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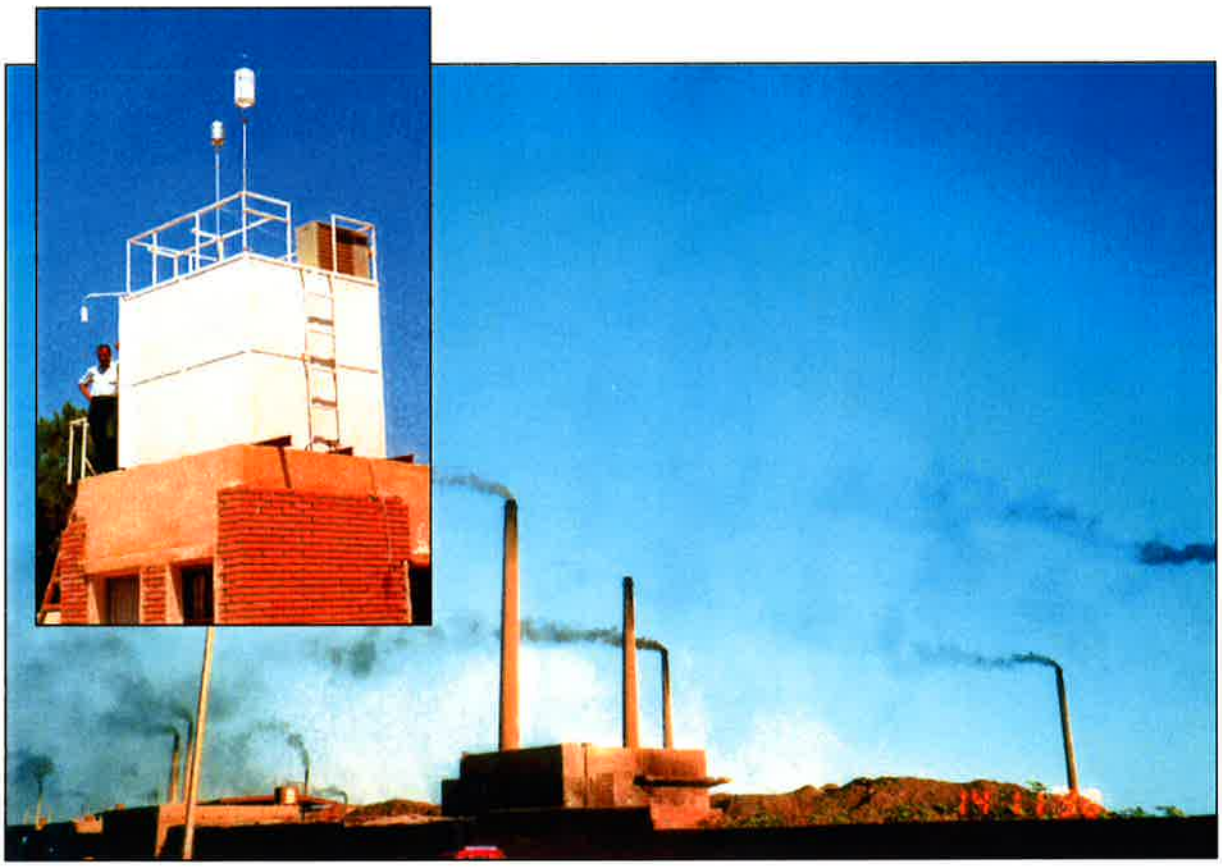
DANIDA

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

Mission 19 Report

Bjarne Sivertsen



EIMP Environmental Information and Monitoring Programme

NILU Norwegian Institute for Air Research

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1 Introduction

The 19th mission to Egypt was undertaken in October 2000. The EIMP project is funded by Danida and headed by COWI.

The work undertaken during the Autumn 2000 included training, audits, data retrieval and data base testing, QA/QC controls and reporting of various kind. Most of the time was spent training the different teams in data retrieval, data evaluation, data statistics and reporting. A field study was undertaken in Cairo using a number of passive samplers for measuring SO2 and NOs over the urban area.. Newsletters were prepared and presented.

The Air Quality Monitoring Team consisted of Bjarne Sivertsen, Haytham Ahmed and Hebatalla Fathy. The main task for the mission was to finalise training and reporting. Some sites were revisited to evaluate the represenatitivity and possibilities for changes and/or additional measurements.

With reference to the work programme the following tasks have been undertaken:

A. Institutional support
   Tested databases, and performed training of counterpart and Monitoring Laboratories.
B. Design of monitoring programme
   Evaluating site representativity.
C. Procurement
   Specified additional equipment needed, evaluated new PM10 monitors, discussed spareparts and consumables.
D. Data management
   Discussed data retrieval, databases, data availability, data quality and data transfer to EEAA.
E. Training
   Continued the on-the-job training at the Monitoring Laboratories and checked the application of procedures.

F. QA/QC
Continued the implementation of the QA/QC procedures at all levels.

G. Monitoring
Designed and performed a field study in Cairo with passive samplers. Continued weekly and biweekly meetings at the institutions to train the monitoring institutions in operation of the programme. Evaluated data, developed reports at Monitoring Laboratories and reports and newsletters at EEAA.

H. Reference Laboratory
Discussed procedures and time delays in equipment for monitor calibrations.

I. Component Co-ordination
Prepared memos and reports, newsletters, monthly status reports, meetings. Discussed air pollution forecast procedures, as well as future use of air pollution data collected by EIMP and CairoAIR.

The responsible personnel at the various institutions involved, as well as some of the persons we met during mission 19 are presented in Appendix A.

2 A. Institutional support

The database programme at the Monitoring Institutions still had problems when operating some of the statistical programmes.

A new version 1.2 had already been installed and tested at EEAA, but it turned out, due to misunderstandings, that the wind roses were not according to specifications.

The monitoring institutions received technical support, and status reports concerning operations and data quality are being prepared after the weekly or bi-weekly meetings at CEHM and at IGSR. (See examples presented in Appendix I.2.)

Training of the Counterparts is at this stage an ongoing process and data quality as well as data reporting was discussed every day. A summary of tasks to be undertaken after the Mission was discussed at a meeting before departure. A memo prepared is presented in Appendix A.2.

Institutional support was given to EEAA through several meetings and memos. The statistical air pollution forecasting procedures, which were tested at EEAA, was discussed at several occasions with the meteorologist in charge.

The use of air quality data from the EIMP programme as well as merging the EIMP and CAIP data were also discussed. A memo was prepared to describe a sustainable air quality measurement programme for Cairo, and how that could be organised in the future. (See Appendix I.2.6.)

3 B. Design of monitoring programme

An updated description of the sites operated in the EIMP programme during Mission 19 was prepared and presented to EEAA. (Appendix 3).

In addition to site descriptions, parameters and instrument types the station start up time is also indicated in Appendix 3.1.

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

Possible modifications to the programme in Alexandria and in the Delta were discussed. The new site at ElShouhada Square (near the main railway station in Alexandria) was inspected to evaluate the representativity. The air intakes are located at the roof of a small building. The intakes are about 4 m above street level and surrounded by heavy traffic included diesel buses. The site was considered representative for the typical city centre of Alexandria.

During a visit to Kafr Zayat and ElMahalla the possibilities for adding measurement sites were discussed. The existing measurement site at KafrZayat is representative for the general air pollution in the city centre. It is located east of the main industrial source areas, and will probably only be strongly impacted from industrial emissions during westerly winds. One additional site could be installed in the future, downwind in the prevailing wind direction; south of the brick factories and the industries. A possible site was pointed out at the Religious College for Girls in Kafr An-Nasriyyah. Passive samplers for SO_2 will be installed here as a beginning. In the future, this site could be equipped with a sequential sampler for SO_2 and soot.

In ElMahallah the present site is located between the textile factories and a large residential area. It was difficult to find a better and more representative site as long as health impact and exposure to the population is one of the main objectives with the measurement programme. (See also Appendix G.3.1.)

4 C. Procurement of equipment, hardware and software

The procurement activities have in this phase of the EIMP programme turned into the discussions of spareparts and consumables. However, some new equipment still remained to be purchased, as shown in Appendix C.1.

4.1 Activity C.2.1 Procure instruments and equipment

Procedures for purchasing spare parts and consumables had been discussed and presented already in October 1999. However, it was felt that these procedures had to be simplified and followed up through new routines to be applied by the Monitoring institutions.

Procedures for ordering instrument parts and calibration equipment had been presented in Mission report 18. During Mission 19 we found out that simple consumables such as charcoal, purafil and filters were not available in Alexandria. Also at CEHM they were missing adequate consumables, which should be easy to obtain. The problem was to assure that someone took the responsibility and that copies of requests were made available at EEAA.

There was also a need for updated lists of consumables and spareparts, which were supposed to be prepared.

New instruments such as Airmetrics PM_{10} samplers and a new generation of PM_{10} monitors had been ordered.

5 D. Data management

The databases and air quality statistics had been installed and tested during the end of 2000. However, some misunderstandings as well as malfunctions were identified. The database was withdrawn, and at the end of Mission 18 the statistical procedures for data treatment were still under development. Statistical programmes such as wind roses, Breuer diagrams and some frequency distributions were discussed and specified for the computer experts. During Mission 19 it was found that the specifications had not been followed, and more work had to be oriented towards the statistical treatment of data.

5.1 Activity D.1.1 Specify data collection and data transfer

During the first visits to IGSR, it was also found that there were data polling problems at some of the sites. (See report Appendix G.4.1.b). First priority support was given from the computer experts at EIMP to solve these problems. One of the problems was that the modems had not been specified correctly.

These problems were solved during the Mission, and automatic polling of data could be performed on a daily basis from all sites.

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

The training of expert personnel for the routine operations to be undertaken at the Monitoring Institutions every day continued during Mission 19. Modems, daily data polling and quality controls had been specified, and operational procedures had been given. However, it turned out that these routines were still not adequately followed, especially at IGSR.

All routines were brushed up again, and at the end of Mission 19, it seemed that the QA/QC officer had taken the responsibility, and that the software and hardware systems necessary to undertake all the controls were working adequately. The local database, which was supposed to be the one developed by EIMP, was not still installed in the final version.

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

A final version of the Standard Operations Procedures Manual had been prepared and was presented after the end of Mission 19. (See Appendix E.2 under training)

5.4 Activity D.1.5 Telecommunication lines

The discussion and possibilities of using mobile telephones, which was discussed during Mission 18, had been left. All communications of data from the measurement sites were to be done by using the normal telephone network. During Mission 19 there was still some problems with lines to some of the sites in the Delta. A final check and verification of lines will be reported at the end of 2000.

5.5 Activity D.2.1 Prepare database for manually analysed data

The database for VOC samples had been prepared at NILU, but due to delays in obtaining the equipment for VOC sampling this part of the tasks have not been finalised yet.

The use of the database for other manually collected data at the CEHM laboratory was again checked and verified. It seemed like the experts were adequately trained in using the database, and that they followed the procedures given.

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

The local database for the data retrieved from the monitoring system is part of the System Manager. The system will not be complete until the database developed at EIMP is fully installed, operated and used. It was anticipated at the end of Mission 19, that this would be in operation at the end of 2000.

5.7 Activity D.3.1 EEAA data base

The situation concerning the EEAA database is the same as specified above. A description of the Topics to be solved during the database development was presented early in the development phase (Appendix D.3)

A first version of the database is in operation, and is being used for creating monthly reports as well as data summaries and newsletters. The first examples of Breuer diagrammes were prepared for the monthly report, as shown in Appendix D.3.1.

All the statistics was still not operational at the end of the Mission, but specifications had been given and the work had started to finalise the database.

6 E. Training

Training during Mission 19 included mainly reporting procedures at the Monitoring Institutions and at EEAA. Monthly, Quarterly and Annual reports were discussed, and the content as well as presentations were updated and changed.

The end point of the operational procedures; calibrating, maintaining, and repairing the instruments was also reached through the presentation of the Standard Operational Procedures Manual.

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

The final documentation, which explains in detail how to perform and document all operations necessary to run, maintain and calibrate the instrumentation both in the laboratory and in the field, was presented at the end of Mission 19. (See Appendix E.2.2.). The document is based on work done during several missions to Egypt in the period of June 1997 to May 2000 for the EIMP project.

The operators in their daily work shall use the procedures. It contains a file of about 350 pages of documentation, sheets, procedures, tables etc. The file has to be available for the QA/QC officer and easily available also to all field operators.

A Table of contents is presented in Appendix E.2.2.

6.2 Activity E.5.1 Use of the System Manager

The System Manager was finally working properly at both Monitoring Laboratories. Final training, including practical use of the system, remote calibrations, data quality controls, cleaning of data, data plots and storage of raw data was repeated and concluded during Mission 19.

6.3 Activity E.5.2.Training in use of EEAA data base

At the end of Mission 18 it was anticipated that an operational database would be finalised at the end of 2000. The statistical programmes designed for presentation of air quality data were, however, still under development. We still managed to use the version that had been produced so far. Some training in the use of this version of the database lead to the presentation of 3 newsletters. (See Appendix I.2.8.) However, the full version was still not available at the end of Mission 19.

6.4 Activity E.6.1 Sample preparations

The training programme for preparing the VOC samplers had been postponed due to personnel problems at CEHM. It also turned out that the equipment available at the CEHM laboratory was not adequate for start up of VOC sampling. This list was updated at the end of the Mission and a final version is presented in Appendix G.6.2.

Practical training in the preparation, sampling and analyses of VOC will start during the Spring 2001.

6.5 Activity E.6.2 Chemical analyses of various filters

A final updated training session for analyses of the manually collected filters will have to be repeated during the last Mission to the laboratory in 2001. This training programme will be prepared during the start up of the VOC sampling programme.

6.6 Activity E.7.1 Air quality data interpretation

The air pollutants measured as part of the EIMP programme are in accordance with the air quality standards given in the environmental laws of Egypt. This has also represented the basis for understanding the air pollution concentration values, as well as understanding the relationship between emission sources, dispersion meteorology and air quality.

The EEAA counterparts have been trained in understanding these connections and have been reporting data in view of why we measure what we measure. This work has been reported through the preparation of monthly reports, newsletters and annual report.

7 F. QA/QC

7.1 Activity F.2.1 Instrument calibration procedures

As mentioned in Chapter E, Training, all measurement and sampling procedures (SOP; Standard Operation Procedures) has been finalised and reported. The operational procedures included calibration, maintenance and repair.

The remaining procedures will be verified through the Audit programme. The expatriate experts will also perform audits to the monitoring sites during 2001.

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

Additional training of the field personnel as well as the laboratory experts at the Monitoring Institutions was identified during Mission 19. We will try to add some on-the-job training in the use of these routines during an Audit type visit to IGSR and CEHM in 2001.

7.3 Activity F.4.1 Input from Reference Laboratory- Air

A summary of requirement for data quality, which all institutions working under EIMP contracts must at least be able to achieve, was presented by the Reference Laboratory after Mission 19. The requirements for data collected by high volume samplers and sequential samplers are presented in Appendix F.4.1. These requirements are supposed to be valid until 30 June 2002. The requirements will be re-evaluated at this date.

An evaluation of the analyses of lead and SO_2 on filters performed at the CEHM laboratory is presented in Appendix F.4.1.b. At low concentrations of lead, the CEHM laboratory overestimated the concentrations. At high lead concentrations, the laboratory performed well. For SO_2 the analyses at low concentrations were adequate, while at high concentrations the laboratory analyses were strongly underestimated. This will have to be investigated in more details later.

The Reference Laboratory-Air started the Auditing of the systems during the Spring 2000. The air pollution component supervised the first Audits. Reports from the later Audits are available through the Reference Laboratory component.

8 G. Monitoring

The EIMP/EEAA air quality monitoring and sampling programme has been operated on a routine basis since January 2000. Some minor changes were discussed during Mission 19. Weekly meetings and monthly reports have updated the status of the programme. A special study using passive samplers for SO2 and NO2 was designed and performed in October 2000.

Maintenance and calibrations have been performed by the Monitoring Laboratories and further developments of reporting formats were discussed during the Mission.

8.1 Activity G.2.3 Monitoring programme updated

The monitoring programme was evaluated and some sites were visited. The main question was raised concerning the representativity of some sites in Alexandria and in the Delta. The following sites were visited:

- ElShouhada in Alexandria
- Kafr Zauyat
- ElMahalla

A report from these visits is presented in Appendix G.3.1. The measurements performed in ElMansoura were also discussed, and the conclusions was that the site will be kept as is, but additional measurements using passive samplers should be performed inside the city, east of the site.

8.2 Activity G.4.1 Maintenance, calibration and operation of the monitoring stations

Monthly status reports are presented in Appendix 4.1. ISGR in Alexandria is responsible for the sites in Alexandria and in the Delta. CEHM at Cairo University is responsible for the rest of the stations in Egypt.

Some problems can be seen in operating the PM10 monitors. During the summer season many of the problems at the sites have been related to air condition system breakdown, or the fact that humidity has developed inside the shelters.

A status report as of 9 October 2000 is presented for the operations in Alexandria and in the Delta in Appendix G.4.1.b. A major shortage at the sites operated by IGSR is due to the fact the corrections and zero line adjustments cannot be undertaken in the System Manager. Calibration results have thus not been taken

into account in the data so far, which means that the database transferred to EEAA has never been correct. Performing corrections at the Excel sheets before presenting the data in reports (monthly, quarterly, annual) will lead to differences in the databases at the Monitoring institution and at EEAA. These problems were discussed specifically, and the changes that were made in the data transfer routines should solve these problems.

A summary of air quality network operations is presented in Appendix G.4.1.c. Procedures to assure that spare parts and consumables were made available to the station operators were a main issue in the first meetings.

8.3 Activity G.4.2 Service and repair

The capacity for undertaking simple repairs to avoid instrument "failures" in the programme was improved as part of on-the-job training performed at CEHM during Mission 18. Spare parts were identified as a problem, as long as the instrument supplier was not able to support some of the parts.

Procedures for maintenance and repair was discussed again during Mission 19 and summarised in Appendix G.4.1.c. Further proposals for procedures to be undertaken to solve problems related to condensation problems, calibrations as well as "hanging zero" and span concentrations are presented in Appendix G.4.2.a.

It has been decided that monitors and samplers will be taken to the laboratory for repair when ever necessary. In some cases simple repairs will be undertaken at the station. A list of repairs that have been undertaken at CEHM is presented in Appendix G.4.2.b. The list was available only for the month of May 2000. We have requested a complete list for future reporting as part of the QA/QC procedures.

8.4 Activity G.5.1 Data retrieval and data evaluation

Data, which are being transferred on a daily basis, are corrected every day and updated on a weekly basis. At CEHM it was demonstrated that these procedures were followed and worked satisfactory. At IGSR, however, the follow up of these procedures from the QA responsible was still not completely fulfilled, and some improvements were initiated during Mission 19.

A part of the training and institutional support the monitoring institutions have been trained to evaluate the relevance of the collected concentration levels. A final training session will be undertaken in the 2001 Mission.

8.5 Activity G.6.1 Sample selection and preparation

Analyses of lead on high volume filters will be performed for a selected number of filters. Several filters were identified from the first half year 1999. A new selection of filters to be analysed for lead was undertaken during Mission 18. In Appendix G.6.1 a third selection of PM_{10} and TSP filters is presented. The criteria for selection of filters were based upon periods when the suspended dust concentrations were higher than average. According to the discussions based upon

the results of evaluations presented in Appendix F.4.1.b, it is believed that the analyses performed at CEHM are of good quality.

8.6 Activity G.6.2 VOC sampling

The VOC sampling programme has been delayed due to personnel problems at the laboratory at CEHM. Also the instruments were not properly prepared and several letters and mails have been sent to update the necessary equipment (See Appendix G.6.2). It is anticipated that the necessary installations, training and start up of VOC sampling will take place during the Spring 2001.

8.7 Activity G.6.3 Passive sampling

Measurements of SO_2 and NO_2 using passive samplers have become part of the routine operated sampling programme. These measurements are now being performed at a number of sites. Results from the passive sampling programme have also been reported in the Quarterly Reports. A complete passive sampling programme is shown in Appendix G.6.3.a.

During Mission 19 a comprehensive sampling programme was planned and performed in Cairo using passive samplers. SO_2 and NO_2 concentrations were collected at 45 different sites. At 3 sites samplers were operated in parallel to check the analyses performed at CEHM. A total of 70 small samplers were placed for integrated measurements over a period of 2 weeks. The total sampling programme is presented in Appendix G.6.3.b. To co-ordinate the sampling sites and enable the use of both EIMP and CAIP sites a letter was prepared for the CAIP field office (Appendix G.6.3.c).

A preliminary analyses of the data indicate that the two week average concentrations of SO_2 ranged from 30 to 150 $\mu g/m^3$ in Cairo, while the NO_2 concentrations ranged from 35 to 130 $\mu g/m^3$. The two weeks when sampling was performed was not specifically polluted compared to Cairo standards. A report about the passive sampling will be prepared during the next Mission to Cairo.

8.8 Activity G.7.1 Monthly and Quarterly reports

Monthly reports were still produced before the quarterly reports and the final data quality controls had been performed. Normally the data should only be fully trusted after the evaluation of the Quarterly reports, when the Monitoring Institutions have been evaluated the data through the QA/QC systems.

However, monthly data reports were produced also during Mission 19 based on preliminary data from the Monitoring Institutions. It may be possible to improve these procedures, when the databases and the data flow in the total system has been finalised.

9 H. Reference Laboratory

9.1 Activity H.3.1 Check field monitors

The Reference Laboratory Air has the responsibility in checking and calibrating all field equipment used by the Monitoring Institutions. During the discussions at IGSR and CEHM it was mentioned that in some cases it take too much time from the monitors are collected till they are returned to be set into filed operations again. This has lead to loss of data.

The problem was investigated, and some of the problems had been related to problems with the calibrator units at NIS. Improved communications may solve some of these problems.

9.2 Activity H. 3.2 Audit programme

Audit programmes are now being performed on a routine bases, and a schedule for these Audits have been made available to the Monitoring Institutions. It is important in the future that the site visits from the Reference Laboratories are communicated with the field operators to avoid visits to sites where instruments are down due to malfunctions or major errors at e.g. air conditioning units.

The Reference Laboratory at Ain Shams University has also performed some simple proficiency tests. Synthetic samples on filters of lead and SO_2 were given to the chemical laboratory at CEHM. The results have been reported in two reports issued by the Reference Laboratory, and a summary of the evaluation is presented in Appendix H.3.1.

10 I. Component Co-ordination

Sub-component administration includes co-ordination with internal/external activities, ad-hoc working group meetings, preparation of annual action plans, annual reports and service of the EIMP project management to facilitate interface checks.

Follow up at EEAA has been based on daily contact with the counterpart. Institutional support has been given through the on-the-job training programme. The Monitoring Institutions were followed up through weekly meetings.

10.1 Activity I.2.1 Follow up and administration

A number of meetings were held during Mission 19. Examples of Minutes from the weekly meetings at CEHM and at IGSR are presented I.2.1 and I.2.2. Several malfunctions as well as operational weaknesses were detected during detailed discussions of the field operations, data retrieval and data controls. The problems identified in these weekly meeting were in some cases summarised into an action plan. The matters discussed in one of the meetings at CEHM on 23 October are summarised in Appendix I.2.3.

Weekly EIMP staff meetings normally identifies the status of the development of the different Components. An example of the Minutes from a staff meeting on 25 November 2000 is shown in Appendix I.2.4.

Several topics were discussed in meetings with the EEAA officials. The air pollution episodes, which were first identified and described in October 1999, was the topic for a meeting with Dr A Gamal, Dr M Nasrallah and Dr Hersham ElAraby. A memo prepared by Dr ElAraby is presented in Appendix I.2.5. The main topic was concerning the "black clouds" reported over Cairo in some episodes. The development of these clouds has been video taped, and shows a slow development of smoke forming from the north into Cairo. The question has also been raised concerning the relative importance of the rise straw burning in the Delta.

Another hot topic during Mission 19 was the possible future of a sustainable air quality monitoring programme for Cairo. A Memo was prepared indicating a possible content of such a programme, based upon the experience and measurements available in both the EIMP programme and the CAIP sampling programme for particles. The memo presented in Appendix I.2.6. was discussed in a meeting on 26 October 2000. The final outcome of these discussions was not clear at the end of Mission 19.

The EIMP ozone measurements performed at RasMOhamed has proven to be one of the most representative sites for background tropospheric ozone data in the region. It has been proposed that these data should be part of the global tropospheric ozone network. A memo was prepared to Dr Ahmed Gamal at EEAA on 28 October 2000, as shown in Appendix I.2.7.

Air quality data have been presented in various forms and for various purposes during Mission 19. Two Newsletters on tropospheric ozone concentrations have been prepared;

- Ozone levels in Egypt,
- Urban ozone in Egypt.

The Newsletters are presented in Appendix I.2.8.

One more abstracts for a paper on air quality in Egypt was prepared, and the content of a web page on air quality was updated. A list of reports available from the EIMP Air Pollution Monitoring component is presented in Chapter 11, References.

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Sivertsen, B. and Dreiem, R. (2000) DANIDA. Environmental Information and Monitoring Programme (EIMP). Air quality monitoring component. Mission 18 report. Kjeller (NILU OR 38/2000).

Appendix A

Institutional support

A.1 People we met and colleagues
A.2 Memo - Comments at departure, Mission 19, 28 October 2000

A.1

EIMP

People we met and colleagues (Spring 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) Dina, Lydia, Hassan, Mahmoud, Emad, Ahmed AlSeoud (EEAA. *tel: 0123102068, 5721289)*
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. Mohamed el Zarka (EIMP counterpart)
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.)
NIOF: Dr.El Betagy
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
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)

Leif Marsteen /Rolf Dreiem: 10 street 86, apt. 10, Maadi, Cairo, tel 351 3226, Magde 351 1359, Maadi contact: Espen Alstad

A.2

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: JFS, AAE, MF
From: Bjarne Sivertsen
Date: 28 October 2000

Comments at departure, Mission 19, 28 October 2000

The EIMP air pollution monitoring programme has been a long process of repeated training of several counterparts and continuous on-the job training at all levels. To keep the programme running it will be important that the people that have received this training will stay with the future EEAA air quality monitoring programme.

From the meetings I had with the monitoring institutions this month, it has become clearer to me than ever that the backbone of obtaining good quality air pollution data is linked to sustainability. As stated in my memo on " A sustainable air quality measurement programme for Cairo", the main challenges are to ensure that the experts will stay and that fast and flexible procedures are established for obtaining equipment and resources necessary to operate the measurements.

Several tasks will have to be followed up in the future:

1. Orders have to be placed from CEHM and effectuated by EEAA for consumables and spare parts such as: Pumps for high volume samplers, various consumables from NILU Products, Spareparts from CTS etc.
2. The updated list of consumables and spareparts available at the monirtoring institutions has to be updated and presented to EIMP/EEAA as soon as possible.
3. Filter holders for Airmetrics samplers have to distributed as soon as possible. (IGSR is waiting for extra supply to adequately undertake measurements every week).
4. A new list (request for quotation) of equipment needed for the sampling programme has been sent from CEHM to NILU Products on 24 OCT by mail. A copy will be given to Haytham who will follow up the ordering.
5. Salaries for the field operators at IGSR have to be provided before these people are leaving the programme.
6. The equipment remaining for performing **VOC measurements and analyses**, as well as training and installation is still lacking a few parts. Haytham has to follow up the matter, and give information to NILU as soon as everything is available.

7. The "catalogue" of sites including **complete site reports** has to be finalised. The report will include UTM references, maps and photos. (HAA).
8. Results from analyses performed at CEHM, of passive samplers from the passive sampling programme as of October 2000, has to be forwarded to NILU. (Heba/Haytham)
9. The layout for an **annual report from EEAA** was prepared and discussed with Heba for the 1999 report. Further refining of this report was scheduled for this Mission, but time did not allow this work. We will have to return to these tasks. I have brought the last year report back to NILU for evaluation. (Heba)
10. Analyses of sequential sampling data and AIRmetrics analyses at CEHM laboratories should be followed up. Filters are taken to NILU for control. Ove Hermannsen will also be instructed to check the routines, when ever he will arrive in Cairo.
11. Check the quality of **lead analyses** from CEHM. Obtain the proficiency test report and evaluate the quality of the data reported as part of the EIMP programme. Also check that the list of new selected filters for analyses are followed up. (Heba/Haytham)
12. Data for ammonium collected with the **NH3 instrument at Air Defence institute** at AbuQuir (Alex) should be reported by IGSR. IGSR experts should also have access to using the instruments during passive sampling campaigns.
13. The **database** programme still has to be **fully tested** at EEAA/EIMP. Check wind roses and Breuer diagrams. (Heba).
14. To follow-up the development including data quality, passive sampling analyses and evaluations, mission reporting and annual reporting the Team Leader will need to have access for the use of **more hours at "home office"** at NILU.
15. Additional training and expatriate input to the EEAA personnel will be needed in the near future.
16. Audits from instrument and monitoring experts to the stations should be considered, in addition to detailed training for maintenance and repair people at CEHM. One operator should participate in this training from IGSR?

Four experts have been appointed by CEHM to undertake repair and maintenance. The names of persons responsible for repair and maintenance are:

- 1- Yassin Fathy
- 2- Mohamed Farouk
- 3- Maher Hafez
- 4- Bassem (will be hired during November)

The PM_{10} monitor repaired for Assyut will be held back at CEHM as backup for PM_{10} monitors in Cairo until the new PM10 monitors are released from CTS at the end of November?

The priority for these monitors will be to replace monitors that does not work properly. PM_{10} instruments that are operating should NOT be moved to other sites.

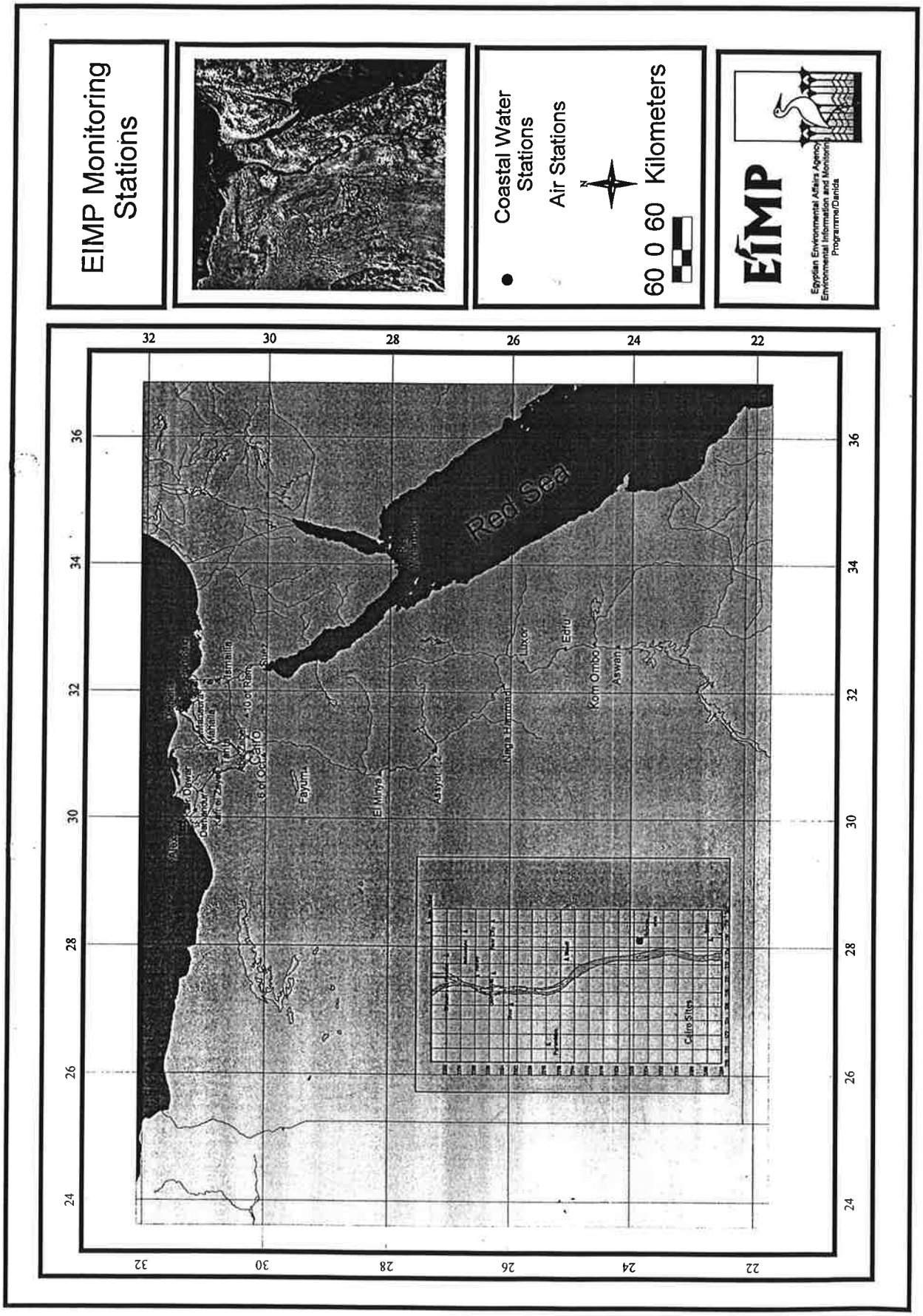
Appendix B

Design

B.3 Map - EIMP Monitoring Stations

B.3.1 The Monitoring and Sampling Sites Operated under EIMP Network

B.3


EIMP Monitoring Stations
Coastal Water Stations
Air Stations
60 0 60 Kilometers
EIMP
Egyptian Environmental Affairs Agency
Environmental Information and Monitoring Programme/Damica
Red Sea
Cairo
Alexandria
Suez
Ismailia
Port Said
Fayum
El Minya
Assyut
Nag Hammadi
Luxor
Edfu
Kom Ombo
Aswan
Cairo Sites
32
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B.3.1

The Monitoring and Sampling Sites Operated under EIMP Network

ID	Station Name	Area Type	Parameters														Starting Date
			Monitors						Samplers								
			SO_2	NO_x	PM_{10}	O_3	CO	Met	SO_2	BS	NO_x	PM_{10}	VOC	TSP	DF	PS	
1	El-Kolaly	Urban Center	1	1	1*									1**			24-May-98
2	El-Gomhoryia	Street Canyon	1	1			1					1					25-Dec-97
3	Abbassyia	Urb. /Res.	1		1	1		1								1	22-May-99
4	Nasr City	Residential							1	1	1	1					08-Oct-98
5	El-Maadi	Residential	1	1								1++					10-Dec-98
6	Tabbin	Industrial	1	1	1			1						1			27-Oct-97
7	Tabbin South	Industrial							1	1				1--	1		19-Oct-98
8	Fum El-Khalig	Road side/Urb.	1	1	1		1										07-Nov-98
9	Abu Zabel	Ind./Res.										1			1	1	16-Nov-98
10	Shoubra El K	Industrial	1					1-			1****	1		1			01-May-98
11	Cairo University	Residential	1	1		1+		1									18-Jul-98
12	Giza Pyramides	Monumental														2	1-Jul-2000
13	6 October	Res./Ind.							1	1	1	1					12-Jan-99
14	10 Ramadan	Residential							1	1		1			1		15-Dec-98
15	Suez	Urban	1	1										1	1		03-Feb-99
16	Port Said	Residential										1				2	10-May-99
17	Ismailia	Urb./Res.										1				2	04-Feb-99
18	El Fayum	Urban										1			1	2	03-Feb-99
19	El-Minya	Res./Ind.										1			1	2	09-Jul-99
20	Assyut1	Res./Urb.													1	2	08-Jul-99
21	Assyut2	Res./Urb.															
22	Nag Hammadi	Ind./Res.										1			1	2	07-Jul-99
23	Luxor	Urb./Res.							1	1					1		08-Jun-99
24	Edfu	Ind./Res.										1			1	2	06-Jul-99
25	KomOmbo	Industrial							1	1		1			1		09-Jul-99
26	Aswan	Urb./Res.	1			1		1"							1	1	23-Jun-99
27	Ras Mohamed	Background				1						1			1	2	13-Mar-99
28	Abu keir	Industrial									1	1				2	22-M-20
42	El Shouhada	Traffic	1	1								1					
29	El-Max	Industrial							1	1	1	1			1		15-Nov-98
30	IGSR		1	1	1		1										15-Nov-98
31	El Asafra								1	1		1			1	1	15-Nov-98
32	Gheat El-Inab								1	1	1	1			1	1	15-Nov-98
33	IGSR. Regional					1		1									15-Nov-98
41	El -Nahda											1			1		20-Feb-2000
34	Damanhur											1				2	15-Feb-99
35	Kafr El-Zayat		1	1	1							1			1		
36	Tanta								1	1		1				1	15-Jun-99
37	El-Mahalla		1		1												17-Jun-99
38	El Mansura		1	1				1									15-Apr-99
39	Damiatta								1	1		1			1		15-May-99
40	Kafr El Dawar								1	1		1				1	15-Mar-99

Appendix C

Procurement

C.1 Procurement

C.1

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

Procurement

Between Mission 18 and Mission 19, several items were reported as part of the procurement process:

- 27 stabilisers have been delivered to CEHM to be installed in the Air network
- NH_3 detector has been delivered to IGSR
- Helmet for the motorbike has been handed over to IGSR
- Accessories for PM_{10} Airmetrics samplers have been delivered to IGSR to start installing the sampler in El Shouhada station
- Flow Calibrator has been delivered to NIS to be used in the calibration of samplers.
- Charcoal and purafil have been delivered to CEHM to be used in the stations.
- Safety boxes for monitors are being prepared to be used in transportation.
- One set of rechargeable batteries have been delivered to IGSR
- 2 PM_{10} Airmetrics units have been delivered to CEHM to be installed in Fayum and Abu Zabel.
- 1 PM_{10} Airmetrics unit has been delivered to CEHM to be installed in Gomhoryia station
- Spare parts for NILU sequential samplers have been delivered to CEHM. 2 PM_{10} monitors have been ordered during the month

New procedures during procurement of spare parts and consumables

The report "Status of the Monitoring Programme operated by IGSR" based on meetings in Alexandria 8-9 October 2000, was the background for the conclusions drawn from a meeting at EEAA on 11 October 2000. After discussions at EIMP it was decided that procedures for obtaining and installing spare parts and consumables has to be specified in writing.

Spareparts and Consumables

1. CEHM has to assure that consumables, such as charcoal, purafil, filters etc. are kept in stock at any time, and ahead of urgent needs.

2. Copies of orders from CEHM for supplying the stock have to be sent to EEAA.

3. Requests from IGSR to CEHM have to be documented and made traceable. Copies therefore have to be sent to EEAA.

4. Deliveries of consumables from CEHM to IGSR have to be effected no later than within two weeks after the request is received from IGSR.

5. Updated lists of consumables and spare parts in stock at CEHM should be presented to EEAA every month.

The measurement operations as well as maintenance, repair, spareparts and consumables will be followed up by an assigned expert at EEAA.

Appendix D

Data management

D.3 Database development

D.3.1 The first presentations of Breuer Diagrammes

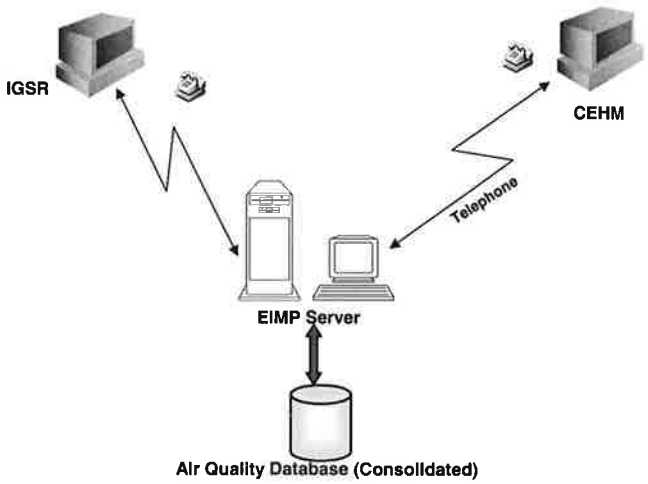
D.3

Database development

Indicated data flow

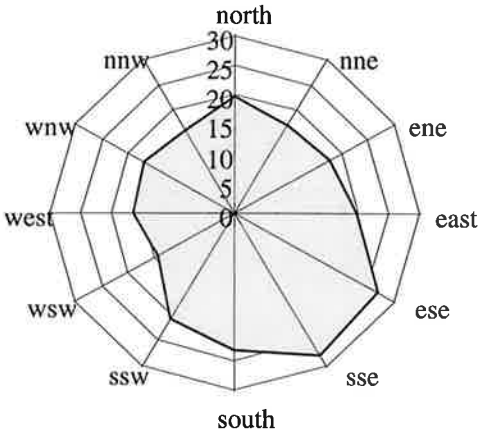
Topics

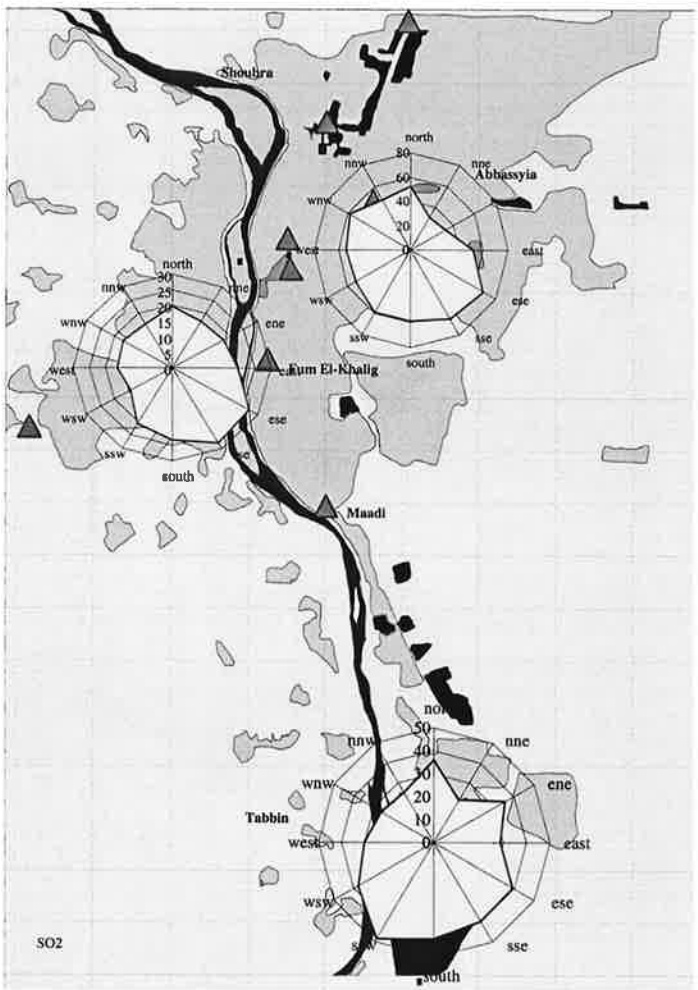
- Link to monitoring system
- Database development
- Data transfer
- Data "cleaning"
- Statistical programs
- Reporting of data
- Discussions



D.3.1.

The first presentations of Breuer Diagrammes





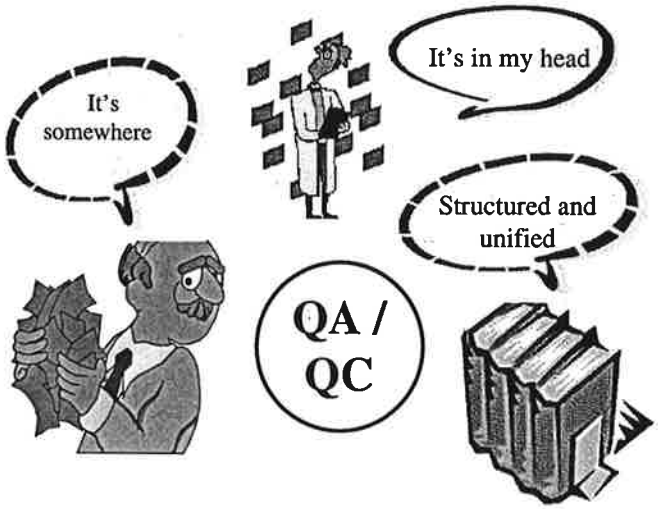
Appendix E

Training

E.2.2 QA/QC Standard Operational Procedures

E.2.2

QA/QC Standard Operational Procedures



Preface

This document is based on work done during several missions to Egypt in the period of June 1997 to May 2000 for the EIMP project. The EIMP project is funded by Danida and headed by COWI.

The document covers the following tasks referring to the work programme activities:

F: QA/QC
Develop and implement a complete QA/QC system for the operational level of the Air Quality component of the EIMP programme.

This documentation explains in detail how to perform and document all operations necessary to run, maintain and calibrate the instrumentation both in the laboratory and in the field. The procedures are supposed to be used by the operators in their daily work. This documentation shall not be stored far from the instrumentation.

The documentation is split into three manuals called:

- The Operational Level Documentation Part I – System Description
- The Operational Level Documentation Part II – Laboratory Operations
- The Operational Level Documentation Part III – Field Operations

To get a quick overview of the Operational Level Documentation you should start by reading the Introduction in Part I.

Standard Operations Procedures Manual

CONTENTS

Routine maintenance on a NILU model FK NO_2 sampler
Routine maintenance on a NILU model SF1 Dustfall sampler
Routine maintenance on an IVL model Passive sampler
Installing a reference standard gas cylinder
Installing a Travelling or working standard gas cylinder
Installing an EMC Station Manager data logger hardware
Installing an EMC Station Manager data logger software

Appendix F

QA/QC

F.4.1 Memo - Requirements for quality of laboratory measurements in the EIMP monitoring programme

F.4.1 Evaluation of CEHM in P.T 12: Pb on Filter: - June 2000

F.4.1

EIMP

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

E-mail: eimp@intouch.com

Memo	REFERENCE LABORATORY
Title	Requirements for quality of laboratory measurements in the EIMP monitoring programme
Version	**001**
Date	21 Nov. 2000
To	Reference laboratories, monitoring institutions, counterparts, task managers
Copy	AAE, JFS, MF
From	UOL

The tables below give the requirement for data quality, which all institutions working under EIMP contracts must at least be able to achieve. The requirements are valid until 30 June 2002. The requirements will be re-evaluated at this date. In particular preliminary requirements will be changed to a higher quality.

The tables also give a concentration range within which the concentrations in the monitoring programme will fall in most cases. The required data quality must be achievable for all concentrations in this range.

Air, filters from high-volume or sequential and passive samplers		
Parameter	Maximum uncertainty*	Minimum required range
Pb	± 10% of value or ± 1 µg/filter	1 – 30 µg/filter
	± 10% of value or ± 0.2 µg/m^3	0.5 – 5 µg/m^3
SO_2	± 10% of value or ± 2 µg/filter	2 – 200 µg/filter
	± 10% of value or ± 3 µg/m^3	4 – 300 µg/m^3
NO_2	± 10% of value or ± 3 µg/filter	10 – 200 µg/filter
	± 10% of value or ± 3 µg/m^3	20 – 200 µg/m^3

The maximum uncertainty is the uncertainty that can be tolerated in all measured values in the monitoring programme. The uncertainty shall be understood as a 95% confidence interval for the measured value.

When evaluating proficiency test results the maximum uncertainty is interpreted as the range around the assigned value, which covers all acceptable results. Laboratories must take measures to avoid recurrence for any result outside this range.

F.4.1.

Evaluation of CEHM in P.T 12: Pb on Filter: - June 2000,

Prepared by EIMP Reference Laboratory Counterpart, CH. Mai E. Ahmed

The requirements for the quality of results for P.T. 12 in Synthetic Samples of Pb filters according to range of standard deviation of assigned value: -	
Parameter	**Max. Deviation from the assigned valve**
Pb	**+, - 10% assign value or +, - 0.2 $\mu g/m^3$ = +,- 1.44 μg/ Filter**

Parameter	**Pb μg/ Filter**	
Sample Type	**Accepted deviation limits**	**Participant result**
Sample A	6.5 – 3.5	**8.78**
Sample B	11 - 9	**13.97**
Sample C	22 - 18	19.15
Sample D	27.5 – 22.5	23.95
Sample E	33 - 27	29.36

Bold: Participant results outside the acceptable range

Batch No.		**Results**	**Recovery (Accuracy)**
A	Average X	8.78	175 .6 % - Unaccepted
B	Average X	13.97	139 .7 % - Unaccepted
C	Average X	19.15	95.75 %
D	Average X	23.95	95.8 %
E	**Average X**	29.36	97.8 %

Pb Lowest recovery	175.6 %
Pb Highest recovery	97.8 %

This Proficiency test was covered the concentration range from 0.69 - 4.2 $\mu g/m^3$

The accuracy for the samples in the low concentrations are not satisfy that the recovery ranged from 175.6- 139.7 % that means there are systematic error may from many reasons as biased calibration or biased blank.

Appendix G

G Monitoring

G.3.1 Visit to Kafr Zayat and ElMahalla - Memo October 2000
G.4.1 Input to: Maintenance and repair
G.4.1 Air Pollution Monitoring, May 2000
G.4.1 Air Pollution Monitoring, June 2000
G.4.1 Air Pollution Monitoring, July 2000
G.4.1 Air Pollution Monitoring, August 2000
G.4.1 Air Pollution Monitoring, Sep 2000
G.4.1 b) Status of the Monitoring Programme operated by IGSR - Meeting 8-9 October 2000
G.4.1 c) Air Quality Network Operations - Memo 11 October 2000
G.4.2 a) Monitoring Operations, problems to be solved - Memo 14 October 2000
G.4.2 b) Repair Report Based on Information from CEHM (1 May - 31 May)
G.4.4.1 Operational problems
G.6.1 Sampling Programme
Filters to be selected for lead analyses
G.6.2 Checking preparations for Ove's mission - memo 28 Sep. from Haytham Ahmed
G.6.3.a EIMP Passive sampling programme Oct 1999
G.6.3.b Passive sampling programme Cairo Oct 2000
G.6.3.c Passive Samplers of EIMP for NO_2 and SO_2 - Correspondance CAIP and EIMP

G.3.1

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: IGSR
Copy, to: Jorgen Simonsen (JFS), Mohamed Fathy (MF), Ahmed AbElScoud, Haytham, Ahmed (HAA), Heba Fathy (HF)
From Bjarne Sivertsen
Date: 16 October 2000

Visit to Kafr Zayat and El Mahalla

Site visits were paid to Kafr Zayat and to ElMahalla to evaluate the representativity of the sites and to identify possible new locations.

Kafr Zayat (Site Location: E: 30 deg 49,15 min; N 30 deg 49,35 min)

The site is located at the roof of a school about 12 m above the surface. The site is representative for the general air pollution over the city centre of Kafr Zayat. The main part of the brick factories emitting particles, black soot and SO_2 are located west and west-south-west of the site. The prevailing wind directions are from north-west. Still we have seen occasions with very high impact of PM_{10} and SO_2 at the site, due to emissions from the industries.

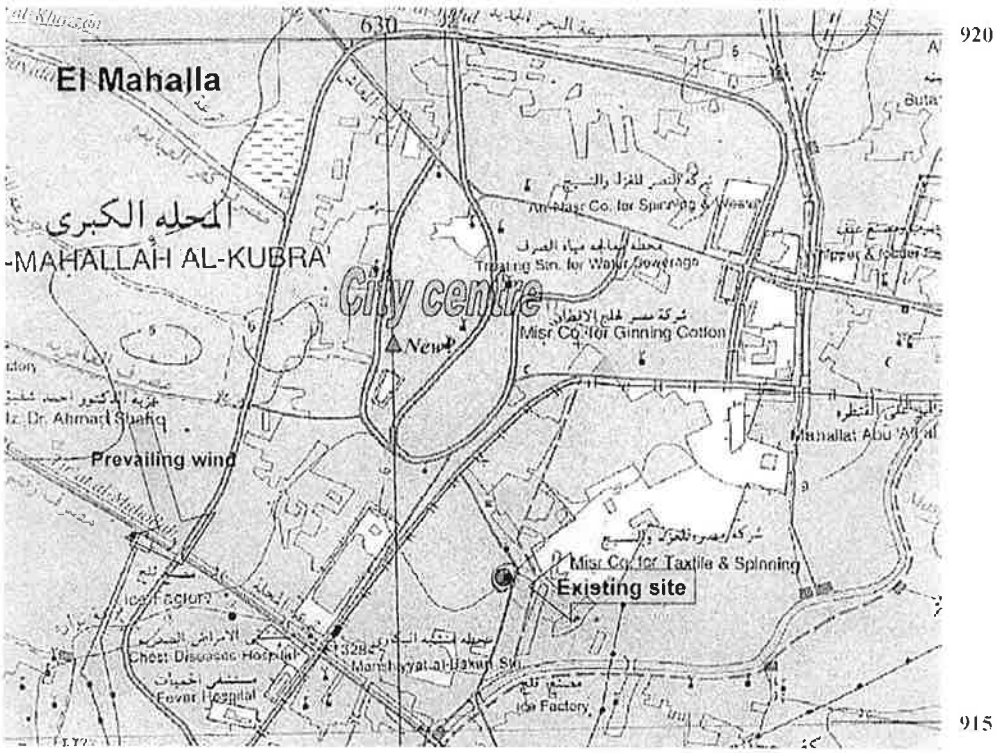
The Kafr Zayat site will be kept at this location as it represents both the general impact in the city as well as catch the impact from industries when the wind is blowing from the industrial areas.

We also identified another site for passive sampling and for a possible future sequential sampler for SO_2 and Black Smoke. This site is located at the Religious Institute for Girls in the village of Kafr An-Nasriyyah. (Location: 30 deg 49,4 min East, 30 deg 47,9 deg N).

E1 Mahallah (Site Location: E:31deg 10,0 min ; N 30 deg 57,3 min)

The existing monitoring site in ElMahallah is located between the textile factories and one of the major residential areas of Maliallah. It is located south-west of the industrial emissions, while the prevailing wind is from north and north-west. (see map).

We tried to find a new location further east, but the roads turn southwards, and the present site would be more representative for both urban impact and industrial impact.



The El Mahalla Air Qualify monitoring site

Another option would be to leave out the industrial impact and move the site into the urban city centre, where the traffic is higher, the streets more well organised and the main business and offices are located. One possibility for such a new location could be near the Library or the Government building.

We propose that passive sampling will have to be undertaken on a weekly basis for a short period at this site (at the Library balcony). The results from the passive sampling programme will be compared with monitoring data from the existing station, and a final decision concerning moving the station will be based upon these results. Another future option could be to add a simple sequential sampler at the Library.

G.4.1

Input to:
Maintenance and repair

After reporting a reduction in SO2 concentrations in some of the monitors, Rolf and Laif were requested to comment on this matter.

Leif had seen sand in the intake tubes and in the filterholder. IGSR was requested by Rolf to try the procedures presented below:

Original Message From: RolfDreiem [SMTP:rolf.dreiem@nilu.no] Sent: 6. oktober 2000 14:36

To: 'yfathy@usa.net' Cc: 'lm@nilu.no'
Subject: RE: Presample Teflon Filter

Hello Yasin.

It was nice to hear from you. I hope the network in Egypt is running well without to many problems. You say you are using Teflon filter 0.5 um pore size. If you look on page 9-10 in SO_2 Instruction Manual it says 5-10 um pore size.

At NILU we are using 5 um Teflon filter. Many things can happen if the pore size is too small.

- Not all air is going through the filter.
- Air coming from other places does not have the same SO2 concentration.
- Airflow is going down.

You can try the following steps:
1. Control airflow on monitor. Do it with and without filter.
2. Measure airflow without filter (on inlet tube).
3. Measure airflow with filter (on inlet tube).
4. Ensure that the filter really is Teflon. Other filters (paper) absorbs SO_2.

This should give answers to your problem I hope. Regards Rolf

Original Message From: yfathy@usa.net [SMTP:yfathy@usa.net] Sent: 4. oktober 2000
15:20 To: lm@nilu.no Cc: RD@nilu.no

Subject: Pre sample Teflon Filter
Hello Dear Mr. Leif Marsteen
How are You, First, I would like to Thank you Very much For the S.O.p for PM_{10} You send it to me, I would like to about the Teflon Filters 0.5 Um Type LS which we are using before sample intake in the Gas monitors because the new batch filter seams to be reducing the SO_2 Readings too Much (eg. in AL-GOMHORYA ST., the reading without the filter about 45 ppb and with the filter about 6 ppb). I understand that it reduce it by small amount that is why we are using it in both Zero and Span also, but by this value it seams that there something Wrong, may the Type, I don't know, please give me an Advise. Yours Sincerely Yasin.

G.4.1

EIMP

Air Pollution Monitoring, May 2000

Procurement

- 27 stabilisers have been delivered to CEHM to be installed in the Air network
- NH_3 detector has been delivered to IGSR
- Helmet for the motorbike has been handed over to IGSR
- Accessories for PM_{10} Airmetrics samplers have been delivered to IGSR to start installing the sampler in El Shouhada station.

Data Management

Generally the data management undertaken by the Monitoring Laboratories is in good routine and according to arrangements with EIMP.

Reporting

- Daily Reports on the air quality in Greater Cairo area during May were prepared.
- Monthly report on the Air Quality of Egypt during April has been prepared.
- Draft Annual Reports have been submitted by CEHM and IGSR.

Monitoring

Abbassyia, Nasr City, Maadi, Tabbin south, Fum El Khalig Abu Zabel, Giza, 6 October, 10 Ramadan, Port Said, Ismailia, EI Fayum, EI Minya, Assyut2, Nag Hammadi, Luxor, Edfu, KomOmbo, Aswan, RasMohammed, EI Max, IGSR, Alasafra, Gheat EI Inab, Alexandria regional, Damanhur, Tanta, Kqfr Dawar & Damietta were working properly.

Kolaly

Problems have been observed in PM_{10} monitor and repaired and now working properly. The new A/C split unit has been repaired and now working properly.

EI Gemhoryia

PM_{10} monitor belongs to Tabbin station has been repaired and installed in the station and now working properly.

Tabbin

The renovation of the station has been finished during May. A new split unit has been installed in the station to work parallel with the old one. Minor problems for PM_{10} monitor has been observed and repaired.

Shoubra

All the equipment of the station was re-installed and working properly (except NO_2 sampler). A new stabiliser was installed in the station.

Suez

Problems in the telephone line appeared and solved and now working properly.

Assyut 1

The stabilisers needed for the working of the station have been handed over to CEHM to be installed in the station.

Abu Keir

NH_3 detector has been delivered to IGSR to be handed over.

El Shouhada square

The station was installed during May and working properly.

Kafr El Zayat

The SO_2 monitor has been repaired and will be installed in the station. Filter Reel assembly has been delivered to IGSR to be installed in the station.

Mahalla

The SO_2 monitor has been repaired and will be installed in the station. PM_{10} monitor is still in repair.

G.4.1

EIMP

Air Pollution Monitoring, June 2000

Procurement

- Flow Calibrator has been delivered to NIS to be used in the calibration of samplers.
- Charcoal and purafil have been delivered to CEHM to be used in the stations.
- Safety boxes for monitors are being prepared to be used in transportation.
- One set of rechargeable batteries have been delivered to IGSR

Data Management

Generally the data management undertaken by the Monitoring Laboratories is in good routine and according to arrangements with EIMP.

Reporting

- Daily Reports on the air quality in Greater Cairo area during June were prepared.
- Monthly report on the Air Quality of Egypt during May has been prepared
- Draft report for the 1st quarter 2000 has been prepared on the Air Quality in Alex. and Delta by IGSR
- Final annual report has been submitted by IGSR for the year 1999.

Monitoring

Kolaly, Nasr City, Maadi, Tabbin south, Abu Zabel, Giza, 6 October, Port Said, Ismailia, El Fayum, El 'Minya, Assyut2, Nag Hammadi, Luxor, Edfu, KomOmbo, Aswan, RasMohammed, El Max, Alasafra , Abu Keir, Gheat El Inab, Alexandria regional, Damanhur, Tanta & Kafr Dawar were working properly.

E1 Gemhoryia

PM_{10} monitor returned to CTS for checking and repaired during the month. 102S calibrator of CO transferred to CEHM for repair. High temperature observed inside the room of the station, the A/C company was informed for repair.

Abbassyia

Automatic daily calibration not performed. CEHM is taking actions for repair

Tabbin

Telephone line is not working in the station.

Fum Al-Khalig

The A/C unit need to be repaired. The A/C company was informed for repair

Shoubra
NO_2 sampler still in repair. Problems with the Met. tower have been observed.

10 Ramadan

The station has been renovated during the month.

Suez

Problems with the 145 calibrator have been observed.

Assyut1

Problems with the telephone line have been observed. NO_x monitor is at CEHM for repair.

EI Shouhada square

The PM_{10} Airmetrics sampler has been installed in the station. Polling of data is working properly. NO_2 monitor has been sent to CEHM for repair.

EI Max

A flow rate value of -45 % was recorded for NO_2 device, this value is reported in the calibration certificate and will be checked.

IGSR

The NO_x monitor has been transferred to CEHM for repair. Telephone still not working in the station. All the other equipment is working properly.

Kafr El Zayat

The SO_2 monitor has been repaired and will be installed in the station. Filter Reel assembly has been delivered to IGSR to be installed in the station

Mahalla

The SO_2 monitor has been repaired and will be installed in the station. PM_{10} has been repaired and waiting for filter reel assembly.

EI Mansura

NRAD readings are suffering from a software problem. A power failure occurred in the station from 8 to 12 June 2000.

Domyat

A flow rate value of -18 % was recorded for SO_2 sampler, this value is reported in the calibration certificate.

Database

3 main problems were reported from the monitoring institutions:
- Very Slow
- Time out error if you take more than 30 days
- Reference data should be corrected.

G.4.1

EIMP

Air Pollution Monitoring, July 2000

Procurement

- 2 PM_{10} Airmetrics units have been delivered to CEHM to be installed in Fayum and Abu Zabel.

Data Management

Generally the data management undertaken by the Monitoring Laboratories is in good routine and according to arrangements with EIMP.

Reporting

- Daily Reports on the air quality in Greater Cairo area during July were prepared.
- Final report for the 1st quarter 2000 has been prepared on the Air Quality in Alex. and Delta by IGSR.
- Final annual report has been submitted by CEHM for the year 1999.

Monitoring

Nasr City, Maadi, Tabbin south, Abu Zabel, Giza, 6 October, Port Said, Ismailia, El Minya, Assyut2, Nag Hammadi, Luxor, Edfu, KomOmbo, Aswan, RasMohammed, El Max, Alasafra, Abu Keir, Gheat El Inab, Alexandria regional, Damanhur & Tanta were working properly.

Kolaly

Problems with the A/C units have been reported, CEHM is taking action for repair.

El Gemhoryia

A/C unit has been repaired during the month. PM_{10} monitor is working but the data is being investigated.

Abbassyia

SO_2 monitor has been sent to CEHM for repair. Automatic daily calibration has been repaired.

Tabbin

Telephone line is working in the station.

Fum Al-Khalig

One of the A/C units is not working. The A/C company was informed for repair.

Shoubra
The Met. tower has been repaired. Spare parts for NO_2 sequential sampler have been ordered.

Giza Pyramid

Passive sampling has been started in Giza and Sakkara.

Suez
145 calibrator has been repaired. SO_2 monitor will be transferred to CEHM for checking.

El Fayum

An Iron box for Airmetrics sampler has been installed in the station.

Assyutl

Telephone line still has problems. NO_x monitor is still at CEHM for repair.

El Shouhada square

NO_x monitor gives strange values, this will be further investigated.

IGSR

Problems in the A/C unit have been observed and repaired during the month. The PM_{10} monitor is cutting its filter reel, it will be subjected to further investigation.

E1 Nahda (E1 Amraya)

Problem in the PM_{10} Hi. Vol. sampler has been observed, the sampler has been sent to CEHM for repair.

Kafr El Zayat

NO_x monitor has been sent to CEHM for repair. The station was renovated during the month.

Mahalla

PM_{10} monitor has been repaired and waiting for filter reel assembly.

El Mansura

Small problem in polling of data, this will be checked during the next visit.

Domyat

The station was renovated during July. The equipment are working properly.

Kafr Dawar

Power failure was observed by the operator during the weekly visit. The samplers are working properly.

G.4.1

EIMP

Air Pollution Monitoring, August 2000

Procurement

- PM_{10} Airmetrics unit has been delivered to CEHM to be installed in Gomhoryia station.

Data Management

Generally the data management undertaken by the Monitoring Laboratories is in good routine and according to arrangements with EIMP.

Reporting

- Daily Reports on the air quality in Greater Cairo area during August were prepared.
- Draft report for the 2nd quarter 2000 has been prepared on the Air Quality in Alex and Delta by IGSR.
- Draft report for the 2nd quarter 2000 has been prepared on the Air Quality in Great Cairo and Upper Egypt.

Monitoring

Nasr City, Maadi, Tabbin south, Shoubra, Giza, 6 October, Port Said, Ismailia, El Minya,Assyut2, Nag Hammadi, Luxor, Edfu, KomOmbo, Aswan, RasMohammed, El Max, Alasafra, Abu Keir, Gheat El Inab, Alexandria regional & Tanta were working properly.

Kolaly

Problems in PM_{10} monitor have been reported, CEHM is taking action for repair.

El Gemhoryia

PM_{10} monitor has been moved from the station to Abbassyia station. PM_{10} Airmetrics unit has been installed in the station to evaluate the previous readings taken from the monitor.

Abbassyia

The PM_{10} monitor of Gomhoryia station has been installed in the station. SO_2 and Ozone monitors still in repair waiting for spare parts.

Tabbin

Problems in polling of data have been observed, CEHM is taking action for repair.

Fum Al-Khalig

NO_x monitor has been repaired during the month. A new lock for the shelter has been installed.

Abu Zabel

An iron box installed in the station (for Airmetrics PM_{10} sampler).

Giza Pyramid

Pasive sampling has been started in Giza and Sakkara.

Suez

SO_2 monitor is being inspected (in the station).

El Fayum

Telephone line has been fixed. NO_x monitor is still at CEHM for repair. Modem needs to be repaired.

E1Shouhada square

The station was inspected by CEHM and monitors have been sent to be calibrated.

IGSR

The station was inspected by CEHM and the monitors have been sent for CEHM to be calibrated.

El Nahda (El Amraya)

Problem in the PM10 Hi. Vol. sampler has been observed, the sampler still at CEHM for repair.

Kafr El Zayat

NO_x monitor has been repaired and installed in the station.

Mahalla

PM_{10} monitor has been repaired and waiting for filter reel assembly. The station was inspected by IGSR team to evaluate the low readings recorded in the station.

El Mansura

NO_x monitor has been sent for CEHM to be calibrated.

Domyat

The station was renovated during July. The equipment are working properly.

Kafr Dawar

Electricity is working properly. The samplers are working properly.

Damanhur

We have got approval for installing PM_{10} Airmetrics sampler in the station.

G.4.1

EIMP

Air Pollution Monitoring, Sep 2000

Procurement

Spare parts for NILU sequential samplers have been delivered to CEHM. 2 PM_{10} monitors have been ordered during the month.

Data Management

Generally the data management undertaken by the Monitoring Laboratories is in good routine and according to arrangements with EIMP.

Reporting

Daily Reports on the air quality in Greater Cairo area during September were prepared.

Daily Reports on PM_{10} in Greater Cairo area have been prepared for the early warning system.

Final report for the 2nd quarter 2000 has been prepared on the Air Quality in Great Cairo and Upper Egypt.

Monitoring

Gomhoryia, Nasr City, Maadi, Tabbin, Tabbin south, Fum Al-Khalig, Shoubra, Giza, Giza pyramides, 6 October, 10 of Ramadan, Port Said, Ismailia, El Fayum, El Minya, Assyut2, Nag Hammadi, Luxor, Edfu, KomOmbo, Aswan, RasMohammed, El Max, Alasafra, Abu Keir, Gheat El Inab, IGSR, Alexandria regional, Kafr El Zayat, Kafr Dawar & Tanta were working properly.

Kolaly

The PM_{10} monitor of Assyut station has been installed in the station.

Abbassyia

SO_2 has been repaired and installed in the station. Ozone monitors still in repair waiting for spare parts.

Tabbin

Polling of data has been repaired and working properly.

Abu Zabel

Airmetrics PM_{10} sampler has been installed in the station.

Suez

SO_2 monitor is working properly after inspection.

Assyut1

A new modem has been bought for the station. SO_2 monitor has been delivered for monitor lab for the annual calibration. NO_x monitor is still at CEHM for repair.

El Shouhada square

The data of the station have bad quality and being inspected by IGSR.

El Nahda (El Amraya)

The PM_{10} Hi. Vol. sampler has been repaired.

Mahalla

Filter reel has been installed in the PM_{10} monitor.

El Mansura

NO_x monitor has been calibrated. 145 calibrator has been closed for one week to inspect the reading of the station.

Damanhur

PM_{10} Airmetrics sampler has been installed in the station.

G.4.1 b)

EIMP

Status of the Monitoring Programme operated by IGSR

From the meetings on 8-9 October 2000
Reported by Bjarne Sivertsen

System Manager NOT functioning properly

A major shortage in the monitoring programme operated by IGSR is the fact the corrections and zero line adjustments cannot be undertaken in the System Manager. Calibration results have thus not been taken into account in the data so far, which means that the database transferred to EEAA has never been correct. Performing corrections at the Excel sheets before presenting the data in reports (monthly, quarterly, annual) will lead to differences in the databases at the Monitoring institution and at EEAA.

These malfunctions in the System Manager was first reported in a memo to EEAA on 6 February 2000, and repeated several times, last time in a fax to EEAA dated 13 September 2000.

Apparently neither Mohamed Zaki nor any other system responsible persons have managed to solve this problem even after correspondence with Steve Gersch at EMC. It is of crucial importance to the data handling that these matters are being solved, and a schedule for this work will have to be agreed upon as soon as possible.

No polling of data from IGSR

Due to problems with a modem specification there is still no daily polling of data from the IGSR station and from the Regional background station at IGSR. This polling is an important part of the QA/QC system, and may introduce errors in the data.

The correct modems will have to be installed and tested as soon as possible!

28 Ahu Quir

Sequential NO_2 sampler operates adequately in new shelter. Passive samples of SO_2 and NO_2 are collected weekly. For NO_2 samples are collected at the shelter and at 100 m SW of the shelter, for SO_2 at the shelter.

NH_3 measurements performed by the Air Defence College. Data have not yet been available to IGSR or EIMP. These data will be reported in next Quarterly Report.

29 El Max

Sequential samplers (SO_2 and NO_2) as well as PM_{10} and dust fall are all working properly. The data show relatively high NO_2 and PM_{10} concentrations, surprisingly low SO_2 concentrations.

30 IGSR

There is no daily polling of data from this station due to missing response in the modem selected. We can thus not check the last weeks of data..

The SO_2 monitor is being operated without permeation tubes. These tubes worked only for two months before they were used up. New tubes have been requested.

The permeation tubes for the NO_x monitor worked properly for 1,5 years.

The data presented for August-September seem to be somewhat strange, and will have to be checked. The data (for some periods in August and September) also seem to contain a delay in zero air and span gases of up to 3 hours. In some strange way the calibration gases have influenced the concentration readings at some of the stations??

The operators asked whether it is necessary to perform the daily zero-span checks by permeation tubes. They would prefer to use the travelling standard gases only together with a zero check when purafil and charcoal will be made available.

The NO_x monitor has been sent to NIS for calibration.

The PM_{10} monitor has shown a strange behaviour in August. Yassin changed the instrument constant (by mistake?). The constant is now changed back according to Rolf specifications. The monitor at IGSR was originally at Tabbin and the manuals have not been changed. This may have caused the confusion.

IGSR need one of the "calibration filters" to check levels.

The CO monitor zero line is changing faster than ever, and there are problems in calibrating and adjusting CO concentrations. The CO correlation wheel has expired and a new correlation wheel is needed. This was requested a long time ago. As long as the System Manager cannot correct data, this has lead to a large problem.

33 Alexandria Regional/Background

Meteorological data were reported of good quality. The ozone data looks good and the variation and levels seem now to be relevant. The modem is not working, which means that data are imported to the system manager only once a month.

31 El Azafra

The SO_2 sequential sampler seems to work properly, even if the level is surprisingly low. The reasons for the very low SO_2 concentrations will be investigated again. NO_2 is measured by passive samplers.

PM_{10} Airmetrics is working, but the instrument needs more filters to operate (totally at least three for each site). More filters are ordered and in custom?

32 Gheat El Inab

The measurements look good. Same comments as for El Azafra.

41 El Nadah

High volume PM_{10} and dustfall is being operated here. No problems were reported.

42 El Shouhada Square

The calibrator has been turned off due to lack of purafil and charcoal. Charcoal was ordered in June, but IGSR only received one fifth of what they needed. CEHM claimed there was not more available.

The SO_2 data shows strange trends and does not behave properly. Water has been detected in connection tubes between the air intake units and the monitor as well as at the bottom of charcoal cylinder? Everything has to be done to prevent condensation water to influence the intake air!

The SO_2 as well as the NO_x monitor show some strange prolonged "zero-air" for about 3 hours after calibration. The SO_2 monitor was sent for calibration in Cairo during the last week of August. PM_{10} Airmetrics is now being operated, but a third filter holder is needed.

34 Damanhour

SO_2 and NO_2 passive samplers are being operated according to schedule. The PM_{10} Airmetrics was installed in September and the first sample will be collected on 11 October 2000, when filter holders will be available.

35 Kafr El Zayet

There is no calibrator at the site? - It is still at CEHM, for repair.

Zero-span is not performed routinely. The SO_2 monitor zero line is off by about 70 $\mu g/m^3$. The monitor was calibrated by the travelling standard and the span gas also showed a difference between monitor and calibration gas of about 75 $\mu g/m^3$. No action has been taken (according to statement from Yassin).

The NO_2 concentration for August seemed okay, but there is a zero line offset of about 8 $\mu g/m^3$. PM_{10} data looks okay, but there are strange negative values, which have been taken out of the August data set. These negative concentrations still occur.

36 Tanta

The sequential samplers and the PM_{10} Airmetrics seem to work adequately.

37 El Mahalia

The SO_2 monitor showed a zero offset of about 7 $\mu g/m^3$and had also a strange behaviour in June, July and August.

The PM_{10} monitor was re-started about one month ago. The problem with this monitor was again related to the constant. Yassin changed the constant in August, and the concentrations became very high. The instrument does not work properly and Yassin will be requested to look at it in the field again, before it eventually will be transferred to Cairo for repair. The instrument needs some spare parts?

The site location will have to be evaluated.

38 El Mansoura

Electricity had been out for short periods. A stabiliser was installed several months ago. The calibrator was stopped for one week and the SO_2 concentrations dropped considerably. The calibrator is now working again, but the operators at IGSR requested to operate the monitor without calibrator if possible.

In August the SO_2 monitor showed peak values every night after 0200 (data removed from the database). After 28 August the data seemed to become correct, without anyone interferring with the data??

The NO_x monitor was sent to CEHM for repair on 22 September, because the cooler was too hot

39 Domiatt

Seem to work properly.

40 Kafr E1 Dawar

The instruments were installed and measurement started on 24 March 1999. The data look good.

G.4.1 c)

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: Jorgen Simonsen (JFSS), Mohamed Fathy (MF), Ahmed AbElSeoud, Haytham, Ahmed (HAA), Heba Fathy (HF)

From Bjarne Sivertsen

Date: 11 October 2000

Air Quality Network Operations

The report "Status of the Monitoring Programme operated by IGSR' based on meetings in Alexandria 8-9 October 2000, was the background for the conclusions drawn from a meeting at EEAA on 11 October 2000.

Spareparts and Consumables

6. CEHM has to assure that consumables, such as charcoal, purafil, filters etc. are kept in stock at any time, and ahead of urgent needs.

7. Copies of orders from CEHM for supplying the stock have to be sent to EEAA.

8. Requests from IGSR to CEHM have to be documented and made traceable. Copies therefore have to be sent to EEAA.

9. Deliveries of consumables from CEHM to IGSR have to be effected no later than within two weeks after the request is received from IGSR.

10. Updated lists of consumables and spare parts in stock at CEHM should be presented to EEAA every month.

11. The measurement operations as well as maintenance, repair, spareparts and consumables will be followed up by an assigned expert at EEAA.

Procedures for maintenance and repair

1. A memo has been prepared for procedures concerning maintenance of PM_{10} monitors. The aim is to reduce the actions of moving these instruments too much. Maintenance should be performed at the site if necessary.

2. It is necessary to strengthen the team of repair and maintenance experts at CEHM. At least 3 or 4 persons should be trained to perform repair.

3. EEAA will request that CEHM present names, background and specialities for these experts.

4. The field operators at IGSR will have to specialise in maintaining one single monitor. Even if they are responsible for several instruments at each site, individuals should be appointed to specialise in one selected type of instrument and learn in detail how to maintain this one. Whenever errors occur at one site the expert for this specific instrument could be consulted.

Data retrieval

1. The System Manager does NOT operate according the manuals. However, it seems we will have to live with the versions that have been installed at CEHM and at IGSR.

2. Corrections and zero line adjustments will have to be performed for short periods (<5 days) or between "missing data".

3. Polling of data on a daily basis will have to be operational from ALL sites as soon as possible.

4. The new modem will be installed by Maher on Sunday 15 October 2000.

Extra training for maintenance and repair will be evaluated and may be given to the repair shop experts at CEHM.

The problems faced at IGSR, such as missing charcoal, purafil, filter holders (for Airmetrics), CO correlation wheel etc. will have to be solved as soon as possible.

These matters will be followed up and reported back to EEAA as soon as they are solved.

G.4.2 a)

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

Memo

To: IGSR and CEH[M
Copy to: Jorgen Simonsen (JFS), Mohamed Fathy (MF), Ahmed AbElSeoud, Haytham Ahmed (HAA), Heba Fathy (HF)

From Bjarne Sivertsen

Date: 14 October 2000

Monitoring Operations, problems to be solved

After meetings in Alexandria 8-9 October 2000 it was revealed that several problems have occurred in the monitors. After consulting Leif and Rolf, the following actions should be undertaken to assure a fair quality in the collected data.

Condensation and Calibration

The problem of water condensation in the scrubbers arises from the fact that the pump inside the calibrator pressurises the air in the scrubbers causing water vapour to condense.

Here is one suggestion to solve the problem with condensation in the calibrator:

1. Check the zero level manually once a week at the station using the permeation tube calibrator. Between the zero checks the calibrator is switched off. This will prevent condensation of water in the scrubbers and the lifetime of the scrubbers will be prolonged. The permeation tubes will never be used and must be removed from the calibrator.

2. Check the span level once a month using a travelling standard gas cylinder. The span gas consume will increase since the span gas is used at the station once a month instead of only once every three months.

This is the preferable solution.

Another solution if you want to use permeation tubes:

1. The pressurised air coming out of the pump inside the calibrator is redirected to a big flask for condensation of water before the air is fed to the scrubbers. The flask should stand in front of the air conditioner. This requires some simple rebuild of the calibrator.

Here is one suggestion to solve the problem of condensation in the intake tubes:

1. The intake manifold and intake tubes must be heated and/or insulated.
2. The intake manifold and intake tubes must be protected using e.g. plywood from the cold air stream coming directly from the air conditioner.
3. In order not to let excessive air into the shelter the air coming out of the blower at the intake manifold must be directed to the outside through a hole in the shelter wall. Rolf instructed the labs to do this one year ago.

"Hanging" zero and span concentrations

The problem is related to water condensation in the whole system. It can be solved this way.

1. Change air inlet Teflon tubing, clean and dry the filter holder.
2. Change Teflon tubing from Calibrator to glass manifold.
3. Put one cylinder of Silica Gel on air inlet to the monitor and let the monitor run for 24 hours.
4. Do the same drying procedure as 3 on the calibrator.

If this do not help the next step is to stop the monitor and calibrator. Take out ALL tubing's and other parts, which are in contact with air, clean and dry it. We assume that there is no air leakage in the system (calibrator, air intake manifold, valves and monitor).

G.4.2 b)

EIMP

G.4.2.b

Repair Report Based on Information from

Center Of Environmental Hazard Mitigation Center

(1 May-31 May)

(Haytham Ahmed)

The following Monitors have been repaired at the Center of Environmental Hazard Mitigation during the period from 1 May till 31 of the same month.

No.	Type	S/N	Station	Received	Returned	Malfunction
1	PM_{10} M	650-58031	Mahalla	06-May	24-May	Output voltage different from the actual reading
2	SO_2 M	43C-4-61006-329	Mahalla	06-May	24-May	Flash Lamp replaced
3	TSP	610-58138-316	Shoubra	06-May	20-May	Controller repaired and the pump replaced by new one
4	Z/S unit	145-58171-317	F. Khalig	13-May	13-May	Solenoid valve disconnection
5	PM_{10} M	650-58029-315	F. Khalig	At station	At station	Installation
6	PM_{10} M	650-58177-316	Kolaly	At station	At station	Repaired
7	SO_2 M	43C-61641-332	Mansura	15 May	15 May	Checked
8	SO_2 M	43C-58165-316	F. Khalig	At station	At station	Pump replaced
9	NO_2 M	42C-56068-306	Giza	At station	At station	Pump replaced
10	NO_2 S	41998003	6th Oct.	-	23 May	Repaired

Calibration Report

No.	Type	S/N	Station	Received	Returned	Malfunction
1	SO_2 M	43C-4-61006-329	Mahalla	15 May	24 May	Annual Calibration
2	SO_2 M	43C-61641-332	Shouhada	10 May	20 May	Recalibration due to improper field calibration

3	NO_x M	42C-61470-331	IGSR	19-May	22-May	Recalibration due to improper field calibration
4	NO_x M	42C61466-331	Suez	09-Apr	04-May	Annual Calibration
5	NO_x M	42C-57955-315	Mon. Lab.	02-May	02-May	Annual Calibration
6	SO_2 M	43C-58178-316	Mon. Lab.	03-May	03-May	Annual Calibration
7	SO_2 M	43C-61050-329	Maadi	10-May	10-May	After changing flash lamp
8	CO C	10107	IGSR	-	25-May	Annual Calibration

G.4.4.1

Operational problems

Instruments are showing problems. A typical correspondence before Mission 20.:

Dear Yasin.

About your temperature problem on NO_x analyzer you can try to measure directly on the cables to the cooler to see how the temp.regulater is working. If you find it is working normal look if temperature goes down when power is on and temperature goes up when power is off. If this happen the regulator or temperature sensor don't work properly any more. Low readings? Is the reaction chamber clean?

- Are you sure the flow is correct even if the instrument says "Flow OK".
- Measure the flow on inlet tube directly.
- Check that you have not mistake a ozone orifice instead of air orifice.

I hope this can help you to solve the problem on your NO_x. It would be very nice if you and all others (inclusive Tarek) can make a list of what you would like me to do when I arrive in February.
Please mail me such a list and give it also to Mr. Bjarne when he arrives in Cairo 1-2 weeks before me.

Looking forward to se you again soon

Regards
Rolf

-----Original Message-----
From: yfathy@usa.net [SMTP:yfathy@usa.net]
Sent: 16. januar 2001 12:40
To: Rolf Dreiem
Cc: lm@nilu.no
Subject: NOx Analyzer Cooler

Dear Mr. Rolf Dreiem
How are you and Happy New year, i have a problem at a NO_x analyzer that the Cooler temp. is fluctuating in Heigh Ranges, e.g. from 0.48 to - 4.5 degree accompanied by Low reading at heigh concentration e.g. at 800 ppb it reads only 250 ppb !, i have looked for any leakage but i didn`t find even in the Reaction Chamber. Could you pleas give me advise to solve this proplem.

Dear Mr. Rolf, I know that you are coming next month, Do you nead any preparation to be ready before you come.
Looking forward to your reply
Yours sencerally
Yasin

G.6.1

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

Memo

From Bjarne Sivertsen
Date: 24 October 2000

Sampling Programme
Filters to be 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	10.June 2000	29 june 2000	307	307	
			17 May 2000		165	
5	Maadi	11 May 2000	30 june 2000	166	105	
			29 june 2000		156	
13	6 October	16 June 2000	17 May 2000	230	156	
			5 April 2000		128	
14	10 Ramadan	17 May 2000	11May 2000	114	111	
			11 April 2000		100	
28	El Nahda	23 June 2000	21 May 2000	104	95	
29	ElMax	12 April 2000	23 May 2000	646	246	
32	Gheat ElEnab	20 April 2000	23 May 2000	84	59	
39	Domyat	15 May 2000	9 May 2000	93	80	

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	11 May 2000	5 April 2000	960	862	
6	Tabbin	29 April 2000	30 June 2000	900	893	
7	Tabbin south	18 May 2000	23 April 2000	2180	1194	
10	Shoubra	11 April 2000	5 April 2000	1468	608	
15	Suez	23 April 2000	29 June 2000	2480	1503	

G.6.2

EIMP
Environmental Information and Monitoring Programme
EEAA - Danida - COW1
30 Misr-Helwan Str. Maadi, Cairo, Egypt
Tel: 202 525 6442, Fax: 202 525 6467

Memo

To: OH
CC :JFS, AAE, MF, BS

From : Haytham Ahmed
Date : 28 Sep. 2000

Checking preparations for Ove's mission

Introduction

Air Quality component is willing to expand the measurement programme by installing 5 VOC samplers in the Air Quality Network. The measurement programme at the start of measurements will be as follows.

Site	Bi-weekly (1)	Comment
El-Gomhoryia	X	Inside the room
Tabbin South	X	In shelter, intake through wall
Shoubra	X	On the top of the roof
El Max	X	In shelter, intake through wall
Damietta	X	In shelter, intake through wall

(1) Sampling days as PM_{10} or TSP samplers.

After installing the canisters in the above mentioned sites, samples will be analyzed in the chemical lab. of CEHM.

Preparations done for training

1 - Calibration Gases

2 cylinders with regulators have been delivered by EIMP to the lab.

I) Propane = 9.83 ppm

II) Hydrocarbon mix of

N-Butane	= 0.102 % moles
Ethane	= 0.0957 % moles
Iso-Butane	= 0.102 % moles
Methane	= 0.189 % moles
N-Pentane	= 0.205 % moles
Propane	= 0.959 % moles

III) 2 Regulators of P/N = 5127BC10
- Inlet installed successfully on the head of cylinders

- Outlet without screw to be installed on the device (Outlet will be Silicon tube of diameter = 1/4 inch.)

2 - External CO_2 Coolant

Available with regulator in the lab. and connected to the Purge and Trap unit
-.CO_2 regulator outlet is 3/4 inch
-.Purge and Trap unit Inlet is 1/8 inch.

3 - Manuals for Purge & Trap unit

Manuals for Purge & Trap unit are available in the lab.
Purge & Trap unit software = G1909-90300
Purge & Trap unit Hardware = G1900-90310

4 - Manuals for GC Software

These kinds of manuals are not available. CEHM has tried to look for it in the local market but they did not find it.
They suggest printing the on-line help from the software itself.

5 - Extension cables

Extension cables for power supply of canisters are available in the lab. Defected batteries have not been changed upon request from Bjarne after meeting with Amr El Seouni (Manger of CTS).

He found these kind of batteries are too expensive and their role is only backup for electricity.

6 - The responsible persons in the lab.

2 persons are working part time for CEHM will be responsible for the operation of GC unit. During training they will be available full time.
These two persons are well trained on operating GC, one of them has 6 years experience in operating such units, the other has 2 years experience in the same field.

7 - Column of GC

Available in the lab but not connected waiting for the requirements of conditioning.

8 - Helium Cylinders

Available in the lab, but not connected due to problems in fitting the regulator of cylinders to the tube. CEHM is manufacturing connection locally.

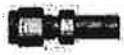
9 - Capillary Tube between Purge & Trap unit and GC

The old tube has been damaged due to intensive work on the unit. A new one has been ordered and will be available soon (within one week)

10 - Pressure Gauge

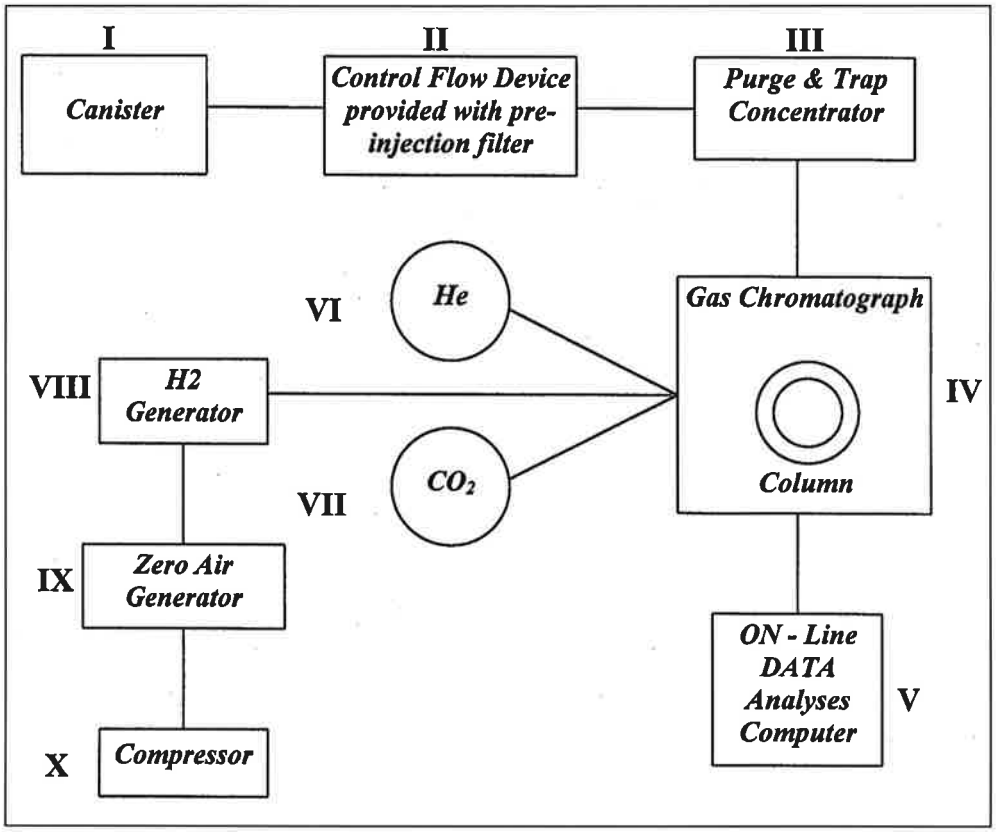
The pressure gauge and its valve controller are available in the lab.

11 - Connection check-list

Quantity	Description	Quantity checked
6	 Reducer $^1/_{16}$" - $^1/_4$" inch	6
6	 Reducer $^1/_{16}$" - $^1/_8$" inch	6
4	 Reducer $^1/_8$" - $^1/_4$" inch	4
4	 Reducing union $^1/_4$" - $^1/_{16}$" inch	4
4	 Reducing union $^1/_4$" - $^1/_8$" inch	4
4	 Reducing union $^1/_8$" - $^1/_{16}$" inch	4
4	 Union $^1/_4$"	4
3	 Tee $^1/_4$"	3
3	 Tee $^1/_8$"	3
10	 Nuts & Ferrules $^1/_{16}$"	10
10	Nuts & Ferrules $^1/_8$"	10
10	Nuts & Ferrules $^1/_4$"	10
5 m	Stainless steel tubing $^1/_{16}$"	not available in market
5 m	Stainless steel tubing $^1/_8$"	OK
5 m	Stainless steel tubing $^1/_4$"	OK
1	Valve, type Nupro SS 4H (same as valves in the VOC-samplers).	OK
1	Pressure gauge, +1 - 3 atm	Ok

Questions by CEHM for Ove

System Chart:



1 - Please describe in details device no II and its connections?

2 - We have our own SOP for conditioning a new column which in brief.
I - Purge by carrier gas for 15 minutes
II - Initial for 1 hour at 100 C and then raising by rate of 2 C/min.
III - Final temperature will be (column maximum temperature - 25 C) or (analyses temperature + 25 C)
IV - Start over night.

So, does this program fit with your SOP system for a new column at VOC system? or you have another program.

3 - Please check if you have to fit a filter before the injection directly on the column or not? because the column may contaminate with particulate matter coming from the canister at sampling process.

4 - The standard VOC mixture are not identified which peak corresponds to what?

5 - After connecting VOC system to the purge & Trap concentrator unit, does this system prevents us from injecting water samples for hydrocarbon determination on purge & Trap concentrator unit or not?

6 - Do we need a specific Trap for VOC for purge & Trap concentrator unit or the existed one is enough for VOC analyses? if you need the specific trap, it is not available in the local market.

G.6.3.a

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

G.6.3.b

Passive sampling programme Cairo

October 2000

			Observer	SO2	NO2	Out		In		
	Site no	Site name				Day	Hr	Day	Hr	Comm
EIMP	AQ-01	El Qualaly.	Omar	1	3	15	1330	28	1330	
		Parallell		88	99					91,89
	AQ-02	El Gemhoroya street	Kamela	7	10	15	1420	28	1510	
	AQ-03	Abbasya	Kamela	5	2	15	1240	28	1510	
		Parrallell		82	83	15		28		84,81
	AQ-04	Nasr City	Mahmoud	4	9	15	1430		1130	
	AQ-05	Maadi EEAA	Heba	22	11	14	1450	28	1053	
	AQ-06	Tabbin	Maher	31		14	1630	28	1000	
	AQ-07	Tabbin south	Maher	2	5	14	1600	28	1045	
	AQ-08	Fum El Khalig	Kamela	9	7	14	1430	28	1650	
	AQ-09	Abu Zabel	Kamela	10	8	15	1030	28	1300	
	AQ-10	Shoubra el Kheima.	Kamela	8	6	15	1110	28	1345	
	AQ-11	Giza, Cairo University.	Tarek	6	4	15	1030	28	1530	
		Parallell		93	97	15		28		94.1
	AQ-12	Gizapyramid		n	n		n		n	lost
CAIP	6	Maadi/Digla	Ashraf	33		15	900	28	1145	
	12	ElDarb ElAhmer	Basil	38		15	1000	29	800	
	16	Mokotam hills	Omar	19		15	1530	28	1430	
	21	Matarya	Omar	36		15	1140	28	900	
	22	ElWaily	Basil	24	13	15	1100	29	900	
	25	Imbaba	Basil	26	20	15	1420	29	1000	
	27	15th May city	Ashraf	37		15	800	28	800	
	28	Almaza	Omar	34		15	1240	28	950	
	29	Basateen	Omar	16		15	1200	28	1215	
	30	Giza, Sheraton	Ashraf	30	19	14	1400	29	900	
	31	Tahrir Square	Omar	29	12	15	1300	29	730	
	32	Zamalek	Ashraf	20		15	1600	28	830	
	33	Helwan	Ashraf	40		15	830	28	930	
	34	El Massara	Ashraf	28	17	15	1000	28	1100	
	35	Heliopolis	Omar	11		15	1215	28	1020	
	36	Abbasya	Ashraf	39		15	1040	28	930	
New		Shoubra, Ayman	Ayman	12		14	1830	28	1930	
		Shoubra Kh., Kamela	Kamela	18		14	815	27	1930	
		Nasr City, Hesham	Hesham	3	1	14	1900	28	1000	
		Parallell	Hesham	96	98	14		28		
		Roda Isl. Lydia	Lydia	25	16	14	2020	28	725	
		Masr el Adina	Haytham	17		14	1900	28	2200	
		Roxy , Heba	Heba	75	76	14	1815	28	2100	
		NIS	Haytham	32		15	1200	28	1400	
		Helwan , Maher	Maher	35		14	2100	27	830	
		Muh. Farid str.	Mahmoud	21	15	15	1600	28	900	
		Sultan Hassan mosq	Heba	27	18	14	1320	28	1028	
		Islamic museum	Heba	79	78	14	1400	28	1017	
		DarelSalam	Haytham	15		14	2000	28	1300	
		Garden City, Ital. Emb	Tarek..	14		15	830	29	1215	

G.6.3.c

CAIP FIELD OFFICE **INTEROFFICE MEMO**

To: **Gilbert Richard**
From: **Mounir Labib**
Date: **15 October ,2000**
Subject: **Passive Samplers of EIMP for NO2 and SO2**

1- I had a message from Eng. Ahmed Abu El Soud to install some passive samplers in our CAIP monitoring sites for one week. They will start on October 14 till October 21, 2000.
2- This will not affect any activity for our work, because it will be stuck on the outer shelter of our monitoring equipment. It is passive samplers.

Attached is the EIMP study of SO2 & NO2 concentrations in GC area.

Please, kindly approve this cooperation with EIMP.

Approved
Gilbert Richard
CAIP, COP

EIMP

Letter

To	**Dr Moneer Labib** **CAIP Air Monitoring Component Manager**
Subject	**Study of SO2 & NO2 Concentrations in Greater CAIro**
CC	**Dr Ahmed Gamal**

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

Date
14 Oct. 2000
Our ref.

Dear Dr. Moneer

I would like to inform you that EIMP air monitoring programme has presently designed a passive sampling study that will cover SO2 and NO2 average concentrations in Greater Cairo area. The sampling program for this study should start on 14th of October till 21st of October 2000. We have selected the sites that will be included in this program so it represents all activities in Greater Cairo. Sixteen of the sites we have chosen are CAIP sites, where we would like to stick the sampler on the CAIP shelter on these areas. I attached with this letter a list of the whole sites that we have chosen to be sampled during this study.

So, would you please approve to use CAIP shelters to stick the passive samplers for SO2 & NO2 and help us to put these samplers on the shelters at the next visit of CAIP operators to these sites.

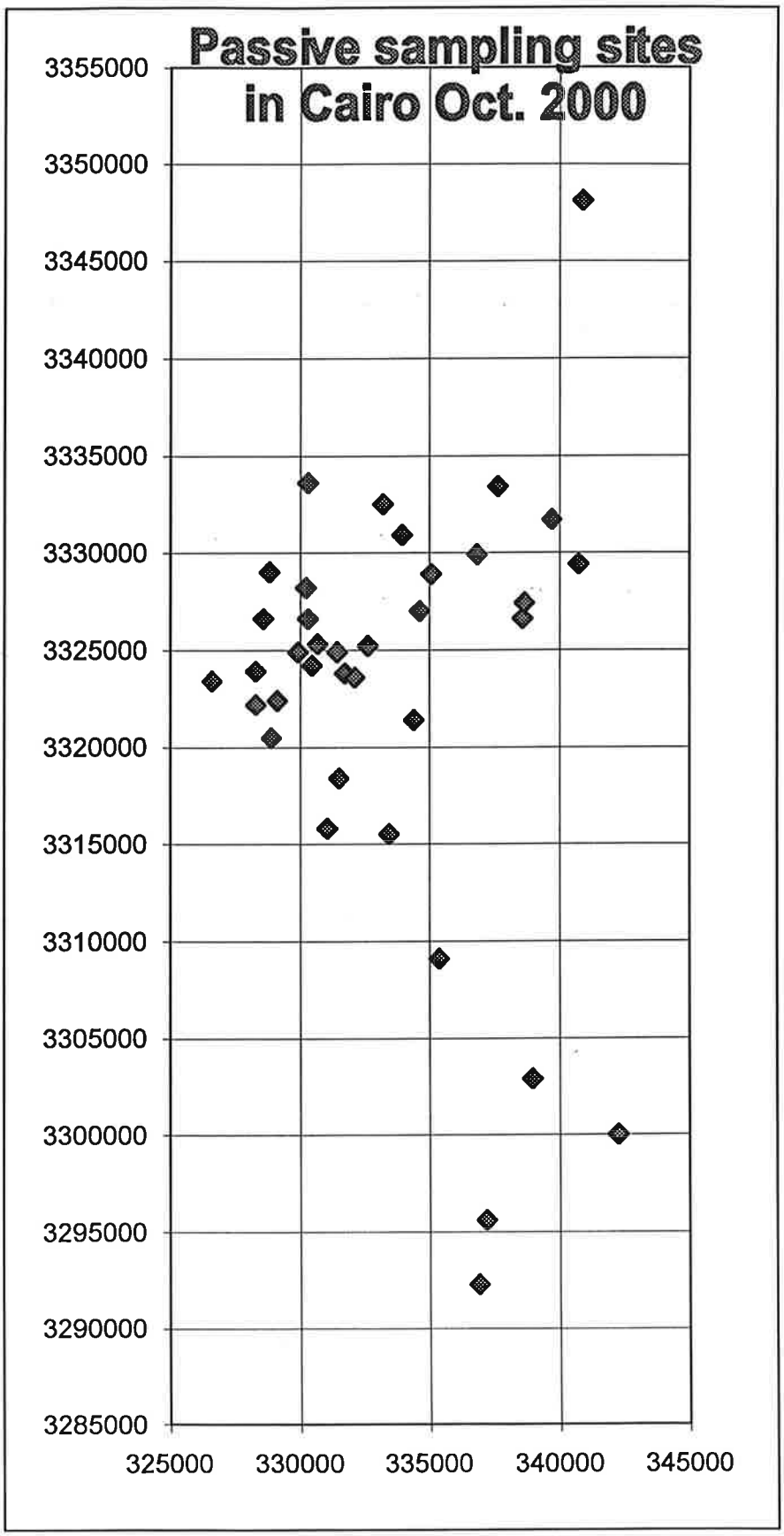
Thanks for your great help and wish you a good day

Sincerely yours,

Ahmed A. Elseoud

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

Eimpserver\ahmed\Caip_3.doc


Passive sampling sites
in Cairo Oct. 2000
3355000
3350000
3345000
3340000
3335000
3330000
3325000
3320000
3315000
3310000
3305000
3300000
3295000
3290000
3285000
325000
330000
335000
340000
345000

Appendix H

Reference laboratory

H.3.1 Evaluation of CEHM in P.T 12: Pb on Filter: - June 2000

H.3.1 Evaluation of CEHM in P.T 10: SO_2 on Filter: - November 1999

H.3.1

Evaluation of CEHM in P.T 12: Pb on Filter: - June 2000,

Prepared by EIMP Reference Laboratory Counterpart, CH. Mai E. Ahmed

The requirements for the quality of results for P.T. 12 in Synthetic Samples of Pb filters according to range of standard deviation of assigned value: -	
Parameter	Max. Deviation from the assigned valve
Pb	+, - 10% assign value or +, - 0.2 $\mu g/m^3$ = +,- 1.44 μg/ Filter

Parameter	**Pb μg/ Filter**	
Sample Type	**Accepted deviation limits**	**Participant result**
Sample A	6.5 – 3.5	**8.78**
Sample B	11 - 9	**13.97**
Sample C	22 - 18	19.15
Sample D	27.5 – 22.5	23.95
Sample E	33 - 27	29.36

Bold: Participant results outside the acceptable range

Batch No.		**Results**	**Recovery (Accuracy)**
A	**Average X**	**8.78**	175 .6 % - Unaccepted
B	**Average X**	**13.97**	139 .7 % - Unaccepted
C	**Average X**	19.15	95.75 %
D	**Average X**	23.95	95.8 %
E	**Average X**	29.36	97.8 %

Pb Lowest recovery	**175.6 %**
Pb Highest recovery	**97.8 %**

This Proficiency test was covered the concentration range from 0.69 - 4.2 $\mu g/m^3$.

The accuracy for the samples in the low concentrations are not satisfy that the recovery ranged from 175.6- 139.7 % that means there are systematic error may from many reasons as biased calibration or biased blank.

Evaluation of CEHM in P.T 10: SO_2 on Filter: - November 1999,

Prepared by EIMP Reference Laboratory Counterpart, CH. Mai E. Ahmed

The requirements for the quality of results for P.T. 10 in Synthetic Samples of SO2 filters according to range of standard deviation of assigned value: -	
Parameter	**Max. Deviation from the assigned valve**
SO_2	**+, - 10% assign value or +, - 3 µg/m^3 = + ,- 0.72 µg/ Filter**

Parameter	**SO_2 µg/ Filter**	
Sample Type	**Accepted range of results within the accepted deviation limits**	**Participant result**
Sample A	16.5- 13.5	**17.60** **17.16**
Sample B	33- 27	**23.76** **23.80**
Sample C	110- 90	**6.84** **7.00**
Sample D	187- 153	**11.96** **11.44**

Bold: Participant results outside the acceptable range

Batch No.		**Results**	**Recovery (Accuracy)**
A	X1	17.60	117.3%
	X2	17.16	114.4%
B	X1	23.76	**79.2%**
	X2	23.80	**79.3%**
C	X1	6.84	**6.8 %**
	X2	7.00	**7 %**
D	X1	11.96	**7 %**
	X2	11.44	**6.7 %**

SO_2 Lowest recovery	**6.7 %**
SO_2Highest recovery	**117 %**

Appendix I

Co-ordination

I.2.1 EIMP Monitoring and Samplig Air Quality Programme Status - Minutes from Meeting at CEHM 7 and 23 October 2000
I.2.2 EIMP Monitoring and Samplig Air Quality Programme Status - Minutes from Meeting at IGSR on 8 October 2000
I.2.3 Memo - Matters from a meeting at CEHM, 23 Oct. 2000
I.2.4 Staff meeting minute (example)
I.2.5 Discussion of episodes (in Arabic)
I.2.6 A sustainable air quality measurement programme for Cairo
I.2.7 Ozone data from Ras Mohammed
I.2.8 Newsletters

I.2.1

Cairo University Center for Environmental Hazard Mitigation (CEHM) DANIDA, Air Pollution Monitoring Project

EIMP
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 Air Quality Programme Status
Minutes from Meeting at CEHM (Cairo University)

7 October 2000

	Site	Area type	Parameter	Status	Responsible	When?
1	Cairo c.Qualaly	Urban centre ☎	AC NO_x SO_2 145 PM_{10} TSP VOC	Tel. okay Need automatically start up sensor okay okay okay okay (Assyut monitor with power board from Kolaly monitor) okay will be installed Nov 2000	Yassin CEHM	27th Sep 00
2	El Gemhoroya st.	Street canyon ☎	NO_x SO_2 145 CO PM_{10} (A)	Tel. okay okay okay (need extra check) okay okay (Daily Calibration ?) okay	Kamla Yassin	
3	Abbasyia	Residential.☎	SO_2 Perm tube O_3 Met PM_{10}	Tel. okay okay okay Not working (need solenoid valve) okay okay	Kamla CTS	
4	Nasr City	Roadside/Res	SO_2 BS NO_2 PM_{10} (s)	okay okay okay	Mahmoud	
5	Maadi EEAA	Residential ☎	NO_x SO_2 145 PM_{10} (S)	~~Tel. not~~ working okay okay okay okay	Maher	

6	Tabbin	Industrial ☎	NO_x SO_2 145 PM_{10} Met TSP	Tel. okay okay okay okay at CTS for repair Gomhoriya monitor installed at the station okay need pump	Maher Febbi + monitor shifted Existing after (1)	From Oct 99 From 3rd Jul 00
7	Tabbin south	Industrial	SO_2 BS TSP DF	okay okay okay	Maher	
8	Fum Al-Khalig	Road /urban ☎	NO_x SO_2 145 CO PM_{10}	Tel. okay ~~okay~~ → not working. okay okay okay (Daily Calibration ?) okay	Kamla Yassin	no solenoid valve
9	Abu Zabel	Industry/Res	PM_{10} DF PS (S+N)	okay (letter needed) okay okay	Kamla →	
10	Shoubra	Industrial ☎	SO_2 Perm tube Met NO_2 TSP PM_{10} DF	Tel. okay okay okay okay okay solenoid need to be changed okay okay okay	Kamla ← 	
11	Giza, Cairo Univ.	Residential	NO_x SO_2 O_3 Met	Internal Tel. okay okay okay okay okay	Yassin	
12	Giza pyramid	Regional	PS (S+N)	okay	Haytham	
13	6 October	Res/industrial	SO_2 BS NO_2 PM_{10} (S) DF	okay okay okay okay	Omar	
14	10 Ramadan	Residential	SO_2 BS PM_{10} (S) DF	okay okay okay	Kamla	
	Canal area					
15	Suez	Res/urban ☎	NO_x SO_2 145 TSP DF	Tel. okay okay okay okay okay okay	Omar	
16	Port Said	Residential	PS (S+N) PM_{10} (A)	okay okay	Omar	
17	Ismailia	Residential	PS (S+N) PM_{10} (A)	okay okay	Omar	
	Upper Egypt					

18	El Fayum	Urban	PM_{10} (A) DF PS(S+N)	okay okay okay	Omar	
19	El Minya	Urban/Res	PM_{10} (A) DF PS(S+N)	okay okay okay	Maher	
20	Assyut 1	Res/Urban.☎	NO_x SO_2 145 PM_{10} Met	Tel. okay at CEHM (need spare parts) at NIS for calibration check okay Tebbin monitor after repair by CTS will be installed at this station At CEHM for repair	Maher CTS	→ working
21	Assyut 2	Residential	DF PS(S+N)	okay okay	Maher	
22	Naga Hammadi	Industrial/res	PM_{10} (A) DF PS (S+N)	okay okay okay	Mahmoud	
23	Luxor	Urban/res	SO_2 BS DF PS(S+N)	okay okay okay	Mahmoud	
24	Edfu	Urban.	PM_{10} (A) DF PS(S+N)	okay okay okay	Mahmoud	
25	Kom Ombo	Industrial	SO_2 BS PM_{10} (A) PS(S+N)	okay okay okay	Mahmoud	
26	Aswan	Urban/res.☎	SO_2 Perm tube O_3 Met DF	Tel. okay okay okay okay okay okay	Mahmoud	
	Sinai Area					
27	RasMohamed	Background	O_3 DF PM_{10}	okay okay okay		

Other Matters

NIS requested a schedule for calibrating all O_3 monitors, SO_2 , NO_2 sequential samplers and 7 selected monitors (NO_x, SO_2, CO from El-Gomhoriya st. station & NO_x and SO_2 from Assyut1 station & SO_2 from El-Shohada Station & NO_x from IGSR Station) to be performed during this year.

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.

Cairo University Center for Environmental Hazard Mitigation (CEHM) DANIDA, Air Pollution Monitoring Project

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 Air Quality Programme Status
Minutes from Meeting at CEHM (Cairo University)

23 October 2000

	Site	Area type	Parameter	Status	Responsible	When?
1	Cairo c.Qualaly	Urban centre ☎	AC NO_x SO_2 145 PM_{10} TSP VOC	Tel. okay Need automatically start up sensor okay okay okay okay (Assyut monitor with power board from Kolaly monitor) okay will be installed Nov 2000	Yassin CEHM	27th Sep 00
2	El Gemhoroya st.	Street canyon ☎	NO_x SO_2 145 CO PM_{10} (A)	Tel. okay okay okay (need extra check) okay okay (~~Daily Calibration ?~~) okay	Kamla Yassin	
3	Abbasyia	Residential.☎	SO_2 Perm tube O_3 Met PM_{10}	Tel. okay okay okay Not working (need solenoid valve) okay okay	Kamla CTS	
4	Nasr City	Roadside/Res	SO_2 BS NO_2 PM_{10} (s)	okay okay Pump is not working (burned)	Mahmoud	
5	Maadi EEAA	Residential ☎	NO_x SO_2 145 PM_{10} (S)	Tel. okay okay okay okay okay	Maher	

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6	Tabbin	Industrial ☎	NO_x SO_2 145 PM_{10} Met TSP	Tel. okay okay okay okay at CTS for repair Gomhoriya monitor installed at the station okay Pump is not working (burned)	Maher	From Oct 99 From 3rd Jul 00 adequate required
7	Tabbin south	Industrial	SO_2 BS TSP DF	okay okay okay	Maher	
8	Fum Al-Khalig	Road /urban ☎	NO_x SO_2 145 CO PM_{10}	Tel. okay Need solenoid valve okay okay okay (Daily Calibration ?) okay	Kamla Yassin	← check this
9	Abu Zabel	Industry/Res	PM_{10} DF PS (S+N)	okay (letter needed) okay okay	Kamla	
10	Shoubra	Industrial ☎	SO_2 Perm tube Met NO_2 TSP PM_{10} DF	Tel. okay okay okay okay okay solenoid need to be changed okay okay okay	Kamla	
11	Giza, Cairo Univ.	Residential	NO_x SO_2 O_3 Met	Internal Tel. okay okay okay okay okay	Yassin	
12	Giza pyramid	Regional	PS (S+N)	okay	Haytham	
13	6 October	Res/industrial	SO_2 BS NO_2 PM_{10} (S) DF	okay okay okay okay	Omar	
14	10 Ramadan	Residential	SO_2 BS PM_{10} (S) DF	okay okay okay	Kamla	
	Canal area					
15	Suez	Res/urban ☎	NO_x SO_2 145 TSP DF	Tel. okay okay okay okay okay okay	Omar	
16	Port Said	Residential	PS (S+N) PM_{10} (A)	okay okay	Omar	
17	Ismailia	Residential	PS (S+N) PM_{10} (A)	okay okay	Omar	
	Upper Egypt					

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18	El Fayum	Urban	PM_{10} (A) DF PS(S+N)	okay okay okay	Omar	
19	El Minya	Urban/Res	PM_{10} (A) DF PS(S+N)	okay okay okay	Maher	
20	Assyut 1	Res/Urban.☎	NO_x SO_2 145 PM_{10} Met	Tel. okay at CEHM (need spare parts) at NIS for calibration check okay Tebbin monitor after repair by CTS will be installed at this station At CEHM will be transferred to CTSfor repair	Maher CTS	
21	Assyut 2	Residential	DF PS(S+N)	okay okay	Maher	
22	Naga Hammadi	Industrial/res	PM_{10} (A) DF PS (S+N)	okay okay okay	Mahmoud	
23	Luxor	Urban/res	SO_2 BS DF PS(S+N)	okay okay okay	Mahmoud	
24	Edfu	Urban.	PM_{10} (A) DF PS(S+N)	okay okay okay	Mahmoud	
25	Kom Ombo	Industrial	SO_2 BS PM_{10} (A) PS(S+N)	okay okay okay	Mahmoud	
26	Aswan	Urban/res.☎	SO_2 Perm tube O_3 Met DF	Tel. okay okay okay okay okay okay	Mahmoud	wind direction check Mah - Mahe.
	Sinai Area					
27	RasMohamed	Background	O_3 DF PM_{10}	okay okay okay		

Other Matters

NIS requested a schedule for calibrating all O_3 monitors, SO_2, NO_2 sequential samplers and 7 selected monitors (NO_x, SO_2, CO from El-Gomhoriya st. station & NO_x and SO_2 from Assyut1 station & SO_2 from El-Shohada Station & NO_x from IGSR Station) to be performed during this year.

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.

I.2.2

IGSR **EIMP**

Air Quality Project

Minutes for the Meeting at IGSR

Date: **Sunday, 15 Oct, 2000**

Time: **10 A.M.**

Attendance:

IGSR Team:

1-Dr. Elsayed Shalaby.
2-Dr. Shawkat Kamal
3-Dr. Zekry Ghattass.
4-Eng. Heba Said.
5-Eng. Ashraf Zahran
6-Eng. Hossam Ahmed

EEAA Team

1-Prof. Bieyarne Seversten
2-Eng.Mahamed fathy
3-Eng. Haytham Ahmed
4-Eng. Heba Fathy
5-Eng. Naglaa
6-Eng.Maher From CEHM .

The meeting started by giving a total summary about the status of all stations. This summary is enclosed in the following table:

→ Pump at TK El Max. flow calibrated, 45% less flow measured at NILU
eshallaby@yahoo.com
capillary tube influence?

→ SO_2 mon: Millipore 10-20 μm filter

→ Take 10 filters 35 filters in Alex – SO_2 to NILU.

IGSR **EIMP**

General comments

1. **We will communicate Dr.Tarek to get information about the sampling data.**
2. **Hossam Said was assigned to be responsible for the repair and the maintenance of PM10.**
3. **Ashraf Zahran is responsible for the repair and the maintenance of SO_2.**
4. **Mohamed Rashad is responsible for the repair and the maintenance of Co.**
5. **Mohamed Mamdouh is responsible for the repair and the maintenance of Nox.**

IGSR Project Manager

Elsayed Shalaby

Elsayed Shalaby

IGSR EIMP

EIMP Monitoring and Sampling Program Status, IGSR

	Site	Area type	Param	Status	Responsible	Comments
	Alexandria					
28	Air Defence College	Industrial	SO_2(PS) NO_2 (PS) NO_2 (SS) NH_3	Ok Ok Ok	M. Mamdouh	P.S of SO_2 at El-Tarh village was added down wind Racta company for two weeks (one/week)/weekly NH3 readings must be reported
29	El-Max Petrogas	Industrial	SO_2 (SS) NO_2 (SS) PM_{10} (HV) DF	Okay Okay Okay Okay	M. Rashad	OK. Correct flow before sending sample To CEHM
30	IGSR, Alex	Urban	NOx (M) SO_2 (M) PM_{10} (M) CO (M) SO_2 (PS) NO_2 (PS)	Ok Ok Ok Ok	H. Said	prevent direct exposure to air condition , The intake was checked So2 Filter may interfere the readings (lowering it) Co Zero will be checked by Mahar Nox is at NIS for calibration So_2 filter Problem dry 10 µm filter..
31	El-Asafra-	Residential	SO_2 SS PM_{10} (AM) SO_2 (PS) NO_2 (PS)	Ok Ok Ok	M. Mamdouh	Cairo university filter holder are not enough (Air metrics) Need more Airmetrics samples. need battery backup / converter. *
32	Gheat El-Inab	Residential	SO_2 (SS) NO_2 (SS) PM_{10} (HVS)	Ok Ok Ok	M.Rashad	Ok. Electricity faitune, our electrician People repaired it .
33	Alexandria regional	Regional	Met Ozone (M)	Ok Ok	H.S.	Ok.
41	El Nahda	Industrial Semi urban	PM_{10} (HV) DF	Ok	M. Rashad	Ok.
42	El-Shohada Square Station	Traffic	SO_2 (M) NO_2 (M) PM_{10} (AM) SO_2 (PS) NO_2 (PS)	Ok Ok Ok	M. Mamdouh	Sent to Cairo for calibration at CEHM and NIS for comparison. Power supply problem of NOx . Calibrator is turned off due to lack of purafil and charcoal, raising of air condition temp has been done.

* SO_2 SS ~4 µg/m³
SO_2 PS ~19 µg/m³

	Delta Area	Area type	Param	Status	Responsible	Comments
34	Damanhur	Urban	PM_{10} (AM) SO_2 (PS) NO_2 (PS)	Ok	H. Ahmed	Ok
35	Kafr El Zayat	Industrial/res	SO_2 (M) NO_2 (M) PM_{10} (M) DF SO_2 (PS) NO_2 (PS)	OK Ok Ok Ok	H. Ahmed	Calibrator is still at Cairo University Check with Dr. Tarak and Eng. Yasseen for calibrationdefine a data for visiting the station by yassin Zero level is very high (22.5PPb). Readings must be corrected. So_2 (ps) must be moved to Kafr Hashad No_2 (ps)
36	Tanta	Urban	SO_2 (SS) PS (N) PM_{10} (AM)	Okay Okay Okay	H. Ahmed	Ok
37	ElMahalla El Kubra	Industr/res.	SO_2 (M) PM_{10} (M) DF	Okay Okay Ok	H. Ahmed	SO_2 levels has been started to increase PM_{10} must be repaired. Eng yassin will come.
38	El Mansura	Indust/res.	Met NOx (M) SO_2 (M) DF	Ok OK Ok Ok	Ashraf Zahran	NOx still in cairo university 16 Oct will check the North for WD
39	Damietta	Urban/resid	SO_2 (SS) PM_{10} (HV) NO_2 (PS) DF	Ok Ok	Ashraf Zahran	Ok
40	Kafr Dawar	Urban/indust r	SO_2 (SS) PM_{10} (AM) SO_2 (PS) NO_2 (PS) DF	Ok Ok	H. Ahmed	Ok Power Failures

I.2.3.

EIMP
Environmental Information
and Monitoring Programme
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Memo

To: JFS, AAE, MF, HAA, HF
From Bjarne Sivertsen
Date: 23 October 2000

Matters from a meeting at CEHM\

At the meeting at CEHM on 23 October 2000 the following matters were raised;

Ozone data Ras Mohamed
Yassin was told during his last visit to Ras Mohamed that UNESCO has requested data of ozone from this site. An analyses of the data, as shown in two newsletters produced today, has indicated that the quality of these data are good, and that the data seem to perfectly reflect a background station in the Middle East region.

I know that also the Tropospheric ozone Programme operated by WMO (World Meteorological Organization) would be interested in these data. I also have been asked by the world database for stratospheric ozone research to consider this site for an ozone profile measurement site. NASA operates this programme with the database located at NILU, Norway.

If EEAA is willing to expose their most important background site, I will supply the relevant references and addresses so that these data can be made available to the international scientific community.

Maintenance at the Delta sites
Yassin will be visiting ElMahalla on Friday. The PM10 monitor will not be moved. However, the NOx monitors, which may be out of order may be taken to CEHM for repair. There is no money available for using the CEHM car for Alexandria inspections and Delta visits, which I find a limitation to the flexibility of site inspections.
This problem has to be discussed and solved.

Consumables for sequential samplers
Spare parts and consumables for the operations of sequential samplers were requested in June 2000. The request was stopped at EEAA, claiming that these

orders would have to be part of the annual request. In the meantime nothing has happened, and CEHM is about to run out of the necessary consumables and spare parts. Some are already finished.
At the EIMP staff meeting it was stated that these parts already has been ordered, which is not the case.
CEHM will place a new request at EEAA as soon as possible this week.
Please do not delay the ordering process again.

PM10 monitor to Assyut?
The PM10 monitor for Assyut is soon ready to be shipped to the site after repair in Cairo. However, it seems that the site selected in Assyut is not well suited for advanced instruments??

The question whether we shall move the monitor back to Assyut is a question of priorities. We know that monitors will break down occasionally. If PM10 measurements in Cairo were more important than in Assyut, I would consider keeping this monitor as a backup at CEHM until new monitors are available for Cairo.

I would also consider changing the measurement site in Assyut to a sampling site, as data from this area may not be necessary on-line. We will still have this information available in the monthly reports.
The matter will have to be discussed further.

The backbone of a sustainable monitoring programme
From the meetings I had with the monitoring institutions this month, it has become more clear to me than ever that the backbone of the operations of the EIMP programme in the future and at present is the possibility to have a fast and flexible way to obtain the equipment and the resources necessary to operate the measurements.

There are hinders at all levels:
- A request from CEHM and from IGSR has to be placed at EEAA ahead of time
- The EEAA staff has to react immediately and not delay the process with discussions modifications, reductions etc.
- The suppliers has to react and/or order from outside immediately after the order from CEHM/EEAA has been confirmed,
- Money has to be made available without delay whenever prepayment is requested.

All these barriers have been broken during the last year, and at present the ordering of spareparts and consumables seems to be one year behind normal schedules. This will result in a total breakdown of the measurement programme within a few months.
To avoid this actions have to be taken NOW! – at all levels!

I.2.4

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

Staff meeting

Minutes of Meeting

Date: 25 November 2000
Place: EIMP Office
Participan Jorgen Simonsen (JFS), Ahmed Abou El Seoud (AAE), Khaled Hamdy (KH), Erling Povelsen (ERP), Ayman El-Maazawy (AEM) Haytham Ahmed (HAA), Al Shabrawy Mahmoud (SMI), Lydia Kiriakos (LSK), Hossam El Shakhs (HS), Mohamed Kassem (MK) , Mohamed Ali (MS) & Mai Ahmed (MEA)
Absent Mohamed Fathy (MF), Mohamed Zaki (MZ) & Naglaa Darwish (NMD)
Prepared LSK **Reviewed by:** MF
Distributi EIMP Staff

Component	Task Description	Start Date	End Date	Person
1- Institutional Support				
	• Install another hard disk for NMD's computer as it is still under warranty;	25 Nov	28 Nov	Office Automation
	• Modify the data structure on EIMP servers to allow all EIMP users to access data;	25 Nov	28 Nov	AEM
	• Prepare a demo on EIMP databases;	25 Nov	28 Nov	AEM
	• Prepare a chart for the new data structure and create backup folder for each user on the server;	25 Nov	28 Nov	AEM
	• Working with EEIS for making the EIMP and EEIS servers visible to each other;	25 Nov	28 Nov	AEM

	• Continue gathering and completing the air database system documentation;	4 Nov	For one month	HS
	• Continue following up with Ehab finalizing the tasks in his contract;	25 Nov	28 Nov	HS
	• Continue doing the comments on the CW, Phase 2 database system; and	25 Nov	28 Nov	MK
	• Continue working in the development of CW user's manual (latest version).	18 Nov	28 Nov	AEM & MK
2- Coastal Water Monitoring				
	Continue preparing 2000/2001 contracts for Phase II, organic part;	25 Nov	28 Nov	SMI
	Follow up with NIOF & IGSR and Arab British Dynamics to deliver the equipment for calibration;	25 Nov	28 Nov	SMI
	Review the 5th sampling campaign draft report;	25 Nov	28 Nov	SMI & Dr.Dorgham
	Send a fax to NIOF justifying the money deducted from the last invoice of Phase II, inorganic part;	25 Nov	28 Nov	SMI
	Continue the 6th sampling campaign for year 2000; and	25 Nov	28 Nov	NIOF & IGSR
	Have separate meetings with each of Dorgham, Mamdouh Fahmy & Samir Nasr to review Phase 1 monitoring programme.	25 Nov	28 Nov	SMI
3- Air Pollution Monitoring				
	Finalize preparation of CEHM draft contract for year 2001;	25 Nov	28 Nov	HAA
	Continue working in IGSR draft contract for year 2001;	25 Nov	28 Nov	HAA
	Follow up with CTS the delivery of the new PM10 monitors;	25 Nov	28 Nov	HAA
	Finish September monthly progress report;	25 Nov	28 Nov	HF
	Start preparing October monthly progress report; and	25 Nov	28 Nov	HF
	Continue preparing the daily report and providing data hourly.	25 Nov	28 Nov	HAA
4- Reference Laboratories				
	Deliver and operate international QC software programme at CEHM;	25 Nov	25 Nov	MEA
	Submit Ain Shams draft contract for year 2001 to the management for review;	25 Nov	28 Nov	MEA

	Send to EIMP the cost of shipping the multipoint flow meter to EMPA;	25 Nov	28 Nov	NIS
	Collect the PM10 accessories from CTS stores;	25 Nov	28 Nov	MEA
	Continue discussions about the activities that will be included in year 2001 contract; and	25 Nov	28 Nov	MEA & NIS
	Check with CEHM about the results of the inter-comparison calibration of gas cylinders.	25 Nov	28 Nov	MEA

I.2.5

Cairo University
Center for
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جامعة القاهرة
مركز الحد من المخاطر البيئية

DISCUSSION OF EPISODES

معالي وزيرة الدولة لشئون البيئة

السيدة الأستاذة الدكتورة / نادية مكرم عبيد

Description of episodes.

تحية طيبة وبعد ...

بالإشـــارة للاجـــتماع الخاص بنظام الإنذار المبكر لنوبات تلوث الهواء بتاريخ ٢٠٠٠/٩/١٦ ودعوتكـــم الكـــريمة لمركز الحد من المخاطر البيئية – جامعة القاهرة للحضور للمشاركة بالرأي والمشـــورة في هذا الموضوع الحيوي أود أن أضع تحت تصرف سيادتكم الحقائق والأدلة المؤكدة لطـــبيعة تكـــون السحابة السوداء وكذلك نوبات تلوث الهواء وما يستوجبه ذلك من إجراءات لازمـــة لتدعـــيم نظام الإنذار المبكر ليكون فعالاً وحقيقياً يعتمد عليه في اتخاذ القرارات الطارئة والتحركات السريعة لتقليل حجم المشكلة .

- بناء علي القياسات اليومية والمستمرة التي يقوم بها مركز الحد من المخاطر البيئية لمستوي تـــلوث الهواء بالقاهرة الكبرى لصالح جهاز شئون البيئة بمشروع EIMP و CAIP وكذلك الملاحظات والمتابعة اليومية لخبراء المركز لحالة هواء القاهرة فأنه قد لوحظ بدء تكون وحدوث ظاهرة السحابة السوداء وإن كانت مازالت في مراحل أولية لم تصل بعد لحـــد الـــرؤية بـــالعين المجردة ولكن يلاحظ الآن في بعض الأيام في الصباح الباكر وبعد الغـــروب رائحـــة الدخان الناتج عن الحريق المكشوف لأي مخلفات زراعية أو غيرها . وكما هو مثبت من الرسومات البيانية المرفقة يتضح حدوث هذه النوبات من تركيزات عاليـــه جـــداً مـــن PM_{10} تمر فوق القاهرة وتنقشع بعدها لتعود إلي المعدلات العادية الملاحظة علي مدار العام .
- وهناك فرق كبير جداً بين نوبات تلوث الهواء بالقاهرة نتيجة الظروف الجوية التي تساعد عـــلي تـــراكم الملوثات المتولدة داخل العاصمة نفسها وبين هذه النوبات التي تهب علي القاهرة من الدلتا وتحمل في طياتها الدخان الناتج عن الحريق . ومرفق طيه تسجيل فيديو

تليفون: ٥٧١٩٦٨٨ (٢٠٢) تليفون/فاكس: ٥٧١٩٦٨٧ (٢٠٢) البريد الألكتروني: tmaear@frcu.eun.eg ص.ب: ٤٥٣ الأورمان - الجيزة - الرقم البريدي: ١٢٦١٢ - ج.م.ع
Tel: (202) 5719688 Tel/Fax: (202) 5719687 E-mail: tmaear-@frcu.eun.eg P.O. Box: 453 Al Orman - Giza - Postal Code: 12612 – Egypt

Cairo University
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جامعة القاهرة
مركز الحد من المخاطر البيئية

لهبوب سحابة الدخان الأسود علي القاهرة في الشتاء الماضي بتاريخ ٩٩/١١/٢١ والذي يثبت برؤي العين مصدر وكيفية حدوث هذه السحابة السوداء وكونها قادمة من خارج القاهرة واختلافها تماماً عن طبيعة التلوث اليومي الذي تعاني منه القاهرة نتيجة المصادر الداخلية بالعاصمة .

ومما سبق عرضه يتضح الآتي :-

- أن نظام الإنذار المبكر كما هو مصمم حالياً والذي يعتمد علي ناتج PM_{10} لثلاث محطات فقط داخل القاهرة الكبرى لن يكون قادراً علي التنبؤ بمثل هذه النوبات من السحب السوداء التي تمر علي سماء العاصمة قادمة من مصدر خارجي . بل هو قادر فقط علي التنبؤ بمستويات التلوث داخل العاصمة نتيجة المصادر الداخلية وبناء علي التغيرات المناخية أما عند حدوث ظروف خارجية بعيدة عن حدود هذه الثلاث محطات فلا يكون قادراً علي التنبؤ بمستويات التلوث التي ستتأثر بقدر هائل بهذه المتغيرات الخارجية الواقعة خارج حدود القاهرة ولن يكون كافياً وقتها إضافة معامل ثابت لزيادة هذه التركيزات كما هو متبع الآن في عمل النظام لأن هذا الثابت متغير بنسب كبيرة جداً حسب طبيعة النوبة .

- ولذلك يقترح المركز تطوير هذا النظام ليضم عدد من ١٥ إلي ٢٠ محطة رصد متصل لـ PM_{10} توزع بعناية فائقة باستخدام احدث طرق نظم المعلومات الجغرافية لتغطي اتجاهات الرياح القادمة للقاهرة وعلي أبعاد متفاوتة خارج العاصمة لتكون بمثابة محطات إنذار مبكر أولي للمؤثرات القادمة من خارج حدود العاصمة ويجب وضع محطات أرصاد جوية مع كل محطة لرصد بيانات اتجاه وسرعة الرياح علي الأقل . ثم ربط هذه المعلومات لحظياً بنظم المعلومات الجغرافية الذي يحدد عليها اتجاهات الرياح ونسب التلوث ومصب هذا التلوث وطريقة الذي سيؤثر فيه وبذلك يكون نظام فعال يعالج المشكلة الحقيقية

تليفون: ٥٧١٩٦٨٨ (٢٠٢) تليفون/فاكس: ٥٧١٩٦٨٧ (٢٠٢) البريد الألكتروني: tmacar@frcu.cun.eg ص.ب: ٤٥٣ الأورمان - الجيزة - الرقم البريدي: ١٢٦١٢ - ج.م.ع
Tel: (202) 5719688 Tel/Fax: (202) 5719687 E-mail: tmaear-@frcu.eun.eg P.O. Box: 453 Al Orman - Giza - Postal Code: 12612 – Egypt

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جامعة القاهرة
مركز الحد من المخاطر البيئية

وهـــي هـــبوب ســـحابة الدخـــان من خارج القاهرة وليس تكونها داخلها وهو مثبت تماماً بالتسجيل السينمائي الحي لحدوث هذه الظاهرة والمرفق بهذا الخطاب .

- مـــا ســـبق هو عن طرق الرصد والتنبؤ أما عن طرق الحد والمنع فإنه يجب حظر الحرق المكشـــوف تماماً في الحقول الزراعية بالدلتا طوال العام وكذلك حظر الحرق المكشوف داخل العاصمة في فصل الشتاء علي الأقل ومتابعة ذلك ميدانياً بواسطة المسئولين التابعين لوزارة الزراعة والداخلية وبمساعدة الجهات الإعلامية للتوعية.

ومركـــز الحـــد من المخاطر البيئية يضع تحت رهن إشارة السيدة الوزيرة كل إمكانياته البشرية والماديـــة للمساهمة في وضع واختيار التصميم الأمثل والمواقع الدقيقة لمحطات التنبؤ واستحداث نظـــم للمعلومات الجغرافية لاستيعاب مثل هذه البيانات وتشغيل محطات التنبؤ علي مدار الساعة بصفة منتظمة ومستمرة ودقيقة كما هو عهدنا دائماً بجميع المهام المكلفة لنا من قبل سيادتكم في هذا المجال .

وذلك وفق توجهات معاليكم للحفاظ علي البيئة النظيفة للقاهرة ومصرنا الحبيبة في ظل تطلعات الرئيس حسني مبارك المستقبلية " مصر الغد أفضل من مصر الأمس " .

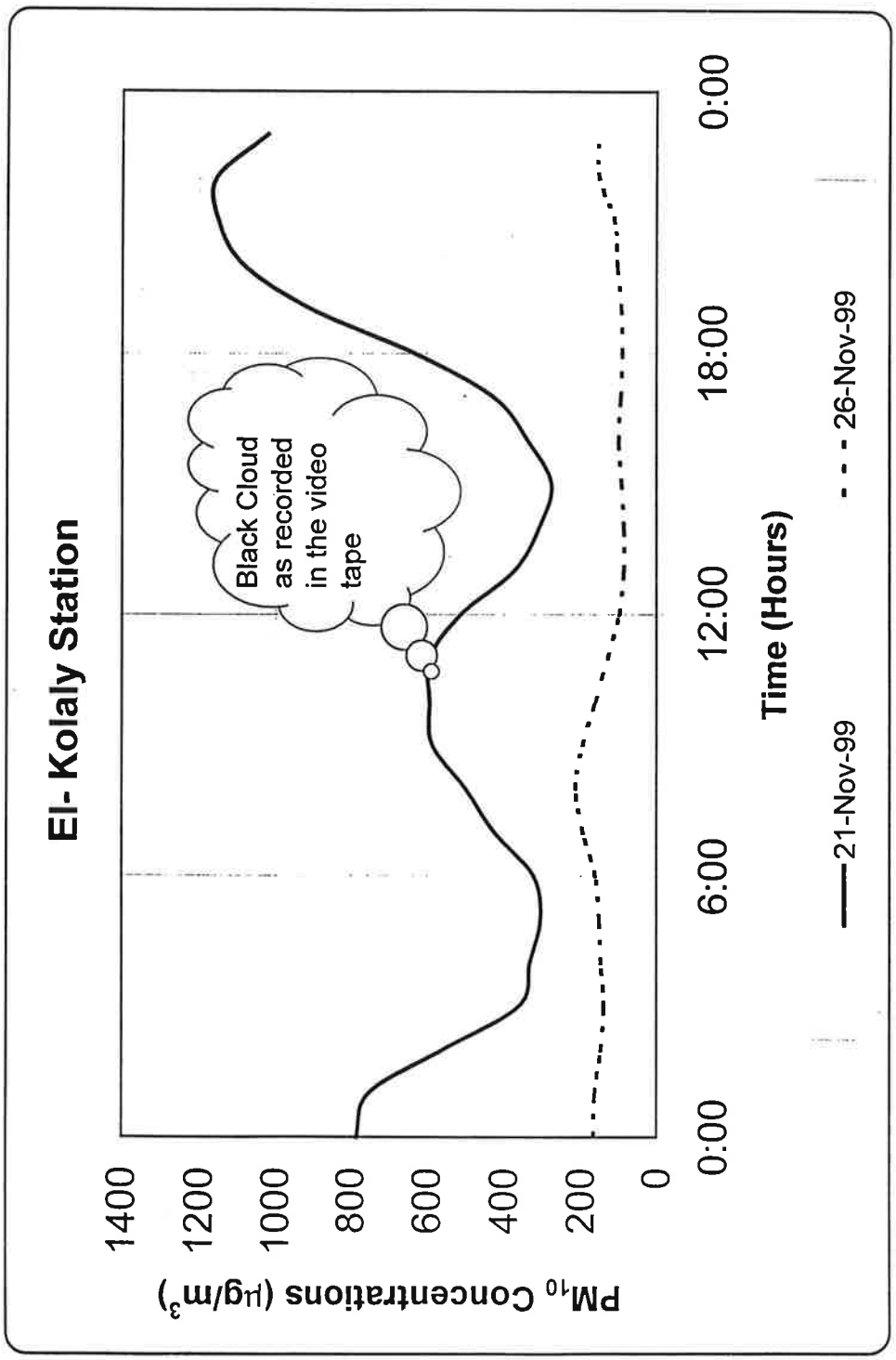
وتفضلوا معاليكم بقبول فائق الاحترام والتقدير

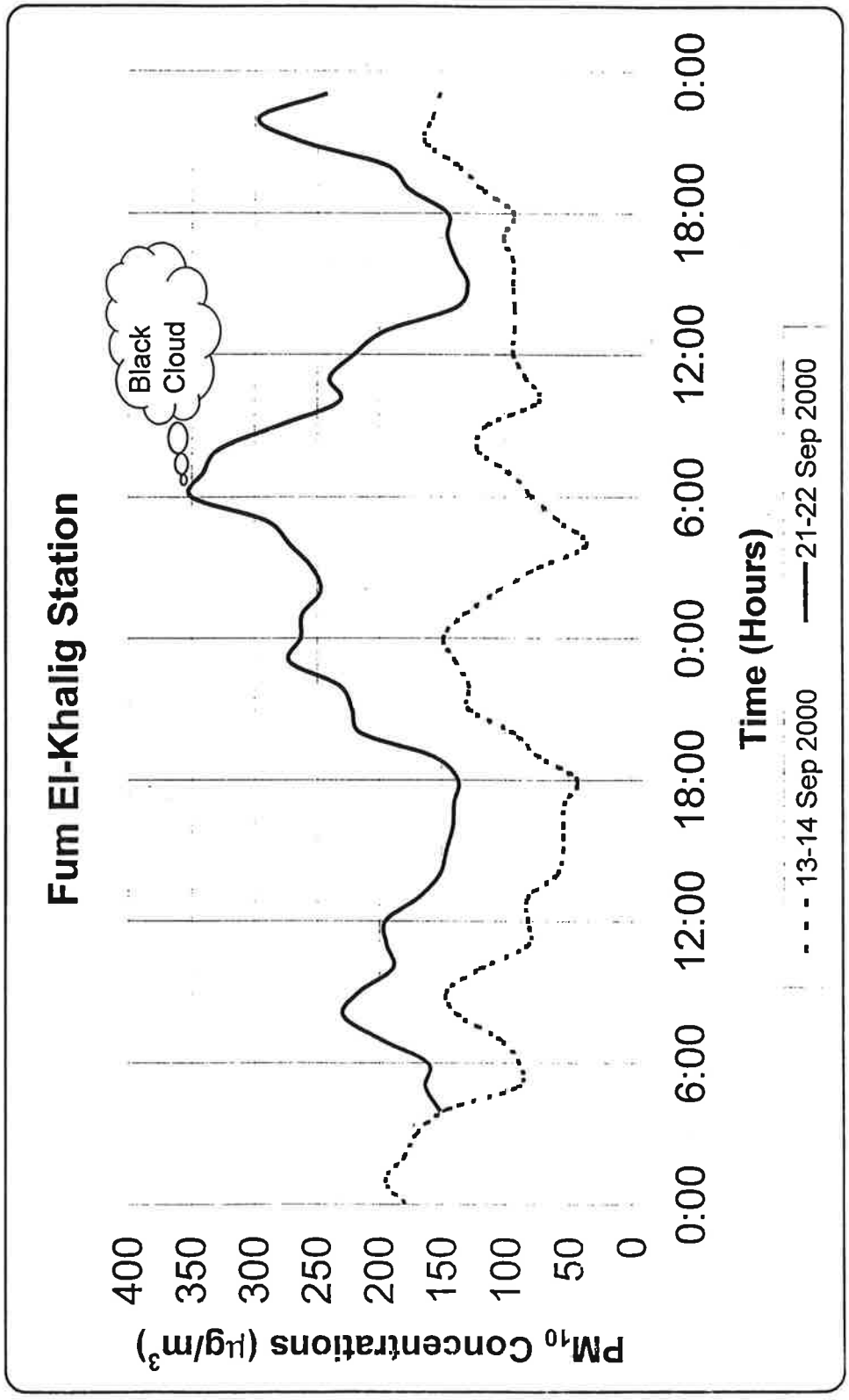
أ.د. يحيي السيد عبد الهادي

مدير مركز الحد من المخاطر البيئية

صورة مبلغه :- أ.د. أحمد جمال رئيس قطاع نوعية البيئة

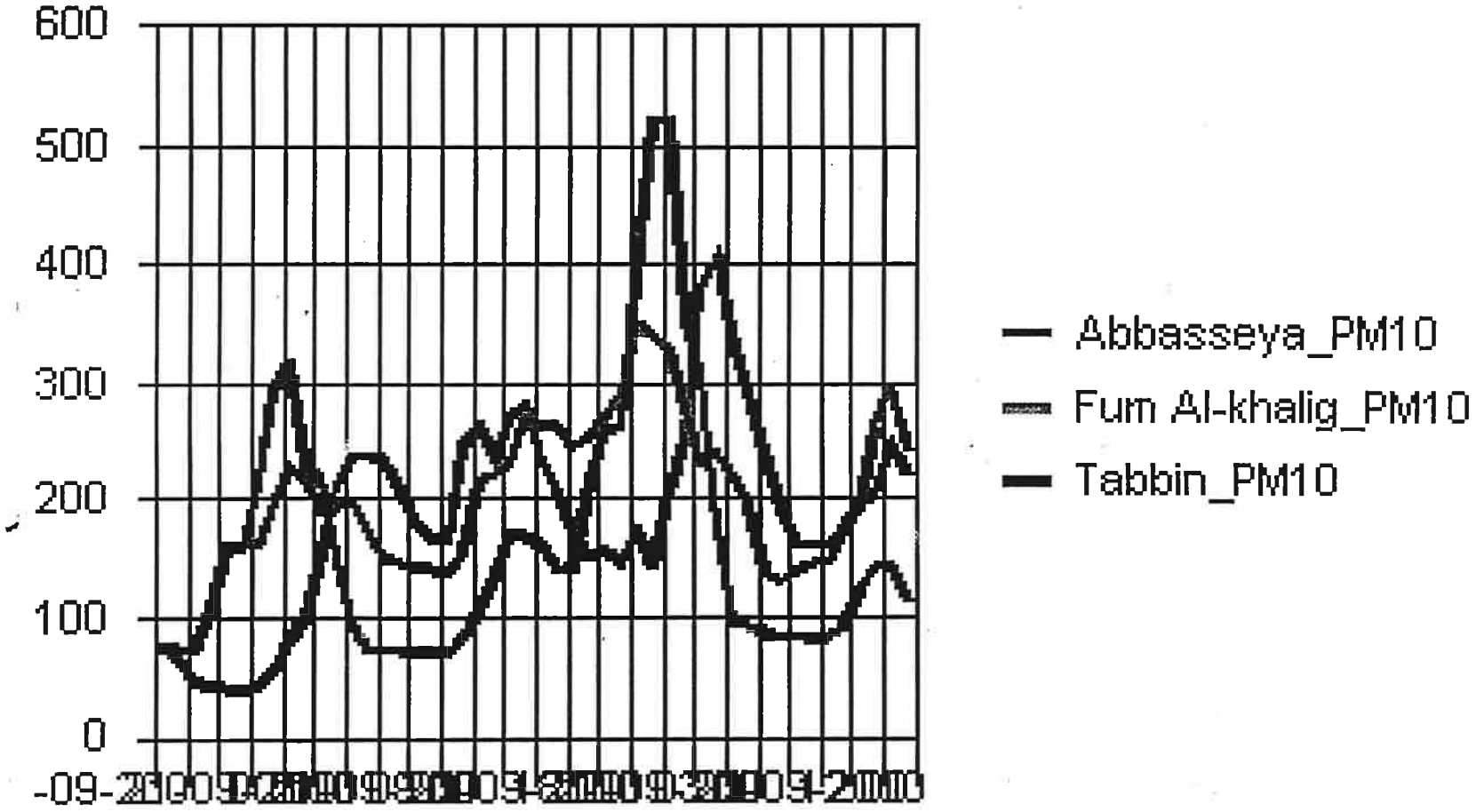
تليفون: ٥٧١٩٦٨٨ (٢٠٢) تليفون/فاكس: ٥٧١٩٦٨٧ (٢٠٢) البريد الألكتروني: tmaear@frcu.eun.eg ص.ب: ٤٥٣ الأورمان - الجيزة - الرقم البريدي: ١٢٦١٢ - ج.م.ع
Tel: (202) 5719688 Tel/Fax: (202) 5719687 E-mail: tmaear-@frcu.eun.eg P.O. Box: 453 Al Orman - Giza - Postal Code: 12612 – Egypt


El- Kolaly Station
Black Cloud as recorded in the video tape
PM10 Concentrations (µg/m3)
1400
1200
1000
800
600
400
200
0
0:00
6:00
12:00
18:00
0:00
Time (Hours)
21-Nov-99
26-Nov-99


Fum El-Khalig Station
Black Cloud
PM10 Concentrations (µg/m3)
400
350
300
250
200
150
100
50
0
0:00
6:00
12:00
18:00
0:00
6:00
12:00
18:00
0:00
Time (Hours)
13-14 Sep 2000
21-22 Sep 2000

	Abbasseya_PM10	Fum Al-khalig_PM10	Tabbin_PM10
21-09-2000 0:00	78	175	76
21-09-2000 1:00	73		66
21-09-2000 2:00	72		49
21-09-2000 3:00	109		42
21-09-2000 4:00	158	152	43
21-09-2000 5:00	160	163	38
21-09-2000 6:00	216	161	45
21-09-2000 7:00	294	199	57
21-09-2000 8:00	321	229	83
21-09-2000 9:00	231	216	99
21-09-2000 10:00	219	189	157
21-09-2000 11:00	151	194	215
21-09-2000 12:00	93	195	236
21-09-2000 13:00	73	168	236
21-09-2000 14:00	72	151	235
21-09-2000 15:00	72	146	211
21-09-2000 16:00	71	141	181
21-09-2000 17:00	70	140	166
21-09-2000 18:00	70	137	165
21-09-2000 19:00	85	156	248
21-09-2000 20:00	107	215	264
21-09-2000 21:00	137	222	236
21-09-2000 22:00	168	232	271
21-09-2000 23:00	168	272	280
22-09-2000 0:00	158	263	230
22-09-2000 1:00	139	262	207
22-09-2000 2:00	143	247	173
22-09-2000 3:00	217	254	151
22-09-2000 4:00	259	272	157
22-09-2000 5:00	263	291	145
22-09-2000 6:00	389	350	173
22-09-2000 7:00	520	341	140
22-09-2000 8:00	520	328	208
22-09-2000 9:00	354	280	253
22-09-2000 10:00	309	232	383
22-09-2000 11:00	175	240	406
22-09-2000 12:00	97	220	344
22-09-2000 13:00	93	195	293
22-09-2000 14:00	87	138	242
22-09-2000 15:00	83	129	194
22-09-2000 16:00	86	138	163
22-09-2000 17:00	80	145	159
22-09-2000 18:00	82	145	159
22-09-2000 19:00	94	176	175
22-09-2000 20:00	123	194	193
22-09-2000 21:00	142	263	204
22-09-2000 22:00	142	297	245
22-09-2000 23:00	116	244	224

Original Values Between 21-Sep-2000 and 22-Sep-2000 11:00:00 PM



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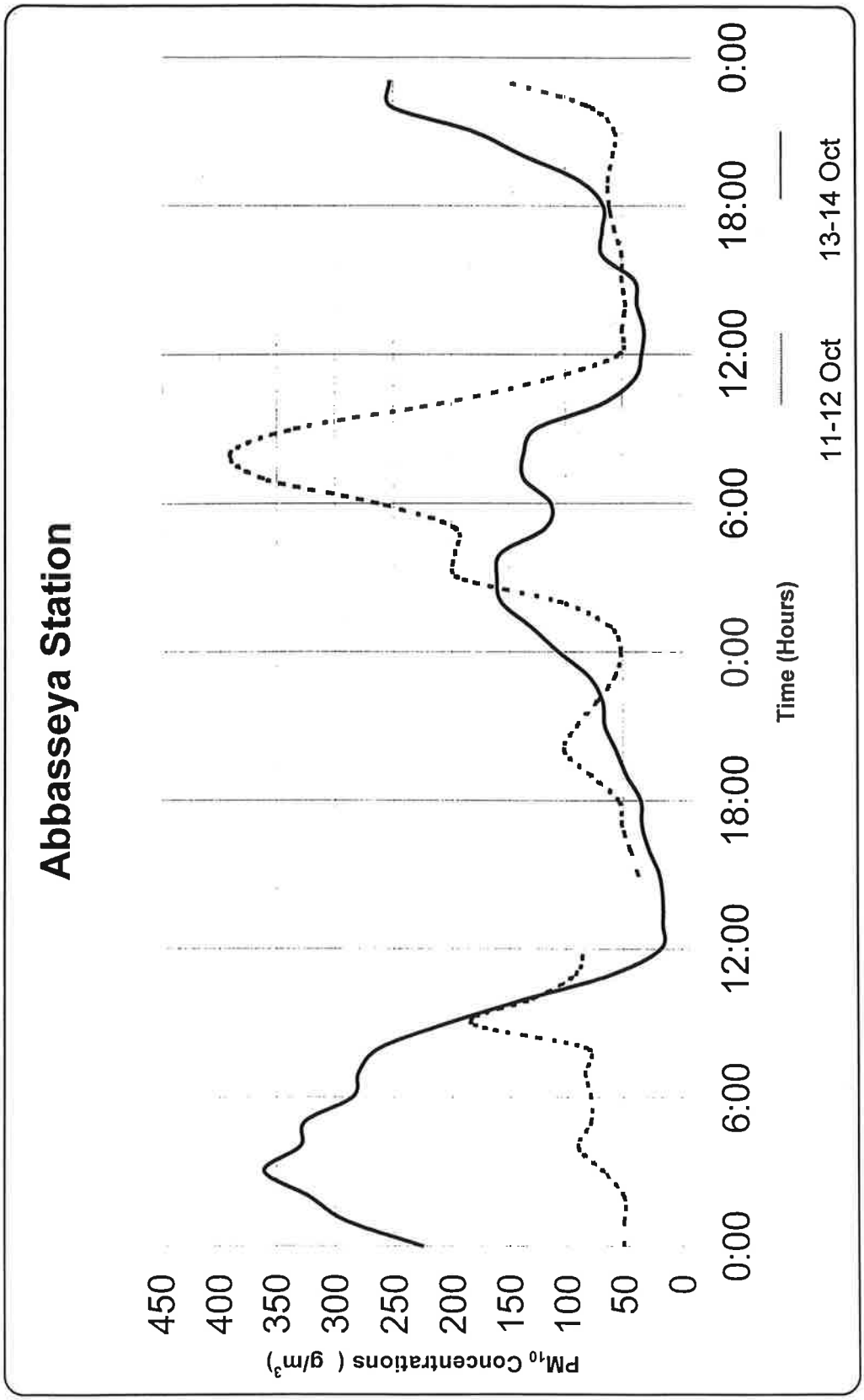
11-10-2000 1:00	50	13-10-2000 1:00	291
11-10-2000 2:00	50	13-10-2000 2:00	323
11-10-2000 3:00	68	13-10-2000 3:00	361
11-10-2000 4:00	90	13-10-2000 4:00	330
11-10-2000 5:00	79	13-10-2000 5:00	326
11-10-2000 6:00	79	13-10-2000 6:00	285
11-10-2000 7:00	84	13-10-2000 7:00	280
11-10-2000 8:00	82	13-10-2000 8:00	262
11-10-2000 9:00	184	13-10-2000 9:00	204
11-10-2000 10:00	130	13-10-2000 10:00	135
11-10-2000 11:00	92	13-10-2000 11:00	59
11-10-2000 12:00	85	13-10-2000 12:00	18
11-10-2000 13:00	0	13-10-2000 13:00	16
11-10-2000 14:00	0	13-10-2000 14:00	16
11-10-2000 15:00	37	13-10-2000 15:00	19
11-10-2000 16:00	44	13-10-2000 16:00	28
11-10-2000 17:00	51	13-10-2000 17:00	34
11-10-2000 18:00	54	13-10-2000 18:00	35
11-10-2000 19:00	78	13-10-2000 19:00	47
11-10-2000 20:00	102	13-10-2000 20:00	56
11-10-2000 21:00	91	13-10-2000 21:00	66
11-10-2000 22:00	73	13-10-2000 22:00	68
11-10-2000 23:00	57	13-10-2000 23:00	80
12-10-2000 0:00	52	14-10-2000 0:00	107
12-10-2000 1:00	61	14-10-2000 1:00	131
12-10-2000 2:00	104	14-10-2000 2:00	157
12-10-2000 3:00	195	14-10-2000 3:00	161
12-10-2000 4:00	197	14-10-2000 4:00	157
12-10-2000 5:00	197	14-10-2000 5:00	118
12-10-2000 6:00	264	14-10-2000 6:00	113
12-10-2000 7:00	362	14-10-2000 7:00	137
12-10-2000 8:00	391	14-10-2000 8:00	137
12-10-2000 9:00	334	14-10-2000 9:00	126
12-10-2000 10:00	211	14-10-2000 10:00	68
12-10-2000 11:00	115	14-10-2000 11:00	39
12-10-2000 12:00	52	14-10-2000 12:00	33
12-10-2000 13:00	50	14-10-2000 13:00	31
12-10-2000 14:00	47	14-10-2000 14:00	37
12-10-2000 15:00	50	14-10-2000 15:00	39
12-10-2000 16:00	50	14-10-2000 16:00	67
12-10-2000 17:00	56	14-10-2000 17:00	67
12-10-2000 18:00	61	14-10-2000 18:00	66
12-10-2000 19:00	62	14-10-2000 19:00	87
12-10-2000 20:00	58	14-10-2000 20:00	136
12-10-2000 21:00	56	14-10-2000 21:00	181
12-10-2000 22:00	78	14-10-2000 22:00	251
12-10-2000 23:00	151	14-10-2000 23:00	253


Abbasseya Station
PM10 Concentrations (g/m3)
450
400
350
300
250
200
150
100
50
0
0:00
6:00
12:00
18:00
0:00
6:00
12:00
18:00
0:00
Time (Hours)
11-12 Oct
13-14 Oct

I.2.6.

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: EEAA
Copy to: JFS, AAE, MF
From Bjarne Sivertsen
Date: 26 October 2000

A sustainable air quality measurement programme for Cairo

Based on a meeting at EEAA on 26 October 2000 between Dr. A Gamal, Dr M Nasrallah, Dr M Labib and Mr B Sivertsen, the following first proposal for a unified air quality monitoring and sampling programme for Cairo may be presented.

The discussions included:

- The objectives
- The indicators
- Sustainability
- Sites and instruments

The objectives

When developing an air quality monitoring programme there are many objectives to consider. In the discussions of a unified EEAA measurement programme for Cairo, we identified the following main objectives:

1. The data should reflect the exposure to the population of greater Cairo, and represent a basis for evaluating health impacts.
2. The data should adequately enable trend analyses and evaluation of changes in air pollution over time.
3. Some of the sites should represent specific source areas, and the data should represent input to statistical or numerical evaluations of the relative importance of different sources.
4. The monitoring system should enable future possibilities for performing impact assessments and optimal abatement strategy planning.

In addition some of the sites should have data available to develop and/or improve the **air pollution forecasting** system ("early warning?") for Cairo. It may even be necessary to evaluate the existing system again and repeat the statistical exercise when more and better quality data are made available.

In general it is my opinion that air pollution forecasts, especially for a complex urban area as Cairo, with sources that are changing in time and space, should be performed using GIS based source oriented numerical dispersion models linked to numerical forecast models. These systems are available.

The fourth objective mentioned above also calls for the development of dispersion models linked to an emission inventory system for Cairo. These tools are also available. The NILU developed AirQUIS system may be one of the more advanced systems available for this purpose.

The indicators

The selected set of environmental indicators is being used by local and regional authorities as a basis for the design of monitoring and surveillance programmes and for reporting the state of the environment.
Air quality indicators should:

- provide a general picture
- be easy to interpret
- respond to changes
- provide international comparisons
- allow development of trend analyses.

To enable a balanced interpretation of the measured data, the results should be compared to international and national air quality limit values, standards or guidelines. The guidelines, as given by for instance the World Health Organisation (WHO), US-EPA or the European Union, and EEAA in Law no. 4, include a selection of basic priority pollutants. These represent the main air pollution indicators, and include usually.

For Cairo measurements performed both by the EIMP programme and by CAIP have demonstrated that ambient concentrations of suspended particles may be the most important parameter to measure. The internationally recognised indicator for suspended dust is particles less that 10 micrometer in diameter (PM_{10}), also referred to as thoracic particles. Experts discuss also to include limit values for PM2,5 . However, presently we will select PM_{10} as our indicator.

The most important indicators in the Cairo air pollution measurement programme will thus be:

- Thoracic particles (PM_{10})_
- Sulphur dioxide (SO2),
- Nitrogen dioxide (NO2) and/or NOx (nitrogen oxides),
- Ozone (O3)
- Carbon monoxide (CO).

In some sites in the greater Cairo area it may be interesting to measure total suspended particulate matter (TSP). Selected filters both for TSP and for PM_{10} may be analysed for lead or other heavy metals. For selected days we may also collect data for hydrocarbons (VOC) to explain possible ozone episodes. Dust fall has been measured as part of the EIMP programme. These data are inexpensive and easy to obtain. Some sites should be kept as indicators for "dirty areas".

The EIMP air quality measurement programme has been designed within limited economic resources available. The measurement sites have been selected to represent different cities, areas and Governerates. The programme has thus not been able to cover all aspects of the air pollution problems in Egypt and in Cairo. For Cairo the EIMP programme has mainly been based on obtaining information about impact to the population.

Some of the indicators selected may in some areas not be fully representative for the type of pollution prevailing in this specific area. The CAIP programme has concentrated on suspended particles and lead in the greater Cairo area. To merge these two programmes may totally represent a better programme for Cairo, but I believe that it will be necessary to look at all indicators and all sites in a unified air quality programme.

Sustainability

The sustainability of keeping a good quality monitoring system running for several years will be a major challenge to EEAA in the future. We have identified a few key challenges that will have to be managed, if the programme of this quality, dimension and complexity will survive more than a few months:

- Training of local experts at all levels
- Profound understanding of QA/QC, and follow up of given procedures!
- Good maintenance of equipment, support training and spareparts!
- A permanent trained staff, ensure that the important experts stay with the programme!
- Sufficient economic support at all levels!
- A good database and presentation system
- Well defined objectives and application goals

From recent meetings with the monitoring institutions (during October 2000), it has become more clear to me than ever that the backbone of the operations of the Air Quality Monitoring programme in the future and at present is the possibility to have a fast and flexible way to obtain the equipment and the resources necessary to operate the measurements.

Only concerning consumables and spareparts there are hinders at all levels:

- Request from the monitoring institutions have to be placed at EEAA ahead of time, before they run out of it.
- The EEAA staff has to react immediately and not delay the process with discussion, modifications, reductions etc.
- The suppliers has to react and/or order from outside immediately after the order has been confirmed,

- Money has to be made available without delay whenever prepayment is requested.

All these barriers have been broken during the last year, and at present the ordering of spareparts and consumables seems to be lacking one year behind normal schedules.
If this remains it will result in a total breakdown of the measurement programme within a few months.

The last point I want to stress to ensure sustainability is the payment of station field operators. The EIMP programme is about to loose experts that have been trained over 3 years, because of limited resources for paying these experts their salaries. These problems have to be looked into and solved!

Sites and instruments

The sites selected for a future air quality measurement programme in Cairo has to meet the objectives. The sites should represent different area types, bearing in mind that the EIMP programme is mainly designed to monitor the impact in areas where people live. For this specific objective we have to ensure that the sites cover area characteristics such as:

- Regional and background areas
- Residential areas,
- Urban city centres,
- Streets and road sides,
- Industrial areas,
-

A total of 18 sites were identified in the greater Cairo area. Not all of them are monitoring sites. We have tried to use the sites already established by CAIP and EIMP as these sites already have all necessary infrastructure such as shelters, electricity, telephone lines, air condition etc.

A few new sites have also been identified to cover the needs for forecasting, better background information and general impact in the Cairo region.

A summary of the proposed sites including site representativity and indicators (instruments) are presented in the Table and in the map. Sites for meteorological data are also indicated. Additional sampling campaigns using passive samplers the VOC samplers or other mobile equipment are not included in the table.

Based on this programme operated by EEAA the following number of instruments will be needed:

- 17 PM_{10} monitors
- 15 SO_2 monitors and/or samplers
- 12 NOx monitors and/or samplers
- 6 Ozone monitors
- 2 CO monitors
- 8 TSP samplers

- 5 Meteorological stations; wind (speed/dir.), temp., net rad., stability, rel. hum.++.)

The PM_{10} monitors may be obtained through CAIP. There are only 4 beta gauge monitors for PM_{10} in the EIMP programme in Cairo, and these have been operated for almost 3 years.
In the EIMP programme in the greater Cairo area there is also:

- 8 SO_2 monitors
- 6 NOx monitors
- 3 Ozone monitors
- 2 CO monitors
- 4 TSP samplers

To develop a complete air quality measurement programme as described, several new instruments have to be procured. There are already 4 meteorological stations in the EIMP programme and at least two in CAIP. The VOC samplers available are also adequate for the sampling needed. All SO2 sites does not necessary require monitors. Some of them could be equipped with sequential samplers, which in Egypt has proven to have the highest data availability. A new generation of sequential samplers for continuous measurements of 24-h average SO2 concentrations is available on the market.

The proposed air quality monitoring and sampling programme proposed for Cairo.

			Indicators								
Site	**Name**	**Type**	**P**	**S**	**N**	**O**	**C**	**T**	**V**	**M**	**Repr.**
New	Qaliobiyya	Background	m	m		m			s	m	1,3,5
New	Teeba language school	Background	m	p	p	m					1,3,5
EIMP-01	Cairo city El Qualaly.	Urban centre	m	m	m			s	s		1,2,3,4,5
EIMP-02	El Gemhoroya street	Street canyon	m	m	m		m		s		1,2,3,
EIMP-03	Abbassyia	Urban / Res.	m	m		m				m	1,2,3,4,5,
EIMP-04	Nasr City	Roadside/Res.	m	s	s						1,2,5
EIMP-05	EEAA Maadi	Residential	m	m	m						1,2,5
EIMP-06	Tabbin	Industrial	m	m	m			s		m	2,3,4
EIMP-07	Tabbin south	Industrial	s	s	s			s	s		1,2,3
EIMP-08	Fum El Khalig	Urban/road	m	m	m	m	m		s		2,4,5
EIMP-11	Giza, Cairo University.	Residential	m	m	m	m				m	1,2,4,5
EIMP-10	Shoubra el Kheima.	Industrial	m	m	m			s	s	m	2,3,4,5
New	Shoubra city.	Urban/res.	m	m	m						1,2,4,
CAIP-22	ElWaily	Industrial	m	m				s			1,2,3,5
CAIP-25	Embaba	Residential	m	m	m			s			1,2,3,4
CAIP-32	Zamalek	Residential	m	m	m	(m)					2,4,5
CAIP-33	Helwan	Residential	m	m	m			s			1,2,3,4
New	AlGiza-Badrahin	Residential	m	m	m	m		s			1,2,4,5

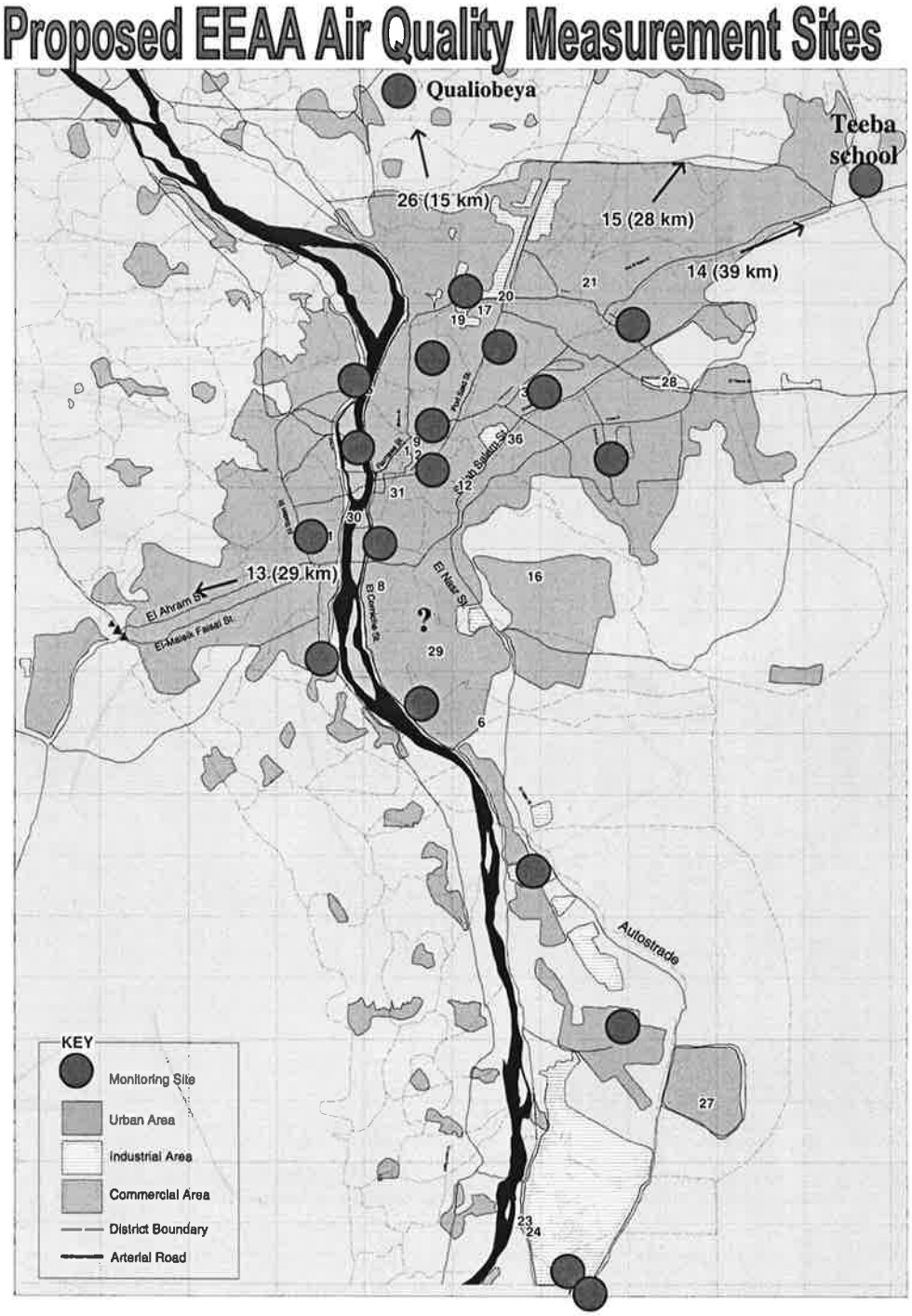
P = particles (PM10)
S = SO2
N = NO2 / NOx
O = ozone
T = total suspended particles
C = carbon monoxide (CO)
V = Volotile organic comp. (VOC)
M = meteorological parameters

m = monitor
s = sampler
p = passive sampler

Representative for:
1 = population exposure
2 = trend analyses
3 = specific sources
4 = impact, strategy planning
5 = forecast, early warning

A combination of monitors and samples will reduce the budget enough to enable the establishment of a GIS based monitoring and reporting system, which will include report generators with all necessary statistics. It may also include an emission inventory system as well as numerical dispersion models for future use.

The proposal is open for discussions. Additional measurement should in the future be related to the basic air quality measurement programme for Cairo undertaken by EEAA, based upon support from monitoring institutions trained and supported to perform the fieldwork.


Proposed EEAA Air Quality Measurement Sites
Qualiobeya
Teeba school
26 (15 km)
15 (28 km)
14 (39 km)
13 (29 km)
El Ahram St
El Nasr St
Autostrade
KEY
Monitoring Site
Urban Area
Industrial Area
Commercial Area
District Boundary
Arterial Road

I.2.7

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: Ahmed Gamal
Copy: JFS, AAE
From Bjarne Sivertsen
Date: 28 October 2000

Ozone data from Ras Mohamed

The EIMP analyses of ozone concentrations at Ras Mohamed has confirmed that this site may be of particular interest to the global tropospheric ozone network, as it has proven representative for the regional Middle East ozone levels. (see the Newsletters presentad by EIMP on tropospheric ozone in Egypt). The analyses of the data, as shown in two newsletters, also shows that the quality of these data are good, and that the data seem to perfectly reflect a background regional station in the area.

The station operators have been told that UNESCO has requested data of ozone from this site. I am also aware of that the Tropospheric ozone Programme operated by WMO (World Meteorological Organization) would be interested in these data. I have been requested by the world database for stratospheric ozone research to consider this site for an ozone profile measurement site. NASA operates this programme with the database located at NILU, Norway.

If EEAA is willing to expose their most important background site, I will supply the relevant references and addresses so that these data can be made available to the international scientific community.

I.2.8

Ozone levels in Egypt

EIMP
Environmental Information& Monitoring Programme

23 October 2000 Newsletter #8, Air Quality, Issue 5

The EEAA/EIMP Air Quality Monitoring Programme

A total of 42 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
- 8 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
- Regional / background

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

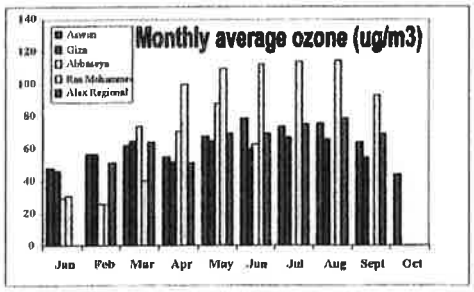
Surface layer ozone concentrations in Egypt

The tropospheric surface layer ozone concentration varies from background areas to the big cities, it varies with the time of the year and time of day and it is modified by various emissions from human activities. The air quality limit values given for Egypt in Law no. 4 from EEAA are exceeded especially during the summer season and at daytime.

The ambient concentrations of tropospheric ozone are measured by the EIMP programme at five sites covering the whole of Egypt. Regional background measurements are undertaken at Ras Mohamed at the southern tip of the Sinai Peninsula. The sites at Cairo University in Giza and at Abbaseya in the north eastern parts of Cairo represent kilometre scale urban areas away from local sources, while the sit at Aswan is located close to the city centre and at a lower latitude.The site in Alexandria is clearly influenced by NOx emissions from traffic in the city. The site seems to be inside the urban boundary layer even if the station is located at the roof of the IGSR building 25 m above the surface.

Ozone measurements at the Sinai background site show a significant annual variation with typical winter averages of about 30 $\mu g/m^3$ and summer averages of around 110 $\mu g/m^3$. The other sites also show annual variations in ozone, but less profound. The typical ranges between winter and summer levels at regional urban sites are from 40 to 80 $\mu g/m^3$.

Diurnal variations in ozone concentrations also depend upon the season and location. The summer season nighttime averages ranges from 30 $\mu g/m^3$ at urban sites to almost 100 $\mu g/m^3$ at the background sites. The highest concentrations are found from mid-day to afternoon, when the background concentrations reach about 140 $\mu g/m^3$ as an average for June, July and August. The highest afternoon concentrations at Giza and Aswan are somewhat less; about 120 $\mu g/m^3$.

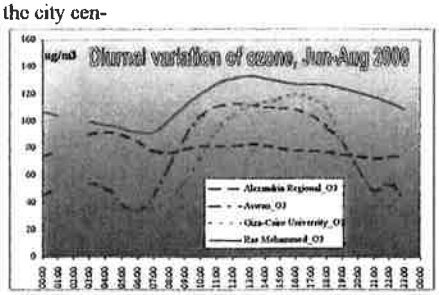


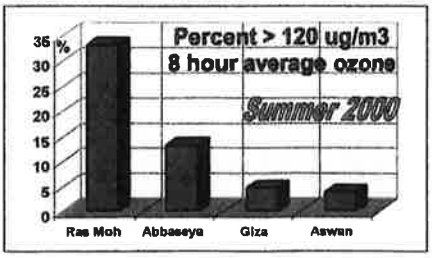
Measurements inside the city centre of Alexandria show a very different diurnal pattern as NOx emissions from traffic in the city being transformed to NO_2 by the use of ozone. Due to the short transport time from the sources to the site, the ozone levels become much lower at this site at day-time.

The air quality limit values given for Egypt in law no. 4 from EEAA are occasionally exceeded. The limit values are 200 $\mu g/m^3$ measured as a one hour average, 120 $\mu g/m^3$ as a 8 hour average.

The one hour average was exceeded less than 1 % of the time at 3 sites.

The 8 hour average limit, however, was exceeded more frequently, as the relatively high ozone concentrations during the summer season seem to last for several hours. At Ras Mohamed the 8 hour average was exceeded during 33.2% of the time, at Abbaseya 13.2 % of the time and at Giza and Aswan about 4 % of the time during 3 summer months 2000.





The EIMP is implemented by the Egyptian Environmental Affairs Agency (EEAA) with support from the Danish International Development Assistance (DANIDA)

Urban Ozone in Egypt

EIMP
Environmental Information& Monitoring Programme

24 October 2000 Newsletter #9, Air Quality, Issue 6

The EEAA/EIMP Air Quality Monitoring Programme

A total of 42 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
- 8 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
- Regional / background

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

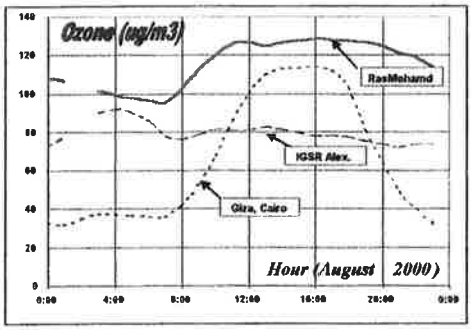
Ozone on urban area

Ozone is created and consumed within the urban areas of Egypt as revealed in the EIMP data from sites such as IGSR in Alexandria and Giza in Cairo. The man made sources of NOx, especially from traffic, will break down the ozone, while the same NOx together with hydrocarbons and sunlight will create ozone on a larger scale. The latter process takes much more time than the NO to NO_2 conversion with ozone. This is the reason why we see large differences in the ozone levels dependent upon the exact location of the measurement site. As long as ozone is available and NO emissions occur from the traffic, large NO_2 concentrations will be found inside the city instead of ozone.

Ambient tropospheric ozone concentrations are modified by the activities inside the urban areas. A typical example from Egypt can be seen from data collected inside the urban boundary layer of Alexandria. Even if this site is placed on top of the IGSR building, about 25 m above the surface, the NOx emissions from traffic along the nearby streets are feeding on the background ozone concentrations and reducing these.

Normally, the highest ozone concentrations are found in the summer season, and from midday until the afternoon. At the background station at Ras Mohamed, a site that is not influenced by local NO emissions, located at the southern tip of Sinai, the nighttime minimum concentration was somewhat less than 100 $\mu g/m^3$ as an average in August 2000. The highest afternoon concentration was about 130 $\mu g/m^3$.

At the urban IGSR site the highest night time concentration, 90 $\mu g/m^3$, almost reached the Ras Mohamed background level, as the air is transported from the Mediterranean Sea without much influence by NOx emissions. During daytime, however, when the vertical mixing over the city as well as the emissions of NOx increase, the ozone level will be reduced and will stabilize at a



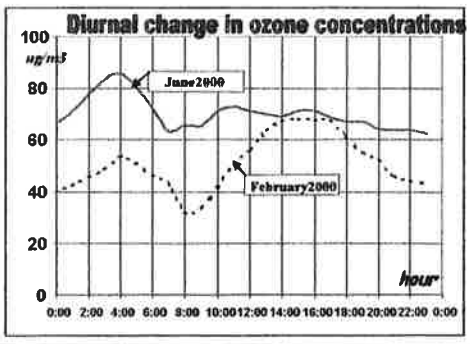
low level of about 80 $\mu g/m^3$. The reason is the fast reactions of NO to NO_2 using the available ozone.

The diurnal pattern here different and from what happens at the regional urban site of Giza in southwestern Cairo. This site reached a very low night time minimum of less than 40 $\mu g/m^3$, because of traffic activities and various human domestic sources creating NOx feeding on the ozone to form NO_2 under a stable inversion layer near the surface.

In the afternoon the measurements at Giza reach high ozone concentrations, averaging more than 110 $\mu g/m^3$, due to formation of ozone in the greater Cairo area due to emissions of NOx and VOC powered or influenced by sun light. These reactions are much slower than the NO to NO2 conversion, and a longer transport and reaction time is needed to see this effect.

In the Alexandria area these reactions may also take place, but the high concentrations will in these cases be found several kilometers south and south east of Alexandria in the Delta.

There is also a large difference in wintertime and summer time variations or levels in Alexandria. This has to be explained by a combination of source strengths, which is largest in the summer season, as there are much more cars in the area at this time, as well as the height and the strength of the urban mixing layer height.



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

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TITLE	PROJECT LEADER
Environmental Information and Monitoring Programme (EIMP). Air Quality Monitoring Component Mission 19 Report	Bjarne Sivertsen NILU PROJECT NO. O-96013
AUTHOR(S) Bjarne Sivertsen	CLASSIFICATION * A CONTRACT REF.

REPORT PREPARED FOR:
COWI/EIMP
EEAA Building, 30 Misr Helwan Street
Maadi, Cairo, Egypt

ABSTRACT
The nineteenth mission to Egypt on the DANIDA EIMP programme included further training monitoring programme auditing, QA/QC procedures and reporting. Monthly and Quarterly air quality data reports were produced and presented. Training in QA/QC operations and reporting was given to the Monitoring Laboratories. Results from evaluations at EEAA were reported in Newsletters. Discussions concerning the future air quality measurement programme for Cairo were reported.

NORWEGIAN TITLE
Overvåkingsprogram for luftkvalitet i Egypt

KEYWORDS		
Air Quality	Monitoring	Training

ABSTRACT (in Norwegian)

* *Classification*
- *A Unclassified (can be ordered from NILU)*
- *B Restricted distribution*
- *C Classified (not to be distributed)*