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Technology and Envi-  
ronment (DOSTE)  
Ho Chi Minh City



**NORAD**

DIREKTORAT FOR  
UTVIKLINGSSAMARBEID  
NORWEGIAN AGENCY FOR  
DEVELOPMENT COOPERATION

Ho Chi Minh City Environmental Improvement Project  
Air Quality Monitoring Component

## **Inception Report, April 2002**



Norwegian Institute for Air Research



Ho Chi Minh City  
Environmental Improvement Project  
Air Quality Monitoring Component



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**Ho Chi Minh City Environmental  
Improvement Project  
Air Quality Monitoring Component  
Inception report, April 2002**

Bjarne Sivertsen, The N. Thanh and Lars R. Hole



## Table of contents

<b>List of Abbreviations</b> .....	<b>5</b>
<b>1 Introduction</b> .....	<b>7</b>
<b>2 Executive Summary</b> .....	<b>8</b>
<b>3 Project Preparation and Start Up</b> .....	<b>10</b>
3.1 Project Start-up .....	10
3.2 Main Activities in the Inception Phase.....	11
3.3 Infrastructure and organisation.....	11
3.3.1 DOSTE organisation .....	11
3.3.2 Project organisation.....	12
3.3.3 Office facilities.....	12
3.4 Other institutions .....	12
3.4.1 Meeting with Schmidt Vietnam .....	12
3.4.2 Visit to CASE.....	13
3.5 Related projects .....	13
3.5.1 SIDA supported emission inventories.....	13
3.5.2 Air Monitoring Project focused on Lead .....	14
<b>4 Status of the project</b> .....	<b>15</b>
4.1 Hold initial meeting with DOSTE .....	15
4.2 Prepare and present kick-off seminar .....	15
4.3 Review existing monitoring programme .....	16
4.3.1 Task 5.3. Assess existing data system.....	16
4.3.2 Task 1.3. Evaluate existing sites .....	16
4.4 Design the updated monitoring programme .....	16
4.5 Procure and install new monitoring stations.....	17
4.6 Assure system integration.....	17
4.6.1 Identify hardware and software needs.....	17
4.6.2 OPSIS/NILU interface .....	18
4.7 Evaluate Quality Assurance and Quality Control (QA/QC) .....	18
4.8 Discuss existing data interpretation and reporting .....	18
4.9 Assess training needs.....	19
4.10 Start capacity building and institutional strengthening .....	19
4.10.1 Kick-off seminar .....	19
4.10.2 Train specialists in Norway .....	20

<b>5</b>	<b>Changes and modifications relative to the project documents .....</b>	<b>21</b>
5.1	Maintenance and repair .....	21
5.2	Dynamic calibrations .....	22
5.3	Reference laboratory .....	22
5.4	Data collection, Enviman update .....	22
5.5	Meteorological data, update and training .....	23
5.6	Dispersion modelling – more training .....	23
5.7	Use passive samplers .....	23
5.8	Audits from NILU .....	24
5.9	Reporting air quality .....	24
<b>6</b>	<b>Project Implementation Plan .....</b>	<b>25</b>
6.1	Work plan .....	25
6.2	Staff Resources .....	26
<b>7</b>	<b>References .....</b>	<b>27</b>
	<b>Appendix A People we met, DOSTE organisation, staff responsibilities</b>	<b>29</b>
	<b>Appendix B Schedules .....</b>	<b>37</b>
	<b>Appendix C Minutes from meetings .....</b>	<b>43</b>

## List of Abbreviations

ADACS	Automatic Data Acquisition System
CASE	Center of Analytical Services and Experimentation, DOSTE – Chemical Laboratory
CEN	European Committee for Standardisation
DANIDA	Danish International Development Assistance
DOSTE	Department of Science, Technology and Environment – HCMC
EDC	Environmental Data Centre
GIS	Geographical Information System
HCMC	Ho Chi Minh City
HEIA	HCMC Environmental Improvement Project, Air Quality Monitoring Component
NILU	Norsk institutt for luftforskning – Norwegian Institute of Air Research
NORAD	Norwegian Agency for Development Cooperation
PIU	Project Implementation Unit
QA	Quality Assurance / Quality Assessment
QC	Quality Control
QR	Quarterly Report
SV	Schmidt Vietnam Co Ltd
TOR	Terms of Reference
UNDP	United Nations Development Program
UNOPS	United Nations Office for Project Services
USAID	United States Agency for International Development



## 1 Introduction

The Inception Phase was undertaken as planned. Three members of the expatriate team spent this period planning, organising, and discussing the project framework and activities with DOSTE.

Technical assistance was provided on establishing new sites for the next 5 air quality monitoring stations in HCMC. Simple analyses of data revealed some errors that will have to be checked. The need for further training of DOSTE personnel was discussed and reported. The procurement of instruments in Norway has started.

This report presents the results from the discussions and conclusions drawn in the inception phase. More detailed background can be found in the Mission 1 report from NILU. (Sivertsen et al., 2002).

Activities undertaken during the Inception Phase include:

- Hold initial meeting with DOSTE
- Prepare and undertake kick-off seminar
- Review existing monitoring programme
- Design the updated monitoring programme
- Procure new monitoring stations
- Assure system integration
- Evaluate Quality Assurance and Quality Control (QA/QC)
- Discuss existing data interpretation and reporting
- Assess training needs
- Start capacity building and institutional strengthening

We would like to thank all the staff of the DOSTE as well as other experts and institutions for their input and assistance during the Inception Period.

Ho Chi Minh City, April 2002.

Bjarne Sivertsen  
Project Manager

The Nguyen Thanh  
IT Manager

Lars R Hole  
Modelling expert

## 2 Executive Summary

Planning activities have taken place involving key persons from DOSTE in order to initiate the activities of the technical assistance to Vietnam. Some of the people we met during the Mission are presented in Appendix A1.

The Project team at DOSTE was identified, and the whole team was involved in meetings and site visits. The team members were:

Name	Affiliation
Doan Thi Toi (DTT)	Head of Environmental Management Division
Le Van Khoa (LVK)	Deputy Director of PIU HEIA Project Manager Counterpart
Nguyen Khac Thanh (NKT)	Project Manager for VIE96-023 (Phase1)
Ngo Thanh Duc (NTD)	Air quality monitoring expert, Instruments, site visits, station operations
Tran Ngoc Thanh (TrNT)	EDC data expert, Data acquisition and GIS expert
Vo Thanh Dam (VTD)	Air quality monitoring expert, Instruments, site visits, station operations, EDC and data
Nguyen Thanh Lam (NTL)	EDC and data expert, Monitoring and site visits
Nguyen Bao Quoc (NBQ)	Air quality monitoring expert, Instruments, site visits, station operations
Nguyen Thi Tuyet Hoa (NTTH)	Director Assistance of PIU

The project team at DOSTE

A detailed description of the team tasks and obligations identified during Phase 1 are presented in Appendix A2.

Site visits were paid to the existing 4 sites established by the Danida funded project (Phase 1) Description of the visits and conclusions are presented in the Mission 1 report Chapter 1.2.

Site visits to existing sites

Kick-off seminar	<p>The proposed seminar programme was presented. A total number of 20 participants were invited to the seminar. Schedules, a list of participants and the material delivered to the participants is presented in Chapter 11 and in Appendix K of the Mission report.</p>
Review existing network	<p>The presentations have also been issued as a NILU report (Sivertsen and Thanh, 2002). The DANIDA supported programme has developed 4 monitoring station in HCMC. These stations have been installed during the year 2000 and training of personnel at DOSTE has been undertaken. These existing air quality monitoring stations were visited on 9 and 10 April 2002. Reports from these site visits are presented in Appendix A2 of the Mission report.</p>
Design new sites	<p>Site studies for identifying the new 5 stations for air quality monitoring supported by NORAD, were performed on 17 to 19 April 2002. DOSTE experts participated in all site studies. Reports from each of the sites are presented in Appendix B 1 of the Mission report. Ten potential sites were visited and reported. Five out of these were selected as first priority. The conclusions drawn in the Mission reports were discussed with DOSTE experts.</p>
Procure instruments	<p>Procurement of new instruments, software and hardware as well as new shelters started in January at NILU. Bids have been evaluated and orders were placed at the end of February. Installations will start at NILU in may 2002.</p>
Assure system integration	<p>The new stations will be integrated in the existing data collection system delivered by OPSIS. The Enviman ComVisioner will be used as the data acquisition system also for the monitors delivered by NILU. As part of the preparation of the interface between the OPSIS system and the NILU developed AirQUIS, NILU collected input data, which are brought back to NILU to be imported into the AirQUIS system.</p>
QA/QC evaluated	<p>The existing Quality Assurance system was evaluated. Presentations and discussions at the DOSTE Environmental Data Centre gave valuable input to the final design of the future QA/QC system. Meetings with Schmidt Vietnam revealed the calibration and reference lab functions as established during Phase 1.</p>
Data collected	<p>Data and information was collected on air quality (one year of data taken to NILU), emissions, population distributions and population density, traffic density and traffic prognoses. Several international projects are performing studies that could be used as input to the HEIA project, as part of the data preparation, for the assessment and air quality management phase.</p>
Capacity Building Assess training needs	<p>A training needs assessment document has been prepared on request from UNOPS. This document is presented in Appendix K1 in the Mission 1 report. In summary training needs have been identified both for operations and maintenance of instruments, for data retrieval and controls as well as for understanding air pollution and performing air quality assessment and planning.</p>

## 3 Project Preparation and Start Up

### 3.1 Project Start-up

The contract between The Department of Science, Technology and Environment (DOSTE) and The Norwegian Institute for Air Research (NILU) was signed in Kjeller, Norway on 21 December 2001.

Two project meetings have been held at NILU to plan the procurement phase and to design the kick-off seminar. Planning of the first visit to HCMC, Mission 1 was also part of these meetings. Minutes from these meetings are presented in Appendix C.

The first Mission to HCMC was undertaken from 5 April to 26 April 2002. The expatriate experts who participated in this mission were:

- Bjarne Sivertsen (Project Manager)
- The Nguyen Thanh (IT manager)
- Lars R Hole (Modelling expert)

The project logo for the project has been designed at NILU and was based on the project title; **Ho Chi Minh City Environmental Improvement Project, Air Quality Monitoring Component (HEIA)**. The HEIA logo was presented at the first meeting with the DOSTE staff. The logo was accepted as presented by NILU. The logo will be used from now on for all future documentation.

During the inception mission the project manager counterpart was identified to be Dr. Le Van Khoa. Daily morning meetings between the project manager and the DOSTE appointed counterpart was agreed upon and held every day during the mission.

The consultant team has worked with the DOSTE staff on preparing a detailed schedule for the inception activities. The schedule was in agreement with the list of activities presented in Chapter 1.

A schedule of consultant missions and project events in the coming months has been established. A detailed list of activities during the mission was also presented and agreed upon.

## 3.2 Main Activities in the Inception Phase

Tasks originally planned for this phase of the project were:

- Hold initial meeting with DOSTE
- Prepare and undertake kick-off seminar
- Review existing monitoring programme
- Design the updated monitoring programme
- Procure new monitoring stations
- Assure system integration
- Evaluate Quality Assurance and Quality Control (QA/QC)
- Discuss existing data interpretation and reporting
- Assess training needs
- Start capacity building and institutional strengthening

Detailed descriptions of the tasks as well as status reports are presented in the Mission 1 report. (Sivertsen et al., 2002)

## 3.3 Infrastructure and organisation

### 3.3.1 DOSTE organisation

The DOSTE organisation is presented in Appendix A2. DOSTE is directly under the People's Committee of Ho Chi Minh City.

The Project responsible will be the HCMC People's Committee. A Project Management Unit (PMU) has been established for the Project funded by the Asian Development Bank and will be headed by a senior level director. The PMU will be responsible for the overall co-ordination and management of all Project activities.

The Executing Agency for the **Air Quality Monitoring** component of the Project is Department of Science, Technology and Environment (DOSTE). Project Implementing Unit (PIU) has been established in DOSTE, and this will co-ordinate and manage all activities required for the daily implementation and management of the components, while reporting and maintaining continuous contact with the PMU. The PIU will be responsible for the administration and supervision of the implementation of the Air Quality Monitoring component.

DOSTE mandate is mainly in monitoring, inspection and enforcement. DOSTE's workforce consists of 239 persons and is headed by a Director with two Deputy Directors. The attached organisational chart (Appendix A2) shows the various divisions within DOSTE. Within DOSTE the Environmental Management Division has the mandate for this area of work, and has 1 Manager, 2 Dep. Managers and a staff of 15 total. The Environmental Quality Monitoring section is involved in the current air and water quality monitoring in the city.

### 3.3.2 Project organisation

The project will be undertaken in close co-operation between NILU, and DOSTE. The Project Manager Bjarne Sivertsen, NILU will be responsible for co-ordinating the Norwegian and international team of experts, and assure the project progress and results. Le Van Khoa will be the Project Manager counterpart and head the DOSTE team as described in Chapter 2.

The NILU staff proposed to cover the assignments related to the tasks and obligations described in the Work Plan are listed below:

Project manager	Bjarne Sivertsen (BS)
Instrumentation expert, procurement	Leif Marsteen (LM)
IT Manager, AirQUIS platform	The Nguyen Thanh(TNT)
AirQUIS installations and training	Herdis Laupsa (HeL)
Instrument installations	Rolf Dreiem (RD)
Abatement strategy and planning	Steinar Larssen (StL)

Administration of the team, organising and responsible for reporting will be the Project Manager and locally in Ho Chi Minh City the Project Manager Counterpart.

### 3.3.3 Office facilities

A nice office with 3 office places was offered to the NILU team already from the first day. The office has been prepared in co-operation with the NORAD funded Waste Management project.

The office was equipped with shelves, 3 desks a computer and printer.

## 3.4 Other institutions

### 3.4.1 Meeting with Schmidt Vietnam

Schmidt Vietnam (SV) had been appointed candidates for the Reference Laboratory in the original project documents. However, during the meeting it was clear that the experience that SV had would not be adequate to presently serve as a reference laboratory. The plans were therefore slightly changed. SV can, as an instrument supplier for API instruments in Vietnam, support DOSTE in obtaining spare parts when needed.

SV is already performing installations and warranty performance for the Project INT/95/R11 UNOPS in HCMC, and shall carry out service and maintenance for the equipment supplied under the contract. The warranty period for the 4 stations installed in HCMC by the Danish experts in phase 1 will be terminated in April 2003.

For the NORAD supported system to be installed by NILU, we have signed an agreement (Confirmation form) for a warranty period of one year including spare parts and work free of charge from SV.

The experts we met at Schmidt Vietnam were:

Name	Position
Mrs. Hoang Bach Duong . Mr. Phan Truong Son, Mr. Dinh Ngoc Hung, Mr. Dang Ngoc Khang,	(Chief representative in HCMC), (SV Hanoi office), Technical expert Technical expert

### 3.4.2 Visit to CASE

A visit was paid to the Centre of Analytical Services and Experimentation (CASE) where chemical analyses for DOSTE are being carried out. The laboratory is certified ISO 9002 by AFAQ and is associated with Central Analytical Services (CNRS France) and Group of Laboratories Wolff. The CASE laboratory was responsible for the analyses of filters from the Andersen high volume sampler at DOSTE; gravimetric as well as lead analyses. They had also been trained in Denmark to undertake analyses of passive samplers for NO<sub>2</sub>, SO<sub>2</sub> and BTX.

The laboratory seemed well equipped and had 80 employees working with chemical analyses of water, food, sediments and air samples. They are analysing NO<sub>2</sub> samples with spectra photometry and SO<sub>2</sub> with Ion chromatography. The laboratories seemed well equipped with instruments, especially for organic analyses.

## 3.5 Related projects

### 3.5.1 SIDA supported emission inventories

The Asian Regional Research Programme in Energy, Environment and Climate (ARRPEEC) is funded by the Swedish International Development Cooperation Agency (SIDA) and co-ordinated by the Asian Institute of Technology (AIT). It is organised as a regional network involving a number of national institutions from several nation in East, Southeast and South Asia. The first phase of ARRPEC ran from 1995 to 1998.

The project included performing emission inventories, mainly aimed at estimating the emissions of greenhouse gases in Southeast Asia.

Three of the projects undertaken are:

- Mitigating environmental emissions from the power sector: Analyses of technical and policy options in selected Asian countries.
- Analyses of technical options for mitigating environmental emissions from urban transport systems in selected Asian countries

- Biomass energy In Asia: a study on selected technologies and policy options.

The emission inventory techniques introduced to experts also in Vietnam (DOSTE) could be used to generate emission of other pollutants also. These possibilities will have to be investigated in more details.

### **3.5.2 Air Monitoring Project focused on Lead**

To quantify the impact of the lead phase out initiative in Vietnam, the California Air Resources Board, EPA and other key players is providing technical assistance to help officials from Ho Chi Minh City's Department of Science, Technology and Environment (HCMC DOSTE) and the Centre for Analysis, Standards and Experiments (CASE) collect, analyse and interpret ambient lead samples.

This effort will build upon DOSTE's new air monitoring program. DOSTE received financial assistance and general technical training from the United Nations Development Program and from DANIDA, the Danish aid agency, to launch an air-monitoring program. DOSTE will use the Centre as the laboratory to analyse the air samples.

In November 2001, project staff conducted a 3-day training class on "Air Quality Management" for a group of technical staff from DOSTE and CASE. The group also visited Hanoi for 3 days to meet with officials from the Ministry of Science, Technology, and Environment (MOSTE), and Hanoi's DOSTE. The purpose of the visit is to enhance the project staff's understanding on the framework of Vietnam environmental policy and project coordination between national, provincial, and local levels of government.

A contact person for this EPA's cooperative air quality programs with Vietnam is: Sylvia Correa, U.S. EPA, Office of International Affairs (2670R), 1200 Pennsylvania Ave., NW, Washington, DC 20460.

## **4 Status of the project**

The work undertaken during Mission 1 has been described in details in the Mission 1 report. (Sivertsen et. al. 2002).

### **4.1 Hold initial meeting with DOSTE**

An initial meeting was held with the whole DOISTE project team on 8 April 2002. The proposed working agenda during the NILU Mission 1 to HCMC and a draft of the main issues for the coming seminar 15 – 16 April 2002 were handed out by NILU and discussed.

Other items discussed were the project logo, the project tasks and responsibilities as well as the status of the existing air quality monitoring programme.

DOSTE expressed needs for upgrading and much more training than already given. They also stressed the importance of air quality management as a result of the application of the monitoring programme. Crucial parts of the measurements, such as meteorological data, do not function and will have to be checked and followed up by more training.

The DOSTE air quality experts at the Environmental Data Centre (EDC) had a short presentation of the ENVIMAN ComVisioner for data retrieval purpose. The computer is out-dated and will have to be changed during the NORAD supported NILU project. This will be taken up during the project, as it was not originally part of the plans.

### **4.2 Prepare and present kick-off seminar**

The kick-off seminar presenting the main tasks and content of the NORAD funded project was held on 15-16 April 2002 at DOSTE. Participants were also invited from institutions outside DOSTE, and 20 experts participated in the seminar.

The presentations represented an introduction to a modern air quality monitoring and management system. All the different elements included in the development prepared by NILU and funded by NORAD were covered in the

seminar. The programme schedules and list of participants are presented in Mission 1 report, Appendix K 1a-b.

The presentations have also been presented in a separate report (Sivertsen and Thanh, 2002).

### **4.3 Review existing monitoring programme**

#### **4.3.1 Task 5.3. Assess existing data system**

The existing data systems were discussed with the data centre experts. An assessment showed that at least one computer would have to be upgraded.

We also discussed the most optimal way of purchasing new IT-equipment. Local dealers were visited and prices, brand, availability, delivery, warranty and support were evaluated.

Our common conclusion for the moment is to purchase new IT-equipment locally based on the good feedback from DOSTE experts regarding maintenance and repair service. The local PCs must, however, apply to the well-known international PC standards.

#### **4.3.2 Task 1.3. Evaluate existing sites**

Site visits to the existing air quality monitoring stations were paid on 9 and 10 April 2002. Reports from these site visits are presented in Chapter 1.3 and Appendix A2 of the Mission report.

In general the 4 sites instrumented in Phase 1 of the project seem to be well distributed. Some questions concerning representativeness have been raised, but the limitation given by permissions and security we will have to accept the best possible locations.

The measurements of meteorological data undertaken along a 30 m tower at DOSTE was investigated, and found inadequate. DOSTE experts have not received training in controlling, applying or improving the quality of these data. Errors were identified on the wind direction records and on the radiation data. These data will have to be upgraded.

### **4.4 Design the updated monitoring programme**

Field studies were performed to find new sites for air pollution measurements in HCMC. The studies were based on the location of sites decided from the first phase of the project, supported by DANIDA. Several objectives were considered as presented in Chapter 2.1 of the Mission report.

Five new sites have been presented as the first priority sites out of about 12 alternatives considered. These sites are:

- District 9, Truong Thanh, (Background station)
- District 12, IT park, (Residential/urban background)
- District 2 People Committee building (Residential/urban bgr.)
- Thong Nhat Hospital (Roadside), Quan Tan Binh district.
- Binh Chanh Educational Office, (Roadside), Huyen Hoc Mon.

The sites and parameters to be measured is presented in the following table:

Site	NOx	SO <sub>2</sub>	O <sub>3</sub>	CO	PM10	VOC	Site
Truong Thanh	1		1		1		Background.
IT park	1	1	1		1		Urban bg.
District 2 PC	1	1	1		1		Res/urb bg.
Thong Nhat hospital	1	1		1	1	1	Road side
Binh Chanh Educ.	1			1	1	1	Road side
<b>Total instruments</b>	<b>5</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>5</b>	<b>2</b>	

## 4.5 Procure and install new monitoring stations

The procurement phase started at NILU in February 2002. Industriell Måleteknikk (IM) has presented their last bid after discussions with NILU experts. The final agreement with IM has been verified. API provides spare parts for the first year. API will run a training course for DOSTE and Schmidt Vietnam on maintenance and repair. Our instrument expert will also be prepared to train DOSTE in repair operations

## 4.6 Assure system integration

### 4.6.1 Identify hardware and software needs

The needs for hardware and software to be supported by the NORAD funded project was identified. The Project Documents have already indicated that a computer training room in the project office should be established early in the project.

We will use the Environmental Data Centre (EDC) for this purpose. This will facilitate the centralised training sessions on air quality management computer techniques and modelling software. New PCs will be transferred to the EDC centre providing that there will be room enough. The central AirQUIS server will have to be located outside this room because the EDC Centre is also used as a large office for DOSTE team. A server will produce noise that may be disturbing for the people in EDC. The DOSTE experts already indicated a solution.

#### **4.6.2 OPSIS/NILU interface**

As part of the preparation of the interface between the OPSIS system and AirQUIS NILU we have collected monitoring data from 2001. These data will be imported into the AirQUIS system. More details on this can be found in the Mission report, Appendix F3.

For NILU installations and AirQUIS application new computers will be necessary. The development of the interface between OPSIS and AirQUIS could also include a common NILU/OPSIS mission to DOSTE. This was proposed as part of the additional training and upgrading programme presented to UNOPS. (See Mission 1 report, Appendix K1.

A new PC will be purchased for the additional monitoring system. The Enviman data retrieval system will be re-installed on the new computers and interfaces between Enviman ComVisioner and AirQUIS will be prepared. AirQUIS will then in the future be the basis for the air quality management system. As part of the installation of this new PC a joint training mission of NILU experts and OPSIS will be adequate.

#### **4.7 Evaluate Quality Assurance and Quality Control (QA/QC)**

The existing Quality Assurance system was evaluated. Presentations and discussions at the DOSTE EDC Centre gave valuable input to the final design of the future QA/QC system. Meetings with Schmidt Vietnam revealed the functions concerning calibrations and reference lab functions as presented in Mission 1 report. There will be a slight change in the use of a reference laboratory as indicated in Chapter 3.2.1.

We had originally planned to use Schmidt Vietnam as a reference laboratory. However, after meetings and discussions (See Mission 1 report, Appendix E1b) we have realised that SV does not have the experience and the laboratory to undertake these functions in HCMC. During the warranty period, however, SV will serve as the instrument supplier for API monitors, which they actually are.

The Danish experts had already prepared several SOPs during Phase 1, and these are presently being used by DOSTE. The procedures will be discussed with NILU experts on QA/QC. This will form the basis for further improvement of the SOPs.

#### **4.8 Discuss existing data interpretation and reporting**

Data interpretations and reporting has been very limited so far, based on a monthly reporting scheme prepared by Danish experts. This monthly report should be followed up and continued. However, we believe that the data

collected could be used to a much larger extent for explanations and for planning purposes. For this reason it will be necessary to repair and upgrade the meteorological data as soon as possible.

As part of the training one of the future workshops will be dedicated to “Understanding air pollution”. Data interpretation by use of combined air quality, meteorology and source information will be the basis for the information to be prepared. From statistical analyses and use of simple models it may be possible to establish the basis for improving air quality when necessary.

#### **4.9 Assess training needs**

NILU was requested by UNOPS as part of Mission 1 to HCMC to evaluate and assess the training needs by the institutions involved in air pollution monitoring and air quality management. This report briefly answers to the questions raised in the Terms of Reference given by UNOPS.

The aim of the training programme given as part of the establishment of an air quality monitoring and management system for HCMC is to enable DOSTE's staff to properly operate and maintain the instruments and equipment for air monitoring in HCMC, making the air quality monitoring sustainable and to perform an adequate air quality assessment as well as to undertake air quality management and planning.

A specific report was presented based on discussions with DOSTE personnel and local experts. The report can be found in Mission 1 report, Appendix K1.

Hands-on training will be provided for using the database programmes and applying the air quality dispersion models. Additionally, introduction to modelling will be given both at NILU in workshops and in HCMC in a seminar and as hands-on training. Additional training in air quality monitoring techniques including calibrations, maintenance and repair has been indicated as part of the additional training supported by UNOPS.

#### **4.10 Start capacity building and institutional strengthening**

Capacity building started during Mission 1 though the 3-day seminar given on air quality monitoring and assessment. Discussions concerning data retrieval and data reporting will also be considered as part of the hands-on training.

##### **4.10.1 Kick-off seminar**

A kick-off seminar was prepared and held at DOSTE during Mission 1. The seminar represented an introduction to the air quality monitoring and man-

agement programme that will be established for DOSTE in Ho Chi Minh City. Programme schedules and list of participants are presented in Mission 1 report, Appendix K 1a-b.

A separate presentation of the seminar slides has been prepared as a NILU document (Sivertsen and Thanh, 2002).

#### **4.10.2 Train specialists in Norway**

The project also includes a study tour to Norway. This visit was discussed with DOSTE during mission 1, and it was decided that the schedules indicated in the UNOPS document on training follow-up (Appendix K1, Mission 1 report) would be the basis for future training.

An intensive two-week training session in the application of the GIS based AirQUIS planning tool will be given at NILU in May 2003 as requested by DOSTE. The use of AirQUIS as an air quality management system including impact assessment and abatement strategy planning are important elements in the training in Norway. Two selected experts from DOSTE were originally appointed to participate in this training. DOSTE requested during Mission 1 that they wanted to send one additional expert to NILU for the purpose of training in the use of air pollution dispersion models. DOSTE have no experience in this field and again we have to stress that the original time for air quality data assessment and planning has been far too modest.

## **5 Changes and modifications relative to the project documents**

A few changes will have to be implemented during the project compared to the original project documents and plans. These changes will assure that the project objectives are met.

A large part of these changes are related to training. This is also an important part of NILU tasks in the NORAD funded project. However, it has been stressed several times from DOSTE that they believe the time set aside for training from NILU experts is far too short. NILU also agrees in this statement and the matter was an important part of the contract negotiations in December 2001. However, we did not manage to change the ratio of instrument to planning input.

In the following chapters we have briefly discussed the changes that have been discussed for the NORAD supported part of the project. Some of these changes may also be supported by UNOPS.

### **5.1 Maintenance and repair**

It was stressed in the discussions with DOSTE that the shared responsibilities between DOSTE and Schmidt Vietnam (SV) did NOT function properly. In the meetings with Schmidt Vietnam we were presented to a small group of experts, who did not have any long experience in operating air monitors. We have found out that SV is NOT the expert reference laboratory that we thought.

We have thus accepted that DOSTE will receive more training in maintenance and repair of their own instruments. This training will be given by the instrument providers as well as by NILU. A repair and calibration workshop will be established at DOSTE. This workshop will also be used to storage of spare parts. Transfer of knowledge and equipment to DOSTE will increase the uptime of instruments compared to the present situation.

## 5.2 Dynamic calibrations

The yearly linearity check as recommended by and the yearly overhaul as recommended by NILU should be combined and performed at the same time in a laboratory, which will be established at DOSTE. The linearity check requires a complete dilution/calibration unit.

Since DOSTE has a calibrator (Model 700 API) they should do their own dynamic calibrations. The calibrator must have the possibility of letting the operator specify the mixing ratio (output concentration). In addition calibration gases (about 100 ppm NO/ SO<sub>2</sub>, 5000 ppm CO) and a zero air generator is necessary.

Training in performing dynamic calibrations will be given by the NILU instrument experts after installation of the equipment in HCMC.

## 5.3 Reference laboratory

A reference laboratory, which has been indicated in the project documents, might have to be found in the future. However, we do not believe that SV presently is the right institution for this.

We have thus proposed that the calibrator that DOSTE have received will be placed in a repair and calibration room at DOSTE. Annual instrument maintenance and calibrations will thus be undertaken by DOSTE from this laboratory. This will require training, which will be given by the instrument suppliers and by NILU experts.

## 5.4 Data collection, Enviman update

The DOSTE EDC staff undertakes data retrieval using the Enviman software. Instrumatic/OPSSIS installed and supported this software.

The DOSTE experts expressed a need for more training covering installation and configuration of the OPSSIS EnviMan ComVisioner system. The existing documentations are not enough to undertake necessary re-installations and modifications.

DOSTE experts informed also that the PC at the computer centre is 2 years old and hard ware failures are occurring. We have thus proposed that a new PC should be purchased as soon as possible as part of the NORAD funded project. New computers will also be installed as server and clients for the AirQUIS air quality management system in the existing network at DOSTE.

As part of the installation of this new PC a joint training mission of NILU experts and OPSSIS will be adequate. Presently this is proposed for September 2002.

## **5.5 Meteorological data, update and training**

During the Mission 1 visit to HCMC the meteorological tower measurements did not function. The malfunctions have to be corrected, recalibrations of the parameters have to be undertaken by the providers of these instruments, and the DOSTE team need training in the operation and presentation as well as application of the meteorological data, which are important for explaining air quality.

UNOPS has been requested to support this task. As of June 2002 negotiations are still in progress. Instrumatic AS in Denmark will have to take the responsibility for this task supported by OPSIS and NILU.

## **5.6 Dispersion modelling – more training**

DOSTE requested during Mission 1 that they wanted to send one additional expert to NILU for the purpose of training in the use of air pollution dispersion models. DOSTE have no experience in this field and again we have to stress that the original time for air quality data assessment and planning has been far too modest.

We will on request propose that the training period for DOSTE in the use of air quality data for planning purposes is extended by five man-weeks in HCMC. The training will be hand-on working together with the DOSTE experts in collecting input data, preparing meteorological data and performing modelling for planning purposes. The hand-on training will be undertaken over two separate periods. This work will start after March 2003.

NORAD will have to be requested to support this additional training programme.

## **5.7 Use passive samplers**

During the meetings with DOSTE it was proposed that simple inexpensive passive samplers should be used to identify the representativeness of the new sites selected in HCMC.

NILU agreed that this would verify the validity of the measurements undertaken at the fixed locations, and that spatial gradients could be a valuable input also in verifying dispersion models. These models will have to be used for planning purposes in the future.

Passive samplers will be brought to HCMC during future missions. Analyses will be carried out both at NILU and at the CASE laboratories. In this way it will also be possible to evaluate the quality of local analyses performed at CASE.

## 5.8 Audits from NILU

As presented above, the reference laboratory will NOT presently be established outside DOSTE. It may therefore be necessary to undertake external audits to the monitoring system from outside. During the 3-year project NILU has already planned such audit functions, to verify that all operational procedures and QA/QC procedures are followed.

After the second year of operation NILU experts will visit all the monitoring stations, to check the performance and to verify adequate operations. NILU may also support DOSTE in any maintenance operation or simple repairs if necessary. Depending upon the requirement by the Vietnam authorities and the need for external controls it may be necessary to train a local expert institution in the future to perform these audits.

## 5.9 Reporting air quality

Based on the simple monthly reports developed by DOSTE based on templates developed by Danish experts, NILU will elaborate on these presentations. Based on statistics given in the AirQUIS system, DOSTE will be trained in explaining the reasons for the air pollution impact, and to evaluate the relative importance of different sources.

The development of a Web site for the HCMC air quality management project has also been discussed. This web site may be used by the Authorities and by air quality planners and in the future also for the public. If of interest all layout, functions and content will be presented to local users for approval. There will be close contact between developers and users for comments and discussion.

The Internet development was originally not part of the NORAD/NILU project, but it was agreed during Mission 1 that NILU will demonstrate the possibilities of different web solutions during the DOSTE visit to NILU. The possibility for on-line air quality data presentations and forecasts will be discussed again during the last phase of this project.

## 6 Project Implementation Plan

### 6.1 Work plan

A work plan based on the experiences gained after the inception phase reported in the Mission 1 report, is indicated in the table below. We have taken into account changes relative to the project document, and a possible support from UNOPS.

*Indicated work plan for 2002 and 2003.*

<b>Time schedule</b>	<b>Activity</b>	<b>Responsible</b>
April 2002	First Mission to HCMC: - Kick-off seminar, training - Assess existing system - Identify new sites, design programme - Assess training needs	<b>BS, TNT</b> <b>BS</b> <b>BS, LVK</b>
May-June	Instruments installed at NILU	<b>LM, RD</b>
June-Aug	Test instruments and data retrieval	<b>RD</b>
Sep. 2002	- Correct meteorological measurements - Install new PC - Training in Enviman applications - Train DOSTE on Meteorological data	Instru- matic <b>NILU</b> <b>OP SIS</b>
Oct. 2002	- Instrument and shelters shipped to Vietnam - Prepare GIS and AirQUIS for HCMC	<b>NILU</b>
Nov-Dec 2002	Installation and start up of new sites in HCMC	<b>RD, BS</b>
Dec 2002	- Training; maintenance and calibrations - Start field operations	<b>RD, NILU</b>
Feb 2003	- Install AirQUIS at DOSTE - Perform AirQUIS training locally (hand-on) - Train air quality reporting	<b>HEL, TNT</b> <b>HEL</b> <b>BS</b>
April-May 2003	- AirQuis training at NILU - Air Quality Dispersion Model applications - Training on the new PM <sub>10</sub> monitor	<b>HEL;</b> <b>TNT,</b> <b>BS,</b> <b>B</b>
April-Sep 2003	- Emission inventories - Preliminary model estimates	<b>HEL, BS</b>
Oct 2003	- Abatement strategy training - Start AQ management and planning	<b>StL, BS</b>

A more detailed project time schedule is presented in Appendix B1. The missions to HCMC may be slightly modified based on available infrastructures, transport of instruments and available data collected locally. Time schedules will be updated in the course of the project.

## **6.2 Staff Resources**

The staff at DOSTE participated in the introductory meeting on 8 April 2002, the kick-off seminar on 15-16 April 2002 and at the summary staff meeting on 25 April 2002. The staffs as described by the first phase of the project are presented in Appendix B2.

The project team as presented for the NORAD funded project is presented in Chapter 2. Staffs and resources seemed to be well prepared for the second phase of the project. The DOSTE experts also seem to be willing to undergo the necessary training to enable takeover of the responsibilities connected to the operations of a complete air quality monitoring and management system for HCMC in the future.

## 7 References

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## **Appendix A**

### **People we met, DOSTE organisation, staff responsibilities**



## Appendix A1: People we met at Mission 1

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## Appendix A2: DOSTE Organisation



## Appendix A3: Air quality monitoring staff responsibilities (as defined by the Phase 1 project).

Role	Responsibility
<b>AQM Steering Committee <u>DOSTE</u></b>	Overall network management Appointment and management of contractual obligations towards UNDP
<b>AQM Manager (DOSTE)</b>  <b>Mr. Le Van Khoa</b>	Daily AQM network management Site selection and installation Equipment procurement Appointment and management of site operators Appointment and management of SVN contract obligations Responsible for reporting of incidents to SVN and follow-up on corrective actions to be taken in case of instrument failure Final data validation Back-up of EDC Data Expert and back-up of Environmental Monitoring Expert functions Provide data reports to People's Committee
<b>EDC Data Expert (DOSTE)</b>  <b>Mr. Tran Ngoc Thanh</b> <b>Mr. Vo Thanh Dam</b>	Data acquisition from sites Daily and weekly QC of data transmitted to EDC Correction of data for zero/span drift Calculation and reporting of daily Air Quality Index Data presentation for monthly and yearly reports Contact Site Operator or SVN when data indicates need for trouble-shooting Back-up of Environmental Monitoring Expert functions
<b>Environmental Monitoring Expert (DOSTE)</b>  <b>Mr. Ngo Thanh Duc</b> <b>Mr. Vo Thanh Dam</b> <b>Mr. Nguyen Bao Quoc</b>	Weekly site visit: QC at stations, filter change, cleaning of manifold, manual zero/span check for CO etc. according to weekly checklist Emergency call-out visits in order to perform basic trouble-shooting Instrument testing, cleaning of valves, according to the user's instruction manual for each instrument Responsible for keeping of logbooks at station Management of local site Assist with site installation Reporting to AQM Manager in case of problem or instrument failure
<b>Calibration and Service</b> <b><u>Schmidt Vietnam Ltd. (SVN)</u></b>	Equipment supply and maintenance Six-monthly equipment servicing according to service scheme1 Immediate response to incident reports from DOSTE Emergency response to equipment breakdown Repair of instruments at no cost for DOSTE in case of warranty repair Provision of traceable gas calibration standards Calibration of API gas analysers Maintain spare equipment and parts inventory
<b>Analysis of samples</b> <b><u>Center of Analytical Services and Experimentation (CASE)</u></b>	Gravimetric analysis of PM filters received from DOSTE Chemical analysis of samples on request from DOSTE: <ul style="list-style-type: none"> <li>• metal analysis of PM filter samples</li> <li>• analysis of NO<sub>2</sub> sampled on passive samplers</li> <li>• analysis of benzene sampled on passive samplers</li> </ul> Provision of reports to DOSTE project manager



## **Appendix B**

### **Schedules**



## Appendix B1: Project time schedule

No	Task	In Norway		In HCMC			Year 1				Year 2				Year 3				
		Exp	DOS	Exp	Cons	DOS													
1	Review existing system	BS		BS	SV	DOS	■	■											
2	Design and update	BS		BS		DOS	■	■											
a	site studies			BS		DOS	■	■											
b	final approved design					DOS	■	■											
3	Procure and install	LM																	
a	Specifications	LM			SV		■	■											
b	Requests and evaluation	LM,IM					■	■	■										
c	Prepare shelters at NILU	RD,JOJ					■	■	■	■									
d	Test instrument setup	RD,JOJ					■	■	■	■									
e	Transport to Vietnam	LM				DOS				■	■								
f	Field installations			RD	TVH	DOS				■	■	■	■	■	■				
4	Assure system integration	TNT		TNT,BS	TVH	DOS	■												
a	Identify existing			BS,TNT			■												
b	Evaluate OPSIS system	TNT		TNT			■	■	■										
c	Prepare interface	RuO		TNT			■	■	■	■									
5	Quality Assurance (QA/QC)	LM,BS																	
a	Design QA/QC	LM		LM	DTA		■	■	■	■									
b	Prepare SOP	LM,RD		RD		DOS	■	■	■	■									
c	QA presentation and training			LM	DTA	DOS	■	■	■	■									
6	Install AirQUIS	HeL		HeL															
a	Prepare GIS and database	HeL		HeL			■	■	■	■									
b	Establish final GIS	HeL		HeL		DOS	■	■	■	■									
c	Develop and test interface	RuO		TNT		DOS	■	■	■	■									
d	Hand-on-training			HeL		DOS	■	■	■	■									
7	Air Quality Modelling	BS		BS															
a	Emission inventorying	HeL		HeL		DOS	■	■	■	■									
b	Prepare input data	HeL		HeL		DOS	■	■	■	■									
c	Dispersion modelling			HeL,BS		DOS				■	■	■	■	■	■	■	■	■	■
8	Field Operations			RD,BS															
a	Start-up phase	RD,JOJ		RD		DOS				■	■	■	■	■	■	■	■	■	■
b	operational phase			RD		DOS				■	■	■	■	■	■	■	■	■	■
c	First audits			RD	DTA	DOS				■	■								
d	Maintenance and service			RD	SV						■	■							
e	Dynamic calibrations				DTA						■	■							
f	Sites re-visited			RD	DTA	DOS					■	■							
9	Data interpretations			BS	DTA	DOS													
a	Understanding AQ	BS		BS		DOS	■				■	■							
b	Use of Meteorological data			BS		DOS					■	■	■	■	■	■	■	■	■
c	Statistical evaluation			BS		DOS					■	■	■	■	■	■	■	■	■
d	Reporting AQ			BS		DOS					■	■	■	■	■	■	■	■	■
e	Internet presentations	TNT		TNT		DOS					■	■							
10	Air Quality Assessment			StL,BS		DOS													
a	Use of AirQUIS			HeL		DOS					■	■	■	■	■	■	■	■	■
b	Emission inventories			HeL		DOS					■	■	■	■	■	■	■	■	■
c	Model exposure estimates			BS,HeL		DOS					■	■	■	■	■	■	■	■	■
d	Abatement and planning	StL		StL		DOS					■	■							
11	Capacity building	BS		BS															
a	Kick-off seminar			BS,TNT	SV	DOS	■												
b	Instruments and monitors			RD	TVH	DOS				■	■	■	■	■	■	■	■	■	■
c	Data retrieval and QA/QC	LM	DOS	TNT		DOS	■			■	■	■	■	■	■	■	■	■	■
d	AirQUIS training	HeL	DOS	TNT		DOS	■			■	■	■	■	■	■	■	■	■	■
e	Use of models	HeL	DOS	BS		DOS	■			■	■	■	■	■	■	■	■	■	■
f	Statistics and reporting	BS	DOS	BS		DOS	■			■	■	■	■	■	■	■	■	■	■
g	AQ assessment and planning	StL	DOS	StL		DOS	■			■	■	■	■	■	■	■	■	■	■
h	Abatement strategies	StL	DOS	StL		DOS	■			■	■	■	■	■	■	■	■	■	■

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LM Leif Marsteen  
TNT The Nguyen Than  
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StL Steinar Larssen  
JOJ Jesper O. Jensen  
SKH Søren K. Hansen  
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SV Schmidt Vietnam

■ work in Norway  
■ work in Vietnam  
■ DOSTE  
a Introduction and kick-off seminar  
b AirQUIS and assessment workshop at NILU  
c Use of models for planning purposes  
d Data treatment reporting and dissemination  
Exp = expatriate experts  
Cons Consultants in Vietnam  
DOS DOSTE experts

**Appendix B2: Daily schedule Mission 1****Mission 1, April 2002**

Day	Hr.	Task	Assignment	NILU	DOSTE	Done
4 April			Departure Oslo SK 477 at 19:30 hrs	BS TNT		Ok
5 April	2000		Arrival HCMC 20:00 hrs RG686 from Bangkok Hotel arranged by Interconsult team (Eirik Wormstrand)	BS TNT		Good
M. 8 April	1000	1	Introduction to DOSTE,  Installations at office, presentations, discuss existing data	BS TNT	DDT, LVK, NTK, TrNT, VTD, NBQ, NTL, NTTH,	Ok  Ok
T. 9 April	0900	2a	Site visits to existing sites; Thu Duc, Tan Son Hoa, Hong Bang  Reporting, prepare seminar	BS TNT	NTD, VTD, NBQ	Ok  Ok
W. 10 April	0900  1000	4  11	Site visit; DOSTE station  Meeting with Director Dr. Dao Van Luong Bank account Prepare seminar	BS TNT  BS TNT	LVK, TrNT, NBQ  LVK	Ok  Ok cont
Th. 11 April	1000  1330 1600	4-5	Visit to Schmidt Vietnam, Evaluate QA/QC procedures Evaluate local IT supplier Final versions of presentations for seminar delivered for printing Reporting at office	BS, TN T.  TNT  BS	LVK   NTTH	
F. 12 April	0900  1100 1400 1500	4  3a 6a  8d	Data acquisition, OPSIS system evaluation, assure system integration, reporting Spare part storage, routines CD with GIS data and AQ data for one year Get maps for siting studies Visit to CASE	BS TNT. LRH  TNT  LRH All	EDC-centre  LVK TrNT  LVK	

Day	Hr.	Task	Assignment	NILU	DOSTE	Done
M. 15 April	0900  1130 1330	11	Seminar on Introduction to the air quality monitoring and planning system (AirQUIS) Lunch Seminar: Monitoring programme and AirQUIS	BS TNT	20 particip.	
T. 16 April	0900  1330  1600	11	Seminar continue: Monitoring operations, Met and models AirQUIS applications, AQ data-EIA-assessment-abatement-forecast Discussions and Summary	BS TNT	20 particip.	
W. 17 April	0800 0900  1500	2,5,11	TNT leave for China Site studies, new site selections, introductory discussion, maps and sources Summary and conclusions from seminar,	TNT BS, LRH	LVK , NKT	
Th. 18 April	0830  2100	2,5,11	Site visits new sites, site selections, LRH leave for Norway	BS, LRH	LVK	
F. 19 April	0900 1500	5a	Finalise site selections, Discuss QA/QC procedures – report on site selections	BS		
M. 22 April	0800	1,4,11	Inception report. Prepare reports for NORAD and UNOPS Evaluate training needs	BS		
T. 23 April	0900  1330	1	Final site visits for design purpose, Continue reporting,	BS	LVK	
W. 24 April	0800  1330	1,4,5	Reporting, Ref lab functions?  Final meeting at Schmidt Vietnam			
Th. 25 April	0900  2100		Summary meeting at DOSTE,  Departure from HCMC at 21:00 hrs with TG 687 to Bangkok	BS	LVK	
26 April	0835		Arrival Oslo SK 450 at 08:35 hrs	BS		

**The staff:****DOSTE**

Doan Thi Toi (DTT),  
Le Van Khoa (LVK),  
Nguyen Khac Thanh (NKT),  
Ngo Thanh Duc (NTD),  
Tran Ngoc Thanh (TrNT),  
Vo Thanh Dam (VTD),  
Nguyen Bao Quoc (NBQ),  
Nguyen Thanh Lam (NTL),  
Nguyen Thi Tuyet Hoa (NTTH),

**NILU**

Bjarne Sivertsen (BS)  
The Nguyen Thanh (TNT)  
Lars R. Hole (LRH)

## **Appendix C**

### **Minutes from meetings**



## Appendix C1: Project meetings at NILU (Minutes)



Department of Science,  
Technology and Environment (DOSTE)  
The Norwegian Institute for Air Research

**Title** Project meeting  
**Date** 17 January 2002  
**Place** NILU  
**Participants** Bjarne Sivertsen, Leif Marsteen, The Nguyen Thanh, Rolf Dreiem  
**Prepared by** Bjarne Sivertsen  
**Distribution** BS, LM, TNT, RD, Steinar Larssen, Herdis Laupsa

### Draft Agenda

1. Project approved
2. LOGO
3. Tasks and time schedules
4. Office in HCMC
5. First Mission 6-16 March, when-who-what?
6. Plan kick off seminar
7. Procurement phase
8. Industriell Måleteknikk, economic agreement
9. Containers and shelters, status
10. Intake structures and instrument details
11. Request and evaluate (who, when?)
12. Preliminary time schedule installations
13. Other matters

### Summary

#### 1. Project approved

NORAD has approved the project. Approval letter has not arrived yet. Project number at NILU is O 101143.

#### 2. LOGO

A project logo, **HEIA**; “Ho Chi Minh City Environmental Improvement Project, Air Quality Component” was discussed and will be finalized.

### 3. Tasks and time schedules

Tasks were discussed. LM should be more emphasized as instrument expert. As it is presented the QA/QC part of its work is dominating.

The time schedule should start at the receipt of the Approval letter. In contract 10 January has been specified. Give information to DOSTE (BS)

### 4. Office in HCMC

An office at DOSTE in Ho Chi Minh City has been established by Kaare Helge Karstensen, who is working on the NORAD Waste Management project (parallel to HEIA). Telephone number at the office is 00 84 8 9326 710. Fax at the office next to ours is. 00 848 9320 271. Mail address for Karstensen is: [hw1vie1702@hcm.vnn.vn](mailto:hw1vie1702@hcm.vnn.vn)

Karstensen also opened a bank account:

Inter Consult International - Hazardous Waste Management Plan  
ANZ Bank, 11 Me Linh Square, District 1, Ho Chi Minh City, Vietnam  
Account nr. 3213245  
SWIFT Code : ANZBVNVX472

### 5. and 6 First Mission

The first mission to Vietnam is planned for 6 to 16 March 2002. This will have to be verified with DOSTE (BS).

BS and TNT will form the team. Some of the tasks are:

Review of existing system

Design and update system

Identify and evaluate instruments and data retrieval

Discuss and report procedures and QA/QC in details

Describe OPSIS establishments and discuss interface

Prepare and present kick-off seminar.

Preparations for the seminar will be finalised at NILU before departure.

### 7. and 8. Procurement and agreement with IM

Instrument procurement is underway. Industriell Måleteknikk (IM) has presented their last bid after discussions with LM/TNT. Included discounts etc. it seems that we will end at a total of 2.508.950 NOK included instruments, calibration gases, and consumables. This agreement with IM will be verified (TNT).

API provides spare parts for the first year. Repair costs are not included.

API will run a training course for DOSTE and Schmidt Vietnam on maintenance and repair. Our instrument expert (RD) will also be prepared to train DOSTE in repair operations.

### 9. Containers and shelters

We have evaluated two bids; from Instrumatic and from a Norwegian deliverer. The Norwegian shelter have been built on specifications from NILU, and seem to be more flexible and more adjusted to our needs. It is also less

expensive than the Danish one. Delivered at NILU the price is 79.400 NOK included air-condition, power set-up, UPS. Air intake will be additional in both bids, at about 15.000 NOK.

RD and LM will prepare a written evaluation before final decision is taken. This will be presented before 6 February 2002. (RD)

### **10. Intake structures and instrument details**

The intake for the PM<sub>10</sub> monitor has been discussed. Whether to use the EPA approved one or the European intake will be decided after discussions in HCMC. We will check what has been used on the OPSIS instrument. The European intake has several advantages:

- Easy maintenance, the collection plate can be easily removed and changed,
- “Ematal” protection reduces corrosion problems,
- Less expensive, totally about 10.000 NOK less for our proposal,
- Lighter and smaller, works better in windy conditions,
- Easily changed to PM<sub>2,5</sub> or PM1 by changing the nozzle plate.

### **11. Request and evaluate**

LM and RD will evaluate the bids and prepare an evaluation report (LM) before 31 January 2002. TNT prepares and presents the order.

### **12. Preliminary time schedule installations**

A instrument preparation time schedule will depend upon many factors, but a preliminary schedule could be as indicated below:

31 January Procurement and order  
6 February Order for shelters  
6 April Instruments and shelters at NILU  
1 May All instrument tested and calibrated in lab.  
20 May Instruments installed in shelters (2 days per shelter)  
May-June AirQUIS – data retrieval- interfaces etc.  
August Test operation, complete instruments  
1 September Prepare for shipping – send instruments to Vietnam.  
October-November installations in Vietnam...

## Appendix C2: Initial meeting at DOSTE



Department of Science,  
Technology and Environment (DOSTE)  
The Norwegian Institute for Air Research

### Minutes of Meeting #1

Title	Introductory meeting at DOSTE
Participants	Doan Thi Toi (DTT), Le Van Khoa (LVK), Nguyen Khac Thanh (NKT), Ngo Thanh Duc (NTD), Tran Ngoc Thanh (TrNT), Vo Thanh Dam (VTD), Nguyen Bao Quoc (NBQ), Nguyen Thanh Lam (NTL), Nguyen Thi Tuyet Hoa (NTTH), Bjarne Sivertsen (BS) and The Nguyen Thanh (TNT)
Distribution	Participants
Author	BS and TNT
Date	8 April 2002
Reference No	O-101143

### Issue No

1. A working agenda proposal during the NILU Mission 1 to HCMC and a draft of the main issues for the coming seminar 15 – 16 April 2002 were handed out by NILU.
2. LVK presented the DOSTE staff and gave a short introduction regarding positions and responsibilities.
3. The HEIA logo was presented and BS asked if there were comments to the project logo. The logo was accepted as it is. The logo will be used from now on for all future documentation.
4. The DOSTE staff proposed a few changes to the proposed working agenda. These changes will be implemented and a new agenda will be distributed.
5. The proposed seminar programme was presented. Questions from the DOSTE staff were discussed, and a list of participants will be prepared within a few days. The number of participants will be about 20 included some invited experts.
6. DOSTE expressed again some dissatisfaction with the tasks undertaken by Schmidt Vietnam. The meeting with Schmidt Vietnam proposed for Wednesday was changed till Thursday 11 April from 10:00 hrs. The meeting has been confirmed.

7. LVK presented DOSTE. He presented also the former and present situation of the air quality network in HCMC.
8. The DOSTE air quality experts at the Environmental Data Centre (EDC) had a short presentation of the ENVIMAN Commissioner for data retrieval purpose. The established SOP for instrument operations and the QA/QC system was briefly presented.
9. DOSTE has also started to prepare digitalised maps of HCMC using MapInfo Software. NILU will get a copy of the maps for preparing the GIS module in the AirQUIS system.

