		
32	Gheat El-Inab	Residential		X			X		
33	Alexandria regional	regional ☎			O				
41	El Amraya district	industrial			X			X	
	Delta Area								
34	Damanhur	Urban			X				
35	Kafr el Zayet	industrial/res. ☎	X					X	
36	Tanta	urban			X		X		
37	ElMahalla El Kubra	industrial/res. ☎	X					X	
38	El Mansura	industrial/res. ☎						X	
39	Domyat	Urban/residential		X	X			X	
40	Kafr Dawar	urban/industr			X			X	
	Total amount of instruments		8	8	12	5	12	21	

O = future AIRmetrics sites

EIMP \instr\smapl-prog.BS\ 26/10/99

The passive sampling programme

The passive sampling programme has been finally designed and discussed with the monitoring institutions. The measurements will start at all sites from November 1999. Most of the sites have already been working for many months.

EIMP Passive sampling programme

Updated Oct 1999

			Quarterly samples									
	Site name	Area type	Jan	Apri	July	Oct	monthly	Passive		Other		
	Cairo											
3	Meteorological Inst	Residential.	x	x	x	x		NO2		SO2	M	
7	Tabbin south	Industrial					x	NO2		SO2		df
9	Abu Zabel	Industry/res					x	NO2	SO2			
12	Gizapyramid	Monument					x	NO2	SO2			
	Sakkara	Monument	x	x	x	x		NO2	SO2			
	Tahrir Sq.Am.Un.	Urban					x	NO2	SO2		A	
	Shoubra (Kamela)	Residential	x	x	x	x		NO2	SO2			
	Helwan (Maher)	Residential	x	x	x	x		NO2	SO2			
	Nasr City (Tarek)	Residential	x	x	x	x		NO2	SO2			
	Heliopolis (Tarek)	Residential	x	x	x	x		NO2	SO2			
	AinShams (Ahmed)	Residential	x	x	x	x		NO2	SO2			
	Canal area											
	Suez industrial	industrial/res.					x	NO2	SO2			df
16	Port Said	Residential					x	NO2	SO2		A	
17	Ismailia	urban/resid					x	NO2	SO2		A	
	Upper Egypt											
18	El Fayum	urban					x	NO2	SO2		A	df
19	El Minya	Res./ Industrial					x	NO2	SO2		A	df
21	Assyut 2	residential/urban					x	NO2	SO2		A	df
22	Naga Hammadi	industrial/res					x	NO2	SO2		A	df
	Luxor, Karnak	monument	x	x	x	x		NO2	SO2			
	Luxor, Temple	monument	x	x	x	x		NO2	SO2			
24	Edfu	Industry/urban.					x	NO2	SO2		A	df
25	Kom Ombo	industrial					x	NO2		SO2	A	p
26	Aswan	urban/residential.					x	NO2		SO2	A	df
	Sinai Area											
	Sharm ElSheik	city, tourist	x	x	x	x		NO2	SO2			
27	Ras Mohamed	background					x	NO2	SO2		O3	df
	Alexandria											
33	IGSR, Background	Urban regional					x	NO2	SO2		O3	M
	AlAzafra (Shallaby)	Residential	x	x	x	x		NO2	SO2			
	Roman theatre	Monument	x	x	x	x		NO2	SO2			
	Delta Area											
40	Kafr Dawar	industrial					x	NO2		SO2	A	df
34	Damanhur	industrial/res					x	NO2	SO2		A	df
	Kafr el Zayet south	industrial					x	NO2	SO2		A	df
36	Tanta	urban					x	NO2		SO2	A	
39	Domyat	resid					x	NO2		SO2	A	df

A = AIRmetrics PM10 sampler
df = dust fall collector

In addition Passive sampling will be undertaken every quarter around the AbuQuir factories.

EIMP \instr\smapl-prog.BS\ 26/10/99

B.2 Parameter list

The set used in tabbin by system mgr

parameter
CAL
LOWER
NET
NO
NO2
NOX
PM10
RH
SIGT
SO2
UPPER
WD
WS

the set used in the mobile met tower:
WS-Windspeed - field3
WD-windDirection-field4
AT-Average Temperature-field7
RH-Relative Humidity- field10

The current set of available parameters in our system;

ParamID	param name	UnitOfMeasurement	Active	InitialUnits	ConversionFactor	Parametrs shouldbe
1	SO2	ug/M3	Yes	PPM	2.61	**SO_2 1)**
2	NO2	ug/M3	Yes	PPM	1.88	**NO_2 1)**
3	PM10	ug/M3	Yes			**PM_{10} 2)**
4	CO	mg/M3	Yes			**CO**
5	NMHC	PPM	Yes			**NMHC**
6	Ozone	ug/M3	Yes			-
7	Meteorology	PPM	Yes			-
8	BlakSomke	PPM	Yes			**BS**
9	TSP	PPM	Yes			**TSP**
10	VOC	PPM	Yes			**VOC**
11	DustFull	PPM	Yes			**DF**
12	PS	PPM	Yes			-
13	WS	000	Yes			**WS**
14	WD	000	Yes			**WD**
15	TEMP	000	Yes			**AT**
16	RH	000	Yes			**RH**
17	CH4	PPM	Yes			**CH4**
18	THC	PPM	Yes			**THC**
19	NO	PPM	Yes			**NO**
20	NOX	PPM	Yes			**NOx**
21	NRAD	000	Yes			**NRAD**
22	TUP	Deg	Yes			**ATU**
23	O3	ug/M3	Yes	PPB	1.96	**O_3**
24	LOWER	000	Yes			**ATL**
25	NET	000	Yes			**NR**
	pressure					**PP**
	windvar					**SIGD**
	precip					**PREC**

1) SO_2 and NO_2 is measured by monitors, sequential samplers and passive samplers
2) PM_{10} is measured by monitors, highvol samplers, AirMetrics samplers

B.3 Site reports

EIMP Air Quality Monitoring, Alex City centre

Air quality monitoring network
Site visit report

Site Name: Al Shouhada Square, Misr Station, Alex City Centre

Coordinates: UTM:

Access/ availability: At the roof on a low building in front of the main railway station in Alexandria. The roof has to be climbed from a ladder.

Buildings and rooms available: Big Shelter on the top of the building

Area description: Urban/traffic, generally highly polluted from traffic.

Representativity: Typical for city centre of Alexandria. Heavy traffic, several diesel buses close to the station.).

Parameters to be measured: SO_2, NOx , PM10

Measurement equipment: Monitors (SO_2, NOx), sampler PM10

Infrastructure:
Power: 220 V available
Telephone lines: Will have to be arranged
Sampler/monitor locations: In shelter.
Air intake: For gas monitors about 5 m above ground

Personnel: Eng. Essam Hasby, The Public Authority for Transportation in Alexandria
3 Aflatom Street
El Chatby – Alexandria
Local contact person: Mr Samir Arafa, General Inspector of the bus station.

BS, 02/12/99

Report on: The selection of a new site instead of Abu Qir Station

Terms of reference. A report required by EEAA to select a new site for in Alexandria City.

Dear Eng/ Haitham

I have the please to write to you informing you that I have selected many sites as follows:

1. The first one is at El-Nahda area down wind Alexandria for tires and carbon black companies at El-Mostawdeat club (we visited it during last your visit to Alexandria which prof. Sivertsen accompanied you.
2. The second site is at Smoha area downwind the 2 big companies and Comp Production Niaza of them are using mazout as a fuel and have many stacks. unfortunatily I did not find any official place to put the shelter on it.
3. The third site is at Ezbet Sekina (El-Awayed area) down wind thermal power station and Alexandria Company for pharmaceutical. This area receives a high amount of pollutants however, I didn't find any suitable place to establish a station there, where all the building are houses only.
4. The forth site is at the center of Alexandria closed to the train station (El-Shohada square). The surface of the building of the bus stations is suitable to set the shelter there. we have to contact
5. The fifth site is at El-Manshia Square above the building of the traffic authority in Alex. The contact person General "Sherif Roshdy
   Colonel Mohamed Fawzy
   Colonel Montasser Abdel Matin
6. Site at burg El-Arab City.
7. Site at Abis area downwind the compost plant and Lake Marriout. South of Alex.

EIMP Air Quality Monitoring, Amryia .

Air quality-monitoring network
Site visit report

Site Name: Amryia district
Co-ordinates: UTM: 500.0, 920.0

Access/ availability: Easily from El Nubaria Canal, inside El Mestoudaat club, south to the carbon black factory Amryia district.

Buildings and rooms available: The instruments will be located in iron boxes on the ground

Area description: Industrial area surrounded by fields from all sides.

Local sources: Industrial emissions from carbon black factory and petrochemicals factory.

Representativity: Representative for industrial areas of Alexandria.

Parameters measured: Presently only PM10 and dust fall will be measured.

Measurement equipment: PM10 Airmetrics and dust fall collector.

Infrastructure: Power: 220 V available.
Telephone lines: not needed.
Sampler/monitor locations: inside iron box located on the ground.
Air intake: 1.5m from the ground.

Personnel: The person responsible is Eng. Mohammed Ali
The director of the site.

Haytham A. Ahmed, site reports

Air quality monitoring network
Site visit report

Site name: Al Shouhada Square, Misr Station, Alex City Centre

Al Shouhada square. The bus station building in the back may be the position for a new shelter.

The bus station building – shelter position in the centre of he picture

Appendix C

Procurement of equipment, hardware and software

C.1 Spare parts and consumables

Purchasing Spare Parts And Consumables

Activity No.	Responsibility Of		
	Institution	Supplier	EIMP
1	Prepare lists of items, specification data sheets and bill of quantities.		
2	Submit request to EIMP with the lists, specifications & quantities.		
3			Review and approve the request.
4	Contact relevant supplier to submit quote.		
5		Submit quote to the Institution taking into consideration the following • Offer must be addressed to the Institution: • Consignee and delivery address must be EEAA-EIMP; and • Proforma Invoice / invoice must be addressed to Danida/ EEAA-EIMP.	
6	Evaluate the quote technically & commercially.		
7	Submit the technical & commercial evaluation reports to EIMP for approval prior to placing the order.		
8			Review and approve the technical & commercial evaluation reports.
9			Asks the Institution to place the order.

10	Place the order and please remember that: • Consignee and delivery address must be EEAA-EIMP; and • Proforma Invoice / invoice must be addressed to Danida/ EEAA-EIMP.		
11		Accept / confirm the order and send the Proforma Invoice (P/I) to the Institution.	
12	Send the Proforma Invoice to EIMP to effect payment according to the payment terms.		
13			Effect payment according to the payment terms.
14			Provide the Institution with authorization letters from EEAA for clearing the goods* from the customs.
15	Proceed with the customs release formalities with / without the help of a customs clearance agency.		
16	Transport the goods to EIMP		
17	Inspect the goods.		Inspect the goods.
18			Hand over officially the goods to the Institution.
19			Reimburse the Institution with the expenses of the customs clearance and land transportation.
20	Issue certificate of acceptance to the supplier.		

* EEAA is exempted from Customs and Sales Taxes for the shipments supplied under EIMP.

C.2 Request consumables

Cairo University
Center for
Environmental Hazard Mitigation

جامعة القاهرة
مركز الحد من المخاطر البيئية

To: Environmental Information and Monitoring Program (EIMP)
Attention: Mr. Haytham Ahmed
Fax No.: 5256467
Subject: Request for consumables and suppliers
Please find enclosed a list of consumables and suppliers needed for Cairo and Alexandria Consultants to run the EIMP Air Monitoring Program

Item No.	Item Description	Quantity
1	SO2 Perm Tube Extended Life #19, 0.8 cm P/N 177-008-0082-T33-C35 Certified at 35 degrees C +/- 2% accuracy Total rate: 2370 ng/min +/- 20% Target rate: 2500 ng/min	10
2	SO2 Perm Tube Extended Life #3, 0.5 cm P/N 187-005-0082-F33-C45 Certified at 45 degrees C +/- 2% accuracy Rate: 665 ng/min +/- 20%	3
3	NO2 Perm Tube Extended Life, 0.7 cm P/N 177-007-0081-C35 Certified at 35 degrees C +/- 2% accuracy Total rate: 1815 ng/min +/- 20% Target rate: 1775 ng/min	10
4	milipore Teflon filters Type LS 5.0 µm (Box Contains 100 filter)	40 Box
5	TEI 650 PM10 monitor filter real	30
6	Sintered glass filter in bulb for NO2 Sequential samplers (NILU)	70
7	Inlet Inline (P/N 9657) for SO2 filter holder used in SO2 Sequential Sampler	70
8	Dust Fall bucket	25

Project Manager
T. M. El-Araby
Dr. Tarek El-Araby

25 AUG 1999

CAIRO UNIVERSITY
Hazard Mitigation Center
Air Pollution Monitoring Project

تليفون:٥٧١٩٦٨٨ (٢٠٢) تليفون/فاكس: ٥٧١٩٦٨٧(٢٠٢) ص.ب. : ٤٥٣ الاورمان – جيزة– الرقم البريدي ١٢٦١٢
جمهورية مصر العربية

C.2.1 Equipment Release Request

Environmental Information
and Monitoring Programme
EEAA - Danida - COWI
30 Misr-Helwan Str. Maadi, Cairo, Egypt
Tel: 202 525 6442, Fax: 202 525 6467
EIMP@intouch.com

Equipment Release Request

Please release the following items from the EIMP store:

Item no	Description	Quantity

Purpose of Equipment release:_____

Prepared by: Date: _____

Name: _____

Position: _____

Approved by: _____

EIMP Instr\equip-request\BS 14/11/99

C.3 Computer upgrading at CEHM

Unknown

From: Dean Jones
Sent: 17. november 1999 09:10
To: Jorgen Simonsen; Bjarne Sivertsen; Ahmed Seoud
Cc: Mohamed Zaki
Subject: Computer Upgrade at Cairo University

Current situation
1 Main Server - (newly upgraded but needs a new network card)
1 Client (RAM upgraded, to 64 MB, works adequately)
1 Backup Server (insufficient for the purpose - would need to be upgraded)

According to Bjarnes memo (9 Nov 1999 - procedure for daily reporing of air quality data from Cairo), to facilitate daily reporting and increased quality control measures, another client computer is needed. This will bring the total number of client computers to two (one for quality control and one for reporting) Cairo University also need a upgraded or replacement backup server, and a new PC for the Laboratory At the same time the network cabling could be upgraded to a more modern architecture (it is currently 10 MB Coaxial Ethernet)

Proposal

Current Machine		New role
Main Server	->	Backup Server
Client 1	->	Stays as client (QA/QC)
Backup Server	->	Laboratory PC

New Hardware	Approx Cost (L.E.)
Server as Main Server	8500
Client as Client for Reports	6000
Hub and accessories	500
Total Cost	15,000

Please confirm that you agree as soon as possible.

D. Jones and M. Zaki

Appendix D

Data management

D.1 Data base operation

EIMP

Note	Environmental Information and Monitoring Programme, EIMP
Subject	Air Database System operation (*Draft*)
Date	31 Oct 1999
To	Ahmed, Jorgen
Copy	Dean, Bjarne, M.Fathy
From	M.Zaki

Environmental Information and Monitoring Programme

EEAA - Danida - COWI

30 Misr-Helwan Street
Maadi, Cairo, Egypt

Tel.: (+202) 5256442
Fax: +202 5256467

E-mail: eimp@intouch.com

1 Introduction

This note was prepared to clarify the possibilities to get the air quality data every day from the monitoring agencies, the needs in terms of equipment and software were also addressed.

2 Details

2.1 CEHM

CEHM manages the big part of the network, 27 station, the way of communication is the only modem they have. This modem is used to poll data form number of stations and at the same time is used to send us the aggregated data, which considered as a single point of failure, specially the modem speed is 1.44 Kbits/sec

As we desire to have the data day-by-day, a tide communication with Cairo University is needed rather than dial-up line specially if we consider the quality of the telephone service. Backup mechanism(s) should be established to insure that we could get the data more frequently, example: the Internet and even better leased line between EIMP and CEHM.

Equipment upgrade and backup, there is one computer supposed to be a backup for the server but this is not the case at the moment. The reason is that the staff does not have enough knowledge to set-up backup server. The responsibilities of maintaining the computer equipment is unclear, to what extent EIMP should help?

2.2 IGSR

IGSR manages less number of stations, the modem is used to poll data form number of stations and at the same time is used to send us the aggregated data. The modem speed is 33.6 Kbits/sec

Backup and upgrade, there is no backup equipment at all which is considered critical

EEAA

Only one modem connected to the old server and there is a need for backup communications, Leased line and the Internet.

Recommendations

1. Increasing the alternatives of the communication between EIMP and the monitoring agencies would maintain the data availability very high, and insure that EEAA would have the data. In addition to our dial-up line, the suggested alternatives are:

Yes!

- The Internet, all parities have an Internet connection. Taking into consideration the security, the monitoring agencies would send EIMP the data any time. That can be achieved by assigning our old server a real IP address.
- Leased line, Between EIMP and CEHM only, various types of leased line can be applied depend on the quality of service, speed we need and the cost

2.Equipment upgrade and backup, a allocated budget for upgrade and backup shall be assigned

2.Difinnation of responsibility of equipment upgrade and maintenance

30/10-99 Comm: Presently data should be prepared from Syst.Man → to Data Base Prog at CEHM!
Info collected on Web-page from EEAA daily!

D.2 Data quality assurance

Data Quality Assurance

Data QA/QC is performed at several levels:
- Calibration of monitors before installed in field
- Calibrations in field,
- Quality checks at data retrieval into the Station/ and System Manager,
- Data adjustment before entering data into the data base,
- Data quality controls through statistical analyses and evaluation.

Calibrations
Quality controls performed through various types of calibrations have been described in different documents, such as:
- Standard Operations Procedures Manuals
- History log book manuals
- Station manuals
- Data validation manuals
- Calibration and maintenance schedules
- Various reference materials.

Why calibrate
All instruments have to be calibrated on a routine basis for various reasons:
- Instrument response changes over time
- Secure correct response
- Example: NO output value
- Instrument parameters changes over time
- Secure correct parameter settings

For Gas monitors such as SO_2 , NOx, CO there are different levels of calibrations undertaken before the data at all enters into the Station Manager and System Manager data base:
- Multi-point calibration,
- Travelling standard gases with known concentration and
- Zero span check (two point calibrations weekly).

O_3 monitors are calibrated with O_3 generator with photometer

Sequential sampler, High volume samplers, and PM_{10} monitors are calibrated through flow calibrations.

For every operation there is a SOP
- SOP for calibrating a monitor in the lab
- SOP for calibrating a monitor at the station
- SOP for correcting data at the Monitoring Centre

Secures that a specific operation is performed the same way by all operators

The calibration results will have to be followed up by the data retrieval staff at the System Manager!

QAQC\dataQA\BS, 06.01.00

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 always 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.

Checking data for the final database

Data QA/QC control at the System Manager
Data from monitoring stations with telephone lines should be polled daily. 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, 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 correct 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)15% , adjust trend on data prior to calibration.

10. Verify remarks and comments in the System Manager Logbook (Copy attached)

Transfer data into the DATAbase programme

QAQC\dataQA\BS, 06.01.00

Clean and filter data in the Data Base programme

1. View data in the Data base programme, 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

Print graph every week, and transfer the data to EEAA.
Store printed graph in specific paper file, add comments etc..

Transfer data to EEAA
Transfer data, cleaned and filtered in the Data base programme and in the System Manager, to the EEAA server every week.

Calibration and maintenance is documented
Correction of data is documented

QAQC\dataQA\BS, 06.01.00

Sheet no:

EIMP DAILY DATA VALIDATION LOG

STATION:	STATION ID:		
Date / time	Remarks on possibly invalid data, communication problems, etc. Write OK if there is no problems	Persons notified	Initials

QAQC\dataQA\BS, 06.01.00

Appendix E

Training activities

E.1 Training needs for the Air Pollution Component

EIMP
Environmental Information
and Monitoring Programme
EEAA - Danida - COWI
30 Misr-Helwan Str. Maadi, Cairo, Egypt
Tel: 202 525 6442, Fax: 202 525 6467

Memo

Training Needs for the Air Pollution Component

General Training for Counterparts
Reporting in English (general training needed)
General environmental knowledge (On-the-job as the project progresses)

On-the-job training to the EEAA counterparts on:
- Preparation of data for monthly, quarterly and annual report
- Preparation of daily reports, understanding air pollution episodes,
- Basic statistical analysis,
- Understanding and using the data base

On-the-job training has been given to the Monitoring Institutions
- Basic air quality science
- Data retrieval and QA/QC procedures
- Data Reporting
- Treating of samples and chemical analyses
- Field staff training in calibration, maintenance and repair
- Collecting and analyses of VOC samples
- QA/QC at the laboratory
- Basic statistical analyses
- Use of the data base statistics and graphics

Background in air pollution science
A Seminar will be given (March 2000) on the following topics:
-Air quality guidelines and regulations,
-meteorology,
-sources and compounds,
–dispersion and deposition,
–understanding the concentration levels.
This seminar will be designed both for EEAA counterparts and for Monitoring Institution experts.

EIMP Memo 10/01/00

E.2 Training activities for station operators

Training activities

The on-the job training has been fulfilled when operations and routine maintenance at all sites are comcerned. Maintenance and calibration activity schedules have been developed as shown in the example below.

Activity plan

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. There is a special plan for each station depending upon the instrumentation at the station and the environment surrounding the station.

There are usually three levels of activities, the routine maintenance peformed once a week, the field calibration and other maintenance performed every 3 months and finally the dynamic calibration and yet other maintenance which are perform yearly.

Maintenance and calibration activities for selected instruments

SOP	Loc.	Period
Routine maintenance on a TEI model 43C SO2 monitor	Field	7 days
Routine maintenance on a TEI model 42C NOx monitor	Field	7 days
Routine maintenance on a TEI model 650PM10 PM10 monitor	Field	7 days
Routine maintenance on a TEI model 610 TSP high volume sampler	Field	7 days
Routine maintenance on a NILU SF1 Dust fall sampler	Field	1 month
Field calibration of a TEI model 43C SO2 monitor	Field	3 months
Field calibration of a TEI model 42C NOx monitor	Field	3 months
Field calibration of a TEI model 650PM10 PM10 monitor	Field	3 months
Field calibration of a TEI model 610 TSP high volume sampler	Field	3 months
Routine maintenance on an Air intake and manifold	Field	3 months
Dynamic calibration of a TEI model 43C SO2 monitor	Lab	1 year
Dynamic calibration of a TEI model 42C NOx monitor	Lab	1 year
Field calibration of a TEI model 650PM10 PM10 monitor	Lab	1 year
Field calibration of a TEI model 610 TSP high volume sampler	Lab	1 year
Routine maintenance on a MO Meteorological tower and sensors	Field	1 year

E.3 VOC method, preparations before training

EIMP

Environmental Information and Monitoring Programme
EEAA - Danida - COWI
30 Misr-Helwan Str. Maadi, Cairo, Egypt
Tel: 202 525 6442, Fax: 202 525 6467

Memo

To: CEMH

From: Ove Hermansen
Date: 10 November 1999

VOC-method, necessary preparations before training:

At least two persons with the experience needed to operate the gas chromatograph must be available all time during next visit. They must have a good understanding of the operation of the instrument whereas no time bla. bla

Necessary items:

Calibration gases:
ppm hydrocarbon mixtures (C_2-C_6) can be ordered from Scotty gases

Tubing and connectors:
Provided by Swagelok or Hoke (Gyrolok) (attachment: Tube connectors and adapters)

Purge & Trap unit:
External coolant, CO_2-cylinder with regulator
Manuals for the P&T (may be somewhere in the laboratory, if not; should be provided by the local supplier)

Gas chromatograph:
Helium cylinders & regulator (attachment: offer from ETICO GAS)
Chromatographic column (Al_2O_3/KCl PLOT coloumn, 50 m, 0.32 mm ID) provided by Chrompack. (Local distributor: Group Engineering & Scientific Systems., PO Box 1024, Al Maadi – Cairo)
Manuals for the GC-software (may be somewhere in the laboratory, if not; should be provided by the local supplier)

Appendix F

QA/QC

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

Procedures for QA/QC

Manual collected samples

SOPs

Training have been performed for 6 methods where SOPs have been developed. This includes the 6 methods given below:

Parameter	Procedure name
SO_2	Procedure for sampling and analysis of SO_2 in air by use of a filterpack sampler
NO_2	Procedure for sampling and analysis of NO_2 in air. Iodide absorption method
Passive SO_2 and NO_2	Procedure for sampling and analysis of NO_2 and SO_2 in air by the use of passive samplers.
TSP, PM_{10}	Procedure for sampling and analysis of suspended particulates in air by the use of a highvolume sampler
Dustfall	Procedure for sampling and analysis of dust fallout from the air
QA-QC	EIMP Air Quality QA-QC-procedures

QA/QC samples

The level of quality control needed was discussed with Ulla Lund, and it was decided that two quality control samples was needed. One should contain of 10.00 and the other 1.00 µg/ml of both $SO_4^=$ and NO_2^-. On the basis of these samples , X- and R-charts should be prepared by the laboratory. The QC-samples should be prepared by the Ain Shams University, and delivered to CEHM of the Cairo university to control the ion chromatographic analysis of sulphate and nitrite. Details about the preparation and handling of the QC-samples is described in a separate procedure "EIMP Air Quality QA-QC-procedures". The laboratory had access to a specially developed program for presentation of quality assurance data. The program is developed by VKI in Denmark and has the name Quality.

F.2 QA/QC ozone monitors

Unknown

From: Lydia Kiriacos
Sent: 26. oktober 1999 14:21
To: Bjarne Sivertsen; Ulla Lund

Date: Tue, 26 Oct 1999 11:35:53 +0100
From: Leif Marsteen <lm@nilu.no>
Subject: Mail to: Bjarne and Ulla. Re: QA procedures
To: Bjarne Sivertsen - EIMP <eimp@intouch.com>
X-MSMail-Priority: Normal
X-MimeOLE: Produced By Microsoft MimeOLE V4.72.3612.1700
X-RCPT-TO: <eimp@intouch.com>

Hei, hei

Mere forklaringer

Re: Defekt fuktighetssensor på IGSR: Dette har vi på lager.

Re: Maintenance sheet sekvensielle samplere: Dette er en av mine oppgaver for min tur denne gangen. Den blir lagd i samarbeide med Rolf i løpet av mine to første uker i Egypt.

Re: QA/QC - O3 monitors.
All O3 monitors will be calibrated yearly at NIS as a routine (dynamic calibration). We do not have a travelling standard for O3 monitors. We agreed that during station audits NIS will bring their O3 monitor to the station and run it in parallell with the O3 monitor at the station for a day or two. This is an alternative to calibrating the O3 monitor using a travelling standard in a gas cylinder which is not possible. This alternative may not be practical as it includes the installation and data logging of an extra monitor, space may not be big enough. The SOP for doing this is not yet written. If we choose not to do this there will be no performance audit at the station. The O3 monitors are known to be very stable and this is probably good enough.

Re: Calibration of travelling standards: NIS will calibrate all new gas cylinders before they are distributed to the network. After receiving a new gas cylinder from NIS CEHM will calibrate it by themselves before use. CEHM will calibrate their own travelling standards every three months. CEHM will visit every station and calibrate the monitors in the field using the travelling standards every three months. NIS will not calibrate CEHM's gas cylinders yearly.

Best regards

Leif Marsteen
Head of Dep. for Instruments and Field Sampling
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<!DOCTYPE HTML PUBLIC "-//W3C//DTD W3 HTML//EN">
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<HEAD>

<META content=text/html;charset=iso-8859-1 http-equiv=Content-Type>
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Appendix G

Monitoring

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

G.4.1.1 Equipment at CTS for maintenance & repair

G.4.2.1 Sparepart 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

G.6.2.1 Sampling programme, filter analyses
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
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

G.2.3.1 Operation of Monitoring Programme

Environmental Information
and Monitoring Programme
EEAA - Danida - COWI
30 Misr-Helwan Str. Maadi, Cairo, Egypt
Tel: 202 525 6442, Fax: 202 525 6467

Memo

To: **Joergen Simonsen**
From **Bjarne Sivertsen**
Date: **7 October 1999**

Operation of the Air Quality Monitoring Programme

In a meeting at Monitoring Institution at CEHM on 7 October 1999 the following points were brought forward:

Consumables and spare parts
It is crucial for the operation of the programme that ordering and obtaining of spare parts and consumables are NEVER delayed at any point in the process.

It has been decided that the ordering and requesting all kinds of consumables and extras is the responsibility of the Monitoring Institution. There should be no delay, discussions or approvals holding up this process.

- Permeation tubes are presently missing at a number of sites, which means that calibration (span checks) has not been undertaken for the last few weeks. The data quality is thus very questionable.

- Permeation tubes were ordered from CEHM in the beginning of September? After that the ordering and purchasing have been stopped by approval by the "management at EIMP"? More than one month of data may have been "spoiled" at several stations.

- Filters for PM_{10} samplers have been ordered "long time ago". It will soon not be able to operate these samplers if the filters can not be purchased immediately.

- A number of 70 Inlet inline filters (type 9657) for the SO_2 sequential samplers were ordered before the summer 1999. They have still not arrived, and CEHM has heard nothing from the EIMP procurement officer. Find out what happened!

- For a smoother operation of the NO_2 sequential samplers another 50 sinter filters are needed. This problem has been identified from the practical field operation

procedures leading to the fact there will always be a delay in delivery of filters from Alexandria and the Delta, and it is impossible to operate the samplers at the normally accepted total number of filters.

- Additional equipment for injecting air samplers to the Gas Chromatograph has been identified and should have been ordered. What happened?

Contract/agreement for repair and spareparts for monitors
CEHM representing the monitoring institutions want to establish a contract/agreement with a highly qualified contractor or the supplier of monitors for assuring availability of spareparts and for repair and maintenance. The contractor should be approved by EEAA/EIMP, but the contract should be directly between CEHM and the contractor.

It has indicated that the contractor will require a certain percentage of the total value of instruments. As a result he will keep in store at any time the necessary spareparts or guarantee a maximum delivery time. In addition he will undertake repair without any extra costs.

The El-Gomhoriya site
Rebuilding the station at El-Gomhoriya is now urgently needed, as all monitors have been out of operation and taken in for repair due to overheating thorugh the summer. Arab Contractors have to be pushed again, otherwise we may have to find another solution in central city centre of Cairo.

Bjarne Sivertsen
Task Manager Air Quality Monitoring

EIMP Memo 10/10/99

G.2.3.2 Status Monitoring Programme Alex and Delta

EIMP

MEMO

Based on meeting at IGSR 12-13 October 1999-10-12

The status of the Monitoring programme Alex and Delta

IGSR station

- New Station Manager (version 6.5), installed 5 Sept., did NOT work. The old version (5.3.) was re-installed on 24 Sept. The status will have to be checked with EMC.
- NOx monitor at CTS since 30 Sept. Agreement with CTS? (see below)
- CO zero line still increasing, had not been adjusted in database.
  Working standard for CO still not available (in customs?)
- SO_2 monitor will be calibrated with travelling standard as soon as possible

Regional site at IGSR

- Ozone measurement levels may have been influenced by water condensed in shelter in July. Water dried and span value changed from 200 ppb to 400 ppb. The monitor will be taken to NIS for total calibration immediately.
- Temperature data were reported okay, but is not perfect. Error may be in the Station Manager (new version 6.5) Have to be checked!
- Relative humidity wrong, problems with sensor? Change sensor as soon as possible!

Abu Quir

- The measurement station does NOT work at the moment
- The NOx monitor (since 19 July), the calibrator and the high volume controller are at CTS since 16 August!
- The SO_2 monitor was calibrated with travelling standard from NIS on 3 August. The monitor shows low values.

ElAsafra

- The measurements seem to work perfectly. Flow reading difficult due to unstable flow indicator (varying between 170-175??). Check flow readings with Dr Soliman at CEHM.
- Is NO_2 being influenced by dirty prefilter at the sequential samplers? Filter will be changed periodically when needed.

Gheat ElEnab

- Same problem as at ElAsafra. Station seems to work properly, but very low SO_2 concentrations. Probably high sulphate concentrations. Will be checked.

ElMax

- The measurements seem to be operated satisfactory. It is, however, difficult to check for power failures. Install battery back up at the site as a test!

Kafr Zayat

- The station is "closed" at the moment, as there are no data logger and computer there. These have been at CTS since 29 July!! The station has both hardware and software problems.
- Mohamed M Kotb had presented a special report from the site.
- PM_{10} filter tapes at the monitor are often broken, due to high humidity?
- The temperature inside some of the shelters have been set to 17 degC!! This has been changed, but still far too cold! Set the temperatures at 25-28 degrees in summer!!
- Data logger had been unstable, new Station Manager installed 17 August, did not work.

El Mahalla

- Presently the data at ElMahalla look reasonable/good.
- The power was unstable and a stabiliser had been installed; for PM_{10} in August, for SO_2 this week.
- Missing PM_{10} data due to the fact that the PM_{10} monitor takes 3 hours to stabilise and record data after a power break.

El Mansoura

- There had been a lot of problems at this site also, but most of them have been corrected.
- The data seem to be fine and the station operates on Station Manager version 5.2.

Tanta

- The measurements are adequately collected. The SO_2 concentrations are low.

Kafr Dawar

- No problems reported. The data look okay.

Damietta

- The measurements are working properly. Very low concentrations of $_{SO2}$, high concentrations of dust.

General problems

Contract with CTS
The delay in repair due to missing spareparts at CTS has been a big problem. The Monitoring Institutions will have to prepare a contract with CTS. The following elements of such a contract have been mentioned.

Providing a certain percentage of the total monitor value (1 %?) is being paid to CTS
1. Repair and maintenance of monitors will be undertaken without any delay. (maximum time spent at CTS will be one week!)
2. Spareparts and ascessories have to be in store in Cairo at any time
3. If crucial parts are missing, orders should be placed directly from the instrument company,
4. A certain amount of important monitors should be kept available in Egypt,
5. Repair and maintenance will be undertaken without any extra costs.

Also discuss the possibility for periodical visits to stations in the Delta and in Alex for maintenance and check. This will be paid from IGSR.

The new Station Manager / System Manager
Several errors have been detected in the new Station Manager version 6.5. Also the System Manager does not seem to work adequately.
EEAA/EIMP will keep in contact with Steve Gersh at EMC until all problems have been solved.

Location of AbuQuir monitoring station
The location of the site at AbuQuir has been discussed. During wind from the fertiliser the SO_2 and NO_2 concentrations are measured to between 50 and 100 $\mu g/m^3$. Most often the site is measuring background concentrations.

Measurements will be collected for one year at his site. After that we will consider using the site for another purpose, and continue measuring at AbuQuir using passive samplers.
The discussion of the new location and the objectives for the use of this station will be finalised at the end of October.

Temperature setting in the shelters
The temperatures inside the shelters have been set to 17 degrees by the air-condition company. This is far too low in the hot summer climate in Egypt, and may have been a participating reason for high humidity inside the shelters.
The temperatures inside the shelters should all be set at 25-28 degrees!!!

Morорcycle for station visits
One motorcycle was requested from IGSR for improving the inspection, maintenance and calibration of the monitoring sites.

Air Condition for the System Manager
The room for the System Manager may occasionally be very hot. It was requested to take the 2.5 hp AC from the roof station to the SM room and replace the roof site with a 1.5.hp AC.

EIMP IGSR

Alexandria: 22/08/99

Technical Report
Kafr El-Zayat station

This report describes the status of Kafr El-Zayat station and explains the reasons for the low data availability at this station.

SO_2 Monitor

SO_2 monitor was working in good conditions till 22 June 99 when observed very high lamp voltage and very low frequency. The troubleshooting guide did not mention this problem, but it mentioned in the operation manual that, to reduce the lamp voltage we have to screw a volt regulator (R28) on the power board, but that did give any response. The monitor was moved to IGSR then to CTS. After repairing the monitor was returned to the station at 7 July 99.

At 28 July, a transformer belongs current output board was brunet and also the input power fuse. The monitor was sent again to CTS for repair and it re-installed in the station at 5 August. The monitor is working in good condition till now

NO_x Monitor

The air condition does not work at 7 July. The temperature inside the shelter was very high. Turned all monitors off till we repaired the air condition at the same day. After repairing the air condition we turned the monitors on, but found an alarm at NO_x monitor and found the ozone flow rate was zero. After regarding the operation manual and troubleshooting guide we diagnosed the status and checked the flow paths inside the monitor, cleaning these paths, but there was no response. The monitor transferred to IGSR and then to CTS. CTS found that the monitor needs a new flow controller but the company has not enough stock of this part. The monitor is in repair till now

PM_{10} Monitor

PM_{10} monitor has problems with the internal battery and connection since the beginning of monitoring at Kafr El-Zayat, but this problem were solved now by replacing the old internal battery and fixing the internal connections.

Project Manager Quality Manager Station Operator

Due to the high humidity level and high water vapor content inside the shelter, as a result of the diference between the temperature inside and outside the shelter, the filter tap becomes soft and easily broken. So, for every routine visit I find the filter tap broken and this leading to loose of data for days, and after repairing, it broken again after one or two days and it remains broken till the next routine visit.

Data logger and PC

In addition to the above problems with the monitors, observed zero values for one-hour averages for all the day hours except one or two hours during the normal working conditions. Also there was noisy readout, it changing from positive to negative reading in sharp way. This implies that some thing wrong with data logger or PC. To solve this problem, I gradually checked the status by checking the output voltage from the monitors to the data logger but it implies that the output from the monitor were okay. Checked the voltage at the data logger but it was noisy and unstable. But it is found that the data logger is responding with the calibration command from the PC. So, after copying all the pervious data on diskette, I tried to re-install the station manager program. Although the software package at the station was original copy but there was some missing fillies and bad diskette media, so I had to shut down the station and back the CPU to IGSR to re-install the station manger by another package. After re-installing the station manager at 17 August, I installed the CPU at the station again and checked all the station again, but the same problem was present. This assuring that the problem is at the data logger. I had to disconnect the data logger and back it to IGSR and then to CTS for repairing.

Air condition

During my routine visit at 7th of July 99, air condition had a malfunction. That malfunction affected monitors specially NO_x monitor. It causes a damage on the flow controller of the ~~zero~~ ozone. We fixed the air condition at the same day for 3 hours. The air condition is working in good conditions now.

Project Manager Quality Manager Station Operator

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

EIMP
Environmental Information
and Monitoring Programme
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Tel: 202 525 6442, Fax: 202 525 6467

Memo

From Bjarne Sivertsen
Updated: 20 November 1999

Sampling Programme for VOC, PM_{10} (AIRmetrics) and Passive samplers

The programme for use of simple samplers for VOC, PM_{10} and SO_2 /NO_2 will be flexible and may be modified as the results from measurements are analysed and evaluated. The following design represents the start up of this sampling at the end of 1999.

VOC samplers

A total of 5 VOC samplers are available for the EIMP programme. The measurement programme at the start of measurements will be as follows.

Site	Bi weekly 1)	Monthly	Comment
El-Gomhoriya	X		Inside new room or at $_{PM10}$ monitor?
Tabbin south	X		VOC in shelter, intake through wall
Shoubra	X		Intake through wall, VOC in room
ElMax	X		VOC in shelter, intake through wall
Damietta	X		VOC in shelter, intake through wall
Next: Fum El-Khalig	x		VOC in shelter, intake through wall, this site should be used while waiting for El-Gomhoriya to be finalised

1) sampling days as PM_{10} or TSP samplers

The programme should start as soon as possible. Due to lack of canisters, samples will only be exposed every second week from the beginning.

PM_{10} sampling with AIRmetrics

The EIMP air quality monitoring programme has presently designed 20 sites for PM_{10} sampling. Eleven of these are using AIRmetrics Minivol air sampler.

A proposed future use of AIRmetrics samplers from Cairo Air Improvement Project (CAIP) initiated an evaluation of the suspended particulate sampling programme

within EIMP. It has been demonstrated that fine particles (PM_{10} and $PM_{2,5}$) may represent a major health hazard to the population in the greater cities and in industrialised areas of Egypt. It may thus improve the quality of the EEEA permanent air quality monitoring programme to extend the PM measurements in the future.

The sampling using the AIRmetrics PM_{10} samplers will start with the following programme:

Site	Weekly 1)	Monthly	Comment
10 Shoubra	x		CAIP box with stand on roof
16 Port Said		x	CAIP box with stand on roof
17 Ismailia		x	CAIP box without stand on roof
19 El Minia	x		? CAIP box with stand on roof
22 Nag Hammadi		x	CAIP box with stand on roof
25 KomOmbo	x		sampler in shelter, intake from roof
27 RasMohamed		x	CAIP box with stand on roof
31 ElAzafra	x		sampler in shelter, intake from roof
34 Damanhour		x	CAIP box
36 Tanta	x		sampler in shelter, intake from roof
40 Kafr Dawar	x		sampler in shelter, intake from roof
41 El Amraya district	x		CAIP box with stand on roof
3 Met. Authority	x		site for future measurements, if more samplers are obtained from CAIP
7 Tabbin South	x		for future
15 Suez	x		for future
18 ElFayum		x	for future
23 Luxor	x		for future
26 Aswan	x		for future
33 Alex Regional	x		for future
11 Giza, Cairo Univ	x		for future
			for future

1) sampling days as PM_{10} or TSP samplers

The total particle programme consists of :

- PM_{10} monitors beta gauge, PMB
- PM_{10} high volume samplers, PSH
- PM_{10} sampling with AIRmetrics PAIR
- TSP high volume, TSP
- Soot from sequential samplers, SSS
- Dustfall DUF

In addition $PM_{2,5}$ and PM_{10} is being measured by the CAIP programme

The total measurement programme for particles in air is presented in the Table below.

The total particle measurement programme of EIMP/EEAA

			PMB	PSH	PAIR	TSP	SSS	DUF	CAIP
1	Cairo c.Qualaly	Urban centre ☎	X			X			A
2	El Gemhoroya st.	Street canyon	X						
3	Meteorological Inst	Residential. ☎			O				
4	Nasr City	Roadside/Residential		X			X		
5	Maadi EEAA	Residential ☎		X					
6	Tebbin	Industrial ☎	X			X		X	
7	Tebbin south	Industrial			O	X	X	X	A
8	Fum Al-Khalig	Road side/urban	(X)						A
9	Abu Zabel	Industry/res						X	
10	Shoubra	Industrial ☎			X	X		X	
11	Giza, Cairo Univ.	Residential			O				
12	Gizapyramid	Regional							
13	6 October	Res/industrial		X			X		A
14	10 Ramadan	Residential		X			X	X	A
	Canal area								
15	Suez	Res/urban. ☎			O	X		X	
16	Port Said	Residential			X				
17	Ismailia	Residential			X				
	Upper Egypt								
18	El Fayum	Urban			O			X	
19	El Minya	Urban/Res			X			X	
20	Assyut 1	Res/Urban. ☎	X						
21	Assyut 2	Residential						X	
22	Naga Hammadi	Industrial/res			X			X	
23	Luxor	Urban/residential			O		X	X	
24	Edfu	Urban.						X	
25	Kom Ombo	Industrial			X		X		
26	Aswan	Urban/resident. ☎			O			X	
	Sinai Area								
27	Sharm ElSheik	Background			X			X	
	Alexandria								
28	Abu Keir College	Industrial ☎		X				X	
29	El-Max Petrogas	Industrial		X			X	X	
30	IGSR, Alex	Urban/road side☎	X						
31	El-Azafra-	Residential			X		X		
32	Gheat El-Inab	Residential		X			X		
33	Alexandria regional	regional ☎			O				
41	El Amraya district	industrial			X			X	
	Delta Area								
34	Damanhur	Urban			X				
35	Kafr el Zayet	industrial/res. ☎	X					X	
36	Tanta	urban			X		X		
37	ElMahalla El Kubra	industrial/res. ☎	X					X	
38	El Mansura	industrial/res. ☎						X	
39	Domyat	Urban/residential		X				X	
40	Kafr Dawar	urban/industr			X			X	
	Total amount of instruments		8	8	12	5	12	21	

O = future AIRmetrics sites

The passive sampling programme

The passive sampling programme has been finally designed and discussed with the monitoring institutions. The measurements will start at all sites from November 1999. Most of the sites have already been working for many months.

EIMP Passive sampling programme

Updated Oct 1999

			Quarterly samples					Passive		Other		
	Site name	**Area type**	**Jan**	**Apri**	**July**	**Oct**	**monthly**					
	Cairo											
3	Meteorological Inst	Residential.	x	x	x	x		NO2		SO2	M	
7	Tabbin south	Industrial					x	NO2		SO2		df
9	Abu Zabel	Industry/res					x	NO2	SO2			
12	Gizapyramid	Monument					x	NO2	SO2			
	Sakkara	Monument	x	x	x	x		NO2	SO2			
	Tahrir Sq.Am.Un.	Urban					x	NO2	SO2		A	
	Shoubra (Kamela)	Residential	x	x	x	x		NO2	SO2			
	Helwan (Maher)	Residential	x	x	x	x		NO2	SO2			
	Nasr City (Tarek)	Residential	x	x	x	x		NO2	SO2			
	Heliopolis (Tarek)	Residential	x	x	x	x		NO2	SO2			
	AinShams (Ahmed)	Residential	x	x	x	x		NO2	SO2			
	Canal area											
	Suez industrial	industrial/res.					x	NO2	SO2			df
16	Port Said	Residential					x	NO2	SO2		A	
17	Ismailia	urban/resid					x	NO2	SO2		A	
	Upper Egypt											
18	El Fayum	urban					x	NO2	SO2		A	df
19	El Minya	Res./ Industrial					x	NO2	SO2		A	df
21	Assyut 2	residential/urban					x	NO2	SO2		A	df
22	Naga Hammadi	industrial/res					x	NO2	SO2		A	df
	Luxor, Karnak	monument	x	x	x	x		NO2	SO2			
	Luxor, Temple	monument	x	x	x	x		NO2	SO2			
24	Edfu	Industry/urban.					x	NO2	SO2		A	df
25	Kom Ombo	industrial					x	NO2		SO2	A	p
26	Aswan	urban/residential.					x	NO2		SO2	A	df
	Sinai Area											
	Sharm ElSheik	city, tourist	x	x	x	x		NO2	SO2			
27	Ras Mohamed	background					x	NO2	SO2		O3	df
	Alexandria											
33	IGSR, Background	Urban regional					x	NO2	SO2		O3	M
	AlAzafra (Shallaby)	Residential	x	x	x	x		NO2	SO2			
	Roman theatre	Monument	x	x	x	x		NO2	SO2			
	Delta Area											
40	Kafr Dawar	industrial					x	NO2		SO2	A	df
34	Damanhur	industrial/res					x	NO2	SO2		A	df
	Kafr el Zayet south	industrial					x	NO2	SO2		A	df
36	Tanta	urban					x	NO2		SO2	A	
39	Domyat	resid					x	NO2		SO2	A	df

A = AIRmetrics PM10 sampler
df = dust fall collector

In addition Passive sampling will be undertaken every quarter around the AbuQuir factories.

G.2.3.4 Programme Status, CEHM & IGSR

Environmental Information and Monitoring Programme
EEAA - Danida - COWI
30 Misr-Helwan Str. Maadi, Cairo, Egypt
Tel: 202 525 6442, Fax: 202 525 6467

EIMP Monitoring and Sampling Programme Status
Minutes from Meeting at CEHM

1 December 1999

	Site	Area type	Param	Status	Responsible	When?
1	Cairo c.Qualaly	Urban centre ☎		Tel. okay AirCon not working	Yassin	
			NOx	okay		
			PM_{10}	okay		
			SO_2	okay		
			TSP	okay	CEHM	
			VOC	will be installed Mar 2000		
2	El Gemhoroya st.	Street canyon		New roo buildt, tele-phone and power 2.12.	Ahmed HAA'	
			CO	at CEDHM,, oka		
			NMHC	will be returned to CTS		CEHM
			NOx	okay (flowcontrol to be ordered from CTS)	CEHM	
			PM_{10}	okay		
			SO_2	okay		
3	Abbasyia	Residential. ☎		okay, modem?	Kamela	?
			Met	okay		
			Ozone	okay		
			SO_2	okay		
4	Nasr City	Roadside/Res	SO_2 BS	okay	Ahmed	
			NO_2	okay		
			PM_{10}	okay		
5	Maadi EEAA	Residential ☎		New Tel line needed!!	HAA/CEHM	Nov 99!!
			NOx	okay (no perm)	Yassin	
			SO_2	okay (no perm)		
			PM_{10}	okay		
6	Tabbin	Industrial ☎		need extra air con?	Maher	
			Met	okay		
			NOx	at CEHM now		
			PM_{10}	PM_{10} low values?	Maher	
			SO_2	okay		
			TSP	okay		
7	Tabbin south	Industrial	SO_2 BS	okay	Maher	
			TSP	okay		
			DF			

8	Fum Al-Khalig	Road /urban ☎	 CO NMHC NOx PM_{10} SO_2	Mobile Telephone one air con out. okay return to CTS okay (no perm) at CTS okay (no perm)	LM Kamela	
9	Abu Zabel	Industry/res	DF PS (S+ N)	okay okay	Kamela	
10	Shoubra	Industrial ☎	 Met SO_2 NO_2 TSP PM_{10} DF	okay, okay okay okay okay not installed (AIRmetrics) okay	CEHM Kamela HAA Kamela	
11	Giza, Cairo Univ.	Residential	 NO_2 SO_2 Ozone Met	need new data logger okay okay okay must be checked	Yassin CEHM BS, CEHM	
12	Giza pyramid	Regional	PS (S+N)	will be started	Yassin/BS	nov
13	6 October	Res/industrial	SO_2 BS NO_2 PM_{10}	okay okay okay	Yassin	
14	10 Ramadan	Residential	SO_2 BS PM_{10} DF	okay okay okay	Kamela	
	Canal area					
15	Suez	Res/urban ☎	 NOx SO_2 TSP DF	tel installed, not working permeation tubes needed okay (no perm) okay (no perm) okay okay	Maher	
16	Port Said	Residential	PS (S+N) PM_{10}	new school, approval installed	Maher HAA	
17	Ismailia	Residential	PS (S+N) PM_{10}	okay installed	Maher	
	Upper Egypt					
18	El Fayum	Urban	DF PS(S+N)	okay okay	Yassin	
19	El Minya	Urban/Res	DF PM_{10} PS(S+N)	okay not installed (AIRmetrics) okay	Ahmed HAA	
20	Assyut 1	Res/Urban. ☎	 NOx SO_2 PM_{10} met	Tel. arrived not connected at CEHM at CEHM at CEHM okay, check data	HAA Ahmed at NIS? CEHM/BS	
21	Assyut 2	Residential	DF PS(S+N)	okay okay	Ahmed	
22	Naga Hammadi	Industrial/res	DF PM_{10} PS (S+N)	okay not installed (AIRmetrics) okay	Mahmooud HAA	
23	Luxor	Urban/res	SO_2 BS DF PS(S+N)	okay okay okay	Mahmoud	

24	Edfu	Urban.	DF PS(S+N)	okay okay	Mahmoud	
25	Kom Ombo	Industrial	SO_2 PS(S+N) PM_{10}	okay okay not installed (AIRmetrics)	Mahmoud	
26	Aswan	Urban/res. ☎	 Met Ozone SO_2 DF	tel. not connected okay, clean okay okay okay	 Maher??	
	Sinai Area					
27	RasMohamed	Background	Ozone DF PM_{10}	okay okay not installed (AIRmetrics)		

Data QA procedure

A new data quality assurance procedure started on 10 Nov 1999. A Draft written procedure was presented to the operators. A written procedure will be finalised during November 1999.

The passive sampling programme

The passive sampling programme has been finally designed and discussed with the monitoring institutions. All measurements have to start at all sites from November 1999. Most of the sites have already been working for many months.

EIMP Passive sampling programme

Updated Oct 1999

			Quarterly samples									
	Site name	Area type	Jan	April	July	Oct	monthly	Passive		Other		
	Cairo											
3	Meteorological Inst	Residential.	x	x	x	x		NO2		SO2	M	
7	Tabbin south	Industrial					X	NO2		SO2		df
9	Abu Zabel	Industry/res					X	NO2	SO2			
12	Gizapyramid	Monument					X	NO2	SO2			
	Sakkara	Monument	x	x	x	x		NO2	SO2			
	Tahrir Sq.Am.Un.	Urban					X	NO2	SO2		A	
	Shoubra (Kamela)	Residential	x	x	x	x		NO2	SO2			
	Helwan (Maher)	Residential	x	x	x	x		NO2	SO2			
	Nasr City (Tarek)	Residential	x	x	x	x		NO2	SO2			
	Heliopolis (Tarek)	Residential	x	x	x	x		NO2	SO2			
	AinShams (Ahmed)	Residential	x	x	x	x		NO2	SO2			
	Canal area											
	Suez industrial	industrial/res.					X	NO2	SO2			df
16	Port Said	Residential					X	NO2	SO2		A	
17	Ismailia	urban/resid					X	NO2	SO2		A	
	Upper Egypt											
18	El Fayum	urban					X	NO2	SO2		A	df
19	El Minya	Res./ Industrial					X	NO2	SO2		A	df
21	Assyut 2	residential/urban					X	NO2	SO2		A	df
22	Naga Hammadi	industrial/res					X	NO2	SO2		A	df
	Luxor, Karnak	monument	x	x	x	x		NO2	SO2			
	Luxor, Temple	monument	x	x	x	x		NO2	SO2			
24	Edfu	Industry/urban.					X	NO2	SO2		A	df
25	Kom Ombo	industrial					X	NO2		SO2	A	p
26	Aswan	urban/residential.					X	NO2		SO2	A	df
	Sinai Area											
	Sharm ElSheik	city, tourist	x	x	x	x		NO2	SO2			
27	Ras Mohamed	background					X	NO2	SO2		O3	df
	Alexandria											
33	IGSR, Background	Urban regional					X	NO2	SO2		O3	M
	AlAzafra (Shallaby)	Residential	x	x	x	x		NO2	SO2			
	Roman theatre	Monument	x	x	x	x		NO2	SO2			
	Delta Area											
40	Kafr Dawar	industrial					X	NO2		SO2	A	df
34	Damanhur	industrial/res					X	NO2	SO2		A	df
	Kafr el Zayet south	industrial					X	NO2	SO2		A	df
36	Tanta	urban					X	NO2		SO2	A	
39	Domyat	resid					X	NO2		SO2	A	df

A = AIRmetrics PM10 sampler
df = dust fall collector

In addition Passive sampling will be undertaken every quarter around the AbuQuir factories.

EIMP \meet\CEHMstatus\ 6/01/00

Environmental Information and Monitoring Programme
EEAA - Danida - COWI
30 Misr-Helwan Str. Maadi, Cairo, Egypt
Tel: 202 525 6442, Fax: 202 525 6467

Minutes from Meeting at IGSR 29 November 1999

EIMP Monitoring and Sampling Programme Status, IGSR

	Site	Area type	Param	Status	Responsible	When?
	Alexandria					
42	AlShouhada square	urban/traf ☎	SO_2 NOx PM_{10}	New tel line to be ordered New Site selected at the bus/train station	HAA/IGSR installation in decembr?	To be followed up by H.S.
29	El-Max Petrogas	Industrial	SO_2 BS NO_2 PM_{10} DF	okay okay okay okay	M Rashad	
30	IGSR, Alex	Urban/road ☎	 NOx SO_2 PM_{10} NMHC CO	Internal line not operating with the system manager Data logger at CTS reintalled - okay okay, calibrated okay okay okay- zero line at 6	Hossam	 Monitor at Kafr Zayat
31	El-Azafra-	Residential	SO_2 BS NO_2 PM_{10}	okay okay will be installed	Hossam RD	
32	Gheat El-Inab	Residential	SO_2 BS NO_2 PM_{10}	okay okay okay	M. Rashad	
33	Alexandria regional	regional ☎	 Met Ozone	local line, not working, RH okay? change radiation shields error on temp sensor? At NIS for calibration	Hossam RD CEHM RD? NIS	 follow up by Hossam
41	El Amraya district	industrial	PM_{10} DF	not installed (AIRmetrics) installed	M Rashad	
	Delta Area					
34	Damanhur	Urban	PS(S+N) PM10	okay Airmetrics in box	 HAA	 ?

35	Kafr el Zayet	industrial/res. ☎	SO_2 NO_x PM_{10} DF	Tel installed okay (from IGSR) okay (from IGSR) okay okay	M Mamdoua	Transformer and stabiliser needed!
36	Tanta	urban	SO_2 BS PS (N) PM_{10}	okay okay not installed (AIRmetrics)	M Mamdoua	
37	ElMahalla El Kubra	industr/res. ☎	SO_2 PM_{10} DF	NO new telelines available okay monitor hanging after power failure okay	HAA M Mamdoua need repair!!	Ali CTS
38	El Mansura	indust/res. ☎	Met NOx SO_2 DF	Telephone connected no data available 23-28 nov okay okay okay okay	Ashraf	The Station Manager may have to be re-installed, Hossam
39	Domyat	Urban/resid	SO_2 BS PM_{10} DF	okay okay okay	Ashraf	cleaned
40	Kafr Dawar	urban/industr	SO_2 BS PM_{10} DF	Okay not installed (AIRmetrics) okay	M Mamdoua	
41	El Amraya district		PM_{10} DF	AIRmetrics okay		

An addition Passive sampling will be undertaken every quarter around the AbuQuir factories.

Data QA procedure

A new data quality assurance procedure was presented and discussed 15 Nov 1999. A final version was presented and discussed on 29 November 1999.

The passive sampling programme

The passive sampling programme has been finally and the measurements have to start at all sites from November 1999. Most of the sites have already been working for many months.

New site in Alexandria

A new site was selected at the El-Shohoda Square, at the bus station close to the main railway station. We discussed the possibilities with Mr Samir Arafa, general inspector of the bus station. Applications for permits from the Public Authority for transportation in Alexandria is being prepared.

System Manager/ Database programme

The System Manager was updated, a new version of the Data base programme was installed and training was performed. The QA system used during daily retrieval, weekly data check and data transfer to the EEAA server was introduced. After the new telephone lines are installed at ElMansoura and KafrZayat and the problems with LAN lines at IGSR is solved data will retrieved on a daily basis from 4 sites.

EIMP \meetingIGSR\BS\ 02/12/99

G.3.2.1 Work Notes, installation

Works Notes November 1999.

991101 Travel to Cairo. Arrived Maadi at 2100.

991102 Office work, tried to get an update of status at different stations and instrumentation.

991103 Went to storage and found one Ozone monitor (calibrated) ready to start measuring as soon as new AQ 02 ElGemhStr station is ready. A complete new data logger is also at storage and will be transferred to Kafr El Zyat as soon as possible.
Rel Hum sensor at storage is going to be changed with the sensor at Alexandria Regional, hopefully next Sunday. This is the only sensor in the storage.

991104 Went to CEHM to look at 2 PM10 monitors and 1 SO2 monitor. After examine of all monitors I trained Yassin how to make the instrument work. The monitors are now ready to go to work at the stations.
After finalised testing of PM10 monitors Yassin and I went to storage and inspected all SPARE PARTS. Yassin have a spare part list of all spare part at the storage. A spare part request form has to be made.
I handed over 2 sets of battery packs (4 pieces size AA) used as backup on PM10 monitors to Yassin. Without this battery PM10 monitor looses all programmed information.

991105 Friday.

991106 Saturday.

991107 Staff meeting. Meeting at CEHM with all technicians present. We looked at every site and every single instrument at each site. Some instruments were at CTS and some at NIS. Most of this instruments just need small adjustments or a zero span calibration and then the instruments can be brought back to different sites and start measuring again. The job will be done this and next week (before 991118).

991108 Went to storage and picked up a spare blower for the air inlet manifold. Have to find some kind of tubing to get the air from this blower outside the shelter due to condensation inside the shelters in summer time. Office works and starts preparation for the trip to IGSR next week.

991109 Went down town to by rubber tubing for ventilation of excess air from air intake manifold. This ventilation must be done at all stations in the delta aria and some of the stations elsewhere in Egypt.

Started up Air Metrics Mini Volume in storage to test the whole system before bringing it to Alexandria. The Quick Connectors male

and female and tube in-between was not in the shipment. This has to be solved before going to Alexandria.

991110 Jim Howes at the Cairo Air Improvement Project kindly provided us 5 male and female connectors.
Jim had an order of some fastener to fix the filter holder on top of the iron tube. I asked him to add 12 fastener to his order. In this way we will have own filter fastener quicker. EIMP have to order 12 male and female connectors as soon as possible.
Meeting at CEHM.
Temporarily I have to come up with fastener for the filter holder before I go to Alexandria.

991111 Went to storage and made a PM10 AIRmetrics air intake for the first station in Alexandria (El Azafra). I also made 2 others air intakes for other shelters. This air intake is at the storage labelled AIR INNTAKE AIRmetrics. The rest of air intakes have to be made by CEHM. Rest of the day: Office work.

991112 Friday

991113 Saturday.

991114 Staff meeting. Prepared spareparts and AIRmetrics PM10 sampler to Alexandria. Loaded all instruments in the car, ready for an early start tomorrow morning.

991115 Went to Alexandria by car. Meeting at IGSR. Started meeting and discussed all stations and instruments in Alexandria and the Delta. The Relative Humidity at Alexandria Background station did not work fore a long time. The reason for this was a loose wire in the junction box between the Met. Tower and data logger. This is **the same kind of problem** that we solved in June this year at the same site in the same junction box. The only difference is the parameter. In June it was the temperature sensor today it was Relative Humidity.
The Station has only ozone and meteorology parameters installed and the **recommended temperature inside the shelter is 26-28 degree C.**

991116 Istalled AIRmetrics PM10 sampler at El Azafra station. 2 engineers from IGSR were present and can put up the rest (2) of the AIRmetics samplers without any help.
At IGSR station I made a hole in the wall, installed a rubber tube on the air intake blower to blow out excess air. This was done to minimise the water condensation problems inside the shelter. Mohamed and Husan got the drill, rubber tubing and silicone to do this modification on every shelter that has air intake and blower.

991117 Went to Kafr Zyat and installed a new data logger. The monitor was at the station but it did not work. The rest of data logger is at CTS for repair. So2 monitor was not connected to the data logger at all. Some

internal cables were removed by CTS when SO2 monitor was there some time ago. I transported SO2 monitor to The Storage in Cairo and IGSR will bring it to CTS later.
Went to Tanta and stayed the night in Tanta after inspection of sequential sampler in the shelter.

991118 Drove to El Mahalla station. Tried to find the reason why the PM10 monitor never restarts after a power failure. No particular mistake was found except for wrong date in the program after power failure. I recommended IGSR to get a new program from CTS and install it. If this don't work PM10 monitor has to be transported to CTS for repair. It might be some bad connection inside the instrument. Went back to Cairo. Arrived in Maadi at 1700.

991122 Went to CEHM. Training in AIR metrics PM_{10} sampler to Yassin and Ahmed. Control of airflow on SO_2 sequential sampler or original forms from stations. OK.

Many of the NO_2 sequential samplers had low flow. This is due to dirt in the orifice.

Went to Shoubra and installed AIR metrics PM_{10} mini vol. sampler. Kamela was at Shoubra. Training was given in cleaning the orifice on NO_2 seq. sampler.

991123 Transported SO_2 monitor and computer monitor from storage to CTS. These items come from Kafr Zyat station brought to storage on 991118 by me. Male and female fittings ordered from AIR metrics, USA today. Delivery time 2 weeks.
Office work

991124 Made SOP seq. sampler SO_2 and NO_2 together with Leif Marsteen. handed over one Data Logger (EMC) to Maher at CEHM. This Data Logger is for Giza, Cairo University, Yassin, and one stabilizer for Tebbin South (TSP sampler), and one AIRmetrics PM_{10} minivol. sampler for training at CEHM.

991125 Exhibition and lecture.
Office work

991126 Travelling to Norway

G.3.2.2 Work plan November

Work Plan November 1999

Table 1. Work Plan November 1999

Date	OK	Task	Comments
99.11.13 lørdag		• Left Norway at 09:45 • Arrived in Cairo at 01:30	
99.11.14 søndag		• Staff meeting • Planning work ahead	
99.11.15 mandag		• RD goes to Alex • BS in Alex • 09:00 Meeting with UOL - Audits, NIS	
99.11.16 tirsdag		• Define operational level doc. structure	
99.11.17 onsdag		• Prepare PM10 mon. audit SOP	
99.11.18 torsdag		• 09:30 Install calibrator at CEHM • 14:00 Weekly meeting at CEHM • Geir arrives • RD back from Alex after work	
99.11.19 fredag		• Ulla returns to Denmark	
99.11.20 lørdag		• 09:00 - 11:00 RD+LM Sequential, dust fall, passive sampler SOPs	
99.11.21 søndag		• Airplane to Luxor	
99.11.22 mandag		• Holiday in Luxor	
99.11.23 tirsdag		• Holiday in Luxor	
99.11.24 onsdag		• Airplane to Cairo	
99.11.25 torsdag		• Sequential, dust fall, passive SOPs	
99.11.26 fredag		• Rolf returns to Norway	
99.11.27 lørdag		•	
99.11.28 søndag		• Geir returns to Norway • 10:00 Staff meeting • Prepare Seq. smp NO2 SOP	
99.11.29 mandag		• Prepare Seq. smp NO2 SOP	
99.11.30 tirsdag		• Prepare Seq. smp SO2 SOP	
99.12.01 onsdag		• Audit training at Fayum and 6 Oct. • 10:00 Weekly meeting at CEHM • Prepare Seq. smp. SO2 SOP	
99.12.02 torsdag		• Prepare Passive smp. SOP	
99.12.03 fredag		• Bjarne returns to Norway	
99.12.04 lørdag		•	
99.12.05 søndag		• 10:00 Staff meeting • Prepare HiVol SOP	
99.12.06 mandag		• Preapre HiVol SOP	
99.12.07 tirsdag		• Prepare HiVol PM10 SOP	
99.12.08 onsdag		• 10:00 Weekly meeting at CEHM • Prepare HiVol PM10 SOP	
99.12.09 torsdag		• Prepare Seq. smp. NO2/SO2 Audit SOP	
99.12.10 fredag		•	
99.12.11 lørdag		•	
99.12.12 søndag		• 10:00 Staff meeting • Prepare HiVol TSP/PM10 Audit SOP	
99.12.13 mandag		• Audit training at NIS, Seq. smp., dust fall, HiVol, passive smp.	
99.12.14 tirsdag		• Audit training at Fayum and 6 Oct.?	
99.12.15 onsdag		• 10:00 Weekly meeting at CEHM • Mission report	
99.12.16 torsdag		• Mission report	
99.12.17 fredag		• Travel back to Norway	

99.11.17 C:\egypt\reports\Work Plan 1999 Nov.doc

G.4.1.1 Equipment at CTS for maintenance & repair

6/10 - GA

Equipment at CTS workshop for maintenance/Repair

At 22 September 1999

I- for CEHM

No.	Equipment type/ Model	Serial No. / Part No.	Status	Date Received	Date Repaired & advised	
1	TEI 42C NOx	S/N 42C-57904-315	WSP	7 / 9 / 1999		Assyut → repaired at NIS 4/10
2	TEI 48C CO	S/N 48C-58154-317	WSP	24 / 3 / 1999	spare parts	Cairo Univ. Mon.lab – need approval from EIMP ←
3	TEI 145 calibrator	S/N 145-55852-317	WSP	8 / 6 / 1999		Gamhoreya → approval given
4	TEI 102S CO calibrator	S/N 102S-58114-316	WSP	18 / 2 / 1999		Fum. El Khalig
5	TEI 55C H2 generator	S/N 55C-58302-317	WSP	8 / 12 / 1998		Fum El Khalig
6	TEI 1150 CO reactor	S/N 1150-58274-317	Ready**	8 / 12 / 1998		→ Mon.lab.
7	H2 generator	S/N 414629	Ready**	8 / 12 / 1998		ok.
8	GAST Compressor	S/N 9704700389	Ready**	8 / 12 / 1998		
9	High volume sampler Timer	NA	WSP	18 / 2 / 1999		
10	High volume sampler Timer Pressure Recorder	NA	WSP	18 / 2 / 1999		

				at:
TEI 48C	CO	Gamhoria	19.8.99	NIS
42C	NOx	Assyut	8.99	
	PM10	Fum el Kh.	19.8.99	CTS
	SO2 NO2 PM10	Tebbin		CTS.

WSP Waiting for Spare Parts
WAP Waiting for Approval from Client
Ready Repaired and ready to delivery
Ready ** Are Model 55C Accessories and have no Problem

EIMP المهندس / طارق كامل المسئول عن
على الحامد

Equipment at CTS workshop for maintenance/Repair

At 22 September 1999

II- for IGSR

No.	Equipment type/ Model	Serial No. / Part No.	Status	Date Received	Date Repaired & advised
1	TEI 42C NOx	S/N 42C-61470-331	WSP	19 / 7 / 1999	
2	TEI 145 [illegible]	S/N 145-58298-317	WSP	16 / 8 / 1999	
3	Current output Board (43C)	P/N 9954	WSP	29 / 7 / 1999	
4	Model ET174C High Volume Sampler Controller	NA	WSP	16 / 8 / 1999	
	TEI 42c NOx			30.9.99	

Abu Qir
Abu Qir
Kafr Zayat + Computer
Abu Qir
IGSR

WSP	Waiting for Spare Parts
WAP	Waiting for Approval from Client
Ready	Repaired and ready to delivery

G.4.2.1 Spare part list

EIMP

Note

Subject Air monitoring sparepart list

Date 18 Mar 1999

To AAE

Copy MF, RD, BS, JFS

From LM

Environmental Information and Monitoring Programme

EEAA - Danida - COWI

30 Misr-Helwan Street Maadi, Cairo, Egypt

Tel.: (+202) 351 0970
Fax: +202 378 5478

E-mail: eimp@intouch.com

I have prepared an Excel workbook for tracking the use of spareparts in the air monitoring component. The workbook includes one sheet for each group of instruments, eg. monitors, samplers, meteorology etc.

The columns are as follows:

Column:	Includes:
p/n	The sparepart part number
Item	Description of the sparepart
Stor.	Original number of spareparts in the storage according to our first sparepart order.
Take units	Total number of sparepart units removed from the storage
Unit prc. Dkk	Unit price in Danish kroner according to our first sparepart order.
Take Dkk	Total price of all units taken out of the storage.
Instruments	One coumn for each instrument model. A "x" indicates that the sparepart is used by that model.
Comments	Comments

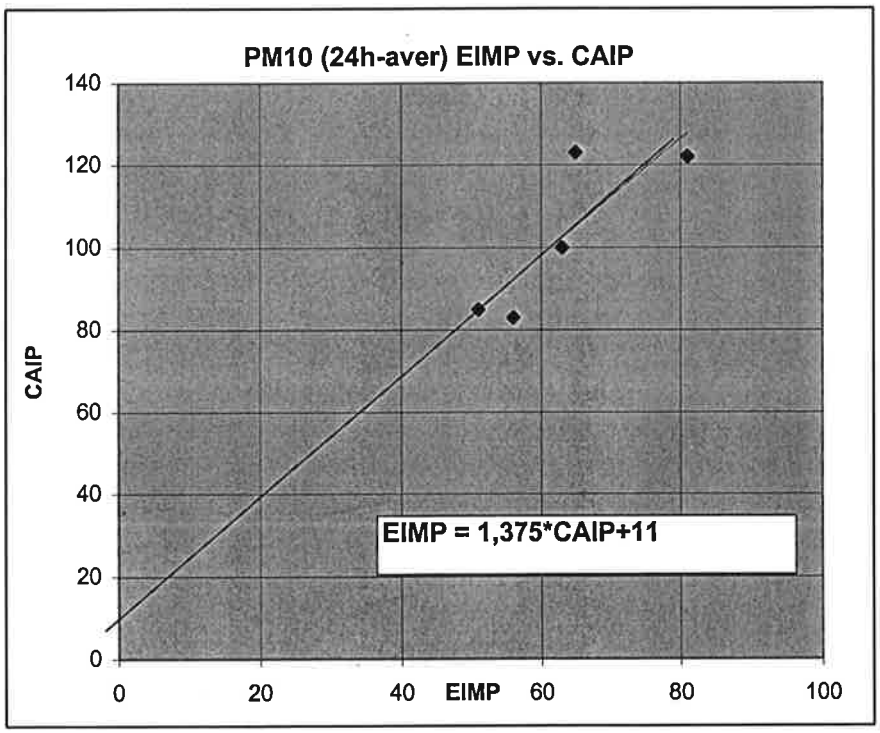
Document location:

\\Eimpserver\Air Quality\Instruments\consumables and spareparts orders.xls

G.5.1.1 Data evaluation

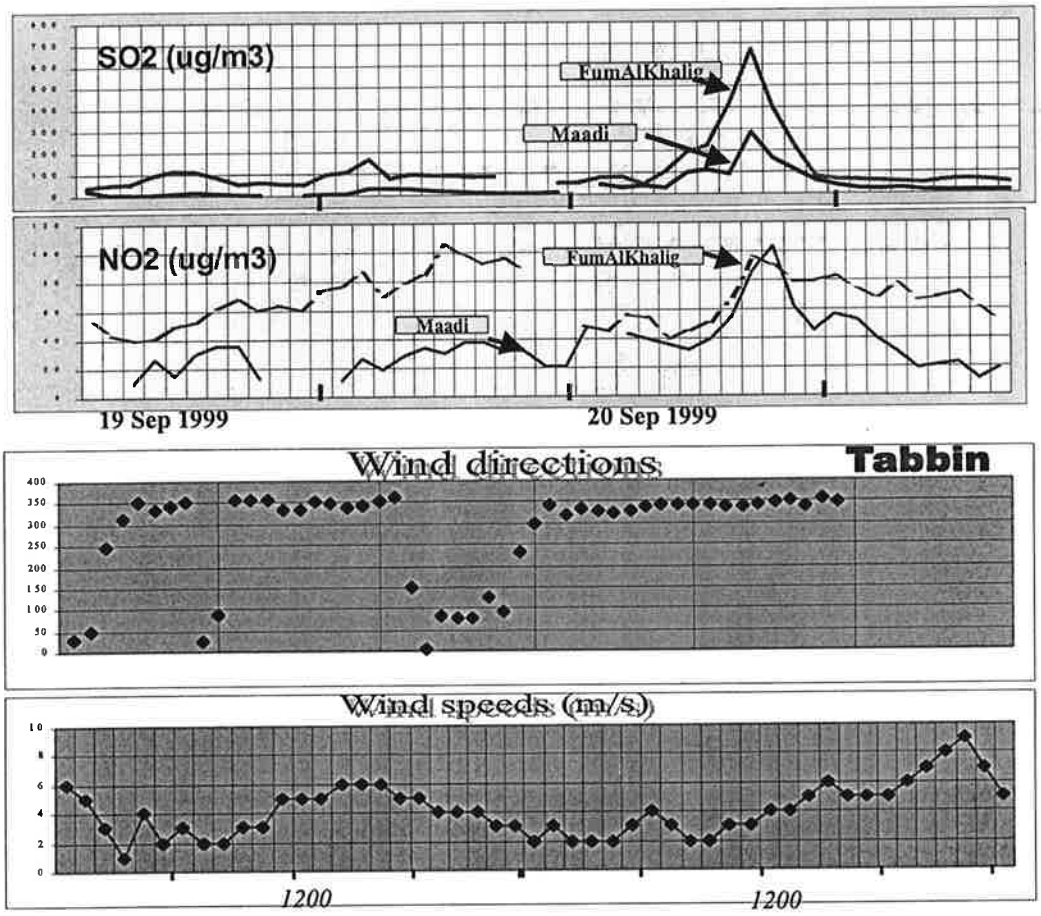
PM10 concentration CAIP vs. EIMP

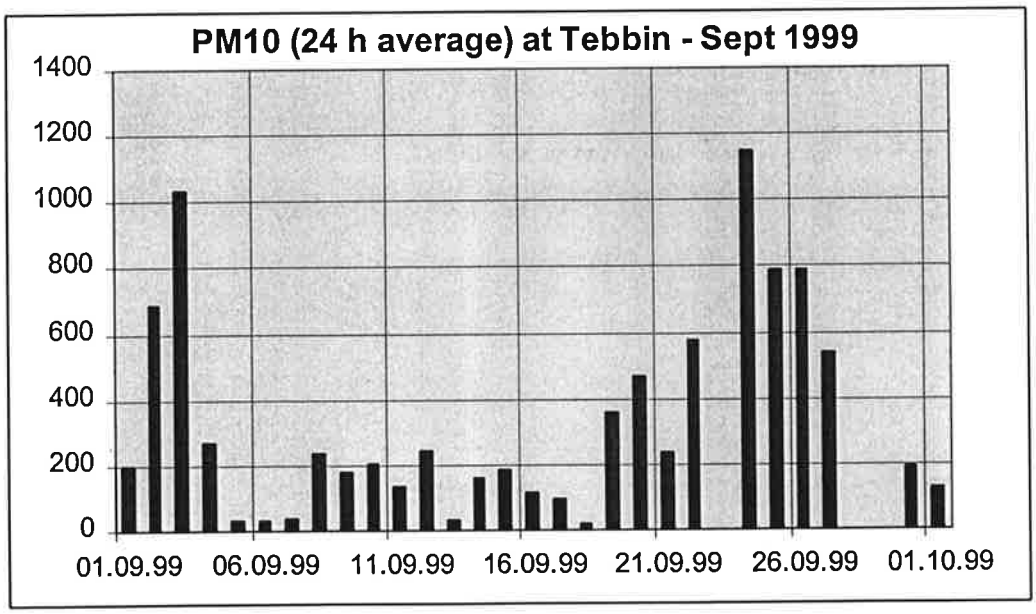
Ident	Pm10 concentration	
	EIMP	CAIP
six-oct-160699	81	122
six-oct-220699	63	100
six-oct-280699	51	85
Ten-ram-100699	65	123
Ten-ram-280600	56	83



G.5.1.2 Example of data evaluation at retrieval

"EPISODE 1"





G.5.2.1 Procedure for data reporting

Environmental Information
and Monitoring Programme
EEAA - Danida - COWI
30 Misr-Helwan Str. Maadi, Cairo, Egypt
Tel: 202 525 6442, Fax: 202 525 6467

Memo

From. Bjarne Sivertsen
9 November 1999

Procedure reporting of Air Quality data from Cairo

Introduction

EIMP fully understands the present emergency situation and is happy being able to support EEAA by providing daily reports. This situation, however, is not sustainable as a long-term solution.

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 is very resource intense (time and personnel) and can not be, and have never meant to be, the normal procedure in the programme.

We have also tried to transfer all one-hour average data from CEHM to EEAA on daily bases. This has 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 is aimed at transferring data to EIMP on a weekly basis.

The following summary of procedures is based upon discussions in a meeting at EEAA on 18 November 1999, and will be made available for answering to the different requests placed by EEAA.

The EIMP sustainable data retrieval, QA/QC and data transfer system

Monitoring data are retrieved daily to the Monitoring Institutions, wherever telephone lines are available. At sites without lines data are retrieved once a week on diskettes.

Data Quality assurance and Quality Controls (QA/QC) is an important part of the data retrieval system and is being performed at several levels:

- Calibration of monitors before installed in field
- Calibrations in field,
- Quality checks at data retrieval into the Station/ and System Manager,
- Data adjustment before entering data into the data base,
- Data quality controls through statistical analyses and evaluation.

After quality controls and data calibration corrections, data will be printed weekly and transferred to the EEAA server. All monitoring data will thus be available at EEAA on a weekly basis. Other air quality data collected by samplers for chemical analyses will be transferred on a monthly basis.

Procedures in case of Emergency situations ("Episodes")

The EIMP/EEAA air quality monitoring programme has not been designed to be an on-line information and forecasting system. For the development of (prognostics) air pollution forecasting, additional modelling tools and weather forecasting procedures have to be added to the system. This has to be planned in details and undertaken as a new development programme.

However, it will be possible to obtain information the same day, if this is needed due to emergency. In these cases data will be retrieved as normally to the Monitoring Institution at Cairo University. First of all only sites with telephone lines will be considered. In case of break down at one station, this site will have to be visited by an expert station operator to repair the error and to retrieve data manually.

Presently, data can be retrieved daily from 5 sites in the Cairo area. To obtain the data from all 8 sites with monitors **new telephone lines** will be required at FumAlKhalig, El-Gomhoriya and Giza/ Cairo University (the latter will be available from 25 November 1999). A new dedicated line at Maadi/EEAA is also needed urgently.

The procedures used during the last weeks, after the air pollution episode on 23 October 1999, are ad hoc procedures that are not suited for a sustainable future monitoring programme.

Proposal for the ad hoc present daily reporting procedure

Due to the present requirements from EEAA a preliminary procedure was discussed in the meeting at EEAA on 18 November 1999.

With the existing data transfer and data handling systems it will be possible to prepare a simplified report daily to be submitted to EEAA. This report will be prepared by CEHM after retrieving data from the sites in Cairo operated on telephone communication.

This report will be submitted to EEAA in the afternoon every day. It will contain information based upon data from the previous day at 12:00 hrs. until the present day at 12:00 hrs. The information will contain:

- The 24-hour average concentrations of a total of 14 parameters from 6 sites in Cairo,
- The maximum one-hour average concentration of the same parameters during the last 24 hours,

EIMP Memo procedure for reporting, Cairo \BSivertsen\ 18/11/99

Additional support to CEHM

To undertake the future emergency reporting and to continue the preliminary daily reporting of air quality data the following additional support are needed at Cairo University (CEHM):

- The computer systems at CEHM have to be upgraded (this is already being taken care of from EIMP),
- CEHM will receive a faster server for the data retrieval system (System Manager and the new Data Base System)
- A new Client computer will be supplied, necessary for preparing the daily report, input data to the monthly reports as well as preparing and the Quarterly reports using the Data Base programme,
- To retrieve data automatically at night-time a "smart UPS" is needed as power backup for the System Manager,
- Daily ad hoc reporting to EEAA is based upon fax transfer. A new fax machine is being requested,
- In case of station failures during episode/emergencies, an extra car may be needed as support from EEAA on that specific day.

In case of emergency situations EEAA will have to pay additional money to CEHM. This has to be added in the new contract.

EIMP Memo procedure for reporting, Cairo \BSivertsen\ 18/11/99

G.6.2.1 Sampling programme, filter analyses

Environmental Information
and Monitoring Programme
EEAA - Danida - COWI
30 Misr-Helwan Str. Maadi, Cairo, Egypt
Tel: 202 525 6442, Fax: 202 525 6467

Memo

From Bjarne Sivertsen
30 October 1999

Sampling Programme
Filters selected for lead analyses

The following **PM_{10} filters** should be analysed

	Site	Filter from day		Conc.		Aver conc
		first priority	second priority	µg/m³		µg/m³ tot
4	Nasr City	26 oct 99	17 dec 98			95
5	Maadi	29 sep 99	15 sep 99			129
13	6 October	29 mar 99	22 may 99			78
14	10 Ramadan	24 dec 98	26 sep 99			69
28	AbuQuir	7 april 99	22 july 99			
29	ElMax	18 feb 99	14 july 99			
32	Gheat ElEnab	14 jan 99	15 april 99			
39	Domyat	22 july 99	10 june 99			

The following **TSP filters** should be analysed

	Site	Filter from day		Conc.		Aver conc
		first priority	second priority	µg/m³		µg/m³ tot
1	Kolaly	18 aug 99	9 sep 99			772
6	Tabbin	24 may 99	14 aug 99			617
7	Tabbin south	9 june 99	8 aug 99			800
10	Shoubra	17 feb 99	24 may 99			569
15	Suez					

G.6.2.2 Status VOC-method

EIMP
Environmental Information
and Monitoring Programme
EEAA - Danida - COWI
30 Misr-Helwan Str. Maadi, Cairo, Egypt
Tel: 202 525 6442, Fax: 202 525 6467

Memo

To: **EIMP EEAA**
Joergen Simonsen
Mohamed Fathy
Ahmed A. El Seoud
From: Ove Hermansen
Date: 3 November 1999

Status VOC-method

Staff:
Most of the time at CEHM has been spent for training of the person responsible for the gas chromatograph, Mr. Hany Nabil. He left CEHM yesterday for a new job at EEAA. There are no other people in the laboratory with similar experience in the field of gas chromatography. The training will be repeated with Dr. Ahmed Soliman Abd Ellah, who will be in charge of the training of new personnel.

VOC-analysis:
The purge & trap unit in the laboratory is constructed for analysis of soil and water samples, not for air samples. It should be possible however to use it for canister samples after doing some technical modifications to the instrument. This involves the use of an external coolant (CO_2-cylinder) and some extra couplings and tubing must be procured. The staff at CEHM is looking for suppliers and prices.

Calibration:
The laboratory does not have any of the standard gases needed for calibration. Certified standards must be procured. This will take some time. Until then, pure gases must be obtained for qualitative detection and semi-quantitative determination.

VOC-samplers:
After finally getting all cables and adapters needed to charge the samplers batteries, it turned out that four out of five samplers needs new batteries. Testing and control of the samplers can be done but they can not be used for sampling until the old batteries are replaced. Suppliers and prices are being looked for by the staff at CEHM.

VOC sampling

Sample no:_____

Filled in at the laboratory

Station	Sampler	Sampling	
Station no.: St. name:	Installed t.o.d.: _____:_____ date:	Start ① t.o.d.: _____:_____ date:	Canister pressure at start: ③
Sampler no.: Canister no.:	Collected t.o.d.: _____:_____ date:	End ② t.o.d.: _____:_____ date:	Canister pressure at end: ④

Before going to the station:

- Ensure that battery has been charged
- Check that the time and day of the digital timer are correct
- Check that program is OK
- Fill in date and time for start and end of sampling ①&②
- Check that all valves #1, #2 and #3 are closed
- Check that the solenoid valve works properly
  1. Select the **MANUAL** position on the timer
  2. Push the **ON/OFF** button three-four times to see if the solenoid valve reacts.
     IMPORTANT: When finished, ensure that the valve is in the **OFF** position
  3. Select the **AUTO** position on the timer

At the station, before sampling:

- Check vacuum pressure
  1. Open the canister valve (#1) completely (counterclockwise)
  2. Open the pressure gauge valve (#2)
  3. Read the pressure and fill in the value ③
  4. Close the pressure gauge valve (#2) (clockwise)
- Install the sampler in the correct place
- Mount the sample tube to the sample inlet (front inlet on the left side)

Collecting the VOC sampler at the station after sampling

- Check vacuum pressure
  1. Open the canister valve (#1) completely (counterclockwise)
  2. Open the pressure gauge valve (#2)
  3. Read the pressure and fill in the value ④
  4. Close the pressure gauge valve (#2) (clockwise)
- Close the canister valve (#1) completely (clockwise)
- Bring the VOC-sampler to the laboratory

G.6.2.3 Estimate soot concentrations

To estimate soot concentrations

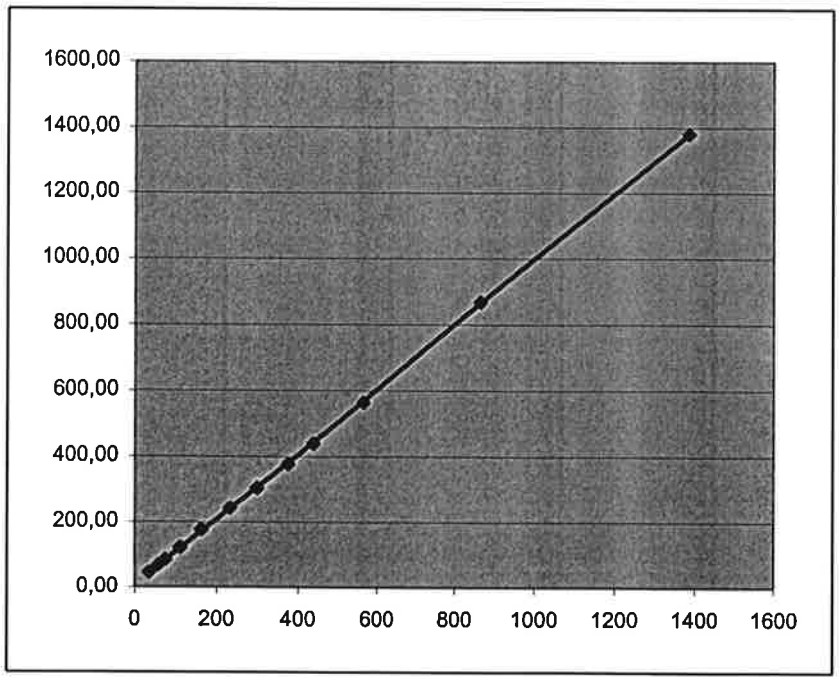
Mass of soot (in ug/cm2): M

M= 602,404-21,89*R+0,326*R*R-=,00232*R*R*R+6,48*R*R*R*R/1000000

Filter area A is: 25 mm filter: 5,06 cm2 , 40 mm filter A= 12,6

Soot curves

				25 mm filter	40 mm filter	
40mm	Percent		Air Volume			
from table	reflection	ug soot	V (m3)	ug soot/m3	ugsoot/m3	ugsoot/filter
35,2	95	3,69	4,1	4,6	11,17	45,81
57,6	92	5,45	4,1	6,7	16,50	67,64
75,5	90	6,78	4,1	8,4	20,50	84,03
112	86	9,77	4,1	12,1	29,55	121,16
163	81	14,20	4,1	17,5	42,95	176,08
233	76	19,50	4,1	24,1	58,98	241,83
299	72	24,52	4,1	30,3	74,14	303,99
375	68	30,38	4,1	37,5	91,87	376,68
439	65	35,45	4,1	43,7	107,20	439,53
566	60	45,46	4,1	56,1	137,50	563,76
866	51	70,03	4,1	86,4	211,79	868,35
1387	41	111,33	4,1	137,4	336,72	1380,54



G.7.0.1 Daily reporting of AQ data

EIMP

Environmental Information and Monitoring Programme
EEAA - Danida - COWI
30 Misr-Helwan Str. Maadi, Cairo, Egypt
Tel: 202 525 6442, Fax: 202 525 6467

Memo

To: **Joergen Simonsen**
From **Bjarne Sivertsen**
Date: **16 November 1999**

Daily reporting of Air Quality data

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

The final goal of the project is to access data on a daily basis at EEAA. However, the system is still under development, and the technical features for data retrieval, data quality assurance and data presentations are not yet finalised. This is also according to schedules.

From discussions aimed at providing EEAA with information every day, also before the system is actually technically finalised, the following conclusions have been drawn:

1. It may still be possible to present air quality data from all sites in Cairo every day, where automatic access (data retrieval) is available,
2. This information will be adequate to evaluate the air pollution situation on a daily basis,
3. However, only 4-5 telephone lines are available at the moment (Shoubra, Tabbin, Abbassyia, Kolaly and Maadi, (At Maadi/EEAA a new line has to be installed!),
4. The lines are not consistently giving signals. One day one line may be out of order,
5. EEAA has to accept that data will be given for only the sites were data are available that day,
6. To present daily data at present means that the data have NOT been quality assured!!
7. In Europe we would never accept at all to distribute data without quality assurance,
8. If the project development could proceed without other interruptions, all data may be available at EEAA every day within a few weeks,

9. In the final version data will be retrieved and checked every day, and calibrations and adjustment will be included every week,

The consequence of continuing the ad.hoc. presentation of data, is that the planned development of the EIMP air quality component is being delayed.

1. The Draft Quarterly report was prepared and discussed two weeks ago but could not be finalised.
2. The monthly report for October is already delayed,
3. The new quality assurance procedures at the Data retrieval computer centre could not be undertaken. Training has been delayed.
4. The routing quality assurance has not been undertaken.
5. The normal calibration and maintenance programme has been influenced by people performing other work during ad.hoc. collection of data.

A final decision has to be taken concerning priorities.
Competing priorities have now been placed at:

- Project development,
- Daily reporting,
- Environment 99 exhibition EIMP/EEAA stand

We are happy to support whatever data are requested from the project, but the working load and the requirements have to be in accordance with the possible technical apparatus available to undertake the task.

Bjarne Sivertsen
Task Manager Air Quality Monitoring

G.7.0.2 Example daily report, 10 November '99

EIMP

Air Quality in Greater Cairo
Daily report for 10 November 1999

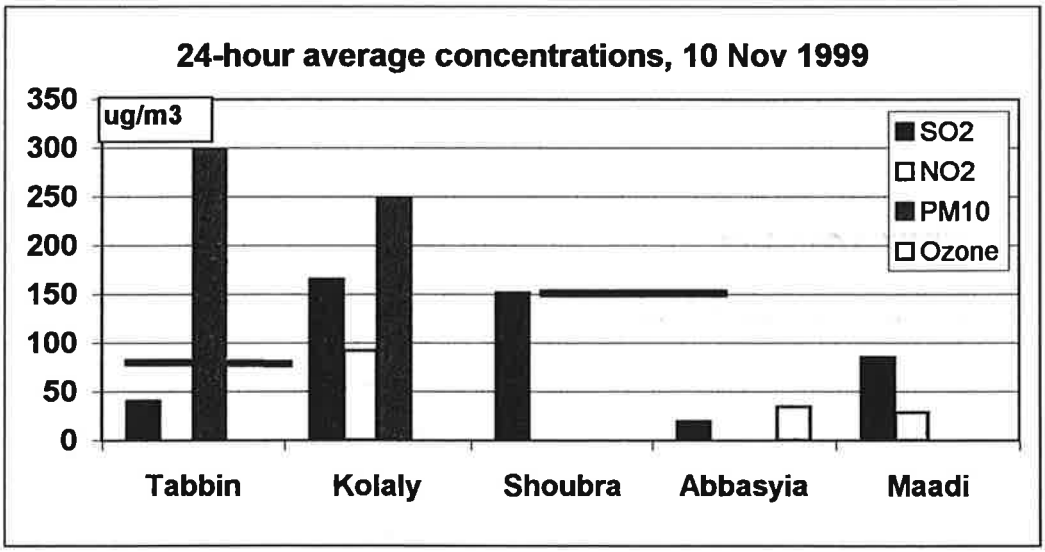
The concentrations are given for the last 24 hours
from 12:00 hrs on previous day till 12:00 hours today

24-hour average concentrations (ug/m3)

	SO2	NO2	PM10	Ozone
Tabbin	40		298,0	
Kolaly	165	92	249,0	
Shoubra	151			
Abbasyia	19			34,0
Maadi	85	28		

Max one-hour average concentration (ug/m3)

	SO2	NO2	PM10	Ozone
Tabbin	105		580,0	
Kolaly	331	124	549,0	
Shoubra	319			
Abbasyia	112			104,0
Maadi	138	62		



The air quality in Cairo was poor. PM10 concentrations exceeded the Air Quality Limit value at both station reporting data. SO2 concentration limits were exceeded at Kolaly and at Shoubra.

G.7.0.3 Smog Episode 23 Oct. '99

EIMP
Environmental Information and Monitoring Programme
EEAA - Danida - COWI - NILU

Cairo hit by a Smog Episode on 23 October 1999

Another air pollution episode occurred in the Cairo area on 23 October 1999. This episode was slightly different from earlier episodes reported by the EEAA/EIMP Air Quality Monitoring Programme. The main reason for the smog like episode experienced by a large part of the Cairo population, was adverse weather conditions with low and variable winds combined with the usual emissions of air pollutants released from a number of different sources near the surface in the Cairo area.

Meteorology and smog

A high-pressure area was situated north of Egypt with its centre in the Eastern Mediterranean, giving rise to a slowly movement of humid air from the north-east across the Delta into the Cairo area. Subsidence of air in the high pressure caused the formation of a temperature inversion in the lower atmosphere, which created a "lid" on the Cairo air mass. Under this lid the wind speeds were decreasing during the afternoon of 23 October to near calm conditions. At the end the local surface winds were turning to slowly move air pollutants back into Cairo from the south in the evening. The unusual high humidity together with high concentrations of suspended dust and other pollutants created what in Europe is called a "winter type smog episode".

Air Pollution levels

The analyses of data from all sites in the area have not been finalised yet. However, from recordings we can see that high concentrations of sulphur dioxide (SO_2), nitrogen dioxide (NO_2), thoracic particles (PM_{10}) and carbon monoxide (CO) were recorded by the EEAA/EIMP network. Except for the particle concentrations, which were very high; around five to ten times the Air Quality Limit values and two to three times the average concentration levels, the other pollution indicators did NOT exceed the Air Quality Limit values as given in the Law no.4. Both black smoke (soot) and CO were measured at about the limit value.

The highest one-hour average concentrations of all pollutants were, however, two to four times higher than the average concentration levels in Cairo. The reason for the dramatic effect of this episode on the population in Cairo was the wide spread distribution of the air pollution.

The EEAA/EIMP Air Quality Monitoring Programme

A total of 40 measurement sites are being operated covering Egypt from Damietta in the north to Aswan in south:

14 sites in greater Cairo
7 sites in the Delta
6 sites in Alexandria area
3 sites in Canal area
9 sites in Upper Egypt
1 site in Sinai

The measurements cover:

- industrial areas
- urban areas
- streets and road sides
- residential areas
- regional7background

Data are reported continuously, on a daily basis and weekly to the monitoring centres at CEHM, Cairo University and at IGSR University of Alexandria.

The Kolaly site in Cairo

Due to winds and weather the whole Cairo area was covered by smog composed by aerosols containing particles, sulphate, nitrate and a mix of unhealthy air pollutants.

Can we avoid the smog episodes?
Air pollution episodes have been recorded in the Cairo area at several occasions. The episodes have different physical properties and are caused by different combinations of weather and air pollution sources.

To avoid the effects of such episodes on the population, both the weather conditions and the sources have to be fully understood. The weather can not be controlled, but may be predicted and forecasted. The pollution sources can be controlled.

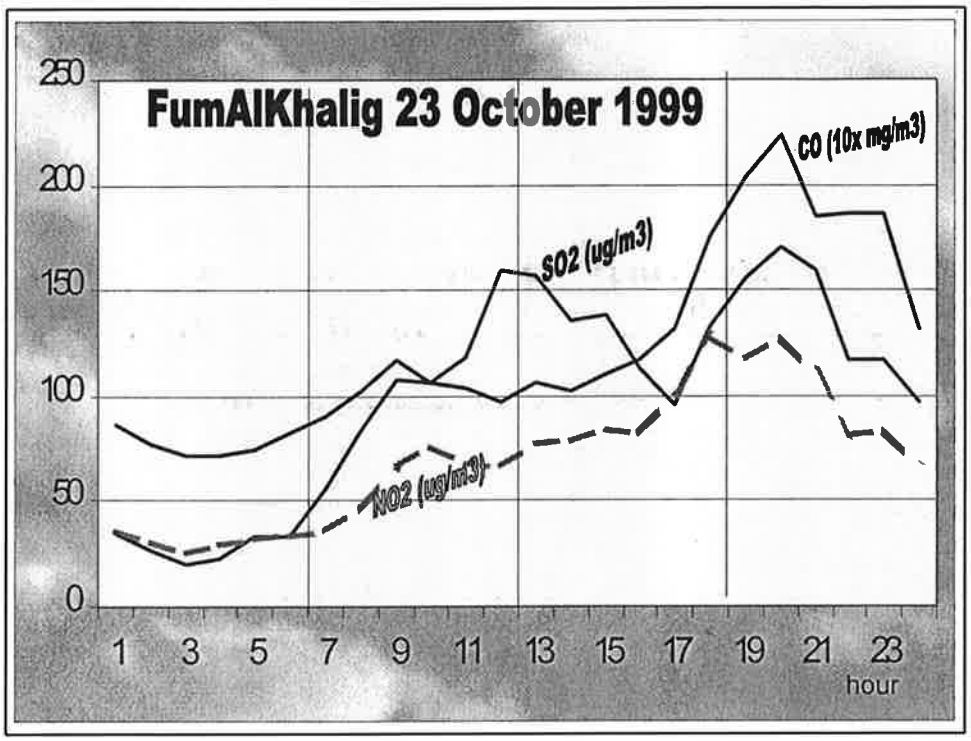
Source identification and control
A number of different sources are the main reasons that Cairo occasionally experiences very high concentration levels of pollutants. Some of the important sources are the traffic, open-air waste burning, and a number of small enterprises and industries, which do not comply with the law and regulations concerning emissions to the atmosphere.

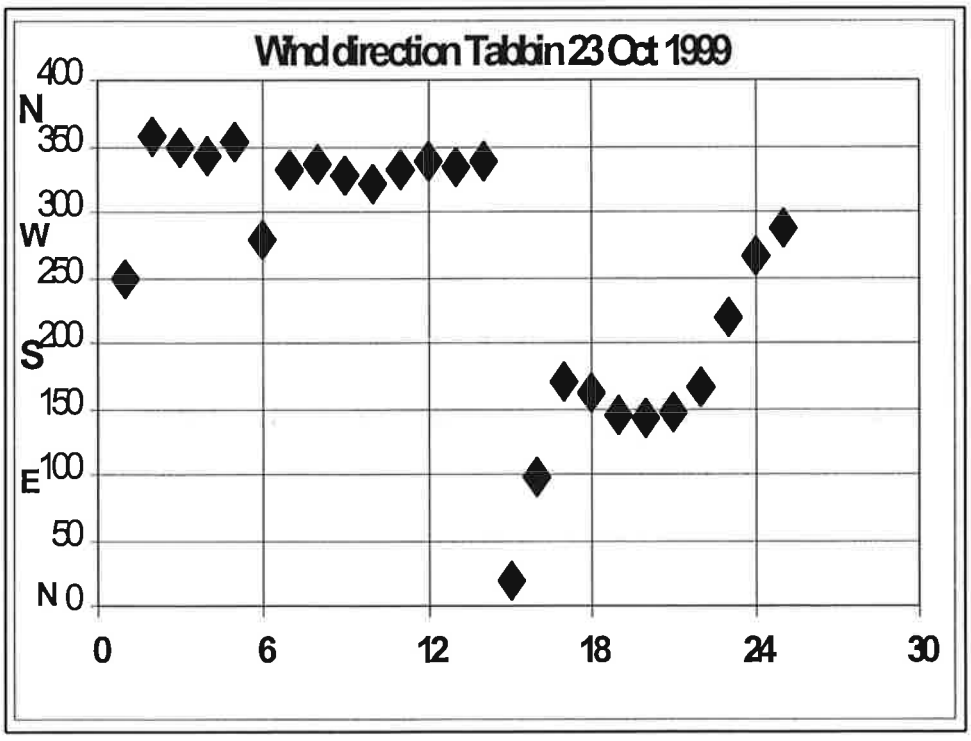
The relative importance of these sources can be estimated from air pollution computer models, which presently has not been developed for Cairo. Only from such models can the Authorities develop and optimal abatement action plan. The discussions of whether burning in the Delta contribute to the high exposure inside Cairo will also be answered by developing a better planning tool for Cairo.

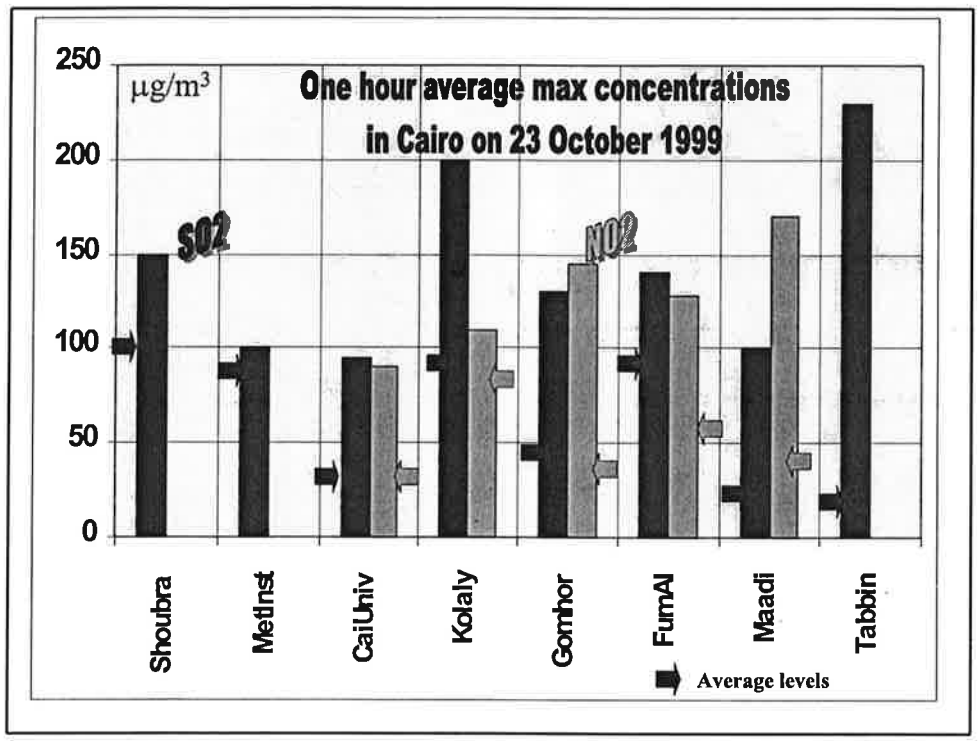
Forecasting the episodes
Several countries in Europe and in the industrialised world are presently developing a tool for monitoring, forecasting and regulating the air pollution in large cities. The basis for these forecasting procedures may be based upon pure statistical data and weather forecasts, or even better upon a combination of local and micro meteorological prognostic models combined with air pollution dispersion models. These tools will help the population to receive better information, not only about the present environmental conditions, but also about tomorrow's pollution levels.

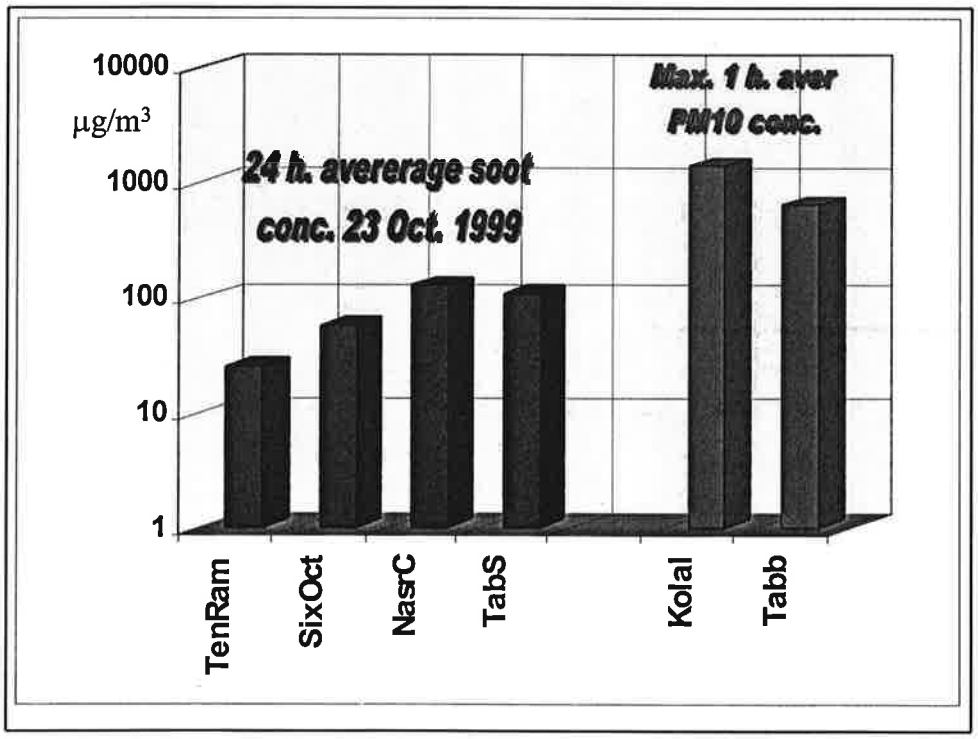
The EEAA/EIMP Air Quality Monitoring programme represents an excellent starting platform for developing such an environmental information system.

EIMP smog episode 231099, B Sivertsen, EIMP Task Manager


FumAlKhalig 23 October 1999
CO (10x mg/m3)
SO2 (ug/m3)
NO2 (ug/m3)
250
200
150
100
50
0
1 3 5 7 9 11 13 15 17 19 21 23
hour


Wind direction Tabbin 23 Oct 1999
N
W
S
E
N
400
350
300
250
200
150
100
50
0
0 6 12 18 24 30


250
200
150
100
50
0
µg/m3
One hour average max concentrations
in Cairo on 23 October 1999
SO2
NO2
Shoubra
MetInst
CaiUniv
Kolaly
Gomhor
FumAl
Maadi
Tabbin
Average levels


10000
µg/m3
1000
100
10
1
24 h. avererage soot
conc. 23 Oct. 1999
Max. 1 h. aver
PM10 conc.
TenRam
SixOct
NasrC
TabS
Kolal
Tabb

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

EIMP
Environmental Information and Monitoring Programme
EEAA - Danida - COWI - NILU

What caused the Smog Episode on 23 October 1999

Bjarne Sivertsen, EIMP Task Manager, Air Pollution Monitoring

The air pollution episode that occurred in the Cairo area on 23 October 1999 was slightly different from earlier episodes reported by the EEAA/EIMP Air Quality Monitoring Programme. The main reason for the smog like episode experienced by a large part of the Cairo population, was adverse weather conditions with low and variable winds, high humidity and a strong temperature inversion at a few hundred metres above the surface. The emissions of air pollutants released from a number of different sources near the surface in the Cairo area added to a slowly transport of particles emitted from burning in the Delta.

Meteorology and smog

A major high-pressure area was covering the Middle East area and southern part of Russia on 23 October 1999. Another high-pressure area was located on the Sahara dessert setting up the usual northerly winds across Egypt. Between these high-pressure areas, smaller low pressures with frontal systems were moving eastwards across the Mediterranean Sea, north of Egypt. The slowly movement of humid air from the north-east across the Delta into the Cairo area was slowed down by a southerly wind set up by the approaching front systems, eventually causing the wind direction to change completely inside Cairo

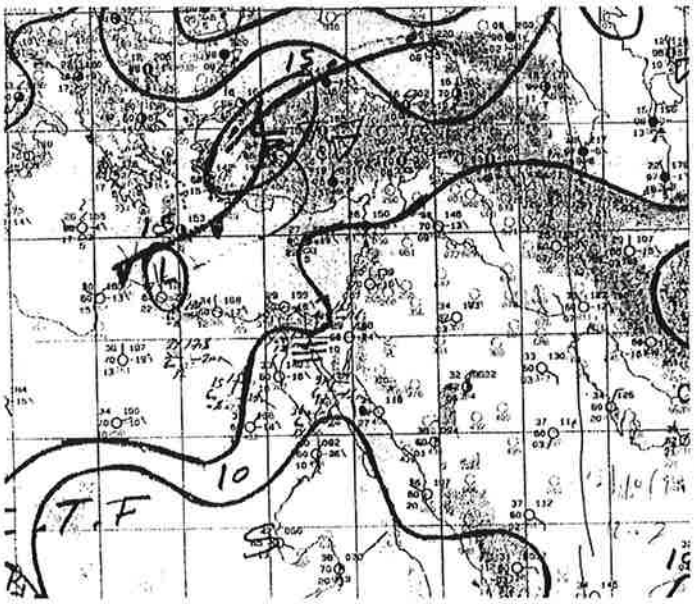


Figure 1: The synoptic weather situation on 23 October 1999 at 12:00 GMT

The change in wind direction in Cairo can clearly be seen on the wind records at the EEAA/EIMP local weather stations. An example is presented below from the Tabbin station, where the wind direction changed to blow from southerly directions from 1700 hrs in the afternoon.

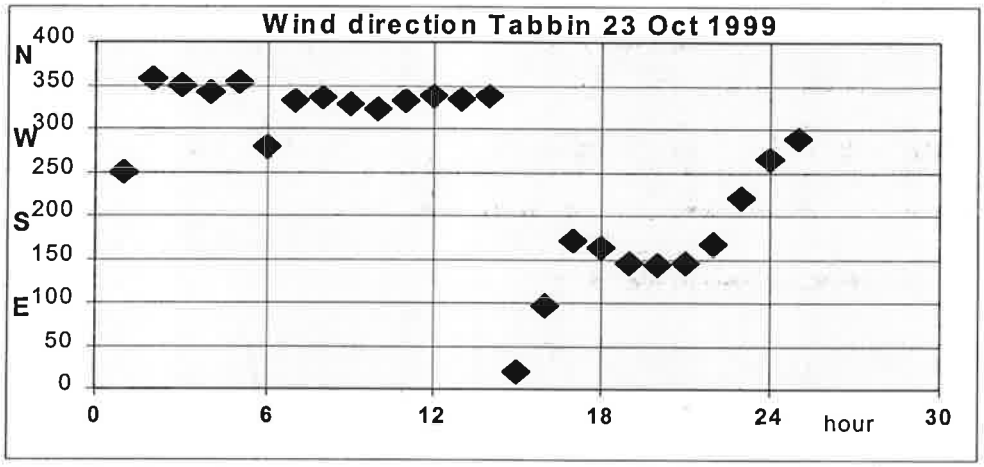


Figure 2: Wind directions recorded at Tabbin on 23 October 1999.

Subsidence of air in the high pressure caused the formation of a temperature inversion in the lower atmosphere, which created a "ceiling" on the Cairo air mass.

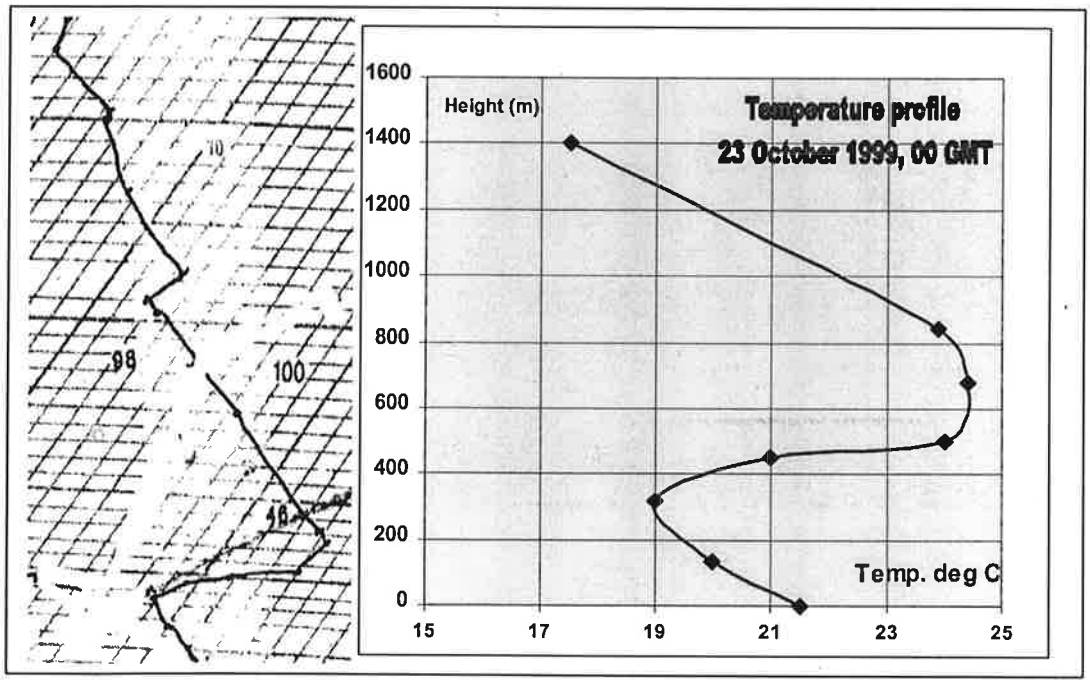


Figure 3: The temperature profile measured over Cairo at 00:00 GMT on 23 October 1999 (Data from the Meteorological Authority station at Helwan).

In the early morning of 23 October, a strong temperature inversion could be seen from about 300 m above the surface. This inversion acted as a lid preventing air pollution emitted at the surface to escape into the atmosphere.

Smog-why\present\BS 31.10.99

This lid increased in height as the sun was heating the surface during the day, but it could still be seen at about 850 m above the surface in the early afternoon.

Under this lid the wind speeds were decreasing during the afternoon of 23 October to near calm conditions. At the end the local surface winds were turning to slowly move air pollutants back into Cairo from the south in the evening. The unusual high humidity together with high concentrations of suspended dust and other pollutants created what in Europe is called a "winter type smog episode".

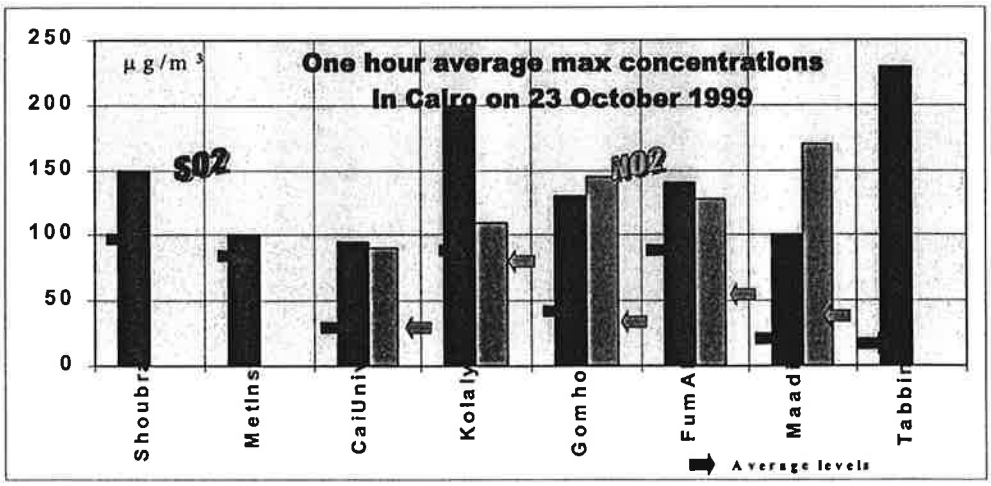
Air Pollution levels

High air pollution levels were building up in Cairo during the early morning hours (in the night-time inversion) and during the daytime (under the inversion ceiling). The air pollutants were slowly transported toward the south until the early afternoon. At the end the local surface winds were turning to move air pollutants back into Cairo from the south.

Emissions from a number of different sources, such as open air waste burning, small enterprises, traffic and general human activities, added to the contribution of particles generated by the burning of rice and cotton straws in the Delta. This, together with the adverse meteorological conditions gave rise to what in Europe is described as a Winter type air pollution episode.

The reason for the dramatic effect of this episode on the population in Cairo was the wide spread distribution of the air pollution. The most critical pollutants were the present of small particles. The concentrations in central Cairo exceeded the Air Quality Limit values as given in the Law no.4.by a factor of 5 to 10. Due to winds and weather the whole Cairo area was covered by smog composed by aerosols containing particles, sulphate, nitrate and a mix of unhealthy air pollutants.

From recordings we can see that high concentrations of sulphur dioxide (SO_2), nitrogen dioxide (NO_2), thoracic particles (PM_{10}) and carbon monoxide (CO) were recorded by the EEAA/EIMP network. Except for the particle concentrations, which were very high; around five to ten times the Air Quality Limit values and two to three times the average concentration levels, the other pollution indicators did NOT exceed the Air Quality Limit values. Both black smoke (soot) and CO were measured at about the limit value.



Smog-why\present\BS 31.10.99

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

EIMP
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Another Smog Episode over Cairo on 20 November 1999 ?

Another day with high air pollution concentrations occurred in the Cairo area on 20 November 1999. This episode was similar to the one reported on 23 October, as the weather conditions were probably the dominating factors. A front system passed the area during the day setting up variable and very light winds. The concentrations of SO_2 , CO, PM_{10} and NO_2 all exceeded the Air Quality Limit values of Egypt

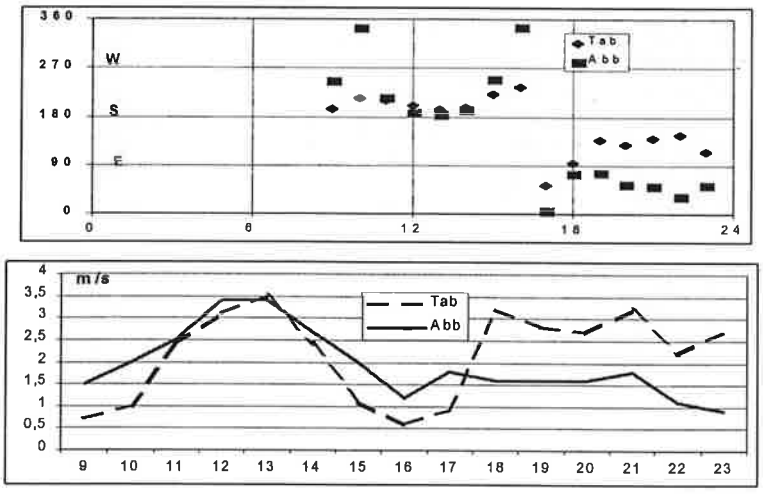
Meteorology and smog

Detailed weather maps and vertical temperature profiles from the Meteorological Service in Cairo have not been available at presentation of this Memo.

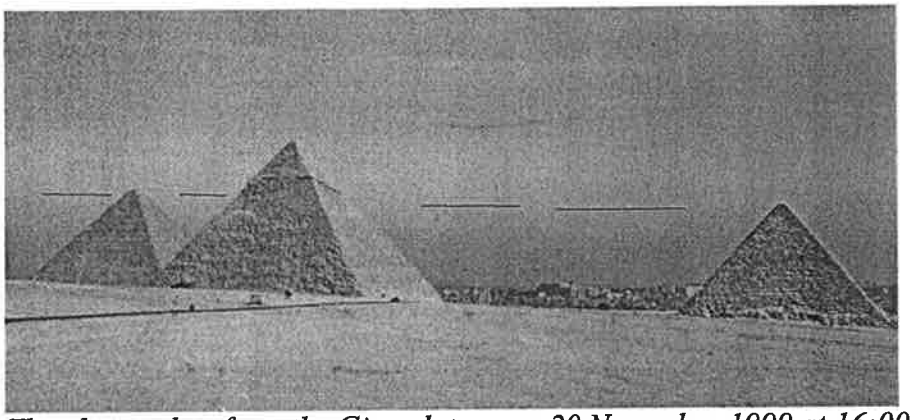
However, it is clear from international weather maps that a front system passed over Cairo during the day on 20 November 1999. Very low wind speeds, less than 1 m/s, were recorded during the afternoon both at Abbasyia and at Tabbin.

The wind was slowly moving from southerly directions until about 16:00 hrs, when (a cold front?) changed the wind to blow from northerly and easterly directions.

Wind direction and wind speed at Tabbin and Gomhoryia 20 November 1999



A dark layer of pollutants was observed under about 300 m above the surface, covering large areas of Cairo.

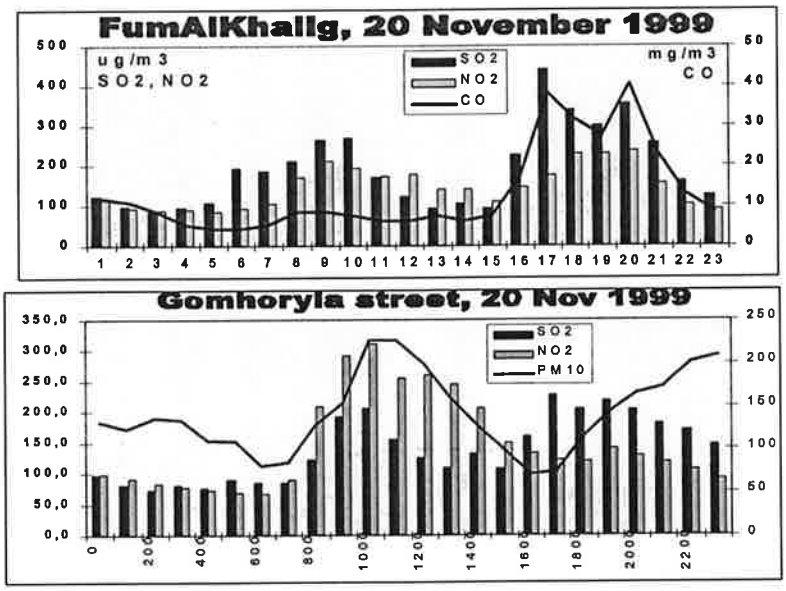


The photo taken from the Giza plateau on 20 November 1999 at 16:00 hrs show a dark cloud covering the bottom layer of the atmosphere over Cairo.

Air Pollution levels

The analyses of data from central Cairo; El-Gomhoriya and Fum El-Khalig indicate that the highest concentrations of NO_2 and PM_{10} at El-Gomhoriya occurred during the southerly winds before noon.

The highest concentrations of SO_2 occurred at both sites after the turning of the



wind in the afternoon. At 17:00 hrs the SO_2 concentration at Fum El-Khalig exceeded the Air Quality Limit value.

What are the sources?

The relatively high concentrations of SO_2 and NO_2 (compared to the PM_{10} concentrations, which were lower than expected), indicate that the sources this time are closer linked to burning of fossil fuels or rubbish.

EIMP smog episode 231099, B Sivertsen, EIMP Task Manager

In Gomhoryia street there is a clear effect of rush hour traffic combined with an unusual low transport of air from the south. Very high levels of NO_2 and PM_{10} are recorded here before noon.

At Fum El-Khalig the highest concentration occurred in the afternoon. At this time the wind had changed to blow from north-east and east. Emissions from traffic in Kasr ElEini street may be the main reason for the highest concentrations. Also CO concentrations at Fum El-Khalig were higher than the Air Quality Limit value of 30 mg/m3 as one-hour average.

Source identification and control

A number of different sources are the main reasons that Cairo occasionally experiences very high concentration levels of pollutants. Some of the important sources are the traffic, open-air waste burning, and a number of small enterprises and industries, which do not comply with the law and regulations concerning emissions to the atmosphere.

The relative importance of these sources can be estimated from air pollution computer models, which presently has not been developed for Cairo. Only from such models can the Authorities develop and optimal abatement action plan. The discussions of whether burning in the Delta contribute to the high exposure inside Cairo will also be answered by developing a better planning tool for Cairo.

Forecasting the episodes

Some experience has been established through the observations and the analyses of different episodes identified in Cairo during the last two years. The one described here for 20 November 1999 was anticipated, as we recognised a front system moving eastwards setting up southerly winds. These winds would balance the existing northerly flow in a high pressure situations. The front moved eastwards towards the Nile valley already from Wednesday 18 November.

Through further observations and training of skilled meteorologists it may, from a statistical point of view, be possible to indicate a worsening of the air quality in the greater Cairo area already one day ahead of the "episode".

EIMP smog episode 231099, B Sivertsen, EIMP Task Manager

G.7.1.1 Monthly report short version

EIMP
Environmental Information and Monitoring Programme
EEAA - Danida - COWI - NILU

High levels of Air Pollution Recorded in Egypt

The monthly report for September from EEAA/EIMP confirms that the levels of fine particles are generally high in Egypt. All measuring stations located inside the big cities recorded levels exceeding the Air Quality Limit values as given by Environmental Law no. 4 for Egypt.

Industrial areas worst

Around industrial sites high concentrations of sulphur dioxide (SO_2) in addition to very high levels of thoracic particles (PM_{10}) At Tabbin the monthly level of PM_{10} averaged about 300 $\mu g/m^3$. The highest 24 hour average concentration was 1150 $\mu g/m^3$, which is more than 16 times the Air Quality Limit value. The measurements at Shoubra and at ElMahalla revealed very high levels of small particles, which may cause health impact to the population living in the areas.

Pollution episodes in Cairo

High concentrations of SO_2 are also occasionally recorded in Cairo. On 20 September 1999 instruments at Kolaly, FumAlKhalig and Maadi all recorded high pollution levels at the same time. These "episodes" can be seen in the Cairo atmosphere especially during the autumn months. There are several reasons for these polluted days, and in September 1999 it seems to have been caused by a combination of burning of fossil fuels (was there a fire?) in northern Cairo and unfavourable weather conditions.

High concentrations of sulphur in some areas

The highest concentrations of SO_2, which is used as an indicator for sulphur from burning of fossil fuels and from industrial processes, were recorded at Kolaly in central parts of Cairo, at ElMahalla and in Komombo. Plumes from industrial activities can also be seen in the data at hours when the wind brings the pollutants to our measurement site. The SO_2 concentrations in Alexandria were lower than in Cairo, and did never reach the Limit values.

The NO_2 concentrations are about the same in Cairo and in Alexandria. These levels did not exceed the Air Quality Limit values in September 1999.

The EEAA/EIMP Air Quality Monitoring Programme

A total of 40 measurement sites are being operated covering Egypt from Damietta in the north to Aswan in south:

14 sites in greater Cairo
7 sites in the Delta
6 sites in Alexandria area
3 sites in Canal area
9 sites in Upper Egypt
1 site in Sinai

The measurements cover:

- industrial areas
- urban areas
- streets and road sides
- residential areas
- regional7background

Data are reported continuously, on a daily basis and weekly to the monitoring centres at CEHM, Cairo University and at IGSR University of Alexandria.

The Kolaly site in Cairo

G.7.1.2 Monthly report September 1999

EIMP

Air Quality Monthly Report

Air Quality in Egypt, September 1999

1.Introduction

This monthly report is based upon preliminary data collected for EIMP/EEAA by the Monitoring Laboratories at the Center for Environmental Hazard Mitigation (CEHM) at Cairo University and the Institute of Graduate Studies and Research (IGSR) at Alexandria University. The monitoring program has been designed and established by EIMP. The construction and installation of the measurement programme have been finalized by the mid of 1999. These monthly data have been pulled from the database at an early stage in the various processes of data quality assurance. The QA/QC on the data has not been finalized, and some of the data may include errors.

2. Air Pollution Impact

2.1 Air Pollution and human health

The assessment of the Air Quality is presently linked to the Air Pollution levels and to the distribution of populations. To protect the health, the concentrations of selected harmful air pollutants should be limited and related to given ambient Air Quality Standards.

2.2 Priority of Pollutants

Among the most common air pollutants normally used as air quality indicators, are sulphur dioxide (SO_2), nitrogen oxides (NO_x), suspended particulate matter (SPM or PM_{10}), carbon monoxide (CO) and ozone (O_3).

SO_2 and NO_x are formed when fossil fuels such as coal, gas and oil are being burned for power generation, in mobile sources and in industries. Solid and liquid particles are emitted from numerous man-made and natural sources such as industrial processes, diesel-powered vehicles, open air waste burning and when dust is re-suspended by wind action from desert areas and from dirty surfaces. Particulate matter, especially fine particles, contains large amount of inorganic and organic toxic materials, such as heavy metals. One important component of heavy metals is lead, resulting from the use of anti-knocking agent in gasoline.

CO is mainly in urban areas being emitted from gasoline-powered motor vehicles especially during idling.

Ozone is a secondary air pollutant chemically produced in the atmosphere mainly from the primary pollutants such as NO_x and hydrocarbons (or volatile organic compounds, VOC). NO_x is emitted from various mobile and stationary sources. VOC is emitted from cars, gasoline filling stations and also from chemical and petrochemical industries.

3. Air Quality measurement instrumentation

EIMP has selected different types of instruments for measurement of air pollutants. These instruments vary in complexity from the simplest passive sampler to the most advanced and most often expensive automatic sampling system based upon light absorption spectroscopy. The following table indicates three types of instruments, used by the EIMP, their ability and the type of data collected from each instrument.

Table1: Different types of instruments used by EIMP

Instrument type	Type of data collected	Data availability	Typical averaging time
Passive sampler	Manual, in situ	After lab analyses	1-30 days
Sequential sampler	Semi-automatic in situ	After lab analyses	24 hour
Monitors	Automatic-continuous, in situ	Directly, on-line	1 hour

4. Sites

During September 1999,25 measurement sites were operated by CEHM and 11 sites were operated by IGSR. These sites are all part of the EIMP/EEAA Air Quality-Monitoring programme. The sites and the selected air quality indicators are presented in Table 2.

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.

It is important to bear in mind, when measuring Air Quality or analyzing results from measurements, that the data we are looking at is a sum of impacts or contributions originating from different sources on different scales.
The total concentration is a sum of:
- A natural background concentration,
- A regional concentrations,
- Local impact from traffic along streets and roads,
- Impact from large point sources; industrial emissions and power plants.

To obtain information about the importance of these different contributions it is therefore necessary to locate monitoring stations so that they are representative for the different impacts.The different measurement sites represent different ara types. The area characteristics selected for the EIMP programme cover

- Industrial areas (13 sites)
- Urban City centers (10 sites)
- Streets and road sides (3 sites)
- Residential areas (11sites)
- Regional and background areas (3 sites)

EIMP/Haytham A.Ahmed, B Sivertsen/Monthly report, September 1999

Table 2: the Air Quality measurement programme operated in Egypt during September 1999

		Indicators								
Site name	**Area type**	**SO 2**	**NO x**	**PM**	**HC**	**O3**	**CO**	**TSP**	**DF**	**Met**
Cairo										
1 Cairo city El Qualaly	Urban centre	m	m	m				s		
3 Meteorological Inst.	Urban / Res.	m				m				a
4 Nasr City	Residential	s	s	s						
5 Maadi EEAA building	Residential	m	m	s						
6 Tabbin	Industrial	m	m	m				s		a
7 Tabbin south	Industrial									
8 Fum Al-Khalig	Urban/road	m	m		m		m			
9 Abu Zabel	Industry/res.	p	p						s	
10 Shoubra el Kheima.	Industrial	m	s	s				s	s	a
11 Giza, Cairo University.	Residential	m	m			m				a
13 6 October	Res./industrial	s	s	s						
14 10 Ramadan	Res./industrial	s	p	s					s	
Canal area										
15 Suez	Industrial/res.	m	m					s	s	
16 Port Said	Residential	p	p	s						
17 Ismailia	Residential	p	p	s						
Upper Egypt										
18 El Fayum	Urban	p	p						s	
19 El Minya	Res./Industrial	p	p						s	
20 Assyut2	Res./urban	p	p						s	
22 Naga Hammadi	Industrial/res.	p	p						s	
23 Louxor	Urban/res.	s	s						s	
24 Edfu	Industrial/urb	p	p						s	
25 Kom Ombo	Industrial	s	s						s	
26 Aswan	Urban/res.	m				m			s	a
Sinai area										
27 Sharm El Sheik	background	p	p			m			s	
Alexandria										
29 El-Max Petrogas	Industrial	s	s	s					s	
30 IGSR, Alex University	Urban/road	m	m	m	m		m			
31 El-Azafra-El Azhar Univers.	Residential	s	s	s						
32 Gheat El-Inab school	Residential	s	s	s						
33 Alexandria regional	regional					m				a
Delta area										
36 Tanta	Urban	s	s							
37 El Mahalla	Industrial/res.	m		m					s	
38 Mansura	Industrial/res.	m	m							a
39 Domyat	Residential	s	s	s					s	
40 Kafr Dawar	Urban/industry.	s	s						s	

m = monitors, s = samplers, p = passive samplers, a = automatic weather station

EIMP/Haytham A.Ahmed, B Sivertsen/Monthly report, September 1999

5. Egyptian Air Quality Limit values

Air Quality Limit values are given in the Executive Regulations of the Environmental Law no. 4 of Egypt (1994). These Air Quality Limit values are presented in Table3.

Table 3: Ambient Air Quality Limit values as given by Law no.4 of Egypt

Pollutant	Maximum Limit	Averaging Time
Sulfur Dioxide (SO_2)	350 $\mu g/m^3$	1 Hour
	150 $\mu g/m^3$	24 Hour
	60 $\mu g/m^3$	Annual
Carbon Monoxide (CO)	30 mg/m^3	1 Hour
	10 mg/m^3	8 Hour
Nitrogen Dioxide (NO_2)	400 $\mu g/m^3$	1 Hour
	150 $\mu g/m^3$	24 Hour
Ozone (O_3)	200 $\mu g/m^3$	1 Hour
	120 $\mu g/m^3$	8 Hour
Black Smoke (BS)	150 $\mu g/m^3$	24 Hour
	60 $\mu g/m^3$	Annual
Total Suspended Particulate (TSP)	230 $\mu g/m^3$	24 Hour
	90 $\mu g/m^3$	Annual
Suspended Particulate <10 µm in diameter (PM10)	70 $\mu g/m^3$	24 Hour
Lead (Pb)	1 $\mu g/m^3$	Annual

The EEAA/EIMP programme aims at establishing a database of knowledge to enable a most effective strategy for reducing Air Pollution in Egypt. On a global scale Air Quality has to be improved through the reduction of emissions of different pollutants. The final objectives are to:

1. Protect the air that people breath from any hazards in all their forms,
2. Assess the environmental impact on the health of people,
3. Identify the most effective ways to reduce the air pollution from the point sources
4. Decrease the effects of the ozone layer depletion,
5. Avoid green house gas emissions resulting in global warming.

6. September 1999 Air Quality data

6.1. Monthly Averages

SO_2 concentrations were measured as monthly average at 14 sites in Egypt in September1999. The monthly average concentrations of SO_2 are presented in Figure1. There is no Monthly Air Quality Limit value given for Egypt. However, assuming that the concentrations are log-normally distributed, the monthly concentrations should not exceed more than about 80 $\mu g/m^3$.

The average levels of SO_2 at Kolaly in the central part of Cairo were higher in September than would be anticipated according to Law no. 4 Air Quality Limit values. The most polluted area was found to be at El-Kolaly.

Also at Komombo and at Tabbin South the SO_2 concentrations were measured at moderate high levels, og slightly less than 50% of tha Air Quality Limit values. All the other stations were ranging from low to moderate concentrations.

EIMP/Haytham A.Ahmed, B Sivertsen/Monthly report, September 1999

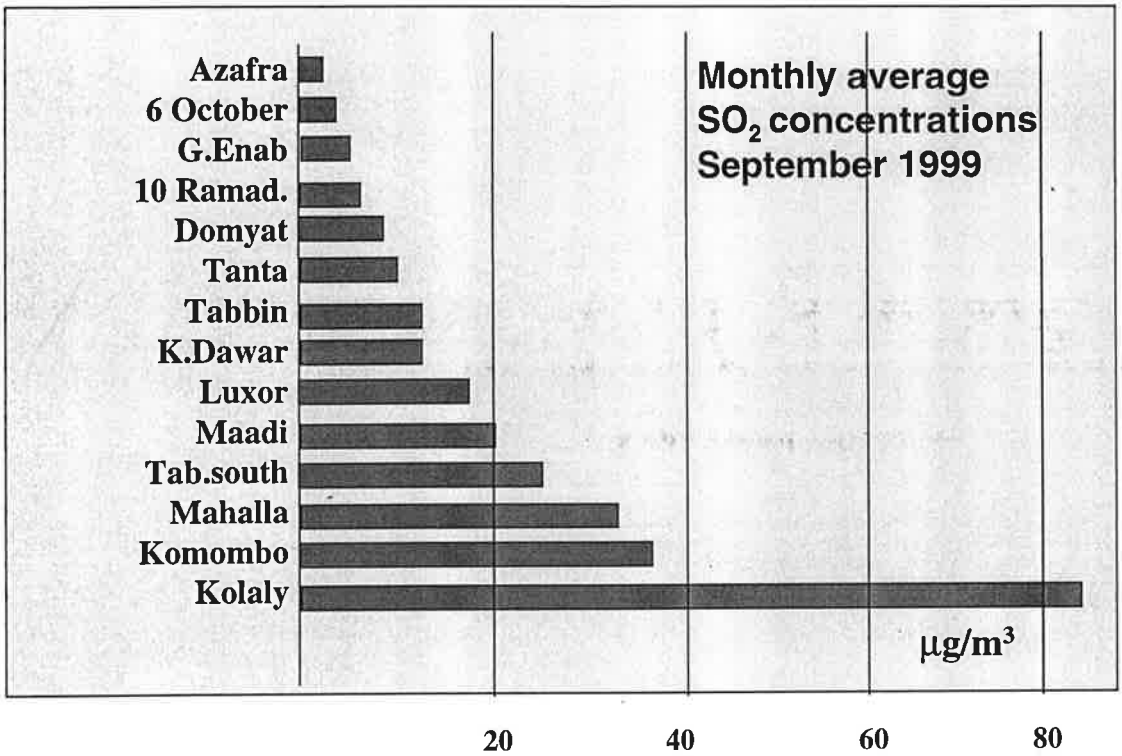


Figure 1: Monthly average concentrations of SO_2 ($\mu g/m^{3)}$ at 13 sites in September 1999.

The monthly average NO_2 concentrations ranged from about 20 $\mu g/m^3$ at sites like 10 Ramadan Maadi and Tabbin to 70 $\mu g/m^3$ at El Kolaly. The level is comparable to the annual average air quality limit given by World Health Organisation at 40 to 60 $\mu g/m^3$.

6.2. 24 hour average concentrations

A summary of the highest 24-hour average concentrations of SO_2 and NO_2 measured in September 1999 is presented in Table4 based upon data from 22 sites operated in the Greater Cairo area, Alexandria, Delta and Upper Egypt.

6.2.1. SO_2 concentrations

The highest SO_2 concentrations ranged from 6 $\mu g/m^3$ at AlAzafra in Alexandria to 322 $\mu g/m^3$ at ElMahalla.

Some general conclusions can be drawn from the analyses: we can see that:

- Only one of the sites showed exceedance of the Air Quality Limit value of SO_2 . This was observed at El Mahalla, which is located downwind from a large textile factory with a fossil fueled power plant. The wind was blowing from around North during the occurrence of the highest 24 h. average concentration.
- At four sites the average daily concentrations exceeded 100 $\mu g/m^3$. These sites were ElKolaly, Fum El-Khalig , Shoubra and Tabbin South.

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Table 4: Maximum 24 h. avarage concentrations measured in Egypt during September 1999

Site	SO2	NO2
1 Kolaly	120	116
3 Met. Inst.	70	
4 Nasr City	25	
5 Maadi	41	39
6 Tebbin	36	33
7 Tebbin south	120	
8 Fum Khalig	100	60
10 Shoubra	110	92
11 Cairo University	36	116
13 6 Oct.	15	45
14 10 Ramadan	10	
15 Suez	20	16
23 Luxor	23	
25 KomOmbo	66	
29 El Max	52	69
30 IGSR	21	60
31 Azafra	6	45
32 Gheat Inab	13	42
36 Tanta	16	
37 Mahalla	322	
38 Mansura	29	30
39 Domyat	75	
Air quality Limit value	150	150

6.2.2. NO_2 concentrations

For NO2, there were no exceedances of the Air Quality Limit value for Egypt were reported in September. This was better than the last month.
ElKolaly and Cairo University had the highest concentrations, which at both sites exceeded 100 µg/m^3.

6.2.3. Suspended particles in air

Daily average concentration of suspended particles are being measured at TSP (total suspended particles), PM_{10} or soot (Black smoke). Only a few of the analyses are available at the time this monthly report is produced. However, a few features can be presented.

TSP concentrations are normally very high in Egypt.

Very high PM_{10} peak concentrations were recorded at El Mahalla (>2000 *µg/m^3*) at the same day as the highest SO_2 concentration was recorded.

A typical presentation of 24-h-average PM_{10} concentrations measured at Tabbin id shown in Figure 2. The daily average concentrations ranged from 20 to 1150 µg/m^3 . Four days had average concentration exceeding more than 10 times the Air Quality limit value of 70 µg/m^3 . This again illustrate the extensive problem of suspended particles in the air in Egypt.

EIMP/Haytham A.Ahmed, B Sivertsen/Monthly report, September 1999

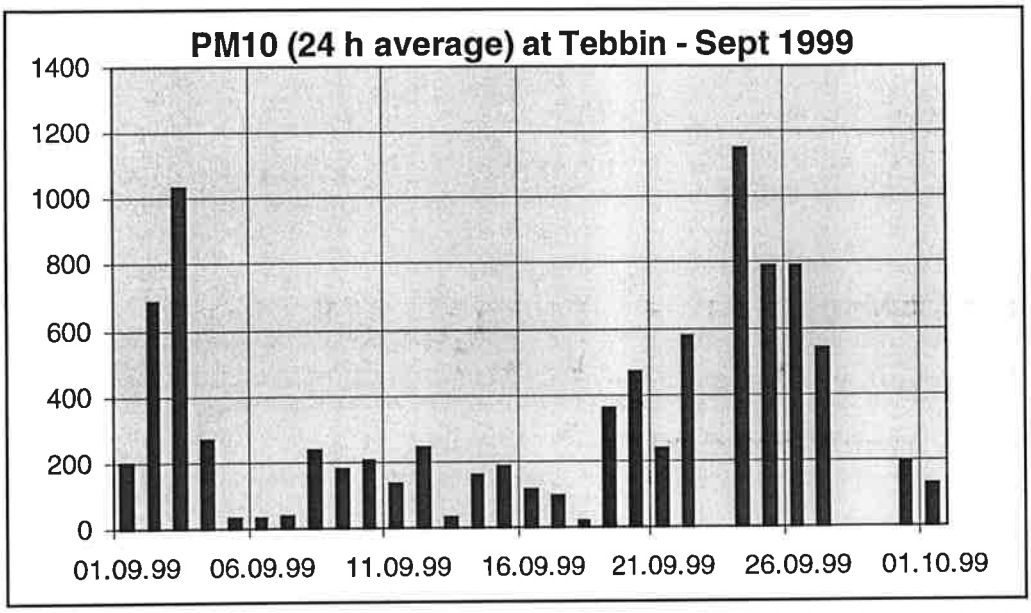

Figure 2: Daily average concentrations of PM_{10} measured at Tabbin in September 1999

Black smoke or soot has been analyzed on selected filters from the sequential samplers at 12 sites in Egypt. Also the soot concentrations have been shown to exceed Air Quality Limit values. Figure 3 shows typical average concentrations picked from a random number of filters in September 1999.

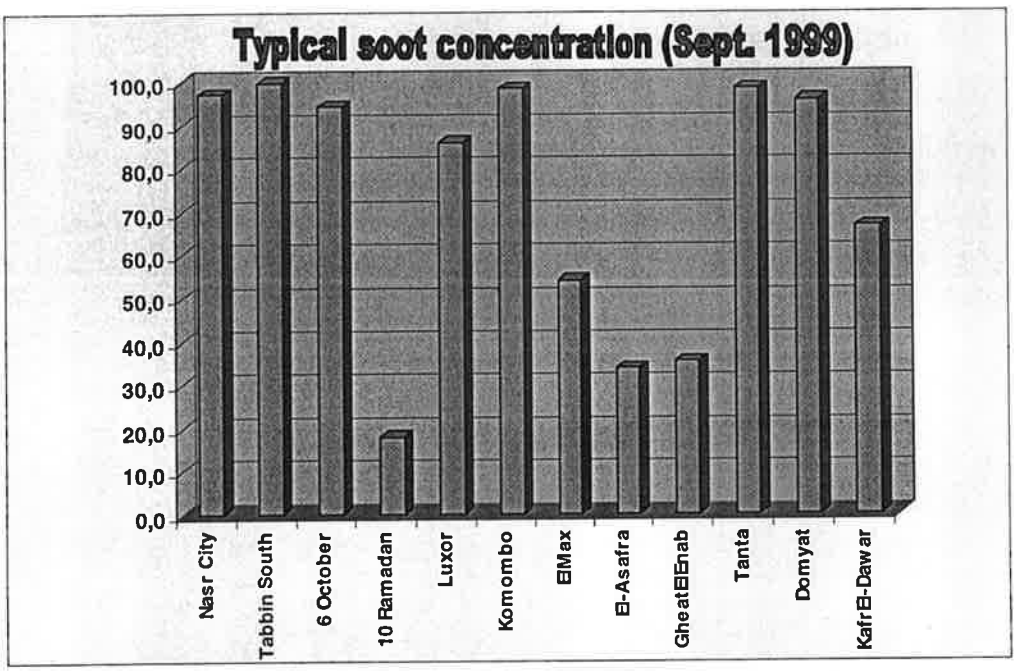

Figure 3: Typical soot concentrations at 12 sites in Egypt, September 1999

These concentrations will have to be compared to the long term average limit value of 60 $\mu g/m^3$. The data in Figure 3 does not represent the maximum 24-hour average concentrations, as these have yet not been analyzed.

EIMP/Haytham A.Ahmed, B Sivertsen/Monthly report, September 1999

6.3 Maximum one-hour average concentrations

The maximum one-hour average concentrations of SO_2 and NO_2 are presented in figure2

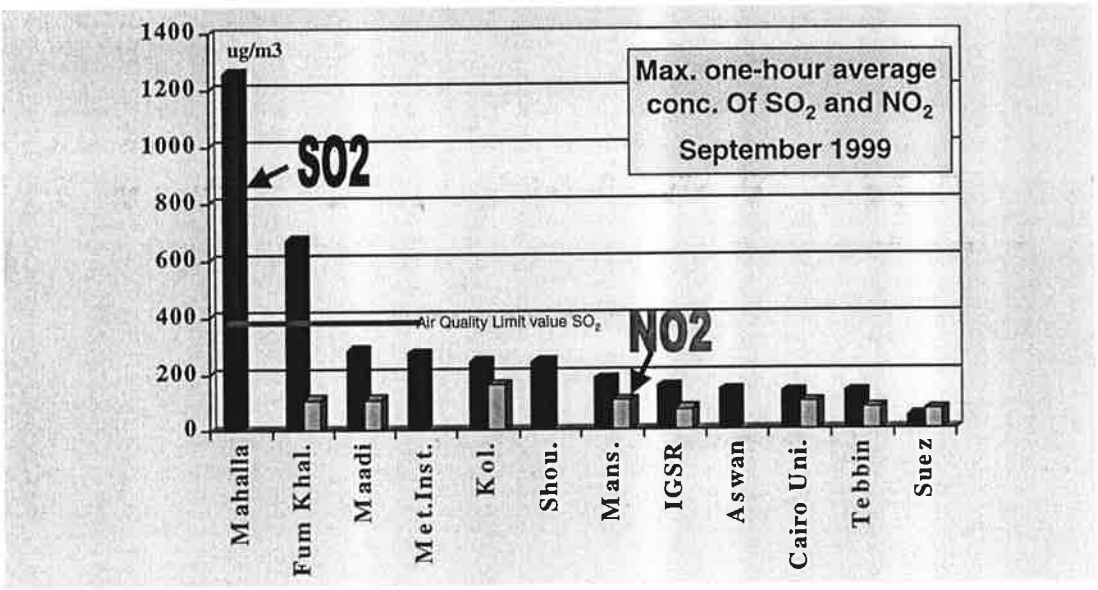

Figure 2: Maximum one-hour average concentrations of SO_2 and NO_2 at 12 sites during September 1999

The SO_2 concentrations were as usual high at some industrial sites in Egypt in September 1999. Generally and especially in Alexandria, the SO_2 concentrations were low. We are studying the levels of total sulfate, which seems to be high. This confirms that much of the sulfur emitted into the atmosphere is converted by chemical reactions with alkaline aerosols in the atmosphere.

Some conclusions from the figures presented above are:

- The Air Quality Limit value of SO_2 of (350µg/m^3) was exceeded at ElMahalla and Fum El Khalig.
- One very high maximum reading at El Mahalla indicated that there is a high impact from a single source (stack) located north of the monitoring station.
- High concentrations were recorded in the morning of 20 September 1999 at several all stations inside Cairo. (see discussion below)
- The concentrations of NO_2 are still much less than the Air Quality Limit value at all measurement stations.
- For PM_{10} all the measurements sites have recorded very high readings (Especially data from Kolaly, Tabbin and El Mahalla show high concentrations)

EIMP/Haytham A.Ahmed, B Sivertsen/Monthly report, September 1999

6.3.1. A short term episode?

The highest monthly one-hour average SO_2 concentrations were recorded simultaneously at ElKolaly, at Fum El-Khalig and at Maadi on 20 September 1999.

The reason for these high concentrations is not evident. A large source located in the northern part of Cairo (fire?) seems to be part of the reason. Meteorological conditions were indicating that an air pollution episode could have occurred during the night before 20 September, as low winds less than 1-2- m/s had turned from southerly to northerly wind directions.

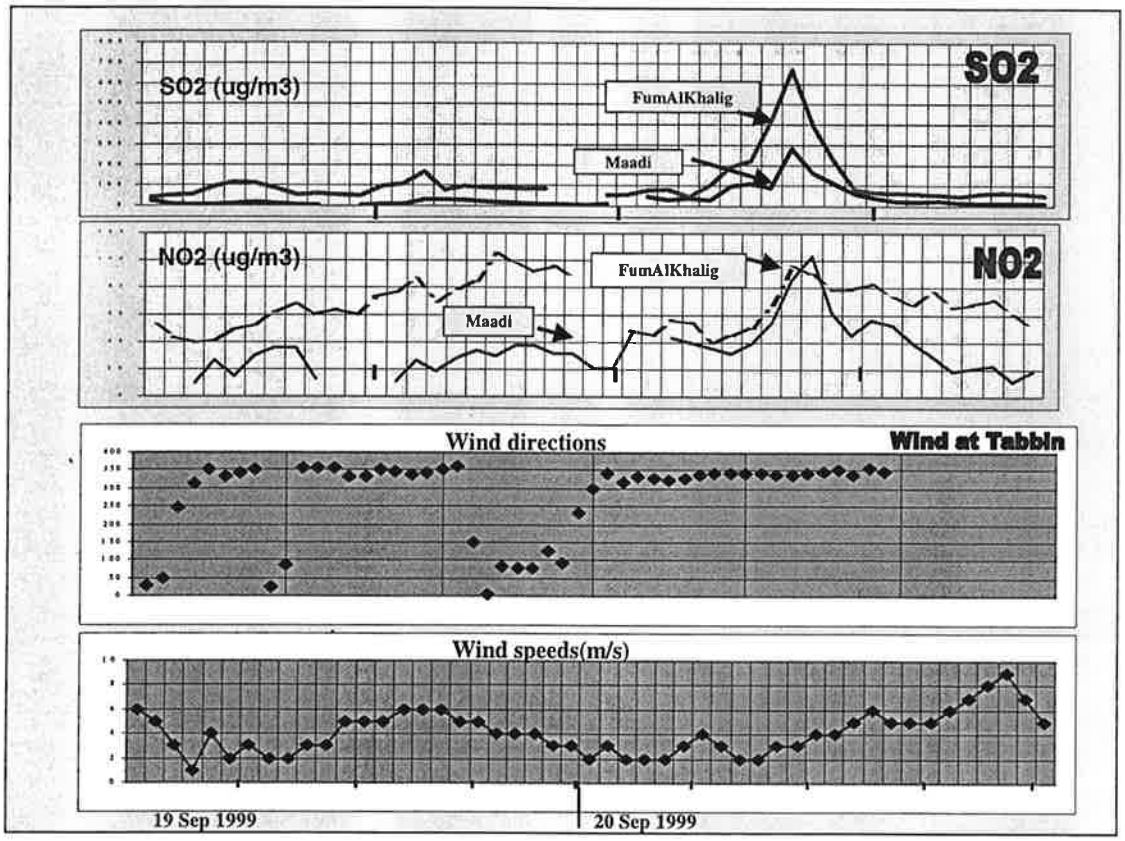

Figure 4: The occurrence of a short term episode on 20 September?

When the concentration start increasing at about 0600 in the morning the wind speed also increased, blowing from the north. This may be the main reason that we suspect a fire or an extensive burning of oil to have been occurring. We see that both SO_2 and NO_2 concentrations reach a peak at the same time, indicating burning of fossil fuel.

EIMP/Haytham A.Ahmed, B Sivertsen/Monthly report, September 1999

G.7.1.3 Newsletters and articles

EIMP

Memorandum

To EIMP Staff

Date June,10, 1999

Subject EIMP Newsletter articles

Environmental Information and Monitoring Programme

EEAA - Danida - COWI

30 Misr-Helwan Street
Maadi, Cairo, Egypt

Tel.: (+202) 525 6439/42/ 47/ 52
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EIMP Newsletter Articles

Date
10, June, 1999
Our ref.

Reference to the agreement in the project staff meeting to prepare a proposal for the schedule of subjects to be addressed in EIMP Newsletter. I would like to propose the following schedule:

Air Quality in Egypt during 98 Based on continues monitoring	June 99
Red Sea Coastal Water Quality in 98	Sep 99
QA/QC System in EIMP Project	Dec 99
Progress on Phase II of Coastal Water Monitoring	Mar 2000
Air Quality of Egypt During 99	June 2000

According to that plan, each component will prepare the material and write the article ahead of time and present it to EIMP management for discussion and approval before releasing it.

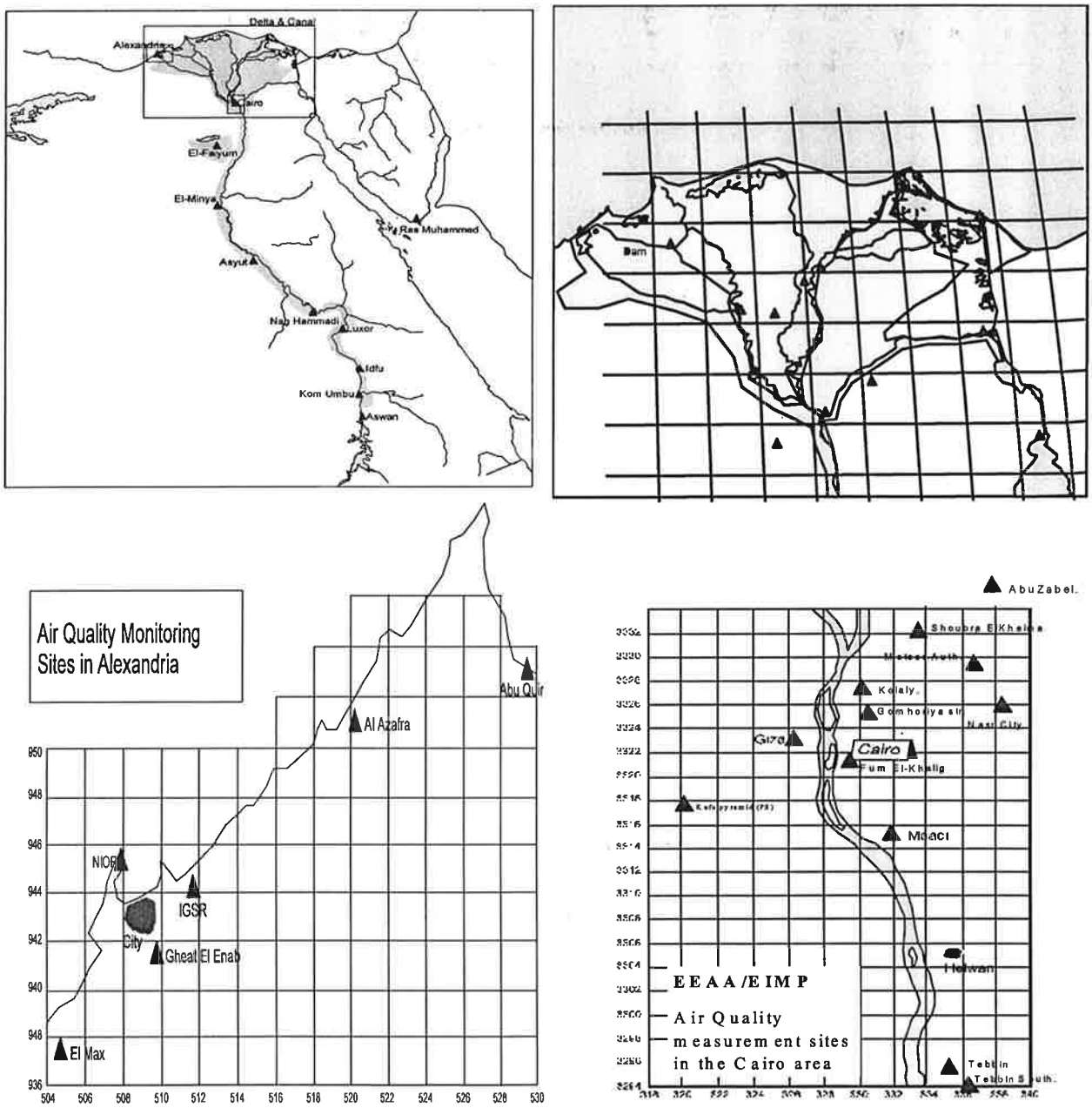
Sincerely yours,

Eng. Ahmed A. Elseoud
Egyptian Project Manager, EIMP/EEAA

G.7.1.4 Air quality component newsletter

EIMP
Environmental Information
and Monitoring Programme

Air Quality component



The location of the Air Quality Monitoring sites in Egypt
Environmental Information and Monitoring Programme
Air Quality in Egypt

EIMP
Environmental Information
and Monitoring Programme

Air Quality component

One of the 3 component of the EIMP is the Air Pollution Monitoring component .This component seeks to develop EEAA capacity to obtain and manage information about the air pollution .It Involves the development of an air pollution monitoring program which includes data collection, data transfer, quality assurance procedures and air pollution data base at EEAA

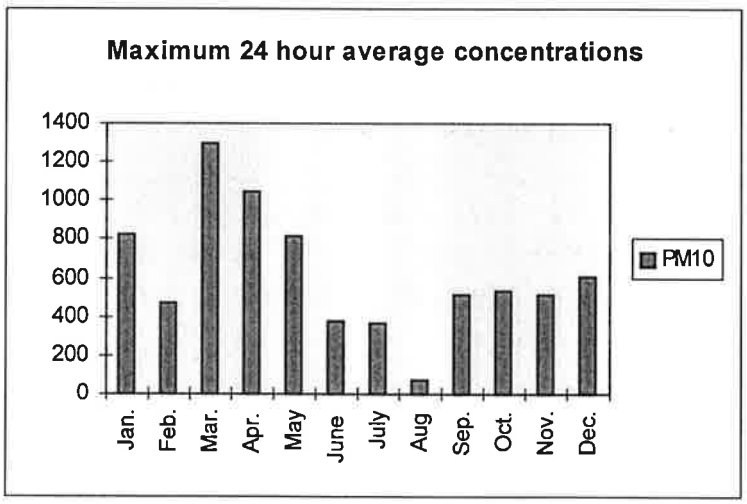
The installation of the network was finalised in Greater Cairo, Upper Egypt, Alexandria and Delta as the schedule of the installation

The parameters measured in the programme include SO2, NOx, CO, NMHC (non-methanic hydrocarbon), O3, PM10 as well as meteorology.

The network in Greater Cairo and Upper Egypt is operated by Center for Environmental Hazard Mitigation (CEHM)in Cairo University.
In Alexandria and Delta area the network is operated by Institute of Graduate Studies and Research, Alexandria University .The data are evaluated and submitted to EEAA.

From the limited amount of data and information collected up till now, we may conclude that:

- Large areas of Egypt is exposed to suspended particles in air at levels far beyond Air Quality Limit values.
- The highest levels of small particles (PM10) were found in industrial areas .
- Concentrations of SO2 are higher than NO2 in Cairo, while it seems the opposite in Alexandria
- Some of the main sources identified as the driving force for the exceeding of the Air Quality Limit values are open-air waste burning, diesel buses and industries.



The Maximum 24 hour average concentrations in Tebbin area($\mu g/m^3$) during the Year 1998

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

Station audit

- System audit
  - On-site evaluation of enitire system
  - Facilities, equipment, procedures, record keeping, practices
- Performance audit
  - Evaluation of measurement system
  - Analysis of a reference material

c:\egypt\training\Station Audits.ppt Leif Marsteen Slide 2 EIMP

Audit conditions

- The station audit must be performed under normal operating conditions
- The auditor must be other then normal operator
- Reference standards must be other then normally used at the station

c:\egypt\training\Station Audits.ppt Leif Marsteen Slide 3 EIMP

Necessary documents

- SOP Station audit
  - Describes how to perform an audit
- Document version control list
- Calibration and maintenance schedule
- Field calibration SOP for every instrument
  - The performance audit is performed according to the field calibration procedure
- Performance acceptance criteria list

c:\egypt\training\Station Audits.ppt Leif Marsteen Slide 4 EIMP

The system audit

- Facilities
  - General conditions at station
- Equipment
  - General condition of instruments
- Operations
  - Are necessary documentation available?
- Record keeping
  - Are forms and logs maintained correctly?

c:\egypt\training\Station Audits.ppt Leif Marsteen Slide 6 EIMP

The system audit, cont.

- Maintenance
  - Is the maintenance frequency correct?
  - Is the maintenance performed according to the SOP? Observe the operator during a maintenance session
- Calibration procedures (performance check)
  - Is the performance check frequency correct?
  - Are the results routinely compared to the performance criteria at the station?

c:\egypt\training\Station Audits.ppt Leif Marsteen Slide 7 EIMP

Performance audit

- Record from Station manual
  - Results from two performance checks
  - Gas monitors: Weekly Zero/ span
  - Samplers: No flow cheks, only field calibration
- Comparison with travelling standard
  - Perform a field calibration - travelling standard
  - Gas monitors: Gas cylinder
  - Samplers and PM_{10} monitor: Flow meter

c:\egypt\training\Station Audits.ppt Leif Marsteen Slide 8 EIMP

H.3.2.2 Flow rate conversion tables

Flow rates [m3]

Instrument	m3/min	m3/hour	m3/day	m3/week
Thermo HiVol TSP/PM10	1,13	67,8	1627,2	11390,4
Thermo PM10 monitor	0,0189	1,134	27,216	190,512
NILU FK NO2	0,0005	0,03	0,72	5,04
NILU FK SO2	0,0025	0,15	3,6	25,2

Flow rates [litre]

Instrument	litre/min	litre/hour	litre/day	litre/week
Thermo HiVol TSP/PM10	1130	1130000	27120000	189840000
Thermo PM10 monitor	18,9	1134	27216	190512
NILU FK NO2	0,5	30	720	5040
NILU FK SO2	2,5	150	3600	25200

Flow rates [feet]

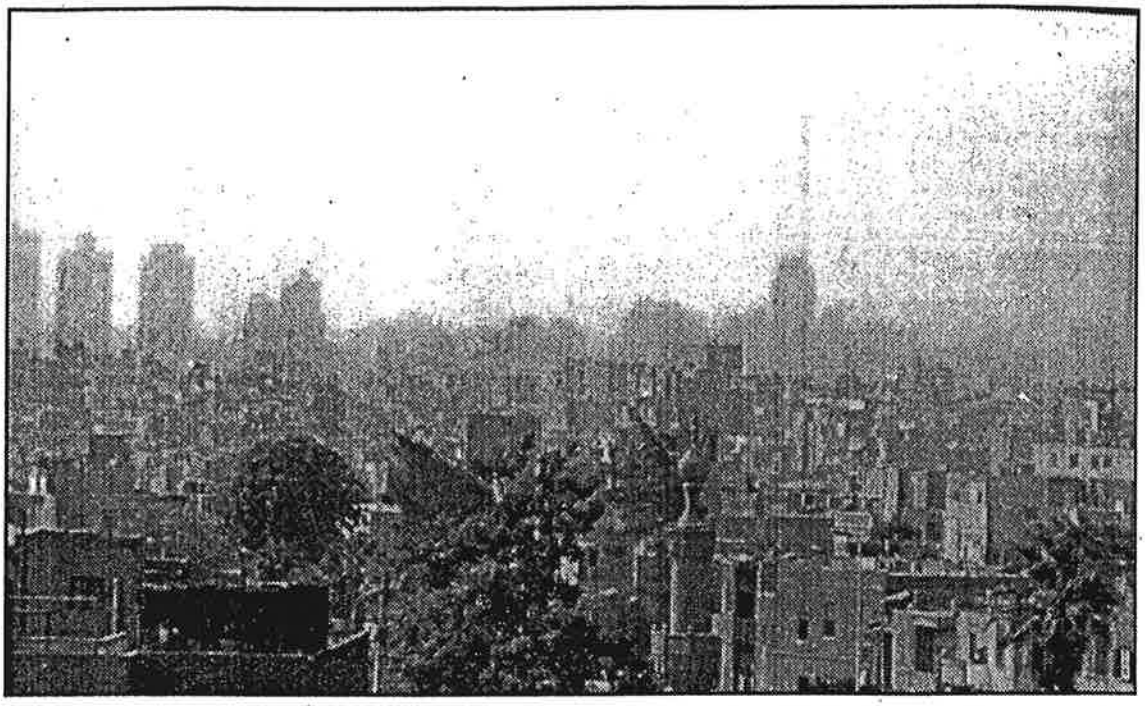
Instrument	ACF/min	ACF/hour	ACF/day	ACF/week
Thermo HiVol TSP/PM10	40,000	2400,000	57600,000	403200,000
Thermo PM10 monitor	0,669	40,142	963,398	6743,788
NILU FK NO2	0,018	1,062	25,487	178,407
NILU FK SO2	0,088	5,310	127,434	892,035

Underlined flowrates are used in manuals, SOPs and forms

Appendix I

Coordination and meetings

I.1 Air pollution episodes as presented in the Press



A CLOUD of black smoke has been attacking Cairo residents in the night over the past weeks.

Cabinet addresses smoggy clouds, earmarks LE 275m. for garbage recycling

THE government yesterday finally stepped in to address the puzzle of choking black smoke that has been hanging over Cairo for the past eight days. Prime Minister Atef Ebeid met with ministers of agriculture, information, environmental affairs, interior, transport and local development as well as the governors of Cairo, Giza, Qalioubia and Sharqia and the chairman of the Egyptian Meteorological Authority.

The meeting came as the meteorological experts predicted that the mysterious smoke would continue for the coming two days.

The smoke has panicked the city's 16 million inhabitants, who demanded an explanation, especially after various authorities give conflicting interpretations for its cause.

One explanation said the phenomenon was caused by farmers' burning the straw from their season's rice crop, with weather experts stressing that atmospheric conditions had hemmed in the smoke, keeping the cloud low to the ground.

The cloud was especially thick in northern Cairo, where the airport is located, but officials there said services had not been disrupted.

"The meeting has reviewed reports from the ministries of agriculture and environment as well as briefings by the governors of Greater Cairo (Cairo, Giza and Qalioubia) and Sharqia," said Information Minister Safwat el-Sherif.

"These reports showed that the smoke phenomenon was caused by various reasons, atop of which the burning of agricultural leftovers," he told reporters, adding that weather conditions helped keep the smoke near the surface.

"The weather reports showed that these conditions would continue until at least Tuesday," the Information Minister said.

He added that the reports had discussed other causes of air pollution in Cairo "like factories, foundries and car fumes".

He added that a report presented by State Minister for Environmental Affairs Nadia Makram Ebeid featured an action plan for the gradual relocation of some of these factories.

He added that the burning of rice crop straw was concentrated in 21 villages in Sharqia governorate. The farmers, Sherif said, usually start the burning at night.

"Scores of similar locations were also spotted in Qaliobia and Cairo," he said. The Cabinet meeting decided to ban the practice and operate surveillance patrols.

Sherif added that the meeting had also formed a committee to address the problem of garbage dumps which burn huge amounts of rubbish and add to the city's air pollution.

"We have allocated a sum of LE 275 million to build 50 factories for garbage recycling. They will be built by the Ministry of Military Production," Sherif said.

Black cloud hanging over Cairo

THE black cloud that shrouded Cairo on Saturday evening had no silver lining. It is a fresh indication that the outrageous policy of "isolated islands" still exists, despite rosy statements and promises issued by our senior officials.

The black cloud, which triggered panic among Cairenes, was a smoke billowing out from burning rice hays in Delta governorates.

There is no doubt that the weather forecasters had expected an air depression these days and that the winds are consequently still. Why then did these weather forecasters fail to recommend a suitable period in which growers would burn rice hays safely and without causing damage to the public's health?

I would also expect that the new minister of transport, who has authority on the Meteorological Office, would immediately contact governors of these Delta provinces to stop burning rice hays until such time as the air depression move away. I think the new minister knows very well that the policy of the cabinet of Dr. Atef Ebeid seeks to maintain coordination and model cooperation among different agencies and authorities. I do not think the new minister would find it difficult to contact these governors; the burning stopped after the panic-stricken public clamoured for immediate action to dissipate the threat hovering over their heads.

Unfortunately, our ministers, governors and senior assistants were in dilemma and unable to understand what was going on overhead. In such cases, the officials in advanced societies - and we are not inferior to them - immediately order citizens and transport companies to run less number of vehicles because the exhaust fumes increase the levels of smog. We also remember the US weather forecasters and officials warning citizens against hurricanes of Gloria, Floyd and Mitch long before these hurricanes would hit.

Anyway, I hope we shall gain good experience out of these situations. I also hope that we will no longer adhere to the proverb, "Don't prepare for ill winds so long as they have not hit." We should have a strategy to brace for threats and danger.

BY SAMIR RAGAB

MONDAY, OCTOBER 25, 1999

Black surprise for Mrs Minister

ALARMED by the smoggy clouds hanging over Cairo, Environment Minister Nadia Makram Ebeid has stepped up her campaign against "black spots of pollution" . On Monday, she made a surprise visit to Old Cairo where potters use environment-unfriendly stuff to make their wares.

During her visit, Ebeid ordered the closure of all the polluting kilns . She also arranged with Cairo governorate to allocate around 50 feddans in an area adjacent to the ring road for potters to do the job. Clean technologies are promised in the new location.

Satisfied? May be. Armed with a spirit of a fighter, the minister left for elsewhere to pursue her anti-pollution battle.

On the same evening, Ebeid was driving back home. On the way she was in for a literally black surprise. She saw smoke billowing from the same area to where she had been in the morning.

She headed right away for the site where she came face to face with the "chocking" fact: A potter was back to his activity using the same polluting stuff. "Enough is enough," the minister must have said amid a fit of coughing. A skyward glance had probably made her conclude that some people have yet to read the ominous writing on the smoky sky.

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

Memo
Project proposal

From Bjarne Sivertsen
Date: 28 November 1999

PM_{10} Air Quality Limit values for Egypt

1. Introduction

Measurements of PM_{10} concentrations in Egypt have proven to exceed the existing Law no4 air quality limit values frequently. Occasionally very high concentrations of PM_{10} have been recorded at most of the sites. Concentrations of more than 10 times the Air Quality Limit values are not uncommon.

In a meeting at EEAA on 31 October the recorded PM_{10} concentration levels as well as the Air Quality Limit values were discussed. It was agreed that it is necessary to further investigate the validity of the limit values as well as the need for verifying the normally/naturally occurring suspended dust concentrations in Egypt.

Two approaches may be followed to develop a more realistic comparison and a better basis for the evaluation of suspended dust measurements in the future:

1. One is to consider raising the Air Quality Limit value for PM_{10} and TSP in the Law no. 4
2. Another approach is to identify an average natural background level, above which the man made contribution to the suspended dust concentrations is to be evaluated.

The proposal below is intended to establish a background for and to justify a more realistic evaluation of the suspended dust concentration levels in Egypt.

2. Objectives

The objectives of the project proposed below is to justify and discuss the rational for changing the Air Quality Limit value for PM_{10} in Egypt, and to establish a typical natural background level for PM_{10} .

3. Scope of work

To evaluate the validity of the present approaches for discussing the levels of suspended particles in the air in Egypt, a number of filters taken from the EIMP and the CAIP monitoring programmes should be selected for detailed analyses. We suggested that we concentrate the work based upon PM10 concentration measurements. The reasons for this limitation are:

- PM_{10} is a better indicator for health impact than TSP,
- Law no. 4 for Egypt has been mainly based upon this indicator,
- $PM_{2,5}$ and dust fall (which are also measured) does not relate to standards.

To confirm typical natural background levels and to justify a possible re-evaluation of the Air Quality Limit value for Egypt, studies of area distributions, chemical compositions and wind blown dust formation will be undertaken.

4. Work description

Three approaches will be used to undertake the investigations of PM_{10} concentration levels in Egypt:

- Spatial distribution of PM_{10} within and at different well-defined area types,
- Wind blown dust; importance and features,
- Chemical composition of dust to estimate impact from various types of sources.

4.1. Spatial distributions

All the filter analyses data selected from the EIMP and from the CAIP programme will be used to evaluate typical PM_{10} concentration levels in various areas. The standardised area type descriptions that have been used by both programmes will be used to compared the levels typical for different area types such as:

- street canyons,
- along roads,
- urban areas,
- residential areas,
- industrial areas,
- background areas,
- mixed areas.

The typical concentrations in background areas will be compared to the concentration levels in other areas, where the concentrations may be influenced by local sources.

4.2. Wind blown dust

At selected sites, which could be identified from the first part of the investigation (spatial distributions), the PM_{10} concentrations will be investigated as function of meteorological parameters. The most interesting one will be wind speed. Also studies of wind direction dependencies, temperature (or rather stability) as well as time of the day and season will be investigated in this part of the project.

It may also be interesting to investigate the PM_{10} concentration distributions as function of other indicators, to separate data from various types of source impact. PM_{10} to SO_2 or NOx correlation analyses in the streets of Cairo have showed to enable the identification of the importance of buses and petrol driven cars versus wind generated dust and waste burning.

4.3. Dust composition

A selection of PM_{10} filters will be sent to the Norwegian Institute for Air Research (NILU) for ICPMS analyses. We have indicated a total 20 filters to be analysed in details. (Also blind filters are needed).
Groups of compounds will be studies such as:

- Al, Si, Fe, Ca,.....
- Pb, Cd, As, Mn, Cu, Cr, Zn ..
- V, Ni, SO4 ....
- Cl, Na, Mg,....
- Ca, NH4, ...

Receptor models may be applied to quantify the importance of the different type of sources. These results may identify the different impact from man made sources compared to the different natural sources for dust.

4.4. The typical background level of PM_{10} , total picture

All information collected in the above tasks will be synthesised in a concluding statement identifying the typical background level, or the natural generated suspended dust concentrations in Egypt, as related to the man made dust.

The discussions of these findings may then evaluate the PM_{10} Air Quality Limit value for Egypt. Whether this limit value will have to be changed or the evaluation of the measured concentrations will have to be related to an identified and justified naturally occurring dust concentration level, will have to be discussed at a later stage.

5. Time schedule

The different tasks identified above will be undertaken during an estimated total period of one year. The first 3 tasks should be finalised and reported before filters are selected for chemical composition analyses.

Task month ⇒	1	2	3	4	5	6	7	8	9	10	11	12
Planning data collection	x	x	x									
Spatial analyses			x	x	x							
Meteorological analyses				x	x							
Selection of filters for analyses					x							
Composition, chemical analyses						x	x	x	x			
Total analyses, receptor models?					x			x	x	x		
Conclusions and reporting		x			x	W				x	x	xW

W = work shops

Simple statistical models may be used in the final phase of the project to understand and quantify the importance of the background dust load.

6. Cost estimate

The cost estimate presented below is based on use of expatriate experts for design, selection of sites and filters and the scientific evaluation of the data. Chemical analyses are performed by NILU, some of the preparatory work is performed in Norway, while the finalising, discussions and reporting is undertaken in Egypt with support from local experts.

Task	1000xLE
1. Planning data collection	10
2. Spatial analyses	15
3. Meteorological analyses, wind generated dust etc.	15
4. Selection of filters for chemical analyses	3
5. Chemical composition, ICPMS analyses	22
6. Total analyses, receptor model, source importance	25
7. Data evaluation, discussions, background estimates	15
8.Conclusions and reporting	15
9. Travel and accommodation	40
10. Two work shops at phase 1 and at the end	10
Total project costs	**170**

Two reports will be available from the project (after 6 moths and after 12 months).
Two workshops will be organised;

1. to discuss the data input after the results of the three first tasks
2. to present the final findings and discuss the implementations of the work.

The cost estimate has to be considered preliminary, and will depend upon final discussions concerning the scope, content, extent and total participation in the project. The costs will be sensitive to any modifications of the plan.

I.3 Minutes from meetings (examples)

Minutes of Meeting	
Subject:	STAFF MEETING # 101
Date:	14th November 1999
Place:	EIMP Office
Participants:	Jorgen Simonsen (JFS), Mohamed Fathy (MF), Anwar Ahmed(AZA), Dean Jones(DJ), Mohamed Salah (MS), Nermine Serag (NS), Ulla Lund (UOL), Heba Fathy (HF), Mai Ahmed (MEA), Rolf Dreiem (RD), Leif Marsteen (LM) Shabrawi Mahmoud (SMI), Lydia kiriakos (LSK), Ayman El-Maazawy (AEM), Naglaa Darwish (NMD), Bjarne Sivertsen (BS), Haytham Ahmed (HAA)
Prepared by:	LSK Reviewed by: MF
Distribution:	EIMP Staff

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Component	Task Description	Time	Person
1- Institutional Support	• Deliver comments on the air and CW database systems after testing it;	This week	IGSR & NIOF
	• Continue testing the CW database system;	This week	SMI
	• Review the information on EIMP web site and forward the updating if any to data management group for implementation;	End of each month	Counterparts
	• Continue updating equipment database;	This week	AEM
	• Continue developing CW Phase 1 database system;	This week	MZ
	• Continue developing the user manual for the CW database system;	This weeks	AEM
	• Continue developing the user manual for the air database system;	This week	NMD
	• Visit IGSR & NIOF, Alex to install life data and test it;	this week	AEM, HF & SMI
	• Send a letter to Steve Gersh (EMC) for providing the documentation for the system manager;	Nov. 14th	JFS
	• Prepare a proposal for the QA manual;	This week	MZ
	• Develop the site report and finish the enhancement in chart modules for the air database system; and	This week	NS
	• Continue developing the CW database system Phase 2.	For 2 weeks	HF & DJ
Procurement	• Deliver the auto sampler for Ion Chromatograph to CEHM;	This week	AZA
	• Continue providing Ayman with updated word files covering all items delivered to the monitoring institutions;	This week	AZA
	• Purchase a stabliser for Tabbin south;	This week	AZA
	• Order one A/C high wall split unit to be	This week	AZA

	installed at Gomhoriya station; • Continue discussions with Customs Exemption follow up delegates; • Deliver data logger to CEHM; and • Continue assisting EEAA to finalize storing formalities for EIMP equipment.	 This week This week This week	 AZA AZA AZA
2- Coastal Water Monitoring	• Finish sampling of benthos and sediment in the Mediterranean; • Assess the analysis of the control samples performed by NIOF, Suez for Phase 2; • Finish the corals sampling in Red sea proper and deliver samples to NIOF Suez; • Start the 6th campaign; • Cooperate with EEIS for producing report and presenting the data; and • Review NIOF 4th sampling campaign draft report.	This week This week This week Next week This week This week	NIOF SMI & AJ NPE IGSR SMI SMI
3- Air Pollution Monitoring	• Prepare sites for installing PM_{10} Air Metrics samplers; • Start data retreival from Suez station after installing the modem; • Continue pushing CEHM & IGSR to finalize the contracts with CTS; • Prepare reports on air Quality in Cairo; • Follow up the installation of the telephone lines at Aswan & Kafr El Zayat stations; • Transfer the foreign currency for purchasing the required permeation tubes; • Install A/C at El Gomehoraya station; • Provide the CVs for the new team at CEHM chemistry lab; • Submit the draft air quality quarterly report; • Submit suggestions for the renewal of the contract; • Visit Alex. to select the new site at Semoha & check the measuring equipment; • Visit Alex & Delta to repair and maintain the air equipment; • Follow up the lead analyses at CEHM; • Install a new telephone line at the monitoring institution in EEAA to retrieve and transfer data properly; • Audit and complete the remaining the SOPs.	This week This week Within two weeks Daily This week This week This week This week This week This week This week Nov. 17th as soon as possible Next 5 weeks	Contractor CEHM EIMP HAA HAA EIMP EIMP CEHM IGSR IGSR & CEHM BS & RD RD BS AAE & HAA LM

4- Reference Laboratories	• Train NIOF, Suez in internal QC; • Audit Fum El Khalig station; • Send P.T.10 samples to the participating laboratories; • Start the analysis of the International P.T. samples (nutrients in sea water & trace metals in biota); and • Submit the draft for both Reflabs new contracts to EIMP management.	This week This week This week This week This week	Ain Shams NIS Ain Shams Ain Shams MEA & UOL

Minutes of Meeting Ambient air monitoring

Subject: Weekly planing meeting

Date: 03 October 99

Place: CEHM (Cairo University)

Participants: H. Ahmed, T. El-Araby, Ahmed, Maher, Yassin, Kamla, Mahmoud, Essam, Ashraf, Mohamed (Cairo University)

Prepared by: M.H. & A.S.

Distribution: T. El Araby, B. Sivertsen, H. Ahmed, M. Fathy, J.Simonsen, and Ahmed A. El Seoud

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Next meeting: Wednesday 13 October 14:00 at CEHM

		Init.
1.	**El-Kolaly Station**	**Yassin**
	• Perm. Tube ordered.	
2.	**El-Gomhoriya Station**	**Ahmed**
	• The station will be worked after two weeks.	
	Met – Authority	
3.	Ok.	**Kamla**
	Nasr City Station	
4.	Ok	**Ahmed**
	El-Maadi Station	
5.	• Perm. Tube.	**Yassin**
	Tebbin Station	
6.	• SO_2 Perm. Tube missing	**Maher**
	• Pump for SO_2 monitor.	
	• PM_{10} filter real always cut off , will call CTS for visit (need repair).	

7.	**Tebbin South Station** • TSP controller was fired and will replaced with one from monitor lab.	**Maher**
8.	**Fum El-Khalig Station** • NMHC and its requirements transferred to CTS on Tu 8 Dec. Waiting for spare parts. • Transformer from EIMP.	**Kamla**
9.	**Abu Zabal Station** Ok.	**Kamla**
10.	**Shoubra El-Kheima Station** • A lot of power Failure.	**Kamla**
11.	**Cairo University Station** • SO_2 need calibration. • Air condition need repair.	**Yassin**
13.	**6 October** Ok.	**Yassin**
14.	**10 of Ramadan** Ok.	**Kamla**
15.	**Suze** Ok.	**Maher**
16.	**Ismailia** Ok.	**Maher**
17.	**Port Said** Ok.	**Maher**
18.	**El-Fayum** Ok	**Yassin**
19	**El Minya** Ok.	**Ahmed**

20	**Assute 1** • Nox not transferred, will transform during this week.	**Ahmed**
21	**Assute 2** • Leader needed	**Ahmed**
22	**Nag Hammadi** Ok.	**Mah**mood
23.	**Louxer** Ok.	**Mah.**
24.	**Edfo** Ok.	**Mah.**
25.	**Komombo** Ok.	**Mah.**
26.	**Aswan** • Met Tower will be checked.	**Mah.**
27.	**Sharm EL-Sheik** Ok. **Other matters**	**Yassin**

Minutes of Meeting Ambient air monitoring

Subject: Weekly planing meeting

Date: 13 October 99

Place: CEHM (Cairo University)

Participants: H. Ahmed, T. El-Araby, Ahmed, Maher, Yassin, Kamla, Mahmoud, Essam, Ashraf, Mohamed (*Cairo University*)

Prepared by: M.H. & A.S.

Distribution: T. El Araby, B. Sivertsen, H. Ahmed, M. Fathy, J.Simonsen, and Ahmed A. El Seoud

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Next meeting: Wednesday 20 October 13:00 at CEHM

		Init.
1.	**El-Kolaly Station** • SO2 & NO2 Perm. Tube ordered. • SO2 repaired 14 Oct. • TSP must be cleaning • Zero / Span check will be performed only during one hour .	Yassin
2.	**El-Gomhoriya Station** • The station will be worked after two weeks. • Hythem will contact with Dr. Islam to start work in the room . • Thursday ,14 SO2,CO,PM10 calibrated and started .	Ahmed
3.	**Met – Authority** Tel. Next week .	Kamla
4.	**Nasr City Station** Ok	Ahmed
5.	**El-Maadi Station** • NO2 Perm. Tube ordered . • The of EIMP will be available after 4 O'clock	Yassin

6.	**Tebbin Station** • SO_2 Perm. Tube ordered. • SO2 , Nox and PM10 at CTS	Maher
7.	**Tebbin South Station** Ok.	Maher
8.	**Fum El-Khalig Station** • SO2 & NO2 permission tube ordered • NMHC and its requirements transferred to CTS on Tu 8 Dec. Waiting for spare parts. • Transformer from EIMP.	Kamla
9.	**Abu Zabal Station** Ok.	Kamla
10.	**Shoubra El-Kheima Station** • A.C. need repair .	Kamla
11.	**Cairo University Station** • SO_2 need calibration.	Yassin
13.	**6 October** Ok.	Yassin
14.	**10 of Ramadan** Ok.	Kamla
15.	**Suze** • SO2 & NO2 permission tube ordered	Maher
16.	**Ismailia** Ok.	Maher
17.	**Port Said** Ok.	Maher

18.	**El-Fayum**	Yassin
	Ok	
19	**El Minya**	Ahmed
	Ok.	
20	**Assute 1**	Ahmed
	• Nox at NIS	
	• PM10 not working good	
	• Portable met tower don not give readings expect for RH.	
21	• **Assute 2**	Ahmed
	• Ladder will be locally handled	
22	**Nag Hammadi**	Mah.
	Ok.	
23.	**Louxer**	Mah.
	Ok.	
24.	**Edfo**	Mah.
	Ok.	
25.	**Komombo**	Mah.
	Ok.	
26.	**Aswan**	
	• Met Tower translator will be checked at shoubra .	Mah.
27.	**Sharm EL-Sheik**	
	Ok.	Yassin
	Other matters	

EIMP Monitoring and Sampling Programme Status
Minutes from Meeting at CEHM

10 November 1999

	Site	Area type	Param	Status	Responsible	When?
1	Cairo c.Qualaly	Urban centre ☎		Tel. okay	Yassin	
			NOx	okay		
			PM_{10}	okay		
			SO_2	okay		
			TSP	okay		
			VOC	will be installed Mar 2000	CEHM	
2	El Gemhoroya st.	Street canyon		The station is being changed, New room buildt	Ahmed HAA'	
			CO	for calibration	NIS	
			NMHC	will be returned to CTS		CEHM
			NOx	okay (flow?)		
			PM_{10}	okay		
			SO_2	okay		
3	Abbasyia	Residential. ☎		Tel not installed,	Kamela	?
			Met	okay		
			Ozone	okay		
			SO_2	okay (alarm,		
				change lamp	Kamela	bef. 17 Nov
4	Nasr City	Roadside/Res	SO_2 BS	okay		
			NO_2	okay		
			PM_{10}	okay		
5	Maadi EEAA	Residential ☎		New Tel line needed!!	HAA/CEHM	Nov 99!!
			NOx	okay (no perm)	Yassin	
			SO_2	okay (no perm)		
			PM_{10}	okay		
6	Tabbin	Industrial ☎		air con unstable, hot! need extra?	Maher HAA check	
			Met	okay check!		BS
			NOx	at CTS (CEHM now)	CEHM	
			PM_{10}	PM_{10} low values	check, Maher	Rolf
			SO_2	at CEHM		Rolf
			TSP	okay		

7	Tabbin south	Industrial	SO_2 BS TSP DF	okay controller burned, stabiliser! okay	Maher Maher/HAA	
8	Fum Al-Khalig	Road /urban ☎	 CO NMHC NOx PM_{10} SO_2	Telephone line needed!!! CO okay? return to CTS okay (no perm) at CTS okay (no perm) new transformer!!	HAA Kamela Kamela check CTS Kamela	 Kamela now! 17 Nov 1999
9	Abu Zabel	Industry/res	DF PS (S+ N)	okay okay	Kamela	
10	Shoubra	Industrial ☎	 Met SO_2 NO_2 TSP PM_{10} DF	tel okay, AC need repair !! okay okay okay okay not installed (AIRmetrics) install	CEHM Kamela HAA Kamela	17 Nov 99 17 Nov? 1 Dec 1999
11	Giza, Cairo Univ.	Residential	 NO_2 SO_2 Ozone Met	need new data logger okay calibrated? okay must be checked	Yassin CEHM BS, CEHM	
12	Giza pyramid	Regional	PS (S+N)	will be started	Yassin/BS	nov
13	6 October	Res/industrial	SO_2 BS NO_2 PM_{10} DF	okay okay okay okay	?	
14	10 Ramadan	Residential	SO_2 BS PM_{10} PS DF	okay okay okay okay	?	
	Canal area					
15	Suez	Res/urban ☎	 NOx SO_2 TSP DF	tel installed, modem!! permeation tubes needed okay (no perm) okay (no perm) okay okay	Maher	17 Nov 99
16	Port Said	Residential	PS (S+N) PM_{10}	Selct new site (school) not installed (AIRmetrics)	Maher HAA	17 Nov 99
17	Ismailia	Residential	PS (S+N) PM_{10}	okay not installed (AIRmetrics)	Maher	
	Upper Egypt					
18	El Fayum	Urban	DF PS(S+N)	okay okay	Yassin	
19	El Minya	Urban/Res	DF PM_{10} PS(S+N)	okay not installed (AIRmetrics) okay	Ahmed HAA	

20	Assyut 1	Res/Urban. ☎	NOx SO_2 PM_{10} met	Tel. arrived not connected for check at CEHM at CEHM need calib at CEHM okay, check data	HAA Ahmed at NIS? CEHM/BS Ahmed must re-install all	 Rolf? 17 Nov 99
21	Assyut 2	Residential	DF PS(S+N)	okay okay	Ahmed	
22	Naga Hammadi	Industrial/res	DF PM_{10} PS (S+N)	okay not installed (AIRmetrics) okay	Mahmooud HAA	
23	Luxor	Urban/res	SO_2 BS DF PS(S+N)	okay okay okay	Mahmoud	
24	Edfu	Urban.	DF PS(S+N)	okay okay	Mahmoud	
25	Kom Ombo	Industrial	SO_2 PS(S+N) PM_{10}	okay okay not installed (AIRmetrics)	Mahmoud	
26	Aswan	Urban/res. ☎	 Met Ozone SO_2 DF	tel. not connected letter needed! have to be re-installed no wind direction okay, clean!! okay okay	HAA HAA Maher??	
	Sinai Area					
27	RasMohamed	Background	Ozone DF PM_{10}	okay okay not installed (AIRmetrics)		

Data QA procedure

A new data quality assurance procedure started on 10 Nov 1999. A Draft written procedure was presented to the operators. A written procedure will be finalised during November 1999.

The passive sampling programme

The passive sampling programme has been finally designed and discussed with the monitoring institutions. All measurements have to start at all sites from November 1999. Most of the sites have already been working for many months.

EIMP Passive sampling programme

Updated Oct 1999

			Quarterly samples									
	Site name	**Area type**	**Jan**	**Apri**	**July**	**Oct**	**monthly**	**Passive**		**Other**		
	Cairo											
3	Meteorological Inst	Residential.	x	x	x	x		NO2		SO2	M	
7	Tabbin south	Industrial					x	NO2		SO2		df
9	Abu Zabel	Industry/res					x	NO2	SO2			
12	Gizapyramid	Monument					x	NO2	SO2			
	Sakkara	Monument	x	x	x	x		NO2	SO2			
	Tahrir Sq.Am.Un.	Urban					x	NO2	SO2		A	
	Shoubra (Kamela)	Residential	x	x	x	x		NO2	SO2			
	Helwan (Maher)	Residential	x	x	x	x		NO2	SO2			
	Nasr City (Tarek)	Residential	x	x	x	x		NO2	SO2			
	Heliopolis (Tarek)	Residential	x	x	x	x		NO2	SO2			
	AinShams (Ahmed)	Residential	x	x	x	x		NO2	SO2			
	Canal area											
	Suez industrial	industrial/res.					x	NO2	SO2			df
16	Port Said	Residential					x	NO2	SO2		A	
17	Ismailia	urban/resid					x	NO2	SO2		A	
	Upper Egypt											
18	El Fayum	urban					x	NO2	SO2		A	df
19	El Minya	Res./ Industrial					x	NO2	SO2		A	df
21	Assyut 2	residential/urban					x	NO2	SO2		A	df
22	Naga Hammadi	industrial/res					x	NO2	SO2		A	df
	Luxor, Karnak	monument	x	x	x	x		NO2	SO2			
	Luxor, Temple	monument	x	x	x	x		NO2	SO2			
24	Edfu	Industry/urban.					x	NO2	SO2		A	df
25	Kom Ombo	industrial					x	NO2		SO2	A	p
26	Aswan	urban/residential.					x	NO2		SO2	A	df
	Sinai Area											
	Sharm ElSheik	city, tourist	x	x	x	x		NO2	SO2			
27	Ras Mohamed	background					x	NO2	SO2		O3	df
	Alexandria											
33	IGSR, Background	Urban regional					x	NO2	SO2		O3	M
	AlAzafra (Shallaby)	Residential	x	x	x	x		NO2	SO2			
	Roman theatre	Monument	x	x	x	x		NO2	SO2			
	Delta Area											
40	Kafr Dawar	industrial					x	NO2		SO2	A	df
34	Damanhur	industrial/res					x	NO2	SO2		A	df
	Kafr el Zayet south	industrial					x	NO2	SO2		A	df
36	Tanta	urban					x	NO2		SO2	A	
39	Domyat	resid					x	NO2		SO2	A	df

A = AIRmetrics PM10 sampler
df = dust fall collector

In addition Passive sampling will be undertaken every quarter around the AbuQuir factories.

Minutes for the Air Quality Staff meeting, IGSR Tuesday 13 April 1999.

Attendants

1. Prof. Bjarne Sivertsen
2. Mr. Ralf Dreiem
3. Dr. Elsayed Shalaby
4. Dr. Shawkat Guirguis
5. Dr. Zekry Ghatass
6. Mr. Hossam Said
7. Mr. Mohamed Mamdouh
8. Mr. Mohamed Rashad
9. Mr. Ashraf Zahran
10. Mr. Aly Elhadidy

Station	ID		Operator
Abu-Qir	AQ-28	- Passive samplers will be done tomorrow 14 April - PM_{10} sampling at the same day	Mr. A. Elhadidy
El-Max	AQ-29	- Power failure 2-4 times	Mr. M. Rashad
IGSR	AQ-30	- PM_{10} is still in repair - CO problem still there.	Mr. H. Said
Ozone	AQ-33	- O.K.	Mr. H. Said
Meteorological	AQ-39	- O.K.	Mr. H. Said
Gheat El-Inab	AQ-32	- The chart of PM_{10} is still under repair SO_2 peaks may be typing errors, SO_2 is still low?? Why? Although we have diesel buses	~~Mr. A. Zahran~~ M. Rashad
El-Asafra	AQ-31	- O.K.	Mr. A. Zahran
Kafr El-Dawar	AQ-40	- Installed 24 March 1999 and looks OK.	Mr. A. Elhadidy
Damanohr	AQ-34	- Not selected yet and needs a visit.	Mr. Hossam
Kafr El-Zayat	AQ-35	- Hossam is contacting Electricity Authority on 13 April 1999. - M. Kotb + Ralf will go on Monday 19 April 1999.	Mr. M. Mamdouh
Tanta	AQ-36	- Postponed visit till next week.	Mr. M. Mamdouh
El-Mansoura	AQ-38	- Installed on 8 April 1999, first visit will be 17 April 1999 by (Ashraf). - Needs system manger & Modem.	Mr. A. Zahran
El-Mahala	AQ-37	- Papers are still to be signed. - 26 April is the plan for installation.	Mr. M. Mamdouh
Dameitta	AQ-39	- Will be visited on 15 April 1999.	Mr. A. Zahran

-The car has been licensed , the cover will be designed.

Minutes of the biweekly meeting with EEAA counterpart and IGSR project staff

Attendance:

1- Dr. Elsayed Shalaby
2- Dr. Zekry Ghatass
3- Eng. Hossam A. Said
4- Eng. Ashraf Zahran
5- Eng. Mohammed M. Kotb
6- Eng. Mohammed Rashad

Date : 23 rd of August 1999
Time : 10:00 am to 12:00 pm

The status of each station was discussed as follows:

Operator (responsible)

Alexandria Station

1- IGSR :

All the instruments as well as the air condition are operating well. — H. Said

2- Background station :

- Ozone instrument is operating well.
- Meteorological station equipment's are running well except temperature sensor and relative humidity sensor, which give zeros. — A. El Nadidy

3- Abu- Qir station :

- No_x at CTS
- So_2 is ok
- The controller of PM_{10} in CTS
- The data logger has to be moved to CTS

4- El-Asafra :

Ok

5-Gheat El-Inab :

Ok

6- El-Max :

Ok

Delta Stations

1- Kafr El-Zayat :

The monitors and data logger, was in trouble and have been sent to the CTS.

2- Tanta :

Ok

3- Kafr El-Dawar :

Ok

4- El Mahalla :

Ok

5-Dommiat :

Ok

5- El-Mansoura :

Ok

With my best wishes
IGSR project Manager
Elsayed Shalaby
Dr. Elsayed Shalaby

Minutes of the Biweekly Meeting with EEAA Counter part and IGSR Project staff.

Attendance :- 1-Dr.Elsayed Shalaby
2- Dr Shawkat Guirguis Hosam
3-Dr.Zekry Ghatass
4- Eng. Mohammed Mamdouh
5-Eng. Mohamed Rashad
And
5- Prof. Bjarne Sevrtson
6- Mr Haitham Ahmed EEAA Counter part.

Date *24/10/1999.*
Time *1-3 p.m.*

Alexandria Station

1-IGSR

All the instruments as well as the air condition are operating well.

2-Background station

Ozone instrument has been sent to NIS for calibration
Meteorological station equipment's are working in a good condition except the temperature sensor and relative humidity. Wind speed sensor gives very high readings for many hours daily.
The phenomena of condensation of the water vapor still present.

3-Abu Qir Station.

The Nox monitor and the calibrator still at CTS.
A permeation is needed from EEAA To submit the data to Air Defense College

4-Al-Asafra is okay

5-Gheat Elanab is okay

6-El-max is okay

El Sayed Shalaby

Delta station

7-Kafr El-Dawar is okay

8-Kafr El-zayat: NOx monitor and data logger were transported to CTS for repair.

9-Tanta is Okay, There is a big hole beside the shelter must be closed for safety

10-El-Mahalh is okay

11-Damietta is okay

12- El-Mansoura is okay.

Comments.

1-Thermometers have to be bought
2- monitors have to be calibrated using travelling standard cylinders

Project Manager
El Sayed Shalaby
Elsayed Shalaby

I.4 Meeting at departure

Memo

To: JFS, AAE, MF
From Bjarne Sivertsen
Date: 1 December 1999

Meeting at departure

We need a meeting before my departure on

Thursday 2 Dec 1999

The following items will have to be discussed:

- Task for two counterparts (Memo)
- Status at the Monitoring Institutions,
- Contract for CEHM, (a realistic input), (Samplers for calibrations from Upper Egypt not included)
- Contract for IGSR (a realistic input) (Memo for one motor bice)
- **Quality instead of Quantity**!!!! Delete the 85 % data availability requirements stated to the Monitoring institutions. They will create false data to meet the requirements. A better solution will be to subjectively consider the Quality of the Quarterly Report and the work performed generally.
- PM_{10} concentration limits for Egypt (Memo)
- The daily data retrieval circus
  ONLY operators are allowed to enter the Station Manager and
  to operate the stations. Errors have been introduced to the data!
  Please report only data available at CEHM in the morning via telephone lines!!
- All instruments out from CTS. IGSR and CEHM are collecting the rest, except for PM_{10} monitors
- Remember to return ALL NMHC monitors to CTS/Thermo, request TWO new PM_{10} monitors (new type: Eberline!)
- Sequential samplers to be calibrated at NIS annually. NIS should be contracted to return the samplers on the same day? NIS generally creates large problems during calibrations. Time and efforts exaggerated. NOx monitor from Assyuit broken. Ozone calibrations, when??
- Tabbin station will have heat problems again next summer. What about a shelter
- Letter needed for sampling at the Pyramids. (Heba/Haytham)
- Various reporting
- My return to EIMP in 2000

Memo

To: JFS, AAE, MF
From Bjarne Sivertsen
Date: 28 November 1999

Tasks to be covered by two counterparts

Two counterparts have been appointed to the Air Pollution Component at EEAA/EIMP. It is important that the different tasks are well defined, and that an agreement is arrived concerning the responsibilities of the two counterparts.

I have in this memo tried to identify the different tasks necessary to undertake the Air Pollution Monitoring programme designed and applied to the EEAA/EIMP programme in order to utilise the experience and skills of the two experts involved.

Haytham Ahmed (main responsible)

Haytham is now experienced in operating the air quality monitoring programme, to contact various institutions, to keep in touch with the monitoring institutions and he has also started reporting data on a daily and a monthly basis. I would suggest that his responsibilities in the future programme will be:

- Follow up the further establishment and the development of the programme,
- Follow up the infrastructure in the Monitoring Programme, such as telephone lines, power, shelters including upgrading,
- Follow up contracts and details in the co-operation between EEAA and the Monitoring Institutions,
- Prepare and undertake status reporting within EEAA/EIMP,
- Co-ordinate and arrange all (weekly and bi-weekly status) meetings with the institutions and see that reporting is undertaken,
- Follow-up Quarterly Reports from the Institutions; correct and approve these,
- Support Heba in developing other reports within EEAA, and work with the database and with the air quality data to secure backup in the programme.

More details concerning tasks to be undertaken during the next weeks are presented in the Appendix.

Hebatalla Fathy Ahmed.

Heba was tested in the evaluation and explaining of air quality data, and has proven that she understands the basics of air pollution, she knows the data base in which data are transferred to EEAA from the Monitoring Institutions and she is able to prepare reports.

I thus suggest the Hebatalla Fathy Ahmed will be responsible for the following tasks in the future EEAA//EIMP Air Quality Monitoring Programme:

- Data retrieval from the Monitoring Institutions to the EEAA server,
- data control and evaluation,
- monthly and annual reporting.

She will also have to support Haytham in the weekly meetings and represent a back-up for the general counterpart tasks.

Appendix

Tasks to be undertaken by EIMP Air Pollution Component Counterparts

Several tasks are still pending at the end of my Mission to Egypt, ending on 3 December 1999.
The following should be followed up:

1. Telephone lines are still missing or data transfer has to be checked at:
   - Maadi (new line needed),
   - Kafr Zayat (no line),
   - ElMahalla (no line),
   - El Mansoura (data retrieval?),
   - Suez (modem to be connected?)
   - Aswan (?)
   - Fum El-Khalig (line required!!)
   - El-Gomhoriya (new line to be installed, from Arab Contractors?),
   - Alexandria Centre (new line new station!),
   - Assyut (to be connected!)

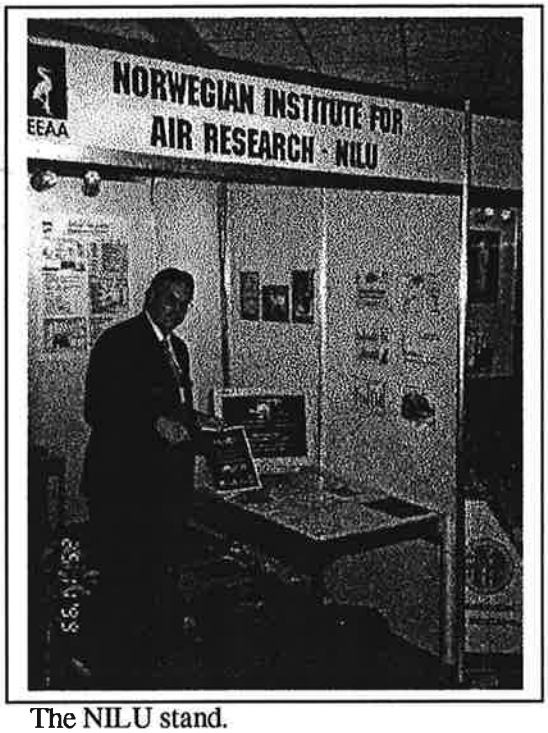
2. Install AirMetrics at all sites, and have CEHM start sampling,
3. Training and start up of AIRMetrics samplers have to be undertaken by and at CEHM,
4. Filters and all accessories at Storage have to be moved to CEHM before start up of training and sampling,
5. PM_{10} High Volume sampler at Maadi not fixed by bolts, have to be done!
6. The stand for AIRMetrics at Shoubra is too small. This has to be enlarged and fixed before the sampler is blown down and damaged.
7. Return 5 male and 5 female connectors to Jim Howes when EIMP receive new connectors from AIRMetrics,
8. One male one female connector and tubing is needed at every AIRMetrics station,
9. Transfer 500 ppm CO to IGSR. This was a request placed 6 months ago.
10. Prepare monthly status reports, (may be based upon the new weekly meeting reports).
11. Follow up removing all instruments from CTS to CEHM when the repair laboratory has been prepared.
12. Collect and return all Non-methane HC-monitors to CTS/EMS (according to agreement in meeting in October). Order two new PM_{10} monitors.
13. Check that new data logger is installed at Giza Cairo University.
14. Follow up that new computers are transferred to CEHM.
15. Request that all equipment needed for VOC sampling is available at CEHM before Ove returns in March 2000.
16. Transfer Thermohygrograph to CEHM laboratory.
17. Check that lead analyses is performed at CEHM.

From the Exhibition at:

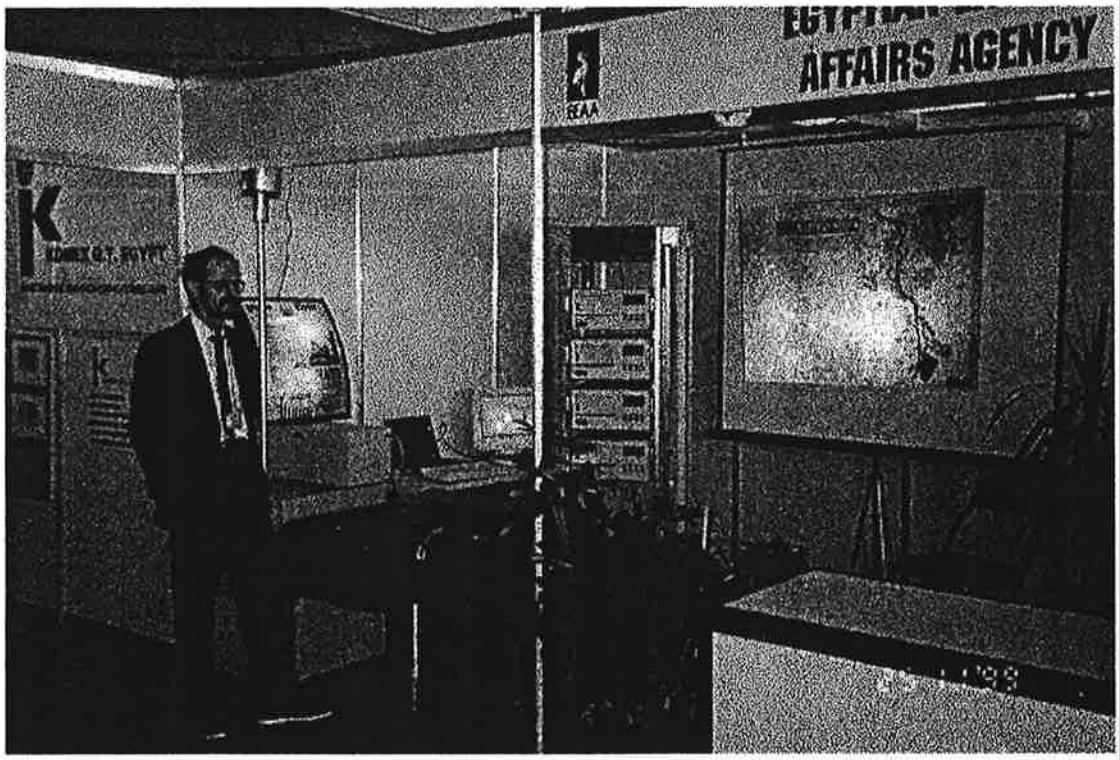
Environment'99

Cairo 24-26 November 1999

The Minister og Environmental Affairs opened the Conference



The NILU stand.



The Egypt Environmental Affairs Agency (EEAA) stand at the exhibition presented the EIMP programme.

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Environmental Information and Monitoring Programme (EIMP). Air Quality Monitoring Component Mission 15 Report	Bjarne Sivertsen NILU PROJECT NO. O-96013
AUTHOR(S) Bjarne Sivertsen, Ove Hermansen, Leif Marsteen and Rolf Dreiem	CLASSIFICATION * A CONTRACT REF.

REPORT PREPARED FOR:
COWI/EIMP
EEAA Building, 30 Misr Helwan Street
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.

NORWEGIAN TITLE
Overvåkingsprogram for luftkvalitet i Egypt

KEYWORDS		
Air Quality	Monitoring	Siting

ABSTRACT (in Norwegian)

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- *B Restricted distribution*
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