

付 属 資 料

1. 終了時評価ミニッツ
2. JCC ミニッツ
3. 実績・評価グリッド
4. 質問票、質問項目等
5. 協議メモ
6. 収集文献・資料一覧

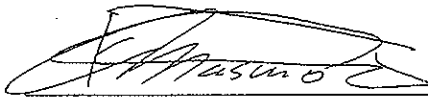
MINUTES OF MEETINGS
BETWEEN
JAPANESE FINAL EVALUATION TEAM
AND THE AUTHORITIES CONCERNED OF
THE GOVERNMENT OF THE SOCIALIST REPUBLIC OF VIETNAM
ON JAPANESE TECHNICAL COOPERATION
FOR “ENHANCING CAPACITY OF VIETNAMESE ACADEMY OF SCIENCE
AND TECHNOLOGY IN WATER ENVIRONMENT PROTECTION”

The Japanese Final Evaluation Team (hereinafter referred to as “the Japanese Team”) organized by Japan International Cooperation Agency (hereinafter referred to as “JICA”) and headed by Mr. MASUMOTO Kiyoshi, visited the Socialist Republic of Vietnam from 28th May 2006 to 9th June 2006 for the purpose of conducting final evaluation of the technical cooperation project for “Enhancing Capacity of Vietnamese Academy of Science and Technology in Water Environment Protection”(hereinafter referred to as “the Project”) in the Socialist Republic of Vietnam.

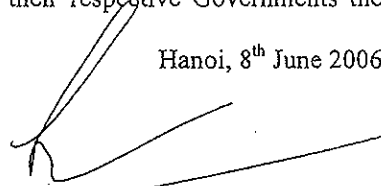
For this purpose, the Japanese Team and the Vietnamese Authorities concerned formed the Joint Evaluation Team (hereinafter referred to as “the Team”). The Team had a series of discussion and exchanged views on the evaluation with the Vietnamese authorities concerned as well as counterparts and experts of the Project.

The Japanese Team and Vietnamese authorities concerned agreed on the contents of the Evaluation Report attached, which were accepted by the Joint Coordinating Committee. As a result of the discussion, the both sides agreed to report to their respective Governments the matter referred to in the attached evaluation report.

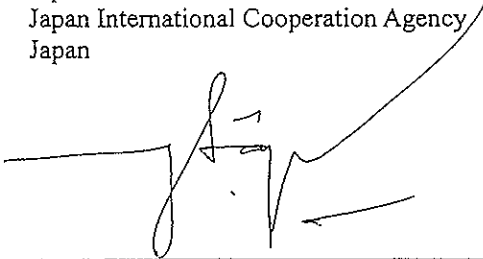
Hanoi, 8th June 2006



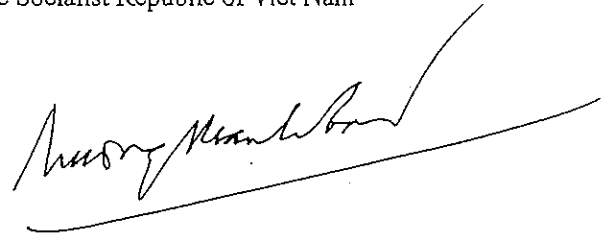
Mr. MASUMOTO Kiyoshi
Leader
Japanese Final Evaluation Team
Japan International Cooperation Agency
Japan



Prof. Nguyen Khoa Son
Vice- President
Vietnamese Academy of Science and Technology
The Socialist Republic of Viet Nam



Mr. Nguyen Gia Lap
Leader
Vietnamese Final Evaluation Team
Vietnamese Academy of Science and Technology
The Socialist Republic of Viet Nam



Dr. Truong Manh Tien
Director General
Department of Environment
Ministry of Natural Resources and Environment
The Socialist Republic of Viet Nam

ATTACHED DOCUMENT

JOINT EVALUATION REPORT
ON
JAPANESE TECHNICAL COOPERATION
ON
ENHANCING CAPACITY OF VIETNAMESE ACADEMY OF SCIENCE AND
TECHNOLOGY IN WATER ENVIRONMENT PROTECTION
IN
THE SOCIALIST REPUBLIC OF VIETNAM

June 8th 2006, Hanoi

A handwritten signature in black ink, consisting of several strokes, located on the left side of the page.A handwritten signature in black ink, consisting of a large loop and a few strokes, located on the right side of the page.

LIST OF ABBREVIATIONS AND ACRONYMS

C/P	Counterpart Personnel
DONRE	Department of Natural Resources and Environment
EOJ	Embassy of Japan
FGD	Focus Group Discussion
HCMC	Ho Chi Minh City
IOC	Institute of Chemistry
IET	Institute of Environmental Technology
JICA	Japan International Cooperation Agency
M/M	Minutes of Meetings
MM	Man Month
MONRE	Ministry of Natural Resources and Environment
PDM	Project Design Matrix
PO	Plan of Operation
R/D	Record of Discussions
VAST	Vietnamese Academy of Science and Technology

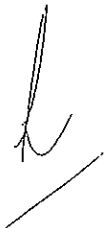


TABLE OF CONTENTS

1. INTRODUCTION	1
1-1 Purpose of Evaluation	1
1-2 Member of Final Evaluation Team	1
1-2-1 Japanese Side	1
1-2-2 Vietnamese Side	1
1-3 Schedule of the Team	2
1-4 List of People Visited by the Team	2
1-5 Methodology of Evaluation	4
2. BACKGROUND AND SUMMARY OF THE PROJECT	5
2-1 Background of the Project	5
2-2 Summary of the Project	6
3. ACHIEVEMENT OF THE PROJECT	8
3-1 Inputs	8
3-2 Accomplishment of Activities	9
3-3 Achievements of Outputs	9
3-4 Achievements of Project Purpose	12
4. EVALUATION	15
4-1 Relevance	15
4-2 Effectiveness	16
4-3 Efficiency	17
4-4 Impact	18
4-5 Sustainability	18
5. CONCLUSION	20
5-1 Results of Evaluation	20
5-2 Lessons Learnt	20
5-3 Recommendations	21

(Reference)

ANNEX I: PDM

ANNEX II: Achievements of Input

- II-1 List of Japanese Experts
- II-2 List of Counterparts
- II-3 Counterpart Training in Japan
- II-4 List of Machinery and Equipment Provided
- II-5 Operational Budget of the Project

ANNEX III: List of Outputs

ANNEX IV: Evaluation Grid



1 INTRODUCTION

1-1 Purpose of Evaluation

The Project has been implemented for two years and seven months since 1st November 2003. Five months prior to the Project completion, the Japanese Team with four members, and the Vietnamese authorities concerned have jointly assessed the achievements of the Project based on the Project Design Matrix (PDM)

The purposes of the Final Evaluation on the Project are

- (1) to verify the achievements of the Project compared to those planned (achievements of inputs, outputs and the Project purpose);
- (2) to evaluate the Project based on the five evaluation criteria (Relevance, Effectiveness, Efficiency, Impact and Sustainability);
- (3) to make recommendations about actions to be taken in the future; and
- (4) to discuss the future direction of the Project.

1-2 Members of Final Evaluation Team

1-2-1 Japanese side

- (1) Mr. MASUMOTO Kiyoshi (Leader)

Group Leader, Environment Management Group, Global Environment Department
Japan International Cooperation Agency (JICA)

- (2) Mr. IMAI Senro (Environmental Management)

Senior Advisor (Environment)
Japan International Cooperation Agency (JICA)

- (3) Dr. MAEDA Yasuaki (Water Environment Protection Technology)

Policy Advisor, International Cooperation Department
Ministry of Natural Resources and Environment (MONRE)

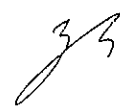
- (4) Ms. OISHI Misa (Evaluation Analysis)

Consultant, Consulting Division, IC Net Limited

1-2-2 Vietnamese side

- (1) Mr. Nguyen Gia Lap (Leader)

Deputy Director, International Cooperation Department
Vietnamese Academy of Science and Technology (VAST)



(2) Dr. Le Thi Hai Le

Senior Officer

Department of Environmental Impacts Assessment and Appraisal

Ministry of Natural Resources and Environment (MONRE)

(3) Dr. Le Thi Hoai Nam

Department of Surface Chemistry and Catalysis

Institute of Chemistry (IOC)

Vietnamese Academy of Science and Technology (VAST)

1-3 Schedule of the Japanese Team

Date		Schedule
May 29	Mon.	Visit Department of Natural Resources and Environment (DONRE), Ho Chi Minh City Visit the IET laboratory in VAST Ho Chi Minh City Interview with laboratory staff in the IET lab.
May 30	Tues.	Visit Dept. of Water Resource Management, MONRE Visit VAST Headquarters in Hanoi The Joint Evaluation Meeting
May 31	Wed.	Visit Embassy of Canada Interview IET staff members at VAST(IET)
June 01	Thurs.	Visit Korean International Cooperation Agency Interview IET staff members at VAST(IET)
June 02	Fri.	Interview Japanese experts Focus Group Discussion with DONRE officers
June 03	Sat.	Discussion
June 04	Sun.	Discussion
June 05	Mon.	Visit Dept. of Environment, MONRE Visit Embassy of Japan Visit JICA, Vietnam Office
June 06	Tues.	Visit IET laboratories and wastewater treatment facilities
June 07	Wed.	Evaluation Meeting
June 08	Thurs.	JCC Meeting
June 09	Fri.	Report to JICA VN Report to Embassy of Japan

1-4 List of Personnel visited by the Japanese Team

Department of Natural Resources and Environment, Ho Chi Minh City (HCMC)

Mr. Nguyen Van Chien, Deputy Director General

Mr. Tran Nguyen Hien, Head of Environmental Management Division

Mr. Nguyen Van Nga, Head of Water resource Management



Vietnamese Academy of Science and Technology (HCMC)

Dr. Bui Quang Cu, Vice Director of Institute of Chemical Technology, Head of VAST-HCMC

Ministry of Natural Resources and Environment (MONRE)

Dr. Truong Manh Tien, General Director, Department of Environment

Dr. Nguyen Thai Lai, Director General, Department of Water Resources Management

Vietnamese Academy of Science and Technology (HQs - Hanoi)

Prof. Dr. Dang Vu Minh, President

Prof. Dr. Nguyen Khoa Son, Vice President

Mr. Chu Tri Thang, Director, International Cooperation Department

Dr. Nguyen The Dong, Director, Institute of Environmental Technology (IET)

Dr. Nguyen Phuong Thao, Department of Environment Quality Analysis, IET

Dr. Phan Do Hung, Department of Environment Engineering, IET

Dr. Nguyen Thi Hue, Department of Environment Quality Analysis, IET

Ms. Chu Thi Thuy, Department of Environment Quality Analysis, IET

Mr. Vu Van Tu, Department of Environment Quality Analysis, IET

Mr. Nguyen Trong Truc, Department of Environment Quality Analysis, IET

Dr. Trinh Van Tuyen, Department of Environment Engineering, IET

Mr. Tran Trung Kien, Department of Environment Engineering, IET

Ms. Dao Hai Yen, Department of Environment Engineering, IET

Mr. Nguyen Huu Trung, Department of Environment Engineering, IET

CIDA

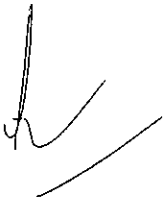
Ms. Le Van Son, Senior Development Officer, Embassy of Canada

KOICA

Mr. Kim Seung-Beom, Resident Representative

Mr. Shin Myung Seop, Deputy Resident Representative

Mr. Kim, KOICA project, Chief Advisor



Department of Natural Resources and Environment

Mr. Vu Hong Xiem, Ha Nam DONRE
Ms. Phan Thi Lan Huong, Ha Nam DONRE
Mr. Bui Ngoc Ha, Ha Nam DONRE
Mr. Mai Van Tam, Hai Duong DONRE
Mr. Nguyen Quang Thai, Thanh Hoa DONRE
Mr. Le Van Binh, Thanh Hoa DONRE
Mr. Bui Manh Tien, Thanh Hoa DONRE
Ms. Ta Thi Tuyen, Ba Dinh District, Hanoi
Ms. Le Lan Anh, Thanh Xuan District, Hanoi

Embassy of Japan

Mr. Rinya Yutani, Second Secretary

JICA. Vietnam Office

Mr. Fumio Kikuchi, Resident Representative
Mr. Yasuhiro Tojo, Senior Deputy Resident Representative
Mr. Shingo Naganawa, Deputy Resident Representative

1-5 Methodology of Evaluation

The Project was evaluated based on the Project Design Matrix (hereinafter referred to as “PDM”) of this Project. The PDM is a summary table describing the outline of the Project.

1-5-1 Evaluation Procedure

The Team developed the evaluation grid which identified the specific evaluation points and the data collection methods. For the data and information collection, the Team applied various methods such as the questionnaire, the interview, the focus group discussions (FGD), and the observation of the laboratories and wastewater treatment facility on site. The Team analyzed and evaluated the Project in terms of the achievement level of the Project, the implementation process, and five evaluation criteria such as Relevance, Effectiveness, Efficiency, Impact and Sustainability. Finally, the Team made the recommendations and drew the lessons learned from the results.



1-5-2 Points for the evaluation

Achievement level and Implementation Process of the Project

The achievement level in terms of Inputs, Activities, Outputs, and Project Purpose was assessed in comparison with the Record of Discussions (hereafter referred to as "R/D"), the PDM and the Plan of Operation (hereafter referred to as "PO"). The implementation process of the Project was also confirmed from the various viewpoints.

Evaluation Criteria

The following five evaluation criteria are applied to the project evaluation.

- (1) Relevance: Relevance of the Project was considered from a viewpoint of the validity of the Project Purpose and Overall Goal in connection with the development policy of the Government of the Socialist Republic of Viet Nam and the needs of the beneficiaries of the Project.
- (2) Effectiveness: Effectiveness was considered in terms of whether the Project has actually benefited the target group. It also assesses whether the Project Purpose is being achieved as expected and whether that is the result of the project's Outputs.
- (3) Efficiency: Efficiency verifies whether the project was efficient in terms of effective use of resources. The relationship between Inputs and Outputs is reviewed. In essence, Efficiency examines whether the input cost is appropriate for the degree of achievement on the Outputs and the Project Purpose and whether there are other means that would have been more efficient than those of the current project.
- (4) Impact: Impact examines the indirect effects and extended effects by the project in the long run. The analysis also includes the positive and negative impacts that were not expected when the project was planned.
- (5) Sustainability: Sustainability of the Project was considered in terms of institutional, financial and technical aspects by examining the extent to what the achievement of the Project will be sustained or expanded.

2 BACKGROUND AND SUMMARY OF THE PROJECT

2-1 Background of the Project

Rapid socio-economic development continues since the Doi Moi (the Reforms) in the Socialist Republic of Viet Nam, and the economic growth rate is in a high level of about 7% from 1990's, and will be maintained this high growth rate for the present. On the other hand, rapid industrialization

that supports the high economic growth rate brings serious environmental problems because of waste and exhaust gas...etc discharged by the factories without treatment. At same time, the urbanization causes an increase of domestic wastewater and the municipal solid waste resulting in accelerating environment deterioration. Such environmental problems begin to be paid attention to by not only the government authorities but also community and people. Among those problems, water environment pollution is recognized as the most serious because it is easily perceivable in the living circumstance of Viet Nam. There is increasing evidence of pollution of Viet Nam's surface, underground and coastal waters. Although the quality of upstream river water is generally good, downstream sections of major rivers reveal poor quality and most of the lakes and canals in urban areas are fast becoming sewage sinks. Groundwater shows pockets of contamination and some salinity intrusion.

The government of Viet Nam has adopted the Law of Environmental Protection in 1993; and followed by setting up environmental regulations and standards to improve the environment. However, Viet Nam's water environment is facing many problems in terms of technology, facilities, and human resources to realize environmentally sustainable development.

Under these circumstances, Viet Nam Government requested a technical cooperation project aiming at capacity development in monitoring, treatment, and management of water environment of Vietnamese Academy of Science and Technology (hereinafter referred to as "VAST") to the Japanese Government.

Upon receiving this request, the Japanese government conducted two preparatory studies and one implementation study, through which series of discussions with authorities concerned of the government of Viet Nam were carried out. Both parties signed the Record of Discussion for this Project on September 10th, 2003. In 1st November 2003, the Project was commenced with 3 years cooperation period.

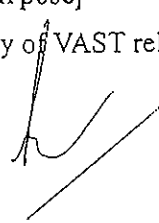
2-2 Summary of the Project

[Overall Goal]

The capacity of Vietnamese authorities related to water environment protection will be improved.

[Project Purpose]

The capacity of VAST related to water environment protection is improved.



[Output of the Project]

- (1) VAST researchers' abilities to conduct water quality monitoring and to develop analysis methods are improved.
- (2) VAST researchers' abilities to develop and apply suitable technologies on domestic and industrial wastewater treatment are improved.
- (3) VAST staff members' abilities to conduct training courses on water quality monitoring and wastewater treatment for central and local organizations are improved.
- (4) VAST researchers are to contribute to MONRE's and related organizations' activities of water environment protection.

[Activities of the Project]

1 Transfer of technologies on water quality monitoring and analysis.

1.1 To develop the manual for water quality monitoring.

1.2 To develop Standard Operation Procedure (SOP) on water quality analysis relevant to water quality standards.

1.3 To recommend appropriate monitoring procedure to relevant government organizations through the process of collecting and assessing data from some water monitoring stations.

2 Transfer of technologies on wastewater treatment.

2.1 To improve wastewater treatment system in NCST by its researchers.

2.2 To advise concerning Vietnamese authorities on suitable technologies for wastewater treatment.

2.3 To collect information of advanced or suitable technologies on wastewater treatment.

3 To train NCST staff members in conducting training courses on water environment protection.

3.1 To conduct training courses on water environment management.

3.2 To conduct training courses for central and local organization on water quality monitoring.

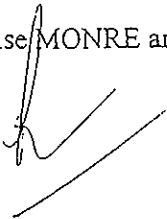
3.3 To conduct training courses on wastewater treatment.

3.4 To conduct seminars on water environment protection in Vietnam.

4 To contribute to MONRE's and other related organizations' activities of water environment protection.

4.1 To implement projects of water environment protection given by MONRE and related organizations.

4.2 To advise MONRE and other organizations on water quality management optimization.



3 ACHIEVEMENT OF THE PROJECT

3-1 Inputs

Inputs from the Japanese side - as of May, 2006

(1) Long-term experts (ANNEX II-1)

A total of six (6) long-term experts were dispatched in the fields of Chief Advisor, Water Analysis, Water Treatment, Monitoring and Coordinator (total 102 MM [man month], and it will amount to 117 MM by the end of the project).

(2) Short-term experts (ANNEX II-1)

A total of eleven (11) short-term experts have been dispatched as of May 2006 (total 13.2 MM).

(3) Trainings in Japan (ANNEX II-3)

Twenty-six (26) counterparts were accepted for training in Japan as of May 2006.

(4) Provision of Machinery and Equipment (ANNEX II-4)

Machinery and equipment amounting Japanese Yen 367,647 thousand was provided.

FY 2003	180,659 thousand Yen
FY 2004	106,434 thousand Yen
FY 2005	79,447 thousand Yen
FY 2006	1,107 thousand Yen

(5) Operational expenses of the project (ANNEX II-5)

Japanese Yen 53,807 thousand was provided as of May 2006.

FY 2003	3,117 thousand Yen
FY 2004	39,093 thousand Yen
FY 2005	7,132 thousand Yen
FY 2006	4,465 thousand Yen

Inputs from the Vietnamese side

(1) Counterpart personnel assigned for the Project (ANNEXII-2)

A total of a hundred and forty four (144) were assigned as counterparts as of May 2006.

(2) Provision of facilities and equipment

The followings were provided by the Vietnamese side.

- IET laboratories: Inside of VAST headquarters and VAST-HCMC
- 3 office rooms for the Japanese experts

(3) Provision of financial resources

FY 2004	300 million VND
FY 2005	3,362 million VND
FY 2006	2,560 million VND

3-2. Accomplishment of Activities

In general, the activities of the Project have been carried out to date. Although the delay of some activities had affected the project progress to some extent, most of the activities are likely to be completed by October 2006. The degree of accomplishing each activity at the time of final evaluation is summarized in ANNEX IV.

3-3. Achievement of Outputs

The achievement level of each output is shown below. The detailed information is included in the Evaluation Grid attached (ANNEX IV).

Output 1:	VAST researchers' abilities to conduct water quality monitoring and to develop analysis methods are improved.
Indicators:	(1) Number of analytical method mastered by VAST (IET) researchers through the technical transfer (2) Number of reports on development of SOP on water quality analysis

Overall achievement level of output 1 is, in general, satisfactory although extra efforts are needed to upgrade SOPs for the rest of the project period. VAST(IET) staff members have acquired analytical techniques of the following 12 major equipments. The C/P agency formed 18 working groups for the main equipments with its own initiative, carried out researches on compositions and functions of equipment, measurement principles and operational methods with support from Japanese experts. The results of these researches were presented in 18 research reports. Contents of some reports were announced at the project steering committee at VAST and were approved by VAST.

1. Inductively Coupled Plasma - Mass Spectrometer (ICP-MS)
2. Liquid Chromatograph - Mass Spectrometer (LC-MS)
3. Atomic Absorption Spectrophotometer (AAS)
4. High Pressure Liquid Chromatograph (HPLC)
5. Gas Chromatograph (GC)
6. Gas Chromatograph - Mass Spectrometer (GC-MS)
7. Ion Chromatograph (IC)

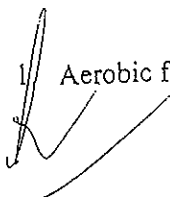
8. Automatic Mercury Analyzer
9. Bacteria Analytical System
10. Fourier Transformation - Infrared Spectrophotometer (FT- IR)
11. Total Organic Carbon and Total Nitrogen Analyzer (TOC)
12. Ultraviolet-Visible Spectrophotometer (UV -VIS)

As mentioned above, the monitoring methods have not been fully standardized and the monitoring results from different organizations are often not consistent with each other. Thus it is urgently necessary for Vietnam to standardize monitoring methods. The Project produced the draft Standard Operation Procedure (SOP) per parameter of the ambient standard and the draft water quality monitoring manual. Currently, the first draft of 18 SOPs for 18 out of 31 parameters of the ambient standard (i.e. the 1995 Surface Water Quality Standard) were drawn up. (For details, see ANNEX III)

Output 2:	VAST researchers' abilities to develop and apply suitable technologies on domestic and industrial wastewater treatment are improved.
Indicators:	(1) Improvement of wastewater treatment system in VAST (2) Number of case studies requested by MONRE and other organizations

Output 2 is likely to be achieved by October 2006 given that more works such as preparing guidelines should be completed in the remaining period to ensure the degree of achievement. The construction of wastewater treatment facility was completed at the end of March 2006, and it is currently in trial operation. The facility was constructed in line with the master plan of the VAST's wastewater treatment developed by the Project; and it can be said that the wastewater treatment system in VAST is gradually improving. It is worth mentioning that a VAST(IET) staff member drew the basic design of this new wastewater treatment facility. In addition, VAST(IET) staff members concerned have learned process technologies of 7 out of the following 9 experimental apparatus for wastewater treatment. In line with these efforts, the Project is now preparing guidelines for treatment of effluent. The other two experiment apparatus (No. 4 and No.5, see below) is supposed to be examined by using the surplus sludge which will be generated from the wastewater treatment facility once it operates fully. Due to the slow start of the wastewater treatment facility, the technology transfer in this regard has been also delayed. Since the facility has started its trial operation, experimental activities by using the above mentioned two apparatus can be started soon.

1/ Aerobic flow bed method test device




2. Flootation unit test device
3. Ozone processing test device
4. Anaerobic Sludge Digestion Tester
5. Composting test device
6. Activated sludge treatment system
7. Anaerobic/aerobic test device
8. Contact oxidation test device
9. Ultrasonic test device

Five studies regarding wastewater treatment were commissioned to VAST(IET), and designs along with studies were prepared by VAST(IET). Especially for No.1 and No.2 studies, data collected through experimental activities were actively used.

- Minh Khai textile company wastewater treatment (2004)
- Huong Sen Beer company wastewater treatment (2004-2005)
- Son La hospital waste water treatment (2004-2005)
- Moc Chau milk company wastewater treatment (2004-2005)
- Tuyen Quang Hospital wastewater treatment (2003-2006)

It can be concluded that the capacity of VAST(IET) staff members regarding to wastewater treatment has been enhanced through designing treatment facilities by themselves and acquiring technology of experimental apparatus. In addition, many researches with the utilization of those apparatus were produced into academic papers, and some of them were even presented at academic conferences. These clearly show the enhanced ability of VAST(IET) staff members. (For details, see ANNEX III)

Output 3: VAST staff members' abilities to conduct training courses on water quality monitoring and wastewater treatment for central and local organizations are improved.

Indicators: (1) More than 6 teaching materials are made by VAST (IET) staff members
 (2) Curriculum are properly developed for each training courses

It can be concluded that Output 3 is satisfactorily achieved. Currently, a number of teaching materials have been prepared by VAST(IET) staff members as follows:

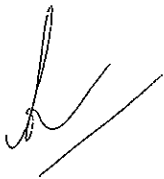



Table 1: Numbers of teaching materials in 2005

Courses		
1	Water Environment Management	5
2	Water Quality Monitoring and Analysis	10
3	Wastewater Treatment Technology	16
	Total	31

C/Ps, who delivered lectures, prepared these materials by themselves based on learning and knowledge acquired from the Project. Since a teaching material were prepared by a few staff members occasionally, the number of staff members who developed teaching materials are as many as 24 persons (cumulatively 28 persons). The numbers of staff members who delivered lectures were as many as 33 persons (cumulatively 39 persons) including those who delivered an explanatory lecture on the laboratory. In addition, Japanese visual materials on monitoring and laboratory management were introduced to the participants.

Since DONRE in each 64 provinces is a responsible organization for field implementation of environmental management, the training courses set their targets to DONRE staff members. First, an assessment of DONRE's training needs was carried out in the beginning by the Project, and the draft training curriculum (Effective Training Curriculum (Draft), February 2006) was developed to improve the trainings. The Project plans to develop an effective scheme for training programs to DONRE, and to propose it to MONRE.

As just seen, more than six teaching materials were produced and the curriculum based on needs was developed. In addition, the actual number of participants exceeded the target 100 persons. Thus it can be said that the ability of VAST(IET) staff members (especially more than mid-level staff members) to conduct training courses on water quality monitoring and wastewater treatment were in deed improved.

Output 4: VAST researchers are to contribute to MONRE's and related organizations' activities of water environment protection.

Indicators: (1) Number of projects given by MONRE and related organizations to VAST(IET)
 (2) Number of evaluation reports for relevant projects of other organization

The achievement level of Output 4 is reasonable at this stage; however extra efforts should be made in the remaining period to ensure the full achievement. Varieties of studies and advices, as seen in the Evaluation Grid in ANNEX IV were carried out and provided to MONRE and local authorities on request-basis. Also, numbers of consulting and engineering services of wastewater treatment

facilities have been carried out for hospitals and private companies. In addition, other donors such as DANIDA and the Swiss agency who have implemented environment projects once requested VAST(IET)'s technical supports to their projects.

It is worth mentioning that it became obvious that some parameters of the ambient standard employ unsuitable figures to the Vietnamese situation. Through experience with the project activities, VAST(IET) submitted document No.285/VCNMT dated on September 14 2005 to the General Department of Standard and Quality/MOST and MONRE with the purpose of proposing to revise the Vietnamese Standards (TCVN) in water environment. This is another example of contribution from VAST/IET to MONRE.

However, the major target, "to recommend on introduction of water quality monitoring system and SOPs", has not been achieved yet. The Project should spend more efforts toward this major target in the remaining period of the Project.

3-4 Achievement of Project Purpose

The achievement level of the Project Purpose is, in general, satisfactory, and that is confirmed by the interviews with C/Ps that the achievement level of the Project Purpose is high.

Since VAST, which is under the national government with the same level of authorities as other ministries, could advise directly to MONRE, the Project plans to propose comprehensive and standardized water quality monitoring methods, which are under development, together with monitoring reports. From October 2005, the Project started implementing monthly monitoring at four points (two rivers and two lakes) based on the IET's own monitoring plan (in the process of conceptualization) and the actual monitoring activities are contributing to enhancing monitoring technologies. Knowledge gained are now incorporated into the water quality monitoring manual (at present, a manual for on-site sampling is completed.)

Achievement can be also measured by numbers of organizations being advised by VAST(IET). In this regard, there is an upward trend in numbers of organizations which request for VAST(IET)'s advices and researches as follows. Following is the number of cases of VAST/IET's provision of such services on request (as of May 2006).



Year 2003	3
Year 2004	25
Year 2005	32
Year 2006	11

VAST (IET) has provided training courses as the importance of human resource development is fully understood by core members of C/Ps including the project manager and the deputy project manager. In fact, as seen in the following table, as many as 213 persons from 25 provinces, which is much higher than the target number of 100 persons, have already participated in the training courses.

Table 2. Numbers of Participants by Course (persons)

	Course Name	2005/03	2005/12	Total
1	Water Environment Management	45	31	76
2	Water Quality Monitoring and Analysis	44	26	70
3	Wastewater Treatment Technology	38	29	67
4	Total	127	86	213

(Note) Participants in the first sessions in March 2005 include staff members of other institutes under VAST.

In addition to three indicators, result of the survey on personal attainment level (Table 3) indicates the level of achievement in this regard. The questionnaire survey to C/Ps on their expected areas of capacity improvement and the personal attainment level of those areas was carried out at the beginning of the Project in October 2003. At the occasion of this final evaluation, the personal attainment level of six core researchers of VAST(IET) are compared with their personal attainment level before the Project.




Table 3. Self-evaluated Personal Attainment Level (%)

Expected Areas to Improve		Before	After
Water Quality	Establishing the standard laboratory	40	65
		40	80
		40	70
		30	50
	Enhancing capacity of water management	50	75
		20	60
Using a perfect analyzing instruments	20	90	
	40	65	
Waste Water Treatment	Application of treatment technology for the wastewater contaminating organic pollutants	20	60
	Application of biological method for wastewater treatment	20	70
	Calculation of chemical process for environmental engineering	40	80
	Development of a biological nitrogen removal process for domestic wastewater treatment	40	80
	Development of a arsenic removal process for domestic wastewater treatment	20	100
	Study on advanced oxidation processes for textile waste water treatment and develop a suitable method	30	100

Based on the progress of preparation of the draft monitoring manual (Indicator 2 and Indicator 3), it can be concluded that the achievement level of the Project Purpose is in general satisfactory.

4. EVALUATION

4-1 Relevance

Overall, the Relevance of the Project is high. The details are as follows.

Relevance of the Project for Vietnamese government's policy

Due to the rapid economic growth and industrialization, the environmental situations are getting worse, which makes environmental prevention a major issue for the government. The *Five Year Socio-Economic Development Plan (2006-2010)*, a national development plan, states that economy, society and environment are perceived as the three important factors that secure the sustainable development. Furthermore, it is clearly stated that the Vietnamese Government will make efforts to protect environment in the *National Strategy for Environmental Protection (2001-2010)* (MONRE, December 2003). In addition, *MONRE's Five Year Plan for Natural Resources and Environment (2006 -2010)* (MONRE, December 2005) explains that MONRE will tackle for the improvement of water quality. Therefore, it can be said the importance of improvement of water quality is widely

recognized. Hence, the relevance of the Project in this regard is satisfactorily secured.

Relevance of the Project for the target groups

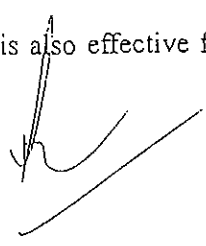
It can be concluded that the project approach is in line with the Overall Goal because its target organization is VAST- the leading research institutes in the field of environmental technologies; and the advanced and reliable analytical ability acquired by VAST through this project will greatly contribute to improvement of water environment protection in Vietnam (the Overall Goal). According to the Government Decree No. 24/2004/ND-CP about the establishment of VAST, this academy is directly under the national government (i.e. the prime minister) with the same level of authorities as other ministries and thus could perform the technical consultancy to the state bodies. In fact, VAST(IET) is designated to perform tasks including research, consultancy to the state bodies on the policy related to the environmental protection, engineering services on environmental technology and provision of training opportunities for the high-qualified staff. Therefore, it is highly plausible that the transferred knowledge and technologies is spread through these channels and contribute achieving the Overall goal.

In addition, according to the interview surveys to core researchers and engineers, it is confirmed that the Project meet the needs of VAST(IET). Eleven interviewees, including the project manager, acknowledged the importance of improving their skills as researchers in the national leading academy and indeed appreciated that the Project helped them improve their knowledge and skills. VAST(IET) has been perceived as one of most reliable institutions from other research institutes, universities, institutes under different ministries and private companies, and effects of VAST(IET) is rather large and reachable to the wider stakeholders. Thus it can be concluded that the selection of C/P agency is highly appropriate at this stage.

4-2 Effectiveness

Based on the achievement of the Outputs and the Project Purpose stated in Section 3. "Achievement", the Project is likely to fulfill its purpose by the end of the cooperation period. However, the quality of the documents which are produced by the Project were not specified in the PDM. When the quality aspect is taken into consideration, it can be assessed that the Project needs to make more efforts to maximize effectiveness. Before the completion of the Project, the overall effectiveness of the project is likely to be further enhanced by the Project's efforts.

The project is also effective for enhancing capacities of DONRE, who should actually implement



the policies and plans aiming at improvement of the environment. In particular, the training courses targeting DONRE staff members were organized based on an assessment of DONRE's training needs. Support to the provinces is expected to be further important.

It is worth mentioning at this point that collaboration in concrete environmental activities between the Project and MONRE, institutes under MONRE and other relevant organizations will become more crucial.

Last but not least, it seems that the effectiveness of the Project was further enhanced by the enormous ability and diligence of C/Ps and the organizational strength of VAST(IET), high recognition of VAST as the national leading research institute, which make VAST work easily with other organization, and ever increasing demands for the environment protection.

4-3 Efficiency

It is true that it took unexpectedly long time to install equipment and some experts were dispatched later than the originally planned. In fact, due to the present status of economy in Vietnam, it was difficult and took time for smaller business entities to handle imported equipment as scheduled. However, it gave opportunities and time for C/Ps to learn specifications, and to choose equipment based on their needs.

C/Ps are satisfied with varieties and numbers of equipment, and high frequency of use. Thanks to the equipment provided by JICA, varieties of analysis became possible to be provided by VAST(IET).

The enormous ability and diligence of C/Ps and the organizational strength of VAST(IET) made the Project fulfill the satisfactory level of achievement in spite of delay in installing all necessary analytical equipment and the 7-month absence of long-term expert on water analysis. Thus, as a result, overall efficiency of the Project can be assessed as highly satisfactory.

¹ *National Strategy for Environmental Protection (2001-2010)* (MONRE, December 2003)
MONRE's Five Year Plan for Natural Resources and Environment (2006 -2010) (MONRE, December 2005) *Five Year Socio-Economic Development Plan (2006-2010)*,

4-4 Impact

In fact, during the evaluation, the Team could find several positive impacts of the Project which have already emerged.

First of all, various studies and advices have been provided by VAST(IET) to MONRE and other local authorities based on requests from them. VAST(IET) also provides consulting and engineering services on wastewater treatment to hospitals and factories. In addition, officers from 25 DONREs out of 64 DONREs in the country participated in the training courses and received lectures from C/Ps. Furthermore, VAST(IET) submitted document No.285/VCNMT dated on September 14 2005 to the General Department of Standard and Quality/MOST and MONRE with the purpose of proposing to revise the Vietnamese Standards (TCVN) in water environment.

Another positive impact of the project is the trainings provided by the Project to DONRE officers. These training courses met their needs well because they contributed to enhancing basic abilities of water environmental management, updating their knowledge and sharing Japanese experiences. After the training courses, VAST(IET) received requests for trainings from Thanh Hoa province, Thai Nguyen province, Bac Ninh province and Hai Duong province where some of the participants belong to. Great demands towards trainings by VAST(IET) were also confirmed at the focus group discussions.

As another event, it is worth mentioning that the university students who were under laboratory trainings in VAST(IET) reported what they have learned in VAST(IET) laboratories, and in response, some universities who sent students to VAST(IET) laboratories invited some staff members as lecturers. This can be considered another positive impact of the Project.

As mentioned, several positive impacts have been already occurring, and thus the further positive impacts in the future can be expected.

4-5 Sustainability

Institutional Aspects

The institutional sustainability is likely to be secured. According to the Government Decree No. 24/2004/ND-CP, about the establishment of VAST, this academy is directly under the national government (i.e. the prime minister) with the same level of authorities as other ministries and thus

could perform the technical consultancy to the state bodies. In fact, VAST(IET) is designated to perform tasks including research, consultancy to the state bodies on the policy related to the environmental protection, engineering services on environmental technology and provision of training opportunities for the high-qualified staff. Therefore, it is highly plausible that the transferred knowledge and technologies is spread through these channels and contribute achieving the Overall goal.

During the project period, staff number of VAST(IET) has been increasing from 70 in April 2003 to 144 in December 2005. Due to the high recognition of VAST(IET) and its provision of high personal development prospects, staff members work long without frequent job hopping, and thus the sustainability from the organizational aspect can be considered secured.

Financial Aspects

It is expected that sufficient budget will be allocated for the future activities. The annual budget of VAST(IET) is indeed in upward trend since the beginning of the Project. In addition to the budget from the government, VAST(IET) could secure own financial resources through providing consulting and engineering services to other organizations such as DONREs, hospitals and factories. This could secure the financial sustainability of VAST(IET). For the future, VAST(IET) should make more efforts to increase own financial resources through the commissioned studies and engineering services in order to not only maintain but also to invest in other equipment.

In general, looking at the financial status and trends, VAST(IET) is stable and thus can secure sustainability of the Project.

Technical Aspects

As reiterated before, the C/P agency formed 18 working groups for main analytical and treatment equipments with its own initiative by using the balancing budget, carried out researches on compositions and functions of equipment, measurement principles and operational method with supports from Japanese experts. The results of these researches were compiled as 18 research reports. Contents of some reports were announced at the project steering committee at VAST and were approved by VAST. Likewise, the level of participation and ownership of the C/P agency can be considered high.

In addition, VAST(IET) have hired external resources on QA/QC with their own budget in order to

increase the reliability of monitoring data. C/Ps have made great efforts to enhance their capacities and this can be said as a sign of sustainability.

As mentioned, Vietnamese side is actively acquiring knowledge and analytical methods by using equipment provided through the Project. It is true that the cost for operation and maintenance for the advanced equipments is rather high, but they recognized the importance to maintain the advanced equipment as the leading research institute in the field of natural science and technology, to raise own funds and to keep on producing accurate data.

Looking at the sustainability of the Project from three different aspects, namely institutional aspect, financial aspect and technical aspect, it can be concluded that the sustainability is likely to be secured in the future.

5. CONCLUSION

5-1 Results of Evaluation

As summarized under the five evaluation criteria, in general the Project has been in good progress, and it is considered that the Project will achieve its objectives originally planned by the end of the Project in October 2006. Therefore, the Project should be able to be terminated in October 2006 as described on Record of Discussions.

Overall, it can be concluded that VAST(IET) comprehended issues in water environment management precisely through the Project, and has acquired fundamental technological knowledge (monitoring, countermeasures, and policy supports), which can be applicable to water environment management. It is worth mentioning that, in addition to efforts by Japanese experts, the active participation and strong ownership from the C/P agency are one of major factors that contributes to the good progress of the Project. In the future, in order to achieve the overall goal and improve water environment, the further efforts of the Vietnamese side is expected.

5-2 Lessons Learned

The following points were identified as lessons learned from the result of evaluation.

(1) Appropriate timing of project implementation

In response to the rapid economic growth and deterioration of environment, Ministry of Natural Resources and Environment was established as an agency for environmental administration

independently from the new Ministry of Science and Technology in August 2002. At the same time, Institute of Environmental Technology was formed under National Center for Science and Technology (NCST) (VAST at present). Hence, it can be seen that the system to battle deteriorating environmental issues is emerging in Vietnam. The Project was started in 2003, and this appropriate timing for commencement could be considered as one of contributing factors to success of the Project.

(2) Selection of appropriate C/P agency and Human Resource Management

VAST is the leading national academy which directly belongs to the central government, and thus the technological level of the organization is believed to be the highest in Vietnam. Naturally, the level of knowledge and technological capacity, and also the awareness towards environmental issues of major C/P personnel in VAST(IET) are reasonably high. Sampling and operation and maintenance of major analytical equipment are also carried out by themselves; Thus, VAST has appropriate features as a C/P agency of technical cooperation. In addition, the VAST(IET) is organizationally strong, and the VAST(IET) as a organization supports the Project adequately. These capabilities and strong commitment of the C/P side can be contributing to the success of the Project.

5-3 Recommendations

The following points were identified as recommendations from the result of evaluation.

(1) Confirmation of fundamental technological capacity and improvement of quality

The Project primarily aims to enhance the fundamental capabilities, and by looking at indicators, it can be said that the Project is almost achieving the objectives. However, on the other, when the quality aspect of outputs is taken into consideration, the level of them were not necessarily satisfactory in order for the Vietnam to carry out environmental monitoring, analysis, researches and policy recommendation, and therefore the further efforts to enhance capacities are essential. At least, during the remaining period of the Project, the Project should make more efforts to conclude the remaining issues such as development and recommendation of standardized monitoring methods and carrying out experiments on wastewater treatment, utilizing opportunities to learn from Japanese experts, and improving the qualitative aspect of the outputs.

(2) Appropriate operation and maintenance of the equipment and the future plan

It can be said that new equipments purchased by the Project is properly used currently. As for the operation and maintenance of equipment, it is important for the Vietnamese side to prepare a plan

for operation and maintenance, secure the budget, and in addition draw another plan for renewal and additions of advanced equipment. Also, along with the expansion of VAST(IET), the VAST(IET) should pay attentions to recruit competent personnel, and should do so in a consistent manner.

Currently the construction of IET building is now undergone. On the occasion of shifting to the new building, the Vietnamese side will be fully responsible to re-install all equipment to new laboratories.

(3) Enhancement of collaboration with other organization

In Vietnam, two organizations, MONRE, a regulator and policy maker relating to environmental issues and VAST(IET), research institute for environmental technology, exist in parallel, and the collaboration of those two institutes has been considered as a major issue since the project formulation stage.

The Project does not only support the research activities, but also aims to contribute to improving the water environment situation in practical for Vietnam. Therefore, VAST(IET) is highly expected to take actions towards not only MONRE and local authorities such as DONREs but also various actors such as private business entities and universities, to collaborate with them in practical manner, and to enhance the partnership that can contribute to improving capacities of all relevant organization.

In addition, it is important to enhance the technical capacity of VAST(IET) through these activities in the fields, and to accumulate know-how in VAST(IET).

(4) Strengthening of the assistance to DONREs

Among all relevant organizations mentioned above, the actual implementing agent of water environment management is DONREs in 64 provinces all over Vietnam. Currently the organizational capacities of DONREs vary greatly, and as a whole, they have not obtained sufficient capacities yet. It is essential and urgent to strengthen DONREs' capacities in order to improve the water environment in Vietnam, and thus VAST(IET), as a leading institute in the field of environmental technology, could play a major role in this aspect. It can be considered that the strengthening of technical capacity of DONREs, in collaboration with MONRE and other organizations, is an important role of VAST(IET) in the future.

ANNEX I PROJECT DESIGN MATRIX (PDM)

Project for Enhancing Capacity of National Center for Natural Science and Technology (NCST) of Vietnam in Water Environment Protection

Target area: Viet Nam Target group: NCST staff members in the sections related to water environment protection 10th September, 2003 (V1.0) 1/3

Narrative Summary	Objective Verifiable Indicators	Means of Verification	Important Assumptions
<p>Overall Goal The capacity of Vietnamese authorities related to water environment protection will be improved.</p>	<ul style="list-style-type: none"> - Number of monitoring points - Number of transferred technologies being applied in actuality - Number of technological issues recommended by NCST (JET) to related authorities 	<ul style="list-style-type: none"> - Water quality monitoring report by MONRE - List of Vietnamese Standards related to water quality - List of laws and regulations related to water environment protection 	<ul style="list-style-type: none"> - State policy on water environment protection remains unchanged
<p>Project Purpose The capacity of NCST related to water environment protection is improved.</p>	<ul style="list-style-type: none"> - Water quality monitoring reports are submitted to MONRE by NCST (JET) - Number of organizations being advised by NCST (JET) will increase compared to the year 2002 - Participants trained by NCST (JET) will reach () persons 	<ul style="list-style-type: none"> - Project final report - NCST (JET) annual reports - Reports on training courses 	<ul style="list-style-type: none"> - Trained researchers continue to work at NCST (JET) - NCST (JET) continue to obtain supports from central government as key institute in field of water environment protection - MONRE, MOI, and other central government agencies, and local provinces and cities are cooperative to the project

ANNEX I - 1

Narrative Summary	Objective Verifiable Indicators	Means of Verification	Important Assumptions
<p>Outputs</p> <p>1) NCST researchers' abilities to conduct water quality monitoring and to develop analysis methods are improved.</p>	<p>1-1. Number of analytical method mastered by NCST (IET) researchers through the technical transfer</p> <p>1-2. Number of reports on development of SOP on water quality analysis.</p>	<p>- NCST (IET) annual report</p> <p>- Project annual reports</p> <p>- Project final report</p>	<p>- Having timely funds from state</p> <p>- Having favorable supports from the state in coordinating with other institutes, ministries, provinces, and cities</p>
<p>2) NCST researchers' abilities to develop and apply suitable technologies on domestic and industrial wastewater treatment are improved.</p>	<p>2-1. Improvement of wastewater treatment system in NCST.</p> <p>2-2. Number of case studies requested by MONRE and other organizations.</p>	<p>- Training course reports</p> <p>- Seminar reports</p>	<p>- Keeping good relationship between NCST and MONRE and other related organizations.</p>
<p>3) NCST staff members' abilities to conduct training courses on water quality monitoring and wastewater treatment for central and local organizations are improved.</p>	<p>3-1. More than six teaching materials are made by NCST (IET) staff members.</p> <p>3-2. Curriculums are properly developed for each training courses.</p>		
<p>4) NCST researchers are to contribute to MONRE's and related organizations' activities of water environment protection.</p>	<p>4-1. Number of projects given by MONRE and related organizations to NCST (IET).</p> <p>4-2. Number of evaluation reports for relevant projects of other organizations.</p>		

Narrative Summary	Objective Verifiable Indicators		Means of Verification	Important Assumptions
<p>Activities</p> <p>1. Transfer of technologies on water quality monitoring and analysis.</p> <p>1.1 To develop the manual for water quality monitoring.</p> <p>1.2 To develop Standard Operation Procedure (SOP) on water quality analysis relevant to water quality standards.</p> <p>1.3 To recommend appropriate monitoring procedure to relevant government organizations through the process of collecting and assessing data from some water monitoring stations.</p> <p>2. Transfer of technologies on wastewater treatment</p> <p>2.1 To improve wastewater treatment system in NCST by its researchers.</p> <p>2.2 To advise concerning Vietnamese authorities on suitable technologies for wastewater treatment.</p> <p>2.3 To collect information of advanced or suitable technologies on wastewater treatment.</p> <p>3. To train NCST staff members in conducting training courses on water environment protection.</p> <p>3.1 To conduct training courses on water environment management.</p> <p>3.2 To conduct training courses for central and local organization on water quality monitoring.</p> <p>3.3 To conduct training courses on wastewater treatment.</p> <p>3.4 To Conduct seminars on water environment protection in Vietnam.</p> <p>4. To contribute to MONRE's and other related organizations' activities of water environment protection.</p> <p>4.1 To implement projects of water environment protection given by MONRE and related organizations.</p> <p>4.2 To advise MONRE and other organizations on water quality management optimization.</p>	<p>Japan side</p> <p>1. Dispatch of experts Long-term experts In charge of:</p> <ul style="list-style-type: none"> - Chief adviser/Environment Management - Coordinator - Water analysis - Water treatment <p>Short-term experts (Depend on actual needs)</p> <p>2. Provision of equipment</p> <p>3. Training in Japan</p> <p>4. Dispatch of study team (Depend on actual needs)</p>	<p>Inputs</p> <p>1. Allocation of counterpart persons Project Director Project Manager Project Sub-Manager Full time counterparts Researchers, secretary, administrative staff and others</p> <p>2. Preparation of lands, office rooms, and other supplementary facilities</p> <p>3. Provision of financial sources for on-site project management</p>	<p>Viet Nam side</p>	<p>The state continues to give priority to water environment protection</p> <ul style="list-style-type: none"> - Have cooperation from Japanese government - Counterpart persons are appropriately allocated <p>Pre-conditions</p> <ul style="list-style-type: none"> - NCST continues to be identified as national research institute - There is no opposition against the project implementation from relevant people

ANNEX II-1 List of Japanese Experts

JICA Long-term Experts

No.	Full name	Duration	Expertise
1.	Mr. YAMAMOTO Mitsuhiro	Aug.25, 2003– Oct. 31, 2006 (38 months)	Chief Advisor, Water environment management
2.	Mr. MAKINO Ichiro	Nov.03, 2003 – Nov.03, 2004 (12 months)	Water analysis
3.	Mr. FUTAMATSU Masayuki	Mar. 2004 –Mar. 2006 (24 months)	Wastewater treatment
4.	Mr. NISHIMIYA Koji	May 2004 – Oct. 31, 2006 (29 months)	Project coordination
5.	Mr. GOI Kunihiro	June 10, 2005 – Oct. 31, 2006 (17 months)	Water analysis
6.	Mr. WARASHINA Munehiro	July 16, 2005 – Oct. 31, 2006 (16 months)	Monitoring

JICA Short-term Experts

Fiscal Year 2004

No.	Full name	Duration	Expertise
1	Mr. NAGAFUCHI Osamu	Sep.16 – Oct.16, 2004 (1.0 month)	Water sampling technology
2	Ms. TSUBUKU Michiko	Nov.29 – Dec.11, 2004 (0.5 month)	Measurement for specified toxic substances
3	Mr. IMAMURA Kiyoshi	Jan.10 – Jan.28, 2005 (0.5 month)	Analysis technology for specific equipment
4	Mr. TOBIISHI Kazuhiro	Feb.13 – Mar. 31, 2005 (1.5 months)	Water Analysis
5	Mr. HOGETSU Akihiko	Feb.13 – Mar. 30, 2005 (1.5 months)	Specific wastewater treatment technology

Fiscal Year 2005

No.	Full name	Duration	Expertise
1	Mr. NAGAFUCHI Osamu	Aug. 21, 2005 – Sept. 10, 2005 (3.0 weeks)	Water sampling technology
2	Mr. ABE Hiroshi	Aug. 27, 2005 – Dec. 14, 2005 (4.0 months)	Wastewater treatment technology by methods
3	Mr. KIKUCHI Shu	Oct.26, 2005 – Dec. 14, 2005 (2.0 months)	Treatment technology for specified wastewater
4	Mr. JINYA Daisuke	Feb.05, 2006 – March 04, 2006 (1.0 month)	Analysis technology for specified toxic substance
5	Mr. SAITOH Katsumi	Mar. 05, 2006 – Mar. 25, 2006 (3.0 weeks)	Technology on standards of procedure for analysis

Fiscal Year 2006

No.	Full name	Duration	Expertise
1	Mr. ABE Hiroshi	May 8, 2006 – Oct. 31, 2006 (6.0 months)	Wastewater treatment technology

ANNEX II-1 - 1

ANNEX II-2 List of Counterparts

No.	Name of C/P	Position	Start of Working In IET
1	Nguyễn Thế Đông	Director	1 Apr. 2003
2	Trịnh Văn Tuyên	Deputy head of Dep.	1 Apr. 2003
3	Nguyễn Minh Tuấn	Deputy head of Dep.	1 Apr. 2003
4	Mai Trọng Chính	Researcher	1 Apr. 2003
5	Đậu Đức Hải	Researcher	1 Apr. 2003
6	Hàn Chiến Thắng	Researcher	1 Apr. 2003
7	Tô Thị Hải Yến	Researcher	1 Apr. 2003
8	Chu Thị Ngọc Quỳnh	Researcher	15 Apr. 2003
9	Nguyễn Thu Hương	Researcher	1 Apr. 2003
10	Đặng Thanh Tú	Researcher	1 Apr. 2003
11	Hoàng Thị Thu Hằng	Researcher	1 Apr. 2003
12	Phan Đỗ Hùng	Researcher	1 Apr. 2003
13	Nguyễn Trung Hải	Researcher	1 Apr. 2003
14	Phạm Thị Thanh Hà	Researcher	1 Apr. 2003
15	Nguyễn Thị Thanh Minh	Researcher	1 Apr. 2003
16	Hoàng Đức Hạnh	Researcher	1 Apr. 2003
17	Mai Thị Phương Thủy	Researcher	1 Apr. 2003
18	Nguyễn Trường Giang	Researcher	1 Apr. 2003
19	Phạm Quang Huy	Researcher	1 Apr. 2003
20	Trần Nam Trung	Researcher	1 July 2003
21	Phạm Thị Thu Hà	Researcher	1 June 2003
22	Vũ Công Nghị	Researcher	1 June 2003
23	Đặng Thị Thủy Nguyễn	Researcher	4 Aug. 2003
24	Hoàng Thị Hằng	Researcher	1 Apr. 2003
25	Kim Ngọc Mai	Researcher	18 Aug. 2003
26	Phạm Thị Thu Hà	Researcher	29 Feb. 2004
27	Phạm Thị Hải Thịnh	Researcher	8 Mar. 2004
28	Nguyễn Văn Đón	Researcher	1 May 2005
29	Trần Huệ Chi	Researcher	1 Aug. 2005
30	Chu Hồng Chuyên	Researcher	1 May 2005
31	Phan Thế Dương	Researcher	1 Aug. 2005
32	Hoàng Thị Trung Hiếu	Researcher	1 May 2005
33	Trần Quang Khôi	Researcher	1 May 2005
34	Trần Trung Kiên	Researcher	1 Aug. 2005
35	Hoàng Lương	Researcher	1 June 2005
36	Nguyễn Khánh Long	Researcher	1 May 2005
37	Nguyễn Hoài Phương	Researcher	1 Aug. 2005
38	Nguyễn Hữu Trung	Researcher	1 May 2005
39	Phạm Anh Tuấn	Researcher	1 Sep. 2004
40	Đào Hải Yến	Researcher	1 May 2005
41	Đỗ Văn Minh	Researcher	1 Jan. 2006
42	Nguyễn Đức Hưng	Researcher	1 Feb. 2006
43	Nguyễn Thị Phương Thảo	Head of Dep.	1 Apr. 2003

No.	Name of C/P	Position	Start of Working In IET
73	Phạm Hoài Long	Researcher	1 Apr. 2003
74	Lê Mai Thảo	Researcher	1 Apr. 2003
75	Lê Minh Tuấn	Researcher	1 Apr. 2003
76	Phan Tiến Hưng	Researcher	1 Apr. 2003
77	Trần Thị Thu Hương	Researcher	1 Apr. 2003
78	Nguyễn Mai Dương	Researcher	1 Apr. 2003
79	Nguyễn Thị Văn Trang	Researcher	1 June 2003
80	Nguyễn Biên Cường	Researcher	1 Jan. 2004
81	Trần Thanh Thân	Researcher	1 Jan. 2005
82	Đàm Quang Thọ	Researcher	2 May 2005
83	Nguyễn Thị Giang Hương	Researcher	1 June 2005
84	Phạm Văn Lam	Researcher	1 June 2005
85	Nguyễn Thị Lê Hương	Researcher	1 Mar. 2005
86	Nguyễn Việt Hoàng	Researcher	1 Jan. 2005
87	Nguyễn Hoài Châu	Deputy Director	1 Apr. 2003
88	Nguyễn Việt Dũng	Head of Dep.	1 May 2003
89	Trần Thị Ngọc Dung	Deputy head of Dep.	1 Apr. 2003
90	Nguyễn Văn Hà	Researcher	1 Apr. 2003
91	Nguyễn Thị Thanh Hải	Researcher	1 Apr. 2003
92	Phùng Đình Tá	Researcher	1 Apr. 2003
93	Ngô Việt Thắng	Researcher	1 Apr. 2003
94	Lê Xuân Thịnh	Researcher	1 Apr. 2003
95	Phạm Hoàng Long	Researcher	1 Apr. 2003
96	Lê Tứ Hải	Researcher	1 Apr. 2003
97	Cao Dũng Hải	Researcher	1 Apr. 2003
98	Trần Mạnh Hải	Researcher	1 Apr. 2003
99	Nguyễn Thái Thu Nga	Researcher	1 Apr. 2003
100	Phạm Kim Cương	Researcher	1 Apr. 2003
101	Phạm Văn Hiền	Researcher	1 Apr. 2003
102	Lê Xuân Lâm	Researcher	1 Apr. 2004
103	Nguyễn Đức Lập	Researcher	1 Apr. 2004
104	Nguyễn Đình Cường	Researcher	1 July 2004
105	Lê Anh Bằng	Researcher	1 Jan. 2005
106	Nguyễn Triều Dương	Researcher	1 Jan. 2005
107	Nguyễn Trung Sơn	Researcher	1 Jan. 2005
108	Đình Ngọc Thái	Researcher	1 Jan. 2005
109	Nguyễn Minh Tuấn	Researcher	1 Jan. 2005
110	Nguyễn Hữu Nam	Researcher	2005/10/1
111	Phạm Thị Bích Thủy	Researcher	1 Jan. 2005
112	Lê Xuân Hội	Researcher	1 Jan. 2005
113	Nguyễn Trọng Bội	Researcher	1 Oct. 2005
114	Đặng Đình Kim	Deputy Director	1 Nov. 2003
115	Trần Văn Tựa	Deputy head of Dep.	1 Nov. 2003

ANNEX II-2 List of Counterparts

44	Nguyễn Thị Huệ	Deputy head of Dep.	1 Apr. 2003
45	Nguyễn Trọng Trúc	Deputy head of Dep.	1 Apr. 2003
46	Nguyễn Tuyết Vân	Researcher	1 Apr. 2003
47	Trần Thị Lan	Researcher	1 Apr. 2003
48	Chu Thị Thuý	Researcher	1 Apr. 2003
49	Phạm Hải Long	Researcher	1 Apr. 2003
50	Tạ Thuý Nguyễn	Researcher	1 Apr. 2003
51	Nguyễn Quang Trung	Researcher	1 Apr. 2003
52	Vũ Văn Tú	Researcher	1 Apr. 2003
53	Đông Thị Minh Hà	Researcher	1 Apr. 2003
54	Phan Quang Thăng	Researcher	1 Apr. 2003
55	Nguyễn Thị Hương	Researcher	1 Apr. 2003
56	Đặng Lan Anh	Researcher	16 Nov. 2005
57	Chu Ngọc Kiên	Researcher	1 Jan. 2004
58	Phạm Anh Tuấn	Researcher	1 Jan. 2004
59	Nguyễn Thanh Thảo	Researcher	1 Jan. 2004
60	Trần Thị Phương Thảo	Researcher	1 Jan. 2004
61	Lê Quỳnh Nga	Researcher	1 Jan. 2004
62	Nguyễn Hồng Khánh	Deputy Director	1 Jan. 2003
63	Nguyễn Minh Sơn	Deputy head of Dep.	1 June 2005
64	Tạ Đăng Toàn	Deputy head of Dep.	1 Apr. 2003
65	Phan Minh Châu	Researcher	1 July 2005
66	Dương Đắc Tuấn	Deputy head of Dep.	1 Apr. 2003
67	Nguyễn Thị Như Định	Researcher	1 Apr. 2003
68	Nguyễn Anh Thảo	Researcher	1 Apr. 2003
69	Nguyễn Tiến Vinh	Researcher	1 Apr. 2003
70	Phạm Tuấn Linh	Researcher	1 Apr. 2003
71	Đặng Thị Lan Hương	Researcher	1 Apr. 2003
72	Nguyễn Thành Đồng	Researcher	1 Apr. 2003

116	Đặng Hoàng Phước Hiền	Researcher	1 Nov. 2003
117	Lê Thị Thu Thuý	Researcher	1 Nov. 2003
118	Tăng Thị Chính	Researcher	1 Nov. 2003
119	Hoàng Thị Bảo	Researcher	1 Nov. 2003
120	Nguyễn Tiến Cư	Researcher	1 Nov. 2003
121	Dương Thị Thuý	Researcher	1 Nov. 2003
122	Nguyễn Sỹ Nguyễn	Researcher	1 Nov. 2003
123	Nguyễn Đức Thọ	Researcher	1 Nov. 2003
124	Đặng Thị Thơm	Researcher	1 Nov. 2003
125	Hồ Tú Cường	Researcher	1 Nov. 2003
126	Bùi Thị Kim Anh	Researcher	1 Nov. 2003
127	Đặng Thị Thanh Xuyên	Researcher	1 May 2005
128	Đỗ Tuấn Anh	Researcher	1 Jan. 2006
129	Trần Hà My	Researcher	1 Jan. 2006
130	Nguyễn Trần Điện	Deputy head of Dep.	1 Apr. 2003
131	Nguyễn Việt Hùng	Deputy head of Dep.	1 Apr. 2003
132	Đỗ Thị Lâm Thanh	Staff	1 Apr. 2003
133	Nguyễn Thị Duyên Hải	Staff	1 Apr. 2003
134	Chu Thị Phương Chi	Staff	1 Apr. 2003
135	Bùi Thị Vân Linh	Staff	1 Apr. 2003
136	Lê Thị Thục Oanh	Staff	13 Aug. 2005
137	Nguyễn Xuân Đại	Driver	1 Apr. 2003
138	Hoàng Trung Thành	Driver	1 June 2004
139	Nguyễn Anh Dũng	Driver	15 Aug. 2004
140	Bùi Quang Cư	Head of Lab. in HCM	Apr. 2003
141	Vũ Hải Yến	Researcher	Sep. 2005
142	Lê Thị Chu Biên	Researcher	Jan. 2006
143	Nguyễn Thị Thảo	Researcher	Mar. 2005
144	Lê Thị Phương Thu	Researcher	Mar. 2005

ANNEX II-2

Fiscal Year 2002

No.	Training Course Title	Duration	Researcher's Name
I. Counterpart Training Course (Preparation for the Project)			
1	Water environmental management	Mar. 05 – Mar.12, 2003 (1 week)	Mr. Dang Vu Minh
2	Water environmental management	Mar. 05 – Mar.12, 2003 (1 week)	Mr. Nguyen The Dong
3	Water environmental management	Mar. 05 – Mar.12, 2003 (1 week)	Mr. Le Tran Lam
4	Water environmental management	Mar. 05 – Mar.12, 2003 (1 week)	Ms. Tran Thi Minh Ha

Fiscal Year 2003

No.	Training Course Title	Duration	Researcher's Name
I. Counterpart Training Course			
1	Water environmental management	Mar. 04 – Mar.16, 2004 (0.5 month)	Mr. Nguyen Khoa Son
2	Water environmental management	Mar. 04 – Mar.16, 2004 (0.5 month)	Mr. Bui Cong Que
3	Water environmental management	Mar. 04 – Mar.16, 2004 (0.5 month)	Mr. Chu Tri Thang
4	Water treatment and analysis	Mar. 04 – Apr.27, 2004 (2.0 months)	Mr. Vu Van Tu
5	Water treatment and analysis	Mar. 04 – Apr.27, 2004 (2.0 months)	Ms. Hoang Thi Thu Hang

Fiscal Year 2004

No.	Training course title	Duration	Researcher's Name
I. Counterpart Training Course			
1	Wastewater treatment technology	July 12 – Sept.16, 2004 (2.0 months)	Mr. Phan Do Hung
2	Facility design for wastewater treatment	June 18 – Aug. 03 2004 (1.5 months)	Ms. To Thi Hai Yen

3	Management of analysis technology	July.26 – Aug.07, 2004 (0.5 month)	Ms. Nguyen Thi Phuong Thao
4	Analysis technology	Jan.23 – Mar.15, 2005 (2.0 months)	Mr. Tran Ngoc Phu
5	Analysis technology	Jan.23 – Mar.15, 2005 (2.0 months)	Mr. Ta Thuy Nguyen
II. Long-term Training Course			
1	Research on environmental Technology	July 27, 2004 – June 26, 2005 (12 months)	Mr. Nguyen Minh Tuan
2	Preparatory course for Entry examination and Master Program	Oct.18, 2004 – Mar.31, 2005 (6.0 months)	Mr. Hoang Duc Hanh
III. Local Authorities Training Course			
1	Measuring and evaluation method by quality value on living environment	Jan.06 – Feb.05, 2005 (1.0 month)	Mr. Pham Anh Tuan
2	Measuring and evaluation method by quality value on living environment	Jan.06 – Feb.05, 2005 (1.0 month)	Mr. Chu Ngoc Kien
IV. Region Focused Training Course			
1	Social capacity development for environmental management and policy evaluation	Nov. 08 – Dec.12, 2004 (1.0 month)	Mr. Nguyen Van Thuong
2	Social capacity development for environmental management and policy evaluation	Nov. 08 – Dec.12, 2004 (1.0 month)	Ms. Nguyen Thi Thanh Hai
V. Third Country Training (China)			
1	First seminar on enhancing development of environmental management among Asian country	Mar. 01 – Mar.10, 2005 (0.5 month)	Mr. Trinh Van Tuyen

Fiscal Year 2005

No.	Training Course Title	Duration	Researcher's Name
I. Counterpart Training Course			
1	Management of Laboratory	Sep. 19, 2005 – Oct. 1, 2005 (0.5 month)	Dr. Bui Quang Cu
2	De-nitrogen and de-phosphorus technology for wastewater treatment	Nov. 5, 2005 – Dec. 3, 2005 (1.0 month)	Mr. Tran Trung Kien
3	Operation control technology for wastewater treatment facility	July 18, 2005 – August 13, 2005	Mr. Tran Nam Trung

ANNEX II-3 - 2

		(1.0 month)	
4	Analysis technology (pesticide etc.)	Sep. 15, 2005 – Nov. 15, 2005 (2.0 months)	Mr. Phan Quang Thang
5	Analysis technology (pesticide etc.)	Sep. 15, 2005 – Nov. 15, 2005 (2.0 months)	Ms. Nguyen Thanh Thao
II. Group Training Course			
1.	Research on Environmental Technology	July 26, 2005 – June 24, 2006 (01 year)	Ms. Bui Thi Kim Anh
III. Long-term Training Course			
1.	Master Program on Archipelago Environmental Engineering	Sep. 20, 2005 – Sep. 29, 2007 (24 months)	Ms. Hoang Thi Thu Hang
IV. Third Country Training (China)			
1	Capacity Building in Environmental Protection among Asian Countries	Nov. 13, 2005 – Nov. 27, 2005 (0.5 month)	Ms. To Thi Hai Yen
V. Region Focused Training Courses			
1	Social Capacity Development for Environmental Management and Policy Evaluation	Nov. 08, 2005 – Dec. 11, 2005 (1 month)	Mr. Han Chien Thang

ANNEX II-3 - 3

ANNEXII-4 List of Machinery and Equipment Provided

FY 2003

Exchange rate (US\$/JP) = 106.69

Equipment procured in Vietnam (over 1.600.000JP)

Date of acceptance	No.	Equipment	Price(US\$)	Qty	Total (US\$)	Installation Place
	01	TOYOTA LAND CRUISER PRADO	29,380	1	29,380	IET-Ha noi
	02	TOYOTA HIACE COMMUTER	20,680	1	20,680	IET-Ha noi
12-Aug-04	03	Atomic Absorption	171,762	1	171,762	IET-Ha noi
13-Aug-04	04	Gas Chromatograph	78,445	1	78,445	IET-Ha noi
13-Aug-04	05	Gas Chromatograph-Mass Spectrometer	177,871	1	177,871	IET-Ha noi
04-Oct-04	06	IR-Fourier Trans	35,742	1	35,742	IET-Ha noi
13-Aug-04	07	Total Organic Carbon Analyzer	54,616	1	54,616	IET-Ha noi
13-Aug-04	08	Auto - Titrator	16,950	1	16,950	IET-Ha noi
13-Aug-04	09	Automatic Mercury Analyzer	45,930	1	45,930	IET-Ha noi
13-Aug-04	10	Stereo Microscope System	21,092	1	21,092	IET-Ha noi
27-Oct-04	11	ICP-MS	237,854	1	237,854	IET-Ha noi
13-Aug-04	12	High Performance Liquid	90,850	1	90,850	IET-Ha noi
13-Aug-04	13	Ion Chromatograph	86,134	1	86,134	IET-Ha noi
13-Aug-04	14	LCMS	235,895	1	235,895	IET-Ha noi
06-Jul-04	15	Water Purification System	20,724	1	20,724	IET-Ha noi
04-Feb-05	16	Microwave Acid Digestion	44,626	1	44,626	IET- Ha noi
13-Aug-04	17	UV-VIS Spectrophotometer	17,592	2	35,184	IET-Ha noi
12-Aug-04	18	Atomic Absorption Spectrophotometer	171,762	1	171,762	IET-Ho Chi Minh
13-Aug-04	19	Gas Chromatograph	78,445	1	78,445	IET-Ho Chi Minh
13-Aug-04	20	UV-VIS Spectrophotometer	8,796	2	17,592	IET-Ho Chi Minh
13-Aug-04	21	Total Organic Carbon Analyzer	54,616	1	54,616	IET-Ho Chi Minh
13-Aug-04	22	Ion Chromatograph	86,134	1	86,134	IET-Ho Chi Minh
04-Feb-05	23	Microwave Acid Digestion	44,626	1	44,626	IET-Ho Chi Minh

Equipment procured in Vietnam(between 100.000JP\ to 1.600.000JP)

Date of acceptance	No.	Equipment	Price(US\$)	Quantity	Total(US\$)	Installation Place
13-Aug-04	01	Total Nitrogen Analyzing Unit	7,285	1	7,285	IET - Ha noi
13-Aug-04	02	Oil Auto-Analyzer	7,986	1	7,986	IET - Ha noi
04-Feb-05	03	Ion Meter	7,800	1	7,800	IET - Ha noi
30-Nov-04	04	Draft Chamber for acidic gas	4,920	10	49,200	IET - Ha noi
04-Feb-05	05	Electric Analytical Balance 10(-5)g	5,400	2	10,800	IET - Ha noi
04-Feb-05	06	Electric Analytical Balance 10(-4)g	3,067	3	9,200	IET - Ha noi
04-Feb-05	07	Electric Analytical Balance 1mg-	1,920	4	7,680	IET - Ha noi
30-Nov-04	08	Furnace	3,895	1	3,895	IET - Ha noi
30-Nov-04	09	Centrifuge	2,680	1	2,680	IET - Ha noi
30-Nov-04	10	Centrifuge	1,266	3	3,797	IET - Ha noi
30-Nov-04	11	Ultrasonic Cleaning Equipment	5,210	1	5,210	IET - Ha noi
30-Nov-04	12	Ultrasonic Cleaning Equipment	2,177	1	2,177	IET - Ha noi
30-Nov-04	13	Cleaning Air Hood	3,416	2	6,832	IET - Ha noi

ANNEXII-4 - 1

ANNEXII-4 List of Machinery and Equipment Provided

04-Feb-05	14	Distillated water System	1,150	2	2,300	IET - Ha noi
04-Feb-05	15	Platinum Crucible	1,350	10	13,500	IET - Ha noi
04-Feb-05	16	Standard Coliform MPN test	2,064	1	2,064	IET - Ha noi
30-Nov-04	17	Autoclave	5,588	1	5,588	IET - Ha noi
30-Nov-04	18	Ice Maker	5,833	1	5,833	IET - Ha noi
30-Nov-04	19	Freezer	1,833	1	1,833	IET - Ha noi
30-Nov-04	20	Incubator for BOD	1,556	2	3,112	IET - Ha noi
30-Nov-04	21	Freezer Dryer	10,790	1	10,790	IET - Ha noi
04-Feb-05	22	Rotary Evaporator	7,000	1	7,000	IET - Ha noi
30-Nov-04	23	Sterilization Oven	1,590	1	1,590	IET - Ha noi
30-Nov-04	24	Programmable Hot Plate	1,126	7	7,882	IET - Ha noi
30-Nov-04	25	Auto Industrial Wastewater	2,260	2	4,520	IET - Ha noi
04-Feb-05	26	Water Quality Monitoring	2,800	2	5,600	IET - Ha noi
16-Jun-04	27	Computer	1,740	26	45,240	IET - Ha noi
16-Jun-04	28	Software	1,379	1	1,379	IET - Ha noi
23-Jun-04	29	Color Laser Printer	3,950	1	3,950	IET - Ha noi
23-Jun-04	30	Photocopy Machine	4,759	1	4,759	IET - Ha noi
30-Nov-04	31	Jar test system	2,145	1	2,145	IET - Ha noi
30-Nov-04	32	Autoclave	3,626	2	7,252	IET - Ha noi
30-Nov-04	33	Oven	1,922	1	1,922	IET - Ha noi
13-Aug-04	34	Total Nitrogen Analyzing Unit	7,285	1	7,285	IET-Ho Chi Minh
04-Feb-05	35	Ion Meter	3,726	1	3,726	IET-Ho Chi Minh
30-Nov-04	36	Draft Chamber for acidic gas	2,460	2	4,920	IET-Ho Chi Minh
04-Feb-05	37	Electric Analytical Balance 10(-5)g	2,485	1	2,485	IET-Ho Chi Minh
04-Feb-05	38	Electric Analytical Balance 10(-4)g	1,320	1	1,320	IET-Ho Chi Minh
30-Nov-04	39	Incubator	1,692	1	1,692	IET-Ho Chi Minh
30-Nov-04	40	Oven	2,667	1	2,667	IET-Ho Chi Minh
30-Nov-04	41	Centrifuge	2,680	1	2,680	IET-Ho Chi Minh
30-Nov-04	42	Ultrasonic Cleaning Equipment	2,605	1	2,605	IET-Ho Chi Minh
30-Nov-04	43	Cleaning Air Hood	3,416	1	3,416	IET-Ho Chi Minh
04-Feb-05	44	Distillated water System	4,444	1	4,444	IET-Ho Chi Minh
04-Feb-05	45	Platinum Crucible	1,604	2	3,208	IET-Ho Chi Minh
04-Feb-05	46	Standard Coliform MPN test	3,417	1	3,417	IET-Ho Chi Minh
30-Nov-04	47	Water Bath	1,044	1	1,044	IET-Ho Chi Minh
30-Nov-04	48	Ice Maker	5,833	1	5,833	IET-Ho Chi Minh
30-Nov-04	49	Storage Cabinet	6,105	1	6,105	IET-Ho Chi Minh
30-Nov-04	50	Chest Freezer	5,880	2	11,760	IET-Ho Chi Minh
05-Feb-05	51	Water Quality Monitoring Equipment	4,175	1	4,175	IET-Ho Chi Minh
10-Dec-03	52	Copy machine	1,748	1	1,748	WEPPProject
30-Nov-04	53	Distillation apparatus for condensation	1,560	1	1,560	IET-Hanoi

Equipment procured in Japan (over 1.600.000JP)

Date of acceptance	No.	Equipment	Price(JP)	Qty	Total (US\$)	Installation Place
08-Nov-04	01	Lab.Waste Water Treatment	2,677.5	1	2,677.5	IET-Ha noi
30-Aug-04	02	Flotation unit	2,760	1	2,760	IET-Ha noi
30-Aug-04	03	Activated sludge treatment system	3,460	1	3,460	IET-Ha noi
30-Aug-04	04	Anaerobic Sludge Digession Tester	3,040	1	3,040	IET-Ha noi

ANNEXII-4 List of Machinery and Equipment Provided

30-Aug-04	05	Composting test device	1,660	1	1,660	IET-Ha noi
30-Aug-04	06	Ozone processing test device	2,760	1	2,760	IET-Ha noi
30-Aug-04	07	Aerobic flow bed method test	2,760	1	2,760	IET-Ha noi
30-Aug-04	08	Anaerobic/aerobic test device	4,140	1	4,140	IET-Ha noi
30-Aug-04	09	Ultrasonic Generator	1,900	1	1,900	IET-Ha noi

Equipment procured in Japan (between 100.000JP\ to 1.600.000JP\)

Date of acceptance	No.	Equipment	Price(JP\)	Qty	Total (JP\)	Installation Place
30-Aug-04	01	Contact oxidation test device	1,260	1	1,260	IET-Ha noi
30-Aug-04	02	Ultrasonic cleaning equipment	760	1	760	IET-Ha noi

Accompanying equipment

Date of acceptance	No.	Equipment	Price(JP\)	Qty	Total (JP\)	Installation Place
26-Aug-03	01	Computer	190	1	190	WEPProject
11-Apr-03	02	Computer	250	1	250	WEPProject

FY 2004

Exchange rate (US\$/JP\) = 108.39

Equipment procured in Vietnam(between 100.000JP\ to 1.600.000JP\)

Date of acceptance	No.	Equipment	Price (US\$)	Qty	Total (US\$)	Installation Place
23-Aug-04	1	Computer (Lap top)	1,665	1	1,665	IET-Hanoi
23-Aug-04	2	LCD Projector	2,900	1	2,900	IET-Hanoi
23-Aug-04	3	Copy machine	8,545	1	8,545	IET-Hanoi
15-Apr-04	4	Computer	1,080.98	1	1,080.98	WEP Project
09-Sep-04	5	Computer	1,655.38	1	1,655.38	WEP Project

FY 2005

Exchange rate (US\$/JP\) = 116.47

Equipment procured in Vietnam (over 1.600.000JP\)

Date of acceptance	No.	Equipment	Price(US\$)	Qty	Total(US\$)	Installation Place
21-Mar-06	01	FID/FPD/FTD/ECD GC	86,989	1	86,989	IET-Ha noi
21-Mar-06	02	UV-VIS Double	15,545	1	15,545	IET-Ha noi
21-Mar-06	03	TOC Auto Analyzer	65,495	1	65,495	IET-Ha noi
27-Feb-06	04	AOX equipment	54,495	1	54,495	IET-Ha noi
22-Mar-06	05	Ion Chromatography	84,968	1	84,968	IET-Ho Chi Minh
28-Mar-06	06	Electric generator (110 KVA)	22,950	1	22,950	IET-Ha noi
31-Mar-06	07	Bioreactor for microorganism cultiv	28,850	1	28,850	IET-Ha noi
23-Mar-06	08	Water Purification System(Ultra Pu	19,850	1	19,850	IET-Ha noi

Equipment procured in Vietnam (between 100.000JP\ to 1.600.000JP\)

ANNEXII-4 List of Machinery and Equipment Provided

Date of acceptance	No.	Equipment	Price(US\$)	Qty	Total(US\$)	Installation Place
07-Mar-06	01	Biological Safety Cabinets	7,200	1	7,200	IET-Ha noi
21-Mar-06	02	Flow injector for UV VIS	7,485	1	7,485	IET-Ha noi
27-Mar-06	03	Ultrasonic Cleaning Equipments	2,650	1	2,650	IET-Ha noi
27-Mar-06	04	Ultrasonic Cleaning Equipments (fo	2,165	1	2,165	IET-Ha noi
27-Mar-06	05	Soxhlet extraction (250 ml)	3,050	1	3,050	IET-Ha noi
27-Mar-06	06	Digestion Extraction System	3,050	1	3,050	IET-Ha noi
07-Mar-06	07	Furnace	1,850	1	1,850	IET-Ha noi
17-Mar-06	08	Solid Phase Extraction (Flow contr	3,150	1	3,150	IET-Ha noi
23-Mar-06	09	l Gel permeation Chromatography	2,254	1	2,254	IET-Ha noi
23-Mar-06	10	Mix reactor for HPLC	2,380	1	2,380	IET-Ha noi
08-Mar-06	11	Homogenizer	1,893	1	1,893	IET-Ha noi
05-Apr-06	12	Rotary evaporator (with pump)	6,000	1	6,000	IET-Ha noi
28-Mar-06	13	Refrigerated Circulator Baths	2,960	2	5,920	IET-Ha noi
27-Mar-06	14	Vacuum pump	1,450	4	5,800	IET-Ha noi
28-Mar-06	15	Vacuum oven	3,850	1	3,850	IET-Ha noi
27-Feb-06	16	Oven (up to 250 degree)	890	1	890	IET-Ha noi
31-Mar-06	17	Laboratory drying oven	1,780	1	1,780	IET-Ha noi
27-Feb-06	18	Freezer (minus 20 degree), chest typ	2,200	1	2,200	IET-Ha noi
27-Mar-06	19	Freezer (minus 20 degree), door typ	2,600	1	2,600	IET-Ha noi
28-Mar-06	20	Ion exchange and distillation water	12,030	1	12,030	IET-Ha noi
23-Feb-06	21	Double water distillation cabinet	4,310	1	4,310	IET-Ha noi
27-Feb-06	22	Water Bath	890	1	890	IET-Ha noi
28-Mar-06	23	Shaker (Horizontal/vertical)	2,535	1	2,535	IET-Ha noi
08-Mar-06	24	Digital Orbital Shaker	2,570	1	2,570	IET-Ha noi
31-Mar-06	25	Thermostat shaker	6,850	2	13,700	IET-Ha noi
27-Feb-06	26	Bench pH/ORP meter (for Lab.)	1,767	2	3,534	IET-Ha noi
01-Mar-06	27	DO meter (for Lab.)	2,353	1	2,353	IET-Ha noi
01-Mar-06	28	DO meter (for Lab.)	2,353	3	7,059	IET-Ha noi
14-Mar-06	29	Incubator Box for BOD	1,450	1	1,450	IET- Ho Chi Minh
14-Mar-06	30	Incubator Box for BOD	1,450	2	2,900	IET-Ha noi
01-Mar-06	31	Conductivity, TDS, Salt meter	868	3	2,603	IET-Ha noi
14-Mar-06	32	COD Reactor	846	3	2,538	IET-Ha noi
23-Feb-06	33	Water quality checker for Field Sur	3,480	1	3,480	IET- Ho Chi Minh
07-Mar-06	34	Water Sampler	1,490	1	1,490	IET- Ho Chi Minh
27-Feb-06	35	Current meter	4,800	1	4,800	IET-Ha noi
27-Feb-06	36	Ion selective meter	5,604	1	5,604	IET-Ha noi
27-Feb-06	37	Titration	4,260	1	4,260	IET-Ha noi
07-Mar-06	38	Multi gas detector	1,350	1	1,350	IET-Ha noi
14-Mar-06	39	Jar tester	1,682	1	1,682	IET-Ha noi

ANNEX II-5 Operational Budget of the Project

(Local budget of Japanese side)

(Unit: Japanese thousand Yen)

Cost of Project for Technology Transfer	JFY 2003	JFY 2004	JFY 2005	JFY 2006	Total
Operational Cost	3,117	8,000	7,132	4,465	22,714
Equipment and Machinery	180,659	106,434	79,447	1,107	367,647
Cost for Construction of Wastewater Treatment Plant in VAST		31,094			31,094
Total	183,776	145,528	86,579	5,572	421,455

ANNEX III

List of Outputs
(As of May, 2006)

No.	Name	Volume (page)
1	Information for freshwater monitoring practice	17
2	Interim report on environmental water monitoring practice	26
3	Effective training curriculum	19
4	- Improvement of wastewater environment treatment technologies - Laboratory waste liquid management system	328
5	Improvement plan for hospital wastewater treatment in Vietnam	80
6	Master plan for wastewater management in VAST (tentative)	5
	<i>Research tasks in the project</i>	-
7	Treatment of beer company wastewater by activated sludge process (AS reactor ASS-20P) (Responsible person: Phan Do Hung)	39
8	Removal of organic pollutants from textile wastewater by contact oxidation process (COTT-4 test device) (Responsible person: Phan Do Hung)	45
9	Simultaneous removal of organic matters and nitrogen from nitrogen-rich wastewater by A2O process (A2O test device) (Responsible person: Phan Do Hung)	28 + annex
10	Installation and utilization of field analyzer (pH-DO meter spectrophotometer DR-2500) (Responsible person: Dr. Nguyen Hoai Chau)	23 + annex
11	Installation and utilization of biological equipment (Microscope BX51, Stereoscope SZX12, Freezer Revco (Ultima II), Incubator) (Responsible person: Dr. Tran Van Tua)	65
12	Installation and utilization of ion chromatograph (Responsible person: MSc. Pham Tuan Linh)	50 + annex
	<i>Related research and development</i>	
13	Development of feasible technology for textile wastewater treatment (2004)	118
14	Development of feasible technology for removing ammonium and arsenics from domestic water (2005)	110
	<i>Master thesis</i>	
15	Study on technology for treatment of arsenics contaminated domestic water feasible to Vietnam conditions (2004)	72
16	Study on application of aerobic activated sludge process in secondary treatment of textile wastewater (2004)	84

ANNEX III - I

17	Treatment of beer company wastewater-by activated sludge process (2005)	95
18	Removal of amonium from domestic supply water by submerged biofiltration processes (2005)	70
	<i>Publication</i>	
19	Nguyen The Dong, Phan Do Hung, Dao Bich Thuy, Kim Ngoc Mai, "Arsenic removal from aqueous solutions by coprecipitation and adsorption using manganese dioxide based adsorbent", <i>Proc. of Environmental Science and Technology and Sustainable Development Conference</i> , Hanoi University of Science, 2004	5
20	Phan Do Hung, Nguyen The Dong, Pham This Than Ha, Pannetier Celine, Nguyen Than Thao, "Textile Wastewater Treatment by Combined Chemical and Biological Methods", <i>Proc. of the International Workshop on Water Quality and Treatment</i> , Hanoi, 2004	6
21	Cao The Ha, Nguyen The Dong, Nguyen Hoai Chau, Phan Do Hung, "Study on Kinetic Parameters of Nitrification and Denitrification Processes", <i>Proc. of Environmental Science and Technology and Sustainable Development Conference</i> , Hanoi University of Science, 2004	5
22	Cao The Ha, Nguyen The Dong, Nguyen Hoai Chau, Phan Do Hung, "Study on Nitrification by Aerated Submerged Biofilter", <i>Proc. of Environmental Science and Technology and Sustainable Development Conference</i> , Hanoi University of Science, 2004	6
23	Nguyen The Dong, Trinh Van Tuyen, Tran Van Hoa, Han Chien Thang, Pham Thi Thu Ha: Cyanide Treatment from wastewater of silver plating plant in LGis -VINA company, <i>1st VAST-AIST workshop, Hanoi, 2004</i>	6
24	Yasuaki Maeda, Nguyen The Dong: Application of Ultrasound to the Waste Treatment, <i>2005 National Environmental Conference, 2005.</i>	6
25	Nguyen The Dong, Phan Do Hung, Nguyen Hoai Chau, Kim Ngoc Mai, Dao Bich Thuy: Removal of arsenics from groundwater by combined Fenton oxidation and co-precipitation, <i>2005 National Environmental Conference, 2005.</i>	6
26	Nguyen The Dong, Pham Thi Thanh Ha, Phan Do Hung: Removal of color and COD from textile wastewater by Fenton oxidation, <i>2005 National Environmental Conference, 2005.</i>	6
27	Phan Do Hung, Nguyen The Dong, Tran Trung Kien, Nguyen Huu Trung, Dao Hai Yen, Futamatsu Masayuki: Comparison between contact oxidation and activated sludge processes in removal of organic pollutants from textile wastewater. <i>USA-VIETNAM Workshop on Water Pollution Prevention Technologies</i> , Hanoi, 2005	8
28	Nguyen The Dong, Phan Do Hung, Dao Hai Yen, Futamatsu Masayuki, Yamamoto Mitsuhiro: Treatment of Textile Dyeing and Starching Wastewater by Activated Sludge Process. <i>Regional Symposium on</i>	6

ANNEX III - 2

	<i>Chemical Engineering</i> , Hanoi, 2005.	-
29	Phan Do Hung, Nguyen The Dong, Tran Trung Kien, Nguyen Huu Trung, Futamatsu Masayuki, Yamamoto Mitsuhiro: Applicability of the Contact Oxidation Process in textile wastewater treatment. <i>Regional Symposium on Chemical Engineering</i> , Hanoi, 2005.	6
30	Trinh Van Tuyen, Nguyen The Dong, Tran Van Hoa, Han Chien Thang, Pham Thi Thu Ha: Treatment of wastewater from silver plating plant, 2 nd AIST-VAST workshop, Tsukuba, Japan, October 2005	5
	<i>Technology transfer</i>	
31	Design and technology transfer document of Moc Chau milk company wastewater treatment system	~ 100
32	Design and technology transfer document of Son La hospital wastewater treatment system	~ 100
33	Design and technology transfer document of Huong Sen beer company wastewater treatment system	~ 100
34	Basic design of wastewater treatment facility in VAST	~ 100
	<i>Environment assessment</i>	
35	Reports on environment impact assessment in Thai Nguyen steel company, 2003	106
36	Reports on environment impact assessment in Thai Nguyen steel company, 2005	3 reports (50×3)
	<i>Outline and report for equipments</i>	
37	Inductively Couple Plasma - Mass Spectrometer (ICP-MS) (Responsible person: Vu Van Tu)	21 + annex
38	Liquid Chromatograph - Mass Spectrometer (LCMS) (Responsible person: Ta Thuy Nguyen)	23 + annex
39	Atomic Absorption Spectrophotometer (AAS) (Responsible person: Tran Thi Phuong Thao)	42 + annex
40	High Pressure Liquid Chromatography (HPLC) (Responsible person: Nguyen Quang Trung)	19 + annex
41	Gas Chromatograph (GC) (Responsible person: Phan Quang Thang)	51
42	Gas Chromatograph - Mass Spectrometer (GCMS) (Responsible person: Nguyen Thi Hue)	27 + annex
43	Ion Chromatograph (IC) (Responsible person: Nguyen Thanh Thao)	33
44	Automatic Mercury Analyser (AULA -254D) (Responsible person: Pham Anh Tuan)	18 + annex
45	Bacteria Analysis	16 + annex

ANNEX III - 3

	(Responsible person: Chu Thi Thuy)	
46	Fourier Transmission - Infrared Radiation (FT-IR) (Responsible person: Nguyen Tuyet Van)	16 + annex
47	Total Organic Carbon (TOC) (Responsible person: Nguyen Trong Truc)	35 + annex
48	Ultraviolet Visible (UV – Vis) (Responsible person: Tran Thi Lan)	32 + annex
	<i>Standard Operation Procedure</i>	
49	SOP for pH measurement	3
50	SOP for analytical method for determination of Biological Oxygen Demand (BOD ₅) (20°C)	6
51	SOP for analytical method for determination of Chemical Oxygen Demand (COD) by Kali bichromate	5
52	SOP for Dissolved Oxygen measurement	4
53	SOP for suspended matter in the water sample	1
54	SOP for determination of Arsenic by hydride generation - AAS	5
55	SOP for analytical method for determination of Cadimium by AAS - Furnace technique	5
56	SOP for analytical method for determination of lead by AAS - Furnace technique	5
57	SOP for determination of Copper by graphite furnace - AAS	5
58	SOP for determination of Manganese by colourimetric method	6
59	SOP for determination of Nikel by colourimetric method	5
60	SOP for determination of total Iron by colourimetric method	6
61	SOP for analytical method for determination of Mercury by AAS - MVU	5
62	SOP for determination of Amonium by colourimetric method	6
63	SOP for Flouride ion analysis	2
64	SOP for determination of Nitrite by colourimetric method	6
65	SOP for determination of Nitrate by colourimetric method	6
66	SOP for analytical method for determination of Coliform, fecal coliform in water by membrane filter	7
67	SOP for method for determination of organochlorine pesticide residue in environmental water by gas chromatograph - mass spectrometer	7
	<i>SOP for equipments such as:</i>	
68	SOP for GC	6
69	SOP for TOC	7
70	SOP for Aula	10

ANNEX III - 4

71	SOP for UV-VIS	14
72	SOP for LCMS	7
73	SOP for IC	6
74	SOP for ICP/MS	6
75	SOP for automatic potentiometer titration AT 510	5

List of Advices and Consultation (As of May, 2006)

Year 2003

* List of Environmental Project

- Study for resistance and removal of some water environmental pollution substances by algae. (2002-2003)
- Study of treatment technology for mud from pond of cultivating shrimps to partly clear fishery cultivation environment and to produce organic microorganism fertilizer. (2002-2003)
- Study for application of electrochemical activated solution to replace antiseptic substances in farms of cultivating shrimps. (2003)

Year 2004

* List of Environmental Project

- Study for toxicity and toxin of toxic cyanobacteria causing freshwater bloom. (2002-2004)
- Study for dynamics of nitrogen treatment process in organic wastewater by biological method. (2002-2004)
- Survey of toxic algae in important water bodies in Hanoi and some northern sites as a basis for the building of biological parameters on water source quality monitoring. (2002-2004)
- Building feasible treatment technology for Arsenic and Ammonium in domestic water. (2003-2004)
- Study for appropriate technology for textile and dyeing wastewater treatment. (2003-2004)
- Study for toxic algae in main cultivating areas of bivalve of Vietnam. Some solution for preventing toxic algae. (2003-2004)
- Removal of hardly degradable organic substances from wastewater of Mink Khai Dye and Textile Company by ozonation method. (2003-2004)

* List of Water Environment Analysis Contracts

- Nui Phao Mining Joint Venture Company (2004)
- Informatic Technology and Environment Development Company – Vietnam Coal General Corporation (2004)
- Institute of Mineral and Geology Research (2004)
- Center of Rural Freshwater and Environmental Sanitation – Ministry of Water Resources (2004)
- Related to UNICEF: Investigation of arsenic for well water used by farmer. (2004)
- Thang Long Industrial Park Company (1) (2004)
- Thang Long Industrial Park Company (2) (2004)
- Thang Long Industrial Park Company (3) (2004)

ANNEX III - 5




- Vietnam TOTO Co., Ltd. (2004)
- Vietnam SAKURAI Co., Ltd. (2004)
- Vietnam MATSUO Co., Ltd. (2004)
- Vietnam HAL Co., Ltd. (2004)
- ALMEC Corporation-JAPAN (NIPPON KOEI, HAIDEP) (2004)
- Thang Long GOSHI Motorbike-Car parts Co., Ltd. (2004)

* Others

- EIA for Vietnamese-Italian steel company. (2004)
- EIA for expansion project of Thai Nguyen steel company.(2003-2004)
- EIA for Tuyen Quang refractory brick mine.(2004)
- Minh Khai textile company wastewater treatment (2004)

Year 2005

* List of Environmental Project

- Study for biodiversity of some strains of toxic cyanobacteria in freshwater in Vietnam. (2004-2005)
- Study to forecast blooms of toxic cyanobacteria in freshwater. (2004-2005)
- Technology for manufacturing nano material from cellulose acetate and application of nano filtration (2004-2005)
- Study to manufacture and to establish process for wastewater treatment equipment to reuse for farms of cultivating shrimps.(2004-2005)
- Establish a model of domestic water supply station for annual flooded area in Kenh Ga village, Gia Thinh commune, Gia Vien District, Ninh Binh province (Project “ Freshwater and Environmental Sanitation”) (2004-2005)
- Study for assessment of pollution level of underground water of important areas in Thai Nguyen province. (2005)

* List of Water Environment Analysis Contracts

- Nui Phao Mining Joint Venture Company (2005)
- Informatic Technology and Environment Development Company – Vietnam Coal.General Corporation(2005)
- Institute of Mineral and Geology Research(2005)
- VEPA : Related to MONRE: Investigation of cause for cancer disease that happens in Phu Tho Province.(2005)
- Thang Long Industrial Park Company (1) (2005)
- Thang Long Industrial Park Company (2) (2005)
- Thang Long Industrial Park Company (3) (2005)
- Vietnam TOTO Co., Ltd. (2005)
- Vietnam PANASONIC Co., Ltd.(2005)
- Vietnam SAKURAI Co., Ltd. (2005)
- Vietnam MITSUBISHI Pencil Co., Ltd. (2005)
- Vietnam DAIWA Joint Venture Co. (2005)
- Vietnam HAL Co., Ltd. (2005)
- ALMEC Corporation-JAPAN (NIPPON KOEI, HAIDEP) (2005)
- Vietnam MATSUSHITA Home Appliances Co., Ltd. (2005)
- FUJIKASUI Environmental Technology and Energy Co., Ltd. (2005)
- Thang Long GOSHI Motorbike-Car parts Co., Ltd. (2005)

ANNEX III - 6

- Hanoi Steel Center Co., Ltd.(2005)

* Others

- Related to MONRE: Investigation of arsenic, nitrite, nitrate and ammonia for groundwater.(2005)
- Investigation of wastewater treatment for hospital. (2005)
- Investigation for improvement of water quality in Hoi An City as world heritage. (2005)
- Investigation of water quality for Urban Development Study in Hanoi City (work related to JICA) (2004-2005)
- EIA for glass fiber tubes factory. (2005)
- Huong Sen Beer company wastewater treatment (2004-2005)
- Son La hospital waste water treatment (2004-2005)
- Moc Chau milk company wastewater treatment (2004-2005)

Year 2006

* List of Environmental Project

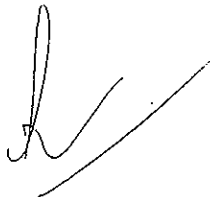
- Study for technical specifications on wastewater treatment technology design in Hai Phong. (2005-2006)
- Study of comparison for domestic and foreign technologies for treating leachate as a basis for proposing leachate treatment technology at level B under Vietnamese Standards for Hanoi landfills. (2005-2006)
- Study to use typical aqua vegetation species for treating industrial wastewater containing heavy metal and food processing wastewater.(2005-2006)

* List of Water Environment Analysis Contracts

- Nui Phao Mining Joint Venture Company (2006)
- Informatic Technology and Environment Development Company – Vietnam Coal General Corporation(2006)
- Institute of Mineral and Geology Research(2006)
- Vietnam TOTO Co., Ltd. (2006)
- Vietnam SAKURAI Co., Ltd. (2006)
- Thang Long GOSHI Motorbike-Car parts Co., Ltd. (2006)

* Others

- Investigation of environmental condition in industrial area constructed by Japanese Company.(2004-2006)
- Tuyen Quan Hospital wastewater treatment (2003-2006)



ANNEX III - 7



ANNEX IV: Evaluation Grid of Terminal Evaluation

Country: Viet Nam

Project Name: Project for Enhancing Capacity of National Center for Natural Science and Technology (NCST) of Vietnam in Water Environment Protection

Evaluation Item	Evaluation Questions		Results
	Questions	Sub-questions (Indicator)	
Verification of performance	<p>Achievement of the Overall Goal (Prospect)</p> <p>The capacity of Vietnamese authorities related to water environment protection will be improved.</p>	<ol style="list-style-type: none"> 1. Number of monitoring points 2. Number of transferred technologies being applied in actually 3. Number of technological issues recommended by NCST (IET) to related authorities 	<p>Based on the concept of national monitoring network by Ministry of Natural Resources and Environment (MONRE) ("Five-year Plan of Natural Resources and Environment October 2005), currently, water quality monitoring has been carried out at several places in the whole country. In addition, there are provincial monitoring places where some DONREs have implemented monitoring. As mentioned, in recent years, monitoring has been actively carried out, thus the number of monitoring points is highly likely to increase. (Indicator.1)</p> <p>These monitoring activities are usually contracted out to external organizations such as universities and research institutes. In fact, MONRE and other related organizations have noticed that a number of monitoring methods is still not standardized; thus has been concerned about the credibility of those monitoring results. To improve the accuracy of monitoring is urgently necessary and therefore the Project has developed a monitoring manual (draft) and optimized Standard Operational Procedure (SOP) (draft) per item of Surface Water Quality Standard (the Standard)* in order to enhance the capacity of VAST(IET) for water quality analysis. Then, the VAST/IET will pursue to propose standardized analytical methods, including optimization of existing methods, which are regulated in TCVN, to the concerned organizations such as MONRE and MOST. (Indicator 2) Once these efforts are materialized, the transferred technologies to VAST (IET) will be passed on to many other organizations beside VAST(IET) and thus it is probable to achieve the Overall Goal. (Indicator 3)</p> <p>In response to the Government Decree issued on January 16th 2004 (No. 27/2004/ND-CP), the name of the C/P organization was changed from National Center for Natural Science and Technology (NCST) to Vietnamese Academy of Science and Technology (VAST) with the increased authority. This academy is directly under the national government (the prime minister) with the same level of authorities as other ministries and thus could perform the technical consultancy to the state bodies. VAST is expected to benefit the society by carrying out researches and developing technologies of natural sciences in line with the national development strategies. Especially VAST(IET) is expected to perform not only research activities on the environmental technological and scientific matters, but to perform the consultancy to the state bodies on the policy related to the environmental protection, to provide engineering services on environmental technology and to provide training opportunities for the high-qualified staff, and therefore it is highly plausible that the transferred knowledge and technologies is spread through these channels and contribute achieving the overall goal.</p> <p>* TCVN 5942: 1995 Surface Water Quality Standard</p>

ANNEXIV-1

<p>Achievement of the Project Purpose</p> <p>The capacity of NCST related to water environment protection is improved.</p>	<p>1. Water quality monitoring reports are submitted to MONRE by VAST (IET)</p> <p>2. Number of organizations being advised by VAST(IET) will increase compared to the year 2002</p>	<p>The interviews reveal that C/Ps and Japanese experts are thinking that the achievement level of the Project Purpose is rather high in general.</p> <p>In addition, VAST, which is under the national government with the same level of authorities as other ministries, could advise directly to MONRE. Thus the Project plans to propose comprehensive and standardized water quality monitoring methods, which are under development, in place of monitoring reports. (Indicator 1) From October 2005, the Project started implementing monthly monitoring at four points (two rivers and two lakes) based on the IET's own monitoring plan (in the process of conceptualization) and the actual monitoring activities are contributing to enhancing monitoring technologies. Knowledge gained are now incorporated into the water quality monitoring manual (at present, a manual for on-site sampling is completed.)</p> <p>There is an upward trend in numbers of organizations which request VAST(IET)'s advices and researches as follows. They are number of cases provided such services on request (as of May 2006). (For details, see the ANNEXIII-1) (Indicator 2)</p> <table border="1" data-bbox="582 1008 718 1288"> <tr> <td>Year 2003</td> <td>3</td> </tr> <tr> <td>Year 2004</td> <td>25</td> </tr> <tr> <td>Year 2005</td> <td>32</td> </tr> <tr> <td>Year 2006</td> <td>11</td> </tr> </table> <p>The importance of human resource development is fully understood by core members of C/Ps such as the project manager and the deputy project manager; thus VAST (IET) has provided training courses. In fact, as seen in the following table, as many as 213 persons, that is much higher than the target number of 100 persons, have already participated in training courses. (Indicator 3)</p>	Year 2003	3	Year 2004	25	Year 2005	32	Year 2006	11												
Year 2003	3																					
Year 2004	25																					
Year 2005	32																					
Year 2006	11																					
<p>3. Participants trained by VAST(IET) will reach 100 persons. (The target number of 100 was decided by the first JCC meeting.)</p>		<p>Table 1. Numbers of Participants by Course (person)</p> <table border="1" data-bbox="957 504 1141 1332"> <thead> <tr> <th>Course Name</th> <th>2005/03</th> <th>2005/12</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1 Water Environment Management</td> <td>45</td> <td>31</td> <td>76</td> </tr> <tr> <td>2 Water Quality Monitoring and Analysis</td> <td>44</td> <td>26</td> <td>70</td> </tr> <tr> <td>3 Wastewater Treatment Technology</td> <td>38</td> <td>29</td> <td>67</td> </tr> <tr> <td>4. Total</td> <td>127</td> <td>86</td> <td>213</td> </tr> </tbody> </table> <p>(Note) Participants in the first sessions in March 2005 include staff members of other institutes under VAST.</p> <p>In addition to three indicators, the result of the survey on personal attainment level is shown below. In the beginning of the Project on October 2003, the Project carried out the questionnaire survey on C/Ps' expected areas to improve capacities</p>	Course Name	2005/03	2005/12	Total	1 Water Environment Management	45	31	76	2 Water Quality Monitoring and Analysis	44	26	70	3 Wastewater Treatment Technology	38	29	67	4. Total	127	86	213
Course Name	2005/03	2005/12	Total																			
1 Water Environment Management	45	31	76																			
2 Water Quality Monitoring and Analysis	44	26	70																			
3 Wastewater Treatment Technology	38	29	67																			
4. Total	127	86	213																			

ANNEXIV-2

and the personal attainment level of those areas at that time. At the occasion of this final evaluation, the personal attainment level of six core researchers of VAST(IET) are compared with their personal attainment level before the Project.

Table 2. Self-evaluated Personal Attainment Level (%)

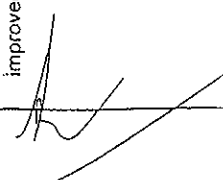
Expected Areas to Improve	Before	After
Water Quality Analysis	40	65
	40	80
	40	70
	30	50
Enhancing capacity of water management	50	75
	20	60
Using a perfect analyzing instruments	20	90
	40	65
Waste Water Treatment	20	60
	20	70
	40	80
	40	80
	20	100
	30	100

As mentioned above, it can be concluded based on the progress of preparation of the draft monitoring manual, indicator two and indicator three that the achievement level of the Project Purpose is in general satisfactory.

Achievement of the Outputs
1. VAST researchers' abilities

1-1. Number of analytical method mastered by VAST (IET) researchers through the technical transfer

VAST(IET) staff members have acquired analytical techniques of the following 12 major equipments. The C/P agency formed 18 working groups for the main equipments with its own initiative, carried out researches on compositions and functions of equipment, measurement principles and operational methods with support from Japanese experts. The results of these researches were compiled as 18 research reports. Contents of some reports were announced at the project

<p>to conduct water quality monitoring and to develop analysis methods are improved.</p> 	<p>steering committee at VAST and were approved by VAST (Indicator 1-1)</p>	<p>1-2. Number of reports on development of SOP on water quality analysis</p>	<ol style="list-style-type: none"> 1. Inductively Coupled Plasma - Mass Spectrometer (ICP-MS) 2. Liquid Chromatograph - Mass Spectrometer (LC-MS) 3. Atomic Absorption Spectrophotometer (AAS) 4. High Pressure Liquid Chromatograph (HPLC) 5. Gas Chromatograph (GC) 6. Gas Chromatograph - Mass Spectrometer (GC-MS) 7. Ion Chromatograph (IC) 8. Automatic Mercury Analyser 9. Bacteria Analytical System 10. Fourier Transformation - Infrared Spectrophotometer (FT-IR) 11. Total Organic Carbon and Total Nitrogen Analyser (TOC) 12. Ultraviolet-Visible Spectrophotometer (UV-VIS) <p>As mentioned above, the monitoring methods have not been fully standardized and the monitoring results from different organizations are often not consistent with each other. Thus it is urgently necessary for Vietnam to standardize monitoring methods. The Project produced the draft Standard Operation Procedure (SOP) per parameter of the ambient standard and the draft water quality monitoring manual, which contributed to enhancing the capacity of VAST(IET) staff members. Currently, the first draft of 18 SOPs for 18 out of 31 parameters of the ambient standard (i.e. the 1995 Surface Water Quality Standard) were drawn up. (For details, see the ANNEX(II-1) (Indicator 1-2)</p>
--	---	---	---

ANNEXIV-4



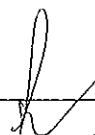

<p>2. VAST researchers' abilities to develop and apply suitable technologies on domestic and industrial wastewater treatment are improved.</p>	<p>2-1. Improvement of wastewater treatment system in VAST.</p>	<p>The construction of wastewater treatment facility was completed at the end of March 2006, and it is currently in trial operation. The facility was constructed in line with the master plan of the VAST's wastewater treatment developed by the Project; and it can be said that the wastewater treatment system in VAST is gradually improving. It is worth mentioning that a VAST(IET) staff member himself draws the basic design of this new wastewater treatment facility. In addition, as for seven out of the following nine experimental apparatus for wastewater treatment, VAST(IET) staff members concerned have learned process technologies of these apparatus. In line with these efforts, the Project is now preparing guidelines for effluent. The other two experiment apparatus (No. 4 and No.5, see below) is supposed to be examined by using the surplus sludge which will be generated from the wastewater treatment facility once it operates fully. Due to the slow start of the wastewater treatment facility, the technology transfer in this regard has been also delayed. Since the facility started its trial operation, experimental activities by using the above mentioned two apparatus can be started soon. (Indicator 2-1)</p> <ol style="list-style-type: none"> (1) Aerobic flow bed method test device (2) Flotation unit test device (3) Ozone processing test device (4) Anaerobic Sludge Digestion Tester (5) Composting test device (6) Activated sludge treatment system (7) Anaerobic/aerobic test device (8) Contact oxidation test device (9) Ultrasonic test device
	<p>2-2. Number of case studies requested by MONRE and other organizations</p>	<p>Five studies regarding wastewater treatment were commissioned to VAST(IET), and designs along with studies were prepared by VAST(IET). Especially for No.1 and No.2 studies, data collected through experimental activities were actively used. (Indicator 2-2)</p> <ul style="list-style-type: none"> • Minh Khai textile company wastewater treatment (2004) • Huong Sen Beer company wastewater treatment (2004-2005) • Son La hospital waste water treatment (2004-2005) • Moc Chau milk company wastewater treatment (2004-2005) • Tuyen Quang Hospital wastewater treatment (2003-2006) <p>It can be concluded that the capacity of VAST(IET) staff members regarding to wastewater treatment was enhanced through designing treatment facilities by themselves and acquiring technology of experimental apparatus. In addition, many</p>

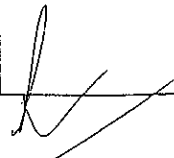
ANNEXIV-5

	<p>3. VAST staff members' abilities to conduct training courses on water quality monitoring and wastewater treatment for central and local organizations are improved.</p>		<p>researches by those apparatus were compiled as academic papers, and some of them were even presented at academic conferences. These facts clearly show the enhanced ability of VAST(IET) staff members. (For details, see the ANNEX(II-1))</p> <p>Currently, a number of teaching materials have been prepared by VAST(IET) staff members as follows:</p>															
		<p>3-1. More than six teaching materials are made by VAST (IET) staff members</p>	<p>Table 3: Numbers of teaching materials in 2005</p> <table border="1" data-bbox="343 705 518 1321"> <thead> <tr> <th></th> <th>Courses</th> <th></th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Water Environment Management</td> <td>5</td> </tr> <tr> <td>2</td> <td>Water Quality Monitoring and Analysis</td> <td>10</td> </tr> <tr> <td>3</td> <td>Wastewater Treatment Technology</td> <td>16</td> </tr> <tr> <td></td> <td>Total</td> <td>31</td> </tr> </tbody> </table> <p>C/Ps, who delivered lectures, prepared these materials by themselves based on learning and knowledge acquired from the Project. Since a teaching material were prepared by a few staff members occasionally, the number of staff members who developed teaching materials are as many as 24 persons (cumulatively 28 persons). The numbers of staff members who delivered lectures were as many as 33 persons (cumulatively 39 persons) including those who delivered an explanatory lecture on the laboratory. In addition, Japanese visual materials on monitoring and laboratory management were introduced to the participants. (Indicator 3-1)</p>		Courses		1	Water Environment Management	5	2	Water Quality Monitoring and Analysis	10	3	Wastewater Treatment Technology	16		Total	31
	Courses																	
1	Water Environment Management	5																
2	Water Quality Monitoring and Analysis	10																
3	Wastewater Treatment Technology	16																
	Total	31																
		<p>3-2. Curriculum are properly developed for each training courses</p>	<p>Since DONRE in each 64 provinces is a responsible organization for field implementation of environmental management, the training courses set their targets to DONRE staff members. First, an assessment of DONRE's training needs was carried out in the beginning by the Project, and the draft training curriculum (Effective Training Curriculum (Draft), February 2006) was developed to improve the trainings. The Project plans to develop an effective scheme for training programs to DONRE, and to propose it to MONRE. (Indicator 3-2)</p> <p>As just seen, more than six teaching materials were produced and the curriculum based on needs was developed. In addition, the actual number of participants successfully exceeded the target 100 persons. Thus it can be said that the ability of VAST(IET) staff members (especially more than mid-level staff members) to conduct training courses on water quality monitoring and wastewater treatment were in deed improved.</p>															

<p>4. VAST's ability to contribute to the process of developing laws, regulations, policies, strategies, etc. related to water environment protection is improved.</p>	<p>4-1. Number of projects given by MONRE and related organizations to VAST(IET)</p>	<p>Varieties of studies and advices, as seen below, were carried out and provided to MONRE and local authorities on request-basis. Numbers of consulting and engineering services of wastewater treatment facilities also have been carried out for hospitals and private companies. (As also seen in the Achievement of the Project Purpose). In addition, other donors such as DANIDA and the Swiss agency who have implemented environment projects once requested VAST(IET)'s technical supports to their projects. It is worth mentioning that it became obvious that some parameters of the ambient standard employs unstable figures to the Vietnamese situation through the project activities, VAST(IET) handed over a position document (General Department of Standard and Quality, Ministry of Science and Technology: No.285/VCNMT, September 14, 2005) to MONRE. However, the major target, "to recommend on introduction of water quality monitoring system and SOPs", has not been achieved yet. The Project plans to prepare the recommendation by the end of the Project.</p>
<p>4-2. Number of evaluation reports for relevant projects of other organization</p>	<p><u>As for Indicator 4-1 (15 cases)</u></p> <ul style="list-style-type: none"> • Related to UNICEF: Investigation of arsenic for well water used by farmer. (2004) • Related to MONRE: Investigation of arsenic, nitrite, nitrate and ammonia for groundwater. (2005) • Related to MONRE: Investigation of cause for cancer disease that happens in Phu Tho Province. (2006) • Study for toxicity and toxin of toxic cyanobacteria causing freshwater bloom. (2002-2004) • Study for biodiversity of some strains of toxic cyanobacteria in freshwater in Vietnam. (2004-2005) • Study for resistance and removal of some water environmental pollution substances by algae. (2002-2003) • Study for dynamics of nitrogen treatment process in organic wastewater by biological method. (2002-2004) • Study to forecast blooms of toxic cyanobacteria in freshwater. (2004-2005) • Study for technical specifications on wastewater treatment technology design in Hai Phong. (2005-2006) • Survey of toxic algae in important water bodies in Hanoi and some northern sites as a basis for the building of biological parameters on water source quality monitoring. (2002-2004) • Building feasible treatment technology for Arsenic and Ammonium in domestic water. (2003-2004) • Removal of hardly degradable organic substances from wastewater of Mink Khai Dye and Textile Company by ozonation method. (2003-2004) • Study of treatment technology for mud from pond of cultivating shrimps to partly clear fishery cultivation environment and to produce organic microorganism fertilizer. (2002-2003) • Study of comparison for domestic and foreign technologies for treating leachate as a basis for proposing leachate treatment technology at level B under Vietnamese Standards for Hanoi landfills. (2005-2006) • Study for assessment of pollution level of underground water of important areas in Thai Nguyen province. (2005) <p><u>As for Indicator 4-2 (8 cases)</u></p> <ul style="list-style-type: none"> • Investigation of water quality for Urban Development Study in Hanoi City (work related to JICA) (2004-2005) 	

<p style="text-align: center;">Verification of Implementation Process</p>	<p style="text-align: center;">Implementation status of activities</p>	<p style="text-align: center;">Were activities implemented as planned?</p>	<ul style="list-style-type: none"> • Investigation of environmental condition in industrial area constructed by Japanese Company. (2004-2006) • Investigation of wastewater treatment for hospital. (2005) • Investigation for improvement of water quality in Hbi An City as world heritage. (2005) • EIA for Vietnamese-Italian steel company. (2004) • EIA for expansion project of Thai Nguyen steel company. (2003-2004) • EIA for glass fiber tubes factory. (2005) • EIA for Tuyen Quang refractory brick mine. (2004)
<p style="text-align: center;">[Activities for Output 1]</p> <p style="text-align: center;"><u>1.1 To develop the manual for water quality monitoring.</u></p> <p>Since understanding problems and important points through actual monitoring activities is crucial to develop a water quality monitoring manual which is suitable to Vietnamese situations, the monitoring activities has been carried out in rivers and lakes since October 2005. Due to the delay in installation of necessary equipment and in dispatch of a long-term expert in the area of water quality monitoring, commencement the actual monitoring and production of the monitoring manual were delayed accordingly. Currently, VAST(IET) staff members concerned have substantially acquired knowledge on sampling methods and skills of on-site simple analysis methods, and leanings from these activities were compiled into the draft monitoring manual (at present, up to the level of on-site manual).</p> <p><u>1.2 To develop Standard Operation Procedure (SOP) on water quality analysis relevant to water quality standards.</u></p> <p>VAST(IET) staff members concerned have acquired knowledge and skills on major 12 analytical equipment provided by the Project. Actual application and use of 12 equipment were summarized into the operational manuals. Due to the unexpected long time to install all necessary analytical equipment and the 7-month absence of long-term expert on water analysis caused delay in development of SOPs. However currently as much as 24 draft SOPs were produced. (For details, see the ANNEXIII-1) Preparation of these SOPs for parameters of the ambient standard is been carried out along with reviewing the appropriateness of those Vietnamese standards.</p>			

<p>Japan, developed the basic design and the detail design after coming back to Vietnam. Currently, the waster treatment facility in VAST is under trial operation.</p> <p><u>2.2 To advise concerning Vietnamese authorities on suitable technologies for wastewater treatment.</u></p> <p>As seen in the Achievement Level of Output 2, five consulting and engineering services to local authorities, hospitals and factories which were under local authorities attention were carried out by VAST(IET).</p>	
<p><u>2.3 To collect information of advanced or suitable technologies on wastewater treatment.</u></p> <p>The Project provided information of the advanced technology used in Japan for the industrial wastewater and hospital wastewater treatment. In addition, the Project hosted a seminar on the septic tank for the domestic wastewater, and introduced its effectiveness and briefly explored its applicability in Vietnam.</p> <p>[Activities for Output 3]</p> <p><u>3.1 To conduct training courses on water environment management.</u></p> <p>The training was carried out both in the 2004 and 2005 (in Japanese financial year), and were participated by officers from 21 DONREs in the northern part of Vietnam. Other than DONRE officers, people from universities and other institutes under VAST participated in the training. In total, 62 persons participated in the training course on water environment management. It is worth mentioning that the additional training sessions were held in 2005 in a selected province and the knowledge was transferred through this seminar at province level to officers from the DONRE and neighboring districts</p>	
<p><u>3.2 To conduct training courses for central and local organization on water quality monitoring.</u></p> <p>The training was carried out both in the 2004 and 2005 (in Japanese financial year), and were participated by officers from 23 DONREs in the northern part of Vietnam. Other than DONRE officers, people from MONRE, universities and other</p>	

			<p>Three open seminars were carried out for Water Environmental Toxicology and Septic Tank in 2004, and Water Environment Management in 2005. As many as 60, 30, and 24 persons participated in the respective seminars. In addition, many internal seminars at VAST(IET) were carried out by the Project.</p>
	<p>[Activities for Output 4] 4.1 To implement projects of water environment protection given by MONRE and related organizations. See Achievement of the Output 4. 4.2 To advise MONRE and other organizations on water quality management optimization. Hai Duong Province and Hoang Mai District of Hanoi requested some advices on environment management planning from VAST(IET).</p>		
<p>Implementation status of monitoring</p>	<p>Has monitoring been carried out? Is monitoring mechanism appropriate? Are responsibilities shared clearly among relevant organizations?</p>	<p>Monitoring has been carried out. The monitoring mechanism is appropriate. Responsibilities are shared clearly among relevant organizations.</p>	<p>Besides reporting the progress to the annual JCC, the regular meeting by Japanese experts is held weekly. As for the progress management of activities by Japanese experts, the chief advisor of the Project monitor the progress thorough weekly meetings. As for Vietnamese side, C/Ps (mainly the project manager and the deputy manager) report the progress even to other institutes at the regular meetings of VAST. The project manager and the deputy manager also monitor all the progress of the project activities by VAST(IET) staff members. As for the progress review of the Project as a whole, the chief advisor and the project manager and the deputy managers communicate regularly and have discussions whenever necessary (such as when problems arise).</p>
<p>Relationship between C/Ps and Japanese experts</p>	<p>Status of communication Appropriateness of selected C/Ps Status of collective problem-solving method Change in C/Ps' attitudes (independence and activeness)</p>	<p>VAST(IET) staff members have remarkable capacities as researchers, and in fact, most of core staff members are PhD holders. In addition, VAST(IET) staff members are proud of being members of the leading research institute, and eager to learn new technologies. The enormous ability and diligence of C/P made the Project fulfill the satisfactory level of achievement in spite of delay in installing all necessary analytical equipment and the 7-month absence of long-term expert on water analysis. As for information sharing with C/Ps, each expert communicates with C/Ps daily through any activities. In addition, as for the experiment activities of wastewater treatment, on-site meetings participated by C/Ps and a Japanese expert are held occasionally whenever the problems arise.</p>	<p>VAST(IET) staff members have remarkable capacities as researchers, and in fact, most of core staff members are PhD holders. In addition, VAST(IET) staff members are proud of being members of the leading research institute, and eager to learn new technologies. The enormous ability and diligence of C/P made the Project fulfill the satisfactory level of achievement in spite of delay in installing all necessary analytical equipment and the 7-month absence of long-term expert on water analysis. As for information sharing with C/Ps, each expert communicates with C/Ps daily through any activities. In addition, as for the experiment activities of wastewater treatment, on-site meetings participated by C/Ps and a Japanese expert are held occasionally whenever the problems arise.</p>
<p>Involvement of beneficiaries</p>	<p>Change in action and awareness of VAST(IET) staffs</p>	<p>Change in action and awareness of VAST(IET) staffs</p>	<p>As for the ability of VAST(IET) staff members, refer the just above. As for the changes in awareness, see Table 2.</p>
<p>Ownership of C/P organizations</p>	<p>Degree of participation of C/P organization</p>	<p>Degree of participation of C/P organization</p>	<p>It can be said that enough numbers of qualified and competent C/Ps are allocated for the project activities. With the</p>



initiatives of the project manager, the deputy managers, almost all staff members in the sections of water quality analysis and wastewater treatment actively participated in the Project, and the degree of participation is reasonably high.

VAST(IET) requested the balancing budget* (financial supports from the government to ODA activities) based on the Project cost publicized by JICA, and received the following supports.

Table 4. Trends of Balancing Budget

	Year	Vietnamese Dong	(Japanese Yen)
1	2004	300mill	2,218,500
2	2005	3362mill	24,862,000
3	2006	2560mill	18,931,200

(Note) 1 VND = ¥0.007395

By using this budget, as mentioned previously, the C/P agency formed working groups for each 12 equipment, carried out researches on compositions and functions of equipment, measurement principles and operational method with supports from Japanese experts. The results of these researches were compiled as 12 research reports. Contents of some reports were announced at the project steering committee at VAST and were approved by VAST. Likewise, the level of participation and ownership of the C/P agency can be said high.

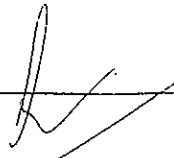
*In case of this project, the maximum 10% of the total amount of assistance is allowed as the balancing budget (Decree 17). Decree 17/2001/ND-CP dated 4 May 2001 on ODA utilization and Management.

Budget allocation	
Appropriateness of allocation and assignment of C/Ps	

Terminal Evaluation by Five Evaluation Criteria


Evaluation Criteria	Evaluation Questions		Results
	Question	Sub-question	
Relevance	<p>Is the Project consistent with the development policy and environmental policy of Vietnam?</p>	Consistency of the overall goal with the development policy and environmental policy	<p>Due to the rapid economic growth and industrialization, the environmental situations are getting worse, which makes environmental prevention a major issue for the government. The Five Year Socio-Economic Development Plan (2006-2010), a national development plan, states that economy, society and environment are perceived as the three important factors that secure the sustainable development. Furthermore, it is clearly stated that the Vietnamese Government will make efforts to protect environment in the National Strategy for Environmental Protection (2001-2010) (MONRE, December 2003). In addition, MONRE's Five Year Plan for Natural Resources and Environment (2006 -2010) (MONRE, December 2005) explains that MONRE will tackle for the improvement of water quality. Therefore, it can be said the importance of improvement of water quality is widely recognized. Hence, the relevance of the Project in this regard is satisfactorily secured.</p> <p>There are many other development assistances. This project has a characteristic to support the leading agency which will play a key role in the field of environmental technology, and thus could support the agency which has not received many other ODAs. In addition, by understanding the importance to support officers of DONREs, the Project has provided the comprehensive technical trainings to them. This is another effective approach that many other agencies such as CIDA and Unicef employ. Thus it can be concluded the Project is both supplement and consistent with supports from other countries.</p> <p>It can be concluded that the project approach is in line with the Overall Goal because its target organization is VAST- the leading research institutes in the field of environmental technologies; and the advanced and reliable analytical ability acquired by VAST through this project will greatly contribute to improvement of water environment protection in Vietnam (the Overall Goal). According to the Government Decree No. 24/2004/ND-CP about the establishment of VAST, this academy is directly under the national government (i.e. the prime minister) with the same level of authorities as other ministries and thus could perform the technical consultancy to the state bodies. In fact, VAST(IET) is designated to perform tasks including research, consultancy to the state bodies on the policy related to the environmental protection, engineering services on environmental technology and provision of training opportunities for the high-qualified staff. Therefore, it is highly plausible that the transferred knowledge and technologies is spread through these channels and contribute achieving the Overall goal.</p> <p>In addition, according to the interview surveys to core researchers and engineers, it is confirmed that the Project meet the</p>
		Consistency of the project purpose with the environmental policy	
		Priority of water-related issues within the framework of the environment policy	
		Consistency with supports from other countries	
	Were/Are the project's components highly needed by VAST?		
	What responsibility does VAST bear in the field of water environment protection?		
	Was the selection of the target group appropriate?		
	Was the size of the target group appropriate?		

ANNEXIV-12

<p>needs of VAST(IET). Eleven interviewees, including the project manager, acknowledge the importance of improving their skills as researchers in the national leading academy and in deed appreciated that the Project helped them improve their knowledge and skills. VAST(IET) has been perceived as one of most reliable institutions from other research institutes such as universities, institutes under different ministries and private companies, and effects of VAST(IET) is rather large and reachable to the wider stakeholders. Thus it can be concluded that the selection of C/P agency is highly appropriate at this stage.</p> <p>In response to the Government Decree issued on January 16th 2004 (No. 27/2004/ND-CP), the name of the C/P organization was changed from National Center for Natural Science and Technology (NCST) to Vietnamese Academy of Science and Technology (VAST) with the increased authority. Other than this, there are no major changes of external factors.</p>		
<p>Environmental protection including the prevention of water pollution has been an important area to support in the framework of Japan's international environmental cooperation. At the instance of the UN conference on Environmental Development in 1997, the Japanese government announced the Initiative for Sustainable Development towards the 21st Century (ISD), and it stated that the water is one of major issues.</p>	<p>Relationships with the policy and plans</p>	<p>Is the Project consistent with Japan's foreign aid policy and JICA's plan for sector-specific program implementation?</p>
<p>In general, the achievement level of the outputs is satisfactory at this stage, and thus it is probable that the Project Purpose will be achieved at the end of the Project. (For details, see the Verification of Performance). However, as for Output 4, extra efforts should be made in the remaining period to ensure better achievement.</p>		<p>Is the achievement level of the project purpose is adequate at this stage?</p>
<p>As mentioned previously, in response to the Government Decree issued on January 16th 2004 (No. 27/2004/ND-CP), the name of the C/P organization was changed from National Center for Natural Science and Technology (NCST) to Vietnamese Academy of Science and Technology (VAST) with the increased authority.</p> <p>The project is also effective for enhancing capacities of DONRE, who should actually implement the policies and plans¹ aiming at improvement of the environment. In particular, the training courses targeting DONRE staff members were organized based on an assessment of DONRE's training needs. Support to the provinces is expected to be further</p>	<p>Were the outputs sufficient to achieve the project purpose?</p> <p>What are the inhibiting and promoting factors for the achievement of the project purpose?</p> <p>Are there any influences from organizational changes of VAST and changes in environmental policies?</p>	<p>Effectiveness</p>

¹ National Strategy for Environmental Protection (2001-2010) (MONRE: December 2003)
 MONRE's Five Year Plan for Natural Resources and Environment (2006 -2010) (MONRE, December 2005) Five Year Socio-Economic Development Plan (2006-2010).



			<p>important</p> <p>It is worth mentioning at this point that collaboration in concrete environmental activities between the Project and MONRE, institutes under MONRE and other relevant organizations will become more crucial.</p> <p>Last but not least, it seems that the effectiveness of the Project was further enhanced by the enormous ability and diligence of C/Ps and the organizational strength of VAST(IET), high recognition of VAST as the national leading research institute, which make VAST work easily with other organization, and ever increasing demands for the environment protection</p> <p>*National Strategy for Environmental Protection (2001-2010) (MONRE: December, 2003)</p> <p>MONRE's Five Year Plan for Natural Resources and Environment (2006-2010) (MONRE, December 2005) Five Year Socio-Economic Development Plan (2006-2010),</p>
	<p>Is the output production inadequate compared to the inputs?</p>	<p>Adequacy of the achievement level of outputs</p> <p>Adequacy of human resources, trainings, equipment invested</p> <p>Level of utilization of inputs (human resources, trainings, equipment)</p> <p>Adequacy of timing of inputs</p>	<p>The situation regarding inputs is as follows.</p> <p>Inputs from Japanese side:</p> <ul style="list-style-type: none"> • It took seven months to replace the long term expert on water analysis. • Dispatch of the long term expert on wastewater treatment was delayed about five months. • The long term expert on water quality monitoring was dispatched one year and eight months later from the project's commencement. • Most of equipment was locally purchased. Due to the nature and level of the market economy in Vietnam, big participants were mainly smaller business entities. In addition, most of equipment was imported. Thus it took unexpectedly long time to receive and install equipment. (It took one year to start using equipment.) • Many VAST(IET) staff members could be sent to Japan as C/P trainings but also as trainees of JICA's group trainings and long-term trainings. These trainings in Japan successfully raised awareness by learning Japanese experiences of environmental management, and motivated them. Knowledge and leanings from those trainings are effectively utilized in their daily work.
<p>Efficiency</p>	<p>Do the outputs justify the invested cost compared to similar projects?</p> <p>What are the inhibiting and promoting factors?</p>		<p>Input from Vietnamese side:</p> <ul style="list-style-type: none"> • A part of IOC building is used for the Project office and the laboratories, but it is indeed smaller than the originally expected by the Project. Currently the new 8th-floor building for IET is under construction in the VAST complex. (The building of IOC was originally meant for IET with expectation of JICA's project. However due to delay in the commencement of the Project, the building was occupied by IOC now.) • Number of VAST(IET) staffs has been increasing compared with the beginning of the Project. Staff numbers of two departments closely worked with the Project are increased from 41 to 66 by now.

ANNEXIV-14



	<p>• VAST(IET) bears the costs of many things such as cost for renovating laboratories, for consumables, electricity, gas and so on.</p> <p>• The balancing budget from the government</p> <p>As just seen, it is true that it took unexpectedly long time to install equipment and some experts were dispatched later than the originally planned. In fact, due to the present status of economy in Vietnam, it was difficult and took time for smaller business entities to handle imported equipment as scheduled. However, it gave opportunities and time for C/Ps to learn specifications, and to choose based on their needs. It is also beneficial in regards of operation, maintenance and repair if necessary</p> <p>C/Ps are satisfied with varieties and numbers of equipment, and frequency in use is also high. Even as for the delay in procurement, no complaints were raised. They said they could take enough time to arrange the laboratories to receive advanced equipment.</p> <p>As for Japanese experts, the demands for short-term experts on analysis of certain special substances were raised during interviews and group discussion.</p> <p>The enormous ability and diligence of C/Ps and the organizational strength of VAST(IET) made the Project fulfill the satisfactory level of achievement in spite of delay in installing all necessary analytical equipment and the 7-month absence of long-term expert on water analysis.</p> <p>As for the prospect of achievement of the overall goal, please see the Verification of Performance.</p> <p>First of all, various studies and advices have been provided by VAST(IET) to MONRE and other local authorities based on requests from them. VAST(IET) also provides consulting and engineering services on wastewater treatment to hospitals and factories. In addition, officers from 25 DONREs out of 64 DONREs in the country participated in the training courses and received lectures from C/Ps. Furthermore, VAST(IET) submitted document No.285/VCNMT dated on September 14 2005 to the General Department of Standard and Quality/MOST and MONRE with the purpose of proposing to revise the Vietnamese Standards (TCVN) in water environment. However, the major target, "to recommend on introduction of water quality monitoring system and SOPs", has not been achieved yet. The Project plans to prepare the recommendation by the end of the Project.</p> <p>Another positive impact of the project is the trainings provided by the Project to DONRE officers. These training courses</p>
	<p>Are there prospects that the overall goal will be achieved as an effect of the Project?</p> <p>Were there any ripple effects to people or organizations other than the target groups?</p> <p>Are effects towards policy making process of MONRE realized?</p> <p>Are there any impacts toward other organizations such as</p>
Impact	

		DONRE? Other	<p>met their needs well because they contributed to enhancing basic abilities of water environmental management, updating their knowledge and sharing Japanese experiences. After the training courses, VAST(IET) received requests for trainings from Thanh Hoa province, Thai Nguyen province, Bac Ninh province and Hai Duong province where some of the participants belong to. Great demands towards trainings by VAST(IET) were also confirmed at the focus group discussions.</p> <p>It is worth mentioning that the university students who were under laboratory trainings in VAST(IET) reported what they have learned in VAST(IET) laboratories, and in reports, some universities who sent students to VAST(IET) laboratories invited some staff members as lecturers. This can be considered another positive impact of the Project.</p> <p>See the Relevance.</p> <p>In addition, depending on the technological fields, the further discussion and collaboration with Hydro and Metrological Center under MONRE and CTC (Center for Consultancy, Training and Technology Transfer) will be necessary. However, VAST(IET) is directly under the national government (the prime minister) with the same level of authorities as other ministries and thus could collaborate with other state bodies, and in fact VAST(IET) signed the cooperation agreement with Vietnam National University (Hanoi). Likewise, VAST(IE) is the organization which could smoothly work with other relevant agencies.</p>																																								
Sustainability	Were there any positive or negative impacts?		<p>During the project period, staff number of VAST(IET) has been increasing from 70 in April 2003 to 144 in December 2005. Due to the high recognition of VAST(IET) and its provision of high personal development prospects, staff members work long without frequent job hopping, and thus the sustainability from the organizational aspect can be considered secured</p>																																								
	Role and responsibility of VAST in the field of water environment protection	Does VAST(IET) have operation and management potential?	<p>Table 5. Numbers of IET Staff</p> <table border="1"> <thead> <tr> <th>Date</th> <th>Dept. of Envt Engineering</th> <th>Dept. of Envt Quality Analysis</th> <th>Dept of Envt Planning</th> <th>Dept of Envt Electro-che mistry</th> <th>Dept of Envt Bio technology</th> <th>Admin.</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2003.4</td> <td>19</td> <td>15</td> <td>15</td> <td>14</td> <td></td> <td>7</td> <td>70</td> </tr> <tr> <td>2003.12</td> <td>25</td> <td>16</td> <td>16</td> <td>15</td> <td>13</td> <td>7</td> <td>92</td> </tr> <tr> <td>2004.12</td> <td>29</td> <td>21</td> <td>17</td> <td>19</td> <td>13</td> <td>9</td> <td>108</td> </tr> <tr> <td>2005.12</td> <td>44</td> <td>22</td> <td>25</td> <td>28</td> <td>14</td> <td>11</td> <td>144</td> </tr> </tbody> </table> <p>The financial status of VAST(IET) is as follows.</p>	Date	Dept. of Envt Engineering	Dept. of Envt Quality Analysis	Dept of Envt Planning	Dept of Envt Electro-che mistry	Dept of Envt Bio technology	Admin.	Total	2003.4	19	15	15	14		7	70	2003.12	25	16	16	15	13	7	92	2004.12	29	21	17	19	13	9	108	2005.12	44	22	25	28	14	11	144
Date	Dept. of Envt Engineering	Dept. of Envt Quality Analysis	Dept of Envt Planning	Dept of Envt Electro-che mistry	Dept of Envt Bio technology	Admin.	Total																																				
2003.4	19	15	15	14		7	70																																				
2003.12	25	16	16	15	13	7	92																																				
2004.12	29	21	17	19	13	9	108																																				
2005.12	44	22	25	28	14	11	144																																				
	Are there prospects that the sustainability is secured?	Are supports from the government and VAST expected?	<p>Are there prospects that the sustainability is secured from a financial</p> <p>Is financial situation of VAST good?</p>																																								

ANNEXIV-16

Table 6. Trend of VAST(IET)'s Annual Budget (as of May 2006)

Financial year	Annual Budget		Total (million dong)	Total (million yen)
	From the government	From others		
2003	2,390.6	2,819.6	5,210.2	38.5
2004	5,957.3	4,929.0	10,886.3	80.5
2005	11,980.6	5,767.7	17,748.3	131.2
2006	12,517.3	—	12,517.3	92.6

(Note 1) 1VND = 0.007395¥

(Note 2) 「from others」 : Income from commissioned projects and studies.

Though the budgets shown above include salaries, the size of budget can be considered as substantially large to operate and maintain the equipment procured by the Project. For the future, VAST(IET) should make efforts to generate own financial resources through the commissioned studies and engineering services in order to not only maintain but to invest in other equipment.

In general, looking at the financial status and trends, VAST(IET) is stable and thus can secure sustainability of the Project. As reiterated before, the C/P agency formed 18 working groups for main analytical and treatment equipments with its own initiative by using the counterpart budget, carried out researches on compositions and functions of equipment, measurement principles and operational method with supports from Japanese experts. The results of these researches were compiled as 18 research reports. Contents of some reports were announced at the project steering committee at VAST and were approved by VAST. Likewise, the level of participation and ownership of the C/P agency can be considered high.

In addition, VAST(IET) have hired external resources on QA/QC with their own budget in order to increase the credibility of monitoring data. C/Ps have made great efforts to enhance their capacities and this can be said as emergence of sustainability.

As seen above, Vietnamese side is actively acquiring knowledge and analytical methods by using equipment through the Project. It is true that the cost for operation and maintenance for the advanced equipment procured by the Project is rather high, but they recognized the importance to maintain the advanced equipment as the leading research institute in the field of natural science and technology, to raise own funds and to keep on producing accurate data. As seen, the annual budget is in upward trend; thus, it can be said that the Project is reasonably sustainable.

point of view?

Is VAST(IET) likely to secure resources (human resources and budget) to continue activities under the Project?

Is a level of transferred technology appropriate enough to be spread?

Did C/Ps acquire knowledge and the transferred technology enough?

Will the transferred technology and equipment be used widely?

Are there prospects that the sustainability is secured from a technical point of view?