

2. 協議議事録 (M / D)

MINUTES OF DISCUSSIONS  
BETWEEN THE JAPANESE IMPLEMENTATION STUDY TEAM AND  
THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF  
THE REPUBLIC OF THE PHILIPPINES ON THE JAPANESE TECHNICAL  
COOPERATION FOR THE CAPACITY BUILDING PROJECT FOR  
ENVIRONMENTAL MANAGEMENT IN MINING

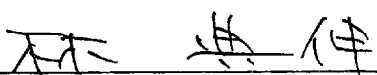
The Japanese Implementation Study Team (hereinafter referred to as "the Team") organized by Japan International Cooperation Agency (hereinafter referred to as "JICA"), and the Department of Environment and Natural Resources (hereinafter referred to as "DENR"), and the Mines and Geosciences Bureau (hereinafter referred to as "MGB") signed the Record of Discussions (hereinafter referred to as "R/D") on the Japanese Technical Cooperation for the Capacity Building Project for Environmental Management in Mining (hereinafter referred to as "Project").

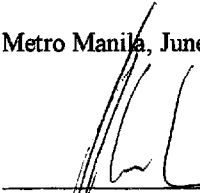
The following Minutes of Discussions are intended to record the understanding reached between both sides in regard to the provisions stipulated in R/D.

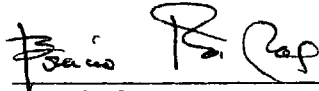
During its stay in the Republic of the Philippines, the Team exchanged views and had a series of discussions with the authorities concerned of the Government of the Republic of the Philippines.

As a result of the discussions, both sides came to reach a common understanding concerning the matters referred to in the document attached hereto.

Metro Manila, June 4, 1999

  
\_\_\_\_\_  
Norinobu Hayashi  
Leader  
Implementation Study Team  
Japan International Cooperation Agency  
Japan

  
\_\_\_\_\_  
Antonio H. Cerilles  
Secretary  
Department of Environment and  
Natural Resources (DENR)  
The Republic of the Philippines

  
\_\_\_\_\_  
Horacio C. Ramos  
Director  
Mines and Geosciences Bureau, DENR  
The Republic of the Philippines

THE ATTACHED DOCUMENT

1. Title of the Project

As to the title of the Project, both sides agreed to the following:

"The Capacity Building Project for Environmental Management in Mining"

2. Implementing Agency of the Project

As to the Philippine agency responsible for the Implementation of the Project, the Philippine side explained and the Team agreed to as follows:

MGB will bear overall responsibility for the implementation of the Project under the supervision of the Department of Environment and Natural Resources (hereinafter referred to as "DENR").

The organizational chart of MGB is as shown in ANNEX 1.

The organizational chart of DENR is as shown in ANNEX 2.

The Project will be implemented at MGB.

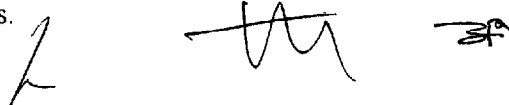
Address	North Avenue, Diliman, Quezon City, Metro Manila
Phone	928-8642
Fax	920-1635

3. Administration of the Project

In accordance with the Article IV of R/D, the organization chart for the administration of the Project is as shown in ANNEX 3-A,3-B.

4. Master Plan of the Project

In accordance with the Article I of R/D, both sides confirmed the Master Plan of the Project as shown in ANNEX 4, in which the activities of the Project were elaborated to fulfill the Project outputs.



## 5. Field of Technology Transfer

Both sides confirmed that the technology transfer from the Japanese experts to the Philippine counterpart personnel (hereinafter referred to as "C/P") would be made in the following fields;

- (1) Upgrading and strengthening of the MGB's functions concerning mine environmental monitoring in the fields of water and soil pollution.
- (2) Upgrading of the MGB's capability concerning chemical analysis techniques in the fields of water and soil pollution.
- (3) Strengthening of the MGB's functions of evaluation for the environmental management technologies in the fields of water and soil pollution.
- (4) Strengthening of the MGB's functions concerning evaluation on the environmental impact assessment reports for mining projects.
- (5) Strengthening of the MGB's functions concerning staff training in the fields of mine environmental management.

## 6. Project Cycle Management

Both sides reached mutual understanding on the Project Design Matrix (hereinafter referred to as "PDM") as shown in ANNEX 5.

Furthermore, both sides agreed on the following;

- (1) Project planning and concept, clarification method entitled Project Cycle Management (hereinafter referred to as "PCM") will be applied to the Project to monitor and evaluate the level of the achievement and enhance the communication for its smooth implementation.
- (2) PDM should continue to be revised as the common reference / communication tool to realize the PCM and to be further discussed between the Japanese experts and the Philippine side.



7. Measures to be taken by Japanese side.

In accordance with the Article II of R/D, both sides confirmed the technical cooperation for the Project

(1) Dispatch of Japanese Experts

The Team explained and the Philippine side agreed that the following Japanese experts would be dispatched in accordance with the fields as following;

(Long-term Experts)

- 1) Chief Advisor
- 2) Coordinator
- 3) Expert in charge of mine environmental monitoring
- 4) Expert in charge of environmental chemical analysis
- 5) Expert in charge of mine environmental management

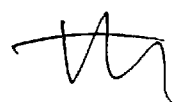
(Short-term Experts)

Short-term experts in specific fields will be dispatched in relation to the fields of technology transfer as a need arises.

(2) Training of Philippine Counterpart Personnel in Japan

The Team explained and the Philippine side agreed that the Philippine counterpart personnel would be accepted for training in Japan according to the following program:

- 1) Number of counterparts accepted  
About two (2) counterparts yearly;
- 2) Term of training  
About three (3) weeks to three (3) months; and



The Team, further, requested the Philippine side and the latter agreed that, as a matter of course, the C/P may apply to other training courses conducted by JICA. However, sufficient consultation should be held between the Japanese experts and the C/P before the application to avoid impeding the smooth implementation of the Project.

Application form for the training program in Japan should be submitted in Form A-2,3 to the Government of Japan by the Philippine side at least two (2) months prior to the scheduled arrival in Japan.

### (3) Provision of Machinery and Equipment

In accordance with the ANNEX III of R/D, the Philippine side requested the Japanese side the provision of machinery, equipment and other materials (hereinafter referred to as "the Equipment") as listed in ANNEX 6.

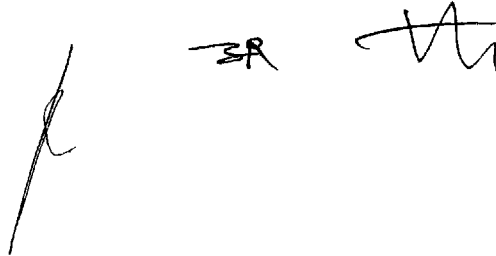
The Team agreed to convey the request from the Philippine side to the Japanese authorities concerned, stating that the actual provision will be subject to the budget appropriation of the Government of Japan.

The Team explained and the Philippine side agreed that the costs and responsibility necessary for domestic transport, installation and maintenance of the Equipment should be borne by the Philippine side in accordance with article III-7-(1) in R/D.

Application form for the request of the Equipment to be provided by the Government of Japan should be submitted in Form A-4 to the Government of Japan by the Philippine side immediately after R/D signed.

## 8. Measures to be taken by the Philippine side

In accordance with the Article III of R/D, the Philippine side will take following measures.



(1) Building and Facilities for the Project

The Philippine side will prepare the building and facilities in MGB for implementation of the Project .

Office space for the Japanese experts,C/P office equipment such as phone and desk will be prepared as early as possible before the commencement of the Project.

In this regard , the Team requested and Philippine side agreed that rooms for Japanese Chief Advisor, Project Coordinator, other experts and a meeting room should be prepared in the same building and that the Japanese experts in charge of technical affairs and their respective C/P should be located in the same building to ensure smooth communication.

The present location map of MGB and the layout of project facilities are as shown in ANNEX 7 and ANNEX 8.

(2) Machinery, Equipment and Materials

The Philippine side,at its own expense, will make its best effort to supply or replace, the machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than those provided by the Government of Japan through JICA.

(3) Assignment of Counterpart Personnel

In accordance with the ANNEX IV of R/D, the Philippine side will provide the service of the C/P and supporting staff as listed in ANNEX 9 and ANNEX 10 for the successful implementation of the Project .

Should the assignment of the C/P be changed for either the personnel or administrative reasons , the Philippine side will immediately take necessary measures to assign appropriate number of personnel as the C/P for the Project.

The Team stated and the Philippine side agreed that permanent assignment of the C/P is the most important key for successful implementation of the Project and its sustainability.



(4) Local Cost

Budgetary allocation for necessary local cost by the Philippine side will be indispensable for the successful implementation for the Project.

Both sides confirmed that the local cost by the Philippine side covers the travel expenses for the C/P to conduct field training.

The Philippine side presented a plan for the appropriation of local cost to implement the Project as shown in ANNEX 11.

(5) Sustainability of the Project

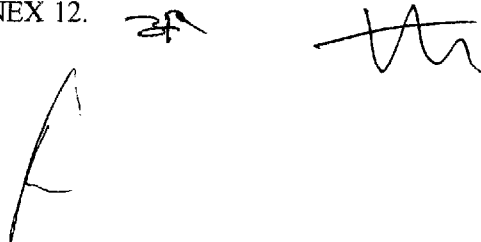
The Philippine side will take necessary measures to ensure that the self-reliant operation of the Project will be sustained during and after the period of the Japanese technical cooperation, through the full and active involvement in the Project by all related authorities, beneficiary groups and institutions so that the technologies and knowledge acquired by the C/P through the Project will ultimately contribute to the environmentally sustainable, economic and social development of the Republic of the Philippine.

9. Joint Evaluation

In accordance with the Article V of R/D, the final evaluation of the Project will be conducted jointly by both sides through JICA approximately six (6) months before the termination of the cooperation period in order to examine the level of achievement of the objectives of the Project.

Other evaluations may be conducted as and when necessary during and after the cooperation period to better monitor the accomplishment and sustainability of the Project.

In this regard, the Team explained the methodology of evaluation, especially five (5) basic evaluation components as shown in ANNEX 12.



## 10. Plan of Operations

The Team and Philippine side discussed the details of Technology transfer in the above fields and drafted Plan of Operations (hereinafter referred to as "PO") as shown in ANNEX 13, in the framework of R/D.

## 11. Tentative Schedule of Implementation

Both sides worked out the Tentative Schedule of Implementation (hereinafter referred to as "TSI"), for the Japanese fiscal year 1999, as shown in ANNEX 14, in the framework of R/D.

### (1) Dispatch of Japanese experts in fiscal year 1999

The Japanese side would consider to dispatch the following experts within the budget appropriation of the Government of Japan.

#### 1) Long-term experts

Chief Advisor

for two (2) years from the beginning of July, 1999.

Coordinator

for two (2) years from the beginning of July, 1999.

Expert in charge of Mine Environmental Monitoring

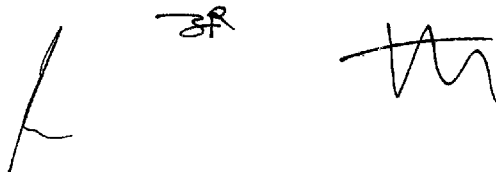
for two (2) years from the middle of August, 1999.

Expert in charge of Environmental Chemical Analysis

for two (2) years from the beginning of July, 1999.

Expert in charge of Mine Environmental Management

for two (2) years from the beginning of July, 1999.

Handwritten signatures and initials. On the left is a large, stylized signature. In the middle are the initials 'ER'. On the right is another large, stylized signature.



2) Short-term experts

Both sides agreed to dispatch short term experts with necessary technical expatriation including;

- a) Mine Environmental Monitoring
- b) Chemical Analysis
- c) Mine Environmental Management
- d) Environmental Impact Assessment

(2) Training of Philippine Counterpart Personnel in Japan

Both sides agreed to train Philippine counterpart personnel in Japan in following fields;

- a) Mine Environmental Monitoring
- b) Environmental Chemical Analysis
- c) Mine Environmental Management
- d) Mine Environmental Impact Assessment

12. Annual Plan of Operations

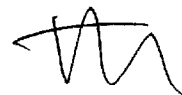
Both sides worked out the Annual Plan Operations (hereinafter referred to as "APO") for the Japanese fiscal year 1999 as shown in ANNEX 15 in the framework of R/D.

13. Other matters

(1) Both sides agreed that common language used in any activities of the Project should be in English.


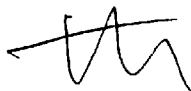
(2) The Team explained and the Philippine side understood the nature and scheme of the Project-type Technical Cooperation by the Government of Japan.

(3) List of attenders during the discussions is as shown in ANNEX 16.



Page 8 (M/D)

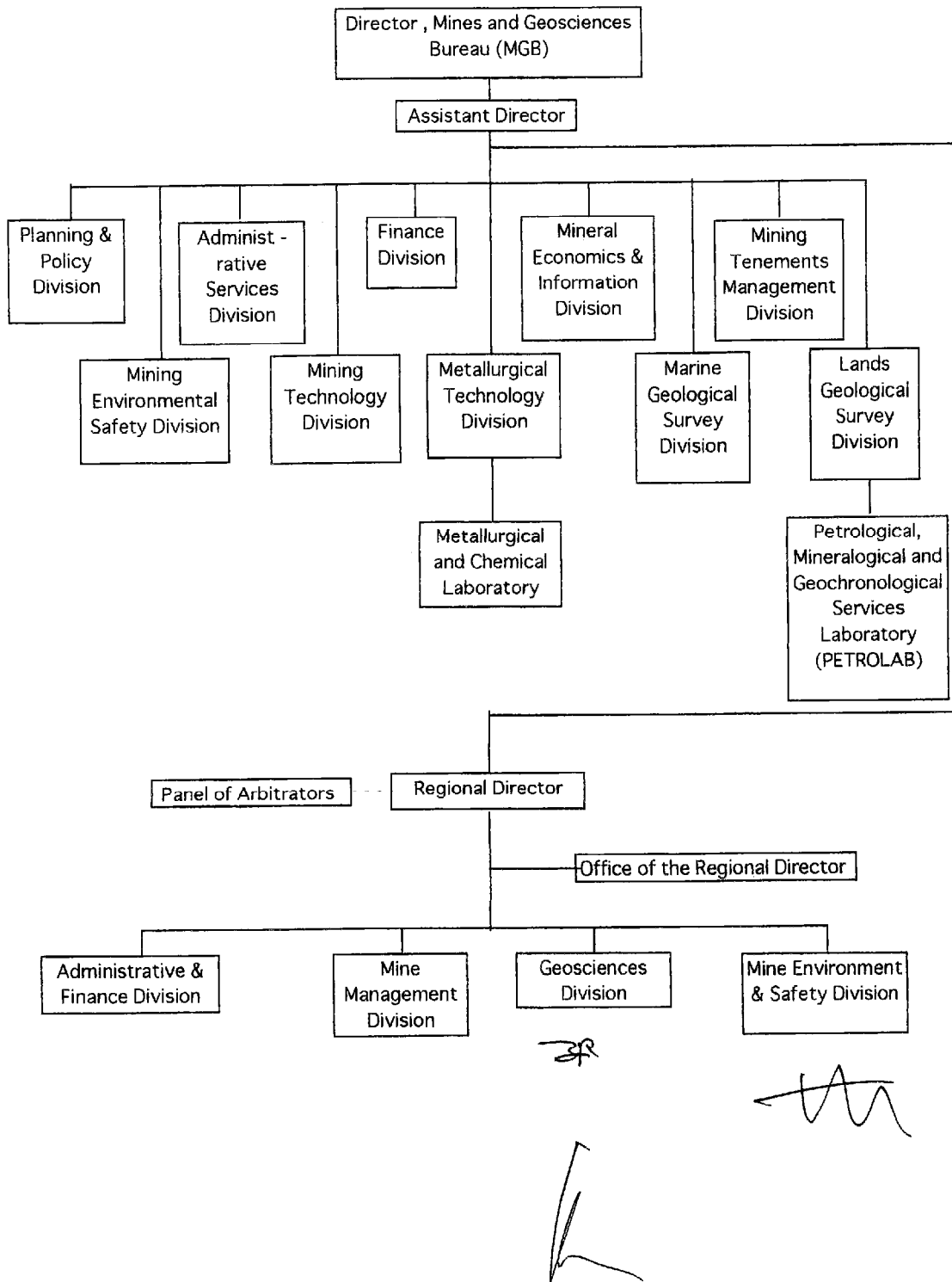
## LIST OF ANNEXES

- ANNEX 1 Organizational Chart of the Mines and Geosciences Bureau (MGB)
- ANNEX 2 Organizational Chart of the Department of Environment and Natural Resources (DENR)
- ANNEX 3-A Organizational Chart of the Administration of the Project by Both Sides
- ANNEX 3-B Organizational Chart of the Administration of the Project by the Philippine Side
- ANNEX 4 Master Plan of the Project
- ANNEX 5 Project Design Matrix (PDM)
- ANNEX 6 List of the Machinery and Equipment for the Project
- ANNEX 7 Location Map of the Project Site
- ANNEX 8 Layout Plan of the Facilities for the Project
- ANNEX 9 Allocation Plan of Supporting Staff
- ANNEX 10 Allocation Plan of counterparts
- ANNEX 11 Local cost
- ANNEX 12 Five Basic Evaluation Components
- ANNEX 13 Plan of Operations (PO)
- ANNEX 14 Tentative Schedule of Implementation (TSI)
- ANNEX 15 Annual Plan of Operations (APO) for the Japanese Fiscal Year 1999
- ANNEX 16 List of Attendance 
- ANNEX 17 Article for the Project 

M/D

### ANNEX 1

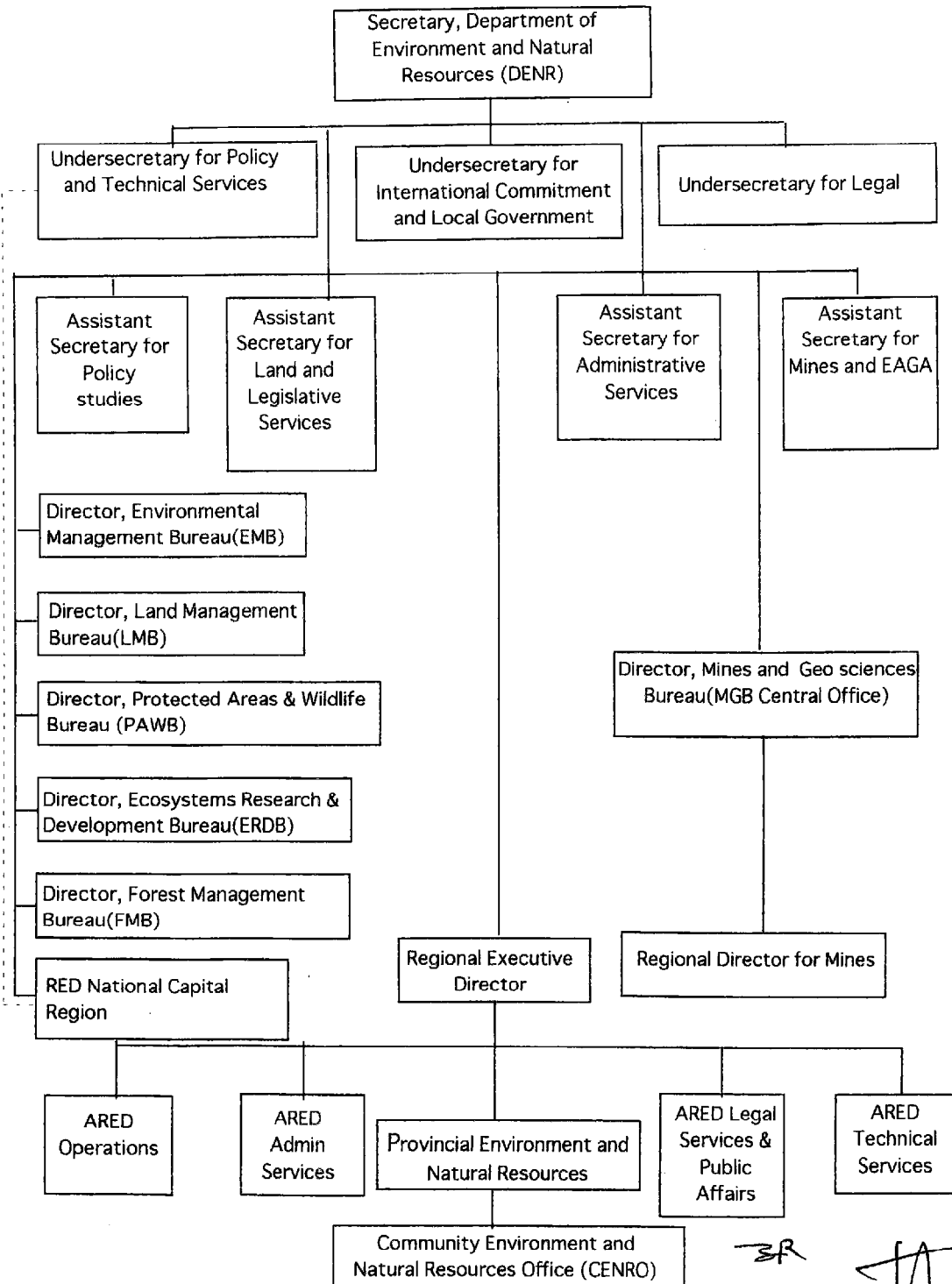
## Organizational Chart of the Mines and Geosciences Bureau



M/D

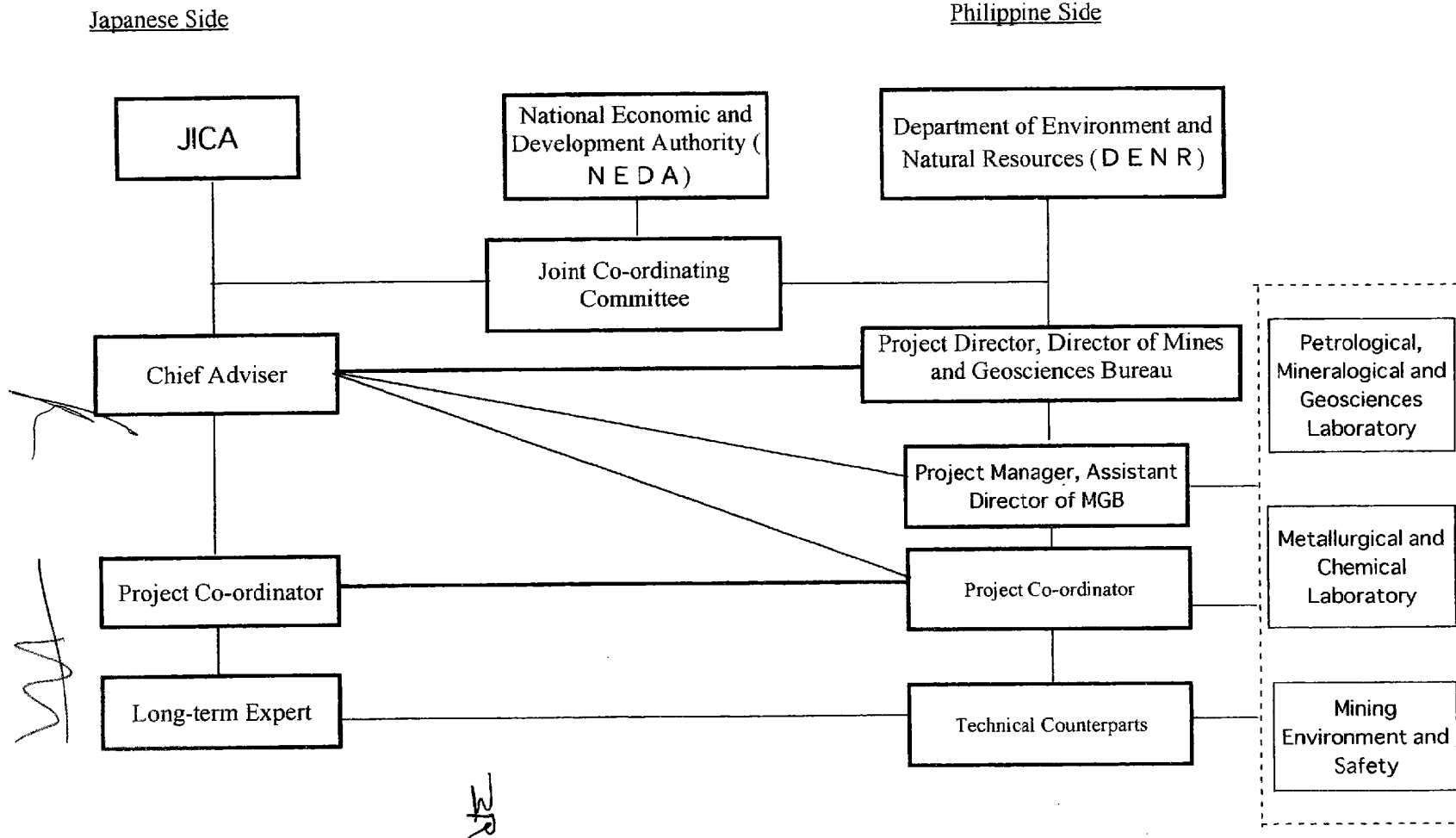
May 28, 1999

## ANNEX 2 Organisational Chart of the Department of Environment and Natural Resources



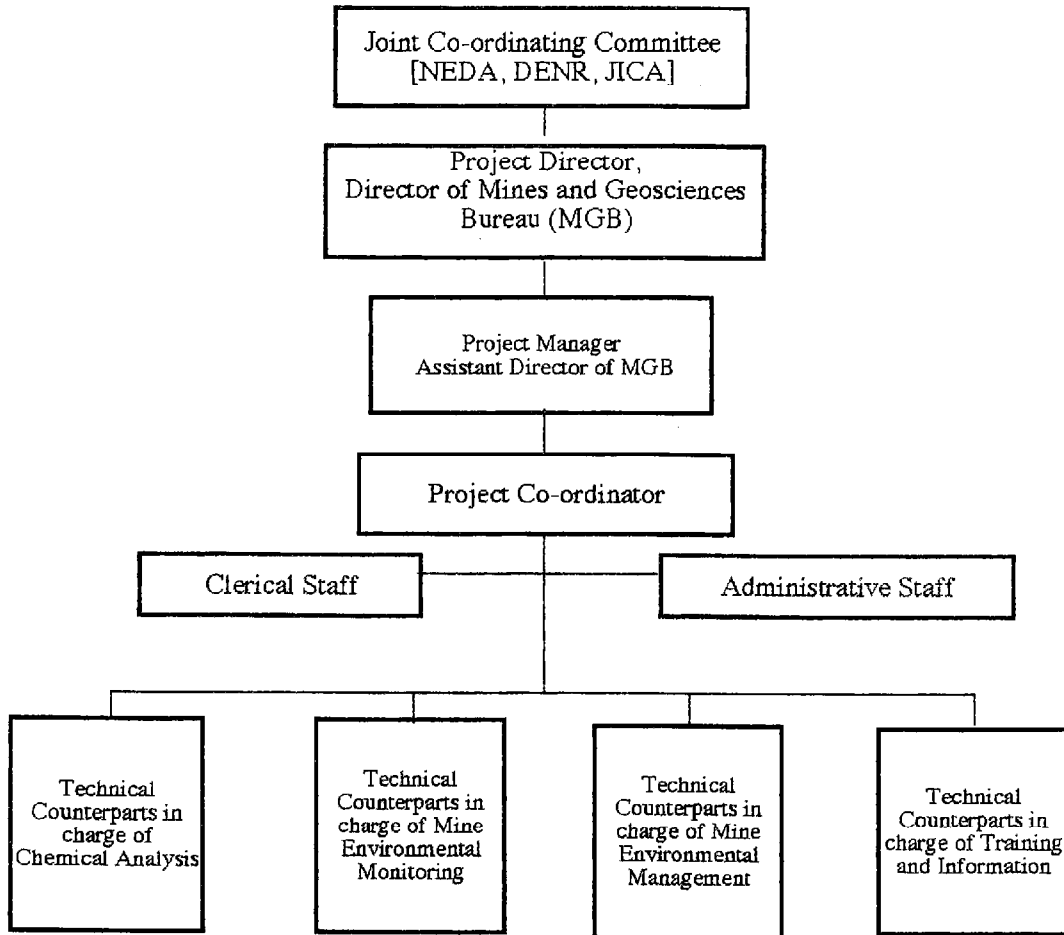
### ANNEX 3-A

#### Organisational Chart for the Administration of the Project by Both Side



### ANNEX 3-B

Organisational Chart for the Administration of the Project by Philippine Side



*3R*  
*th*  
*[Signature]*

M/D

## ANNEX 4 Master Plan of the Project

### 1. Overall goal

The capacity of MGB in mine environmental management in the fields of water and soil pollution caused by mining activities will be enhanced.


### 2. Project purpose

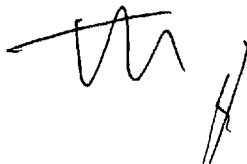
The staff necessary for mine environmental management in the fields of water and soil pollution caused by mining activities will be strengthened at MGB in cooperation with Environmental Management Bureau (EMB).

### 3. Outputs of the Project

- 0) The management system of the Project will be established.
- 1) The operation and maintenance management of the machinery and equipment used for chemical analysis, measurements and experiments will be undertaken by the technical staff of MGB.
- 2) The MGB's functions of mine environmental monitoring in the fields of water and soil pollution will be upgraded and strengthened.
- 3) The MGB's functions of evaluation and guidance on the environmental management technologies in the fields of water and soil pollution will be strengthened.
- 4) The MGB's functions of evaluation on the environmental impact assessment reports for mining projects will be strengthened.
- 5) The MGB's functions of staff training in the fields of mine environmental management will be strengthened.

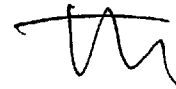
### 4. Activities of the Project

- 0-1 Allocate the staff based on the plan.
- 0-2 Formulate the operational plan.
- 0-3 Formulate the budgetary plan.
- 1-1 Formulate the preparation plan and implement procurement and maintenance of machinery, equipment and facilities.
- 1-2 Implement the installation, and guide in the operation & maintenance of machinery and equipment provided by JICA.
- 1-3 Prepare the manuals on maintenance of the Equipment. 



M/D

- 2-1 Acquire the technical and administrative outline of mine monitoring in the field of water and soil pollution.
- 2-2 Acquire the techniques and prepare the manuals of water and soil sampling for environmental analysis.
- 2-3 Acquire the technology and prepare the manuals of on-site measurements & analysis for water & soil quality.
- 2-4 Acquire the technology and prepare the manuals of laboratory measurements & analysis for water & soil quality.
- 2-5 Acquire the techniques and prepare the manuals on the environmental evaluation of the results of measurement and analysis for water and soil quality.
- 3-1 Acquire the technical information on the environmental management technologies.
- 3-2 Acquire the techniques and prepare the manuals on the environmental evaluation of the practice on the treatment of waste water and tailing.
- 4-1 Acquire the technical information on the process of environmental impact assessment for mining projects.
- 4-2 Acquire the technical information on the evaluation of environmental impact assessment reports for mining projects.
- 5-1 Formulate the training programs.
- 5-2 Prepare the training materials.
- 5-3 Implement the training.
- 5-4 Implement the questionnaire survey to the trainees.



M/D



## ANNEX 5 Project Design Matrix (PDM)

June 1, 1999

Project Summary	Verifiable Indicators	Means of Verification	Important Assumptions
<p>[Overall Goal of the Project] The capacity of MGB in mine environmental management in the field of water and soil pollution caused by mining activities will be enhanced.</p>	<ol style="list-style-type: none"> <li>1. Progress on mine environmental management in the fields of water and soil pollution control by MGB.</li> <li>2. State on water &amp; soil pollution control at mines &amp; mills.</li> </ol>	<ol style="list-style-type: none"> <li>1-1. Records on mine environmental management of MGB.</li> <li>1-2. Interview and questionnaire survey to the parties concerned.</li> <li>2. Records on water &amp; soil pollution monitoring of MGB &amp; LGU.</li> </ol>	<ol style="list-style-type: none"> <li>a. The mine environmental management policy will be sustained by the Government &amp; Industry.</li> <li>b. The coordination between MGB &amp; EMB will be sustained appropriately.</li> </ol>
<p>[Purpose of the Project] The staff necessary for mine environmental management in the fields of water and soil pollution caused by mining activities will be strengthened at MGB in cooperation with EMB.</p>	<ol style="list-style-type: none"> <li>1. Progress on training program of MGB.</li> <li>2. Long &amp; mid-term program of training courses of MGB.</li> </ol>	<ol style="list-style-type: none"> <li>1-1. Records on training courses.</li> <li>1-2. Interview and questionnaire survey to the parties concerned.</li> <li>2. Lists of regular training courses of MGB.</li> </ol>	<ol style="list-style-type: none"> <li>a. The services of the C/P who are trained by the experts will be continued at MGB.</li> </ol>
<p>[Output of the Project] 0. The management system of the Project will be established. 1. The operation and maintenance management of the Equipment used for analysis, measurements and experiments will be undertaken by the technical staff of MGB. 2. The MGB's functions of mine environmental monitoring in the fields of water and soil pollution will be upgraded and strengthened. 3. The MGB's functions of evaluation and guidance on environmental management technologies in the fields of water and soil pollution will be strengthened. 4. The MGB's functions of evaluation on the environmental impact assessment reports for mining projects will be strengthened. 5. The MGB's functions of staff training in the fields of mine environmental management will be strengthened.</p>	<ol style="list-style-type: none"> <li>0. Progress on allocation of personnel and budget by MGB.</li> <li>1-1. Progress on preparation and maintenance of the Equipment.</li> <li>1-2. Progress on the operation &amp; utilization of the Equipment.</li> <li>2-1. Progress on water and soil sampling practice.</li> <li>2-2. Progress on environmental measurements and analysis.</li> <li>2-3. Progress on evaluation of the results of monitoring.</li> <li>3-1. Progress on guidance for mine and mill operation.</li> <li>3-2. Progress on guidance for waste water and tailing treatment.</li> <li>4. Progress on the evaluation of the mine environmental impact assessment reports.</li> <li>5-1. Number of participants in the training courses &amp; seminar.</li> <li>5-2. Present state of trainees.</li> </ol>	<ol style="list-style-type: none"> <li>0. Records on personnel and budget of MGB.</li> <li>1-1. Records on maintenance of the Equipment by MGB.</li> <li>1-2. Manuals on operation and maintenance of the Equipment.</li> <li>2-1. Records on water and soil sampling practice.</li> <li>2-2. Records on measurements and chemical analysis.</li> <li>2-3. Records on evaluation of the results of monitoring.</li> <li>3-1. Records on guidance for mine and mill operations.</li> <li>3-2. Records on guidance for waste water &amp; tailing treatment.</li> <li>4. Records on evaluation of the mine environmental impact assessment reports.</li> <li>5-1. Records on training courses and seminars.</li> <li>5-2. Questionnaire survey to the trainees.</li> </ol>	<ol style="list-style-type: none"> <li>a. The C/P will be arranged appropriately in accordance with the specialty concerning technology transfer.</li> <li>b. The operational costs for the Project will be assured appropriately.</li> </ol>

ANNEX 5 Project Design Matrix (PDM)

June 1, 1999

Project Summary	Input		Important Assumptions
<p>[Activities of the Project]</p> <p>0-1 Allocate the staff based on the plan.</p> <p>0-2 Formulate the operational plan.</p> <p>0-3 Formulate the budgetary plan.</p> <p>1-1 Formulate the preparation plan and implement procurement and maintenance of machinery, equipment and facilities.</p> <p>1-2 Implement the installation, and guide in the operation &amp; maintenance of machinery and equipment provided by JICA.</p> <p>1-3 Prepare the manuals on maintenance of the Equipment.</p> <p>2-1 Acquire the technical and administrative outline of mine monitoring in the field of water and soil pollution.</p> <p>2-2 Acquire the techniques and prepare the manuals of water and soil sampling for environmental analysis.</p> <p>2-3 Acquire the technology and prepare the manuals of on-site measurements &amp; analysis for water &amp; soil quality.</p> <p>2-4 Acquire the technology and prepare the manuals of laboratory measurements &amp; analysis for water &amp; soil quality.</p> <p>2-5 Acquire the techniques and prepare the manuals on the environmental evaluation of the results of measurement and analysis for water and soil quality.</p> <p>3-1 Acquire the technical information on the mine environmental management technologies.</p> <p>3-2 Acquire the technologies and prepare the manuals on the environmental evaluation of the practice on the treatment of waste water and tailing.</p> <p>4-1 Acquire the technical information on the process of environmental impact assessment for mining projects.</p> <p>4-2 Acquire the technical information on the evaluation of environmental impact assessment reports for mining projects.</p> <p>5-1 Formulate the training programs.</p> <p>5-2 Prepare the training materials.</p> <p>5-3 Implement the training.</p> <p>5-4 Implement the questionnaire survey to the trainees.</p>	Philippine Side	Japanese Side	<p>a. Supports of the MGB's Capacity Building Project for Environmental Management in Mining by the central &amp; local governments the mining industry and other related organizations will be sustained.</p> <p>b. The customs clearance of the machinery and equipment provided by the Japanese side will be processed smoothly.</p>
	<p>1. Preparation of Building &amp; Facilities</p> <p>①Renovation of building and facilities</p> <p>②Installation of the Equipment</p> <p>③Office of experts</p> <p>④Office of counterparts</p> <p>⑤Training rooms</p> <p>2. Allocation of Staff</p> <p>①Project director :1</p> <p>②Project manager :1</p> <p>③Project coordinator :1</p> <p>④Technical C/P :16</p> <p>⑤Supporting staff :5</p> <p>a. Clerical staff :2</p> <p>b. Administrative staff :3</p> <p>c. Technical staff :2</p> <p>3. Procurement of Machinery, Equipment and Materials</p> <p>4. Expenses of Local Costs</p>	<p>1. Dispatch of Experts</p> <p>1-1. Long-term Experts</p> <p>①Chief Advisor :1</p> <p>②Coordinator :1</p> <p>③Expert in charge of mine environmental monitoring :1</p> <p>④Expert in charge of environmental chemical analysis :1</p> <p>⑤Expert in charge of Mine environmental management :1</p> <p>1-2. Short-term Experts</p> <p>a. Environmental Monitoring</p> <p>b. Chemical Analysis</p> <p>c. Mine Environmental Management</p> <p>d. Environmental Impact Assessment (When necessity arises)</p> <p>2. Acceptance of C/P for Training in Japan. (About 2 C/P yearly)</p> <p>3. Provision of the Machinery &amp; Equipment (the Equipment necessary for technology transfer)</p>	<p>Preconditions</p> <p>a. The Agreement between MGB and EMB concerning the mine environmental management will be sustained.</p>

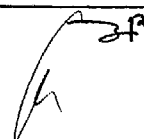
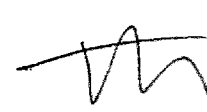
*[Handwritten signatures and initials]*

## ANNEX 6

## List of Machinery and Equipment for the Project

Item No.	Item of Machinery , Equipment and Materials	Specification and/or Description	Quantity	
			1st year	2 & 3 year
<b>A.Laboratoty Supplies</b>				
A-01	Micropipettor	10ul set	4	8
A-02	Micropipettor	20ul set	4	8
A-03	Micropipettor	50ul set	4	8
A-04	Micropipettor	100ul set	4	8
A-05	Micropipettor	200ul set	4	8
A-06	Micropipettor	500ul set	4	8
A-07	Micropipettor	1,000ul set	4	8
A-08	Micropipettor	1-5ml set	4	8
A-09	Pipette tips	0.5-10ul(960 pcs/pack) pack	4	8
A-10	Pipette tips	10-100ul(960 pcs/pack) pack	4	8
A-11	Pipette tips	200-1000ul(960 pcs/pack) pack	4	8
A-12	Pipette tips	1-10ml(960 pcs/pack) pack	4	8
A-13	Chart paper	200mm width roll	8	8
A-14	Beaker	100ml pc	48	8
A-15	Work station	Pipette stand with tips holder pc	4	8
A-16	Polyethylene Vials	5ml, with snap closures (100pcs/set) set	4	8
A-17	Polyethylene Vials	1ml, with snap closures (100pcs/set) set	4	8
A-18	Standard glass cuvettes	for UV-visible spec pc	48	8
A-19	Magnetic polishing disc	(MD-Dur) pack	0	8
A-20	Magnetic polishing disc	(MD-Nap) pack	0	8
A-21	Red lubrication	for diamond polishing litter	0	8
A-22	Conical flask	50ml	20	0
A-23	Conical flask	100ml	10	0
A-24	Conical flask	300ml	20	0
A-25	Conical flask	500ml	40	0
A-26	Conical flask	1000ml	10	0
A-27	Conical flask with stopper	50ml	10	0
A-28	Conical flask with stopper	100ml	10	0
A-29	Conical flask with stopper	300ml	10	0
A-30	Round bottle flask	1000ml	5	0
A-31	Volumetric flask	25ml	20	0
A-32	Volumetric flask	50ml	20	0
A-33	Volumetric flask	100ml	20	0
A-34	Volumetric flask	250ml	10	0
A-35	Volumetric flask	500ml	5	0
A-36	Volumetric flask	1000ml	5	0
A-37	Colored volumetric flask	50ml	5	0
A-38	Colored volumetric flask	100ml	5	0
A-39	Colored volumetric flask	250ml	5	0
A-40	Beaker	100ml	40	0
A-41	Beaker	200ml	40	0
A-42	Beaker	300ml	40	0
A-43	Beaker	500ml	20	0
A-44	Beaker	1000ml	20	0
A-45	Beaker	3000ml	10	0
A-46	Tall beaker	100ml	40	0
A-47	Tall beaker	200ml	40	0

Item No.	Item of Machinery, Equipment and Materials	Specification and/or Description	Quantity	
			1st year	2 & 3 year
A-48	Tall beaker	300ml	40	0
A-49	Tall beaker	500ml	20	0
A-50	Conical beaker	100ml	40	0
A-51	Conical beaker	200ml	40	0
A-52	Conical beaker	300ml	40	0
A-53	Conical beaker	500ml	20	0
A-54	Buret	25ml	5	0
A-55	Buret	50ml	5	0
A-56	Volumetric pipette	1ml	10	0
A-57	Volumetric pipette	2ml	10	0
A-58	Volumetric pipette	5ml	10	0
A-59	Volumetric pipette	10ml	10	0
A-60	Volumetric pipette	25ml	5	0
A-61	Measuring pipette	1ml	10	0
A-62	Measuring pipette	2ml	10	0
A-63	Measuring pipette	5ml	10	0
A-64	Measuring pipette	10ml	10	0
A-65	Komagome-pipette	1ml X 10	2	0
A-66	Komagome-pipette	2ml X 10	2	0
A-67	Komagome-pipette	5ml X 10	2	0
A-68	Komagome-pipette	10ml X 10	2	0
A-69	Measuring cylinder	10ml	10	0
A-70	Measuring cylinder	50ml	10	0
A-71	Measuring cylinder	100ml	10	0
A-72	Measuring cylinder	250ml	10	0
A-73	Measuring cylinder	500ml	5	0
A-74	Measuring cylinder	1000ml	5	0
A-75	Measuring glass(conical type)	10ml	10	0
A-76	Measuring glass(conical type)	20ml	10	0
A-77	Measuring glass(conical type)	50ml	10	0
A-78	Test tube ( $\phi$ 16)	20ml X 100	2	0
A-79	Test tube ( $\phi$ 17)	25ml X 100	2	0
A-80	Test tube. stoper ( $\phi$ 16)	15ml X 10	2	0
A-81	Test tube. stopper ( $\phi$ 17)	20ml X 10	2	0
A-82	Test tube. stopper ( $\phi$ 18)	25ml X 10	2	0
A-83	Separating funnel(skeep type)	100ml	20	0
A-84	Separating funnel(skeep type)	300ml	20	0
A-85	Centrifuging tube	20ml X 10	2	0
A-86	Centrifuging tube	50m X 10	2	0
A-87	Desicator (240mm $\phi$ ) with board		2	0
A-88	Funnel 75mm $\phi$		20	0
A-89	Watch glass	60mm $\phi$	2	0
A-90	Watch glass	120mm $\phi$	2	0
A-91	Suction bottle	1000ml	2	0
A-92	Glass tube	6mm $\phi$ 150mmL,10kg	1	0
A-93	Glass tube	8mm $\phi$ 150mmL,10kg	1	0
A-94	Glass tube	10mm $\phi$ 150mmL,10kg	1	0
A-95	Glass bar	6mm $\phi$ X300mm,10kg	1	0
A-96	Glass bar	8mm $\phi$ X300mm,10kg	1	0
A-97	Glass bar	10mm $\phi$ X300mm,10kg	1	0


 M/D


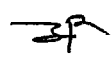
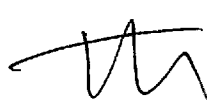
Item No.	Item of Machinery , Equipment and Materials	Specification and/or Description	Quantity	
			1st year	2 & 3 year
A-98	Glass wool	10kg	1	0
A-99	Coiled condenser (graham)	300mmL,15/25,15/2	2	0
A-100	Thermometer 200°C		2	0
A-101	A s generator		20	0
A-102	Supports,clamps, B type-set		2	0
A-103	Porcelain-filter	96mm $\phi$	2	0
A-104	Porcelain-filter	118mm $\phi$	2	0
A-105	Filter paper (No2)	110mm $\phi$	10	0
A-106	Filter paper (No2)	150mm $\phi$	10	0
A-107	Filter paper (No2)	300mm $\phi$	10	0
A-108	Filter paper(5B)	70mm $\phi$	10	0
A-109	Filter paper(5B)	90mm $\phi$	10	0
A-110	Filter paper(5B)	110mm $\phi$	10	0
A-111	Filter paper(5B)	150mm $\phi$	10	0
A-112	Paraffin paper	105mm $\square$	4	0
A-113	Paraffin paper	120mm $\square$	4	0
A-114	Stoppers(silicon)	No1	20	0
A-115	Stoppers(silicon)	No3	20	0
A-116	Stoppers(silicon)	No5	20	0
A-117	Stoppers(silicon)	No7	20	0
A-118	Stoppers(silicon)	No9	20	0
A-119	Stoppers(silicon)	No11	20	0
A-120	Stoppers(silicon)	No13	20	0
A-121	Tubing(silicon)	1/2(10m)	10	0
A-122	Tubing(silicon)	4/6(10m)	10	0
A-123	Tubing(silicon)	6/8(10m)	10	0
A-124	Tubing(silicon)	8/10(10m)	10	0
A-125	Tubing(silicon)	12/16(10m)	10	0
A-126	Tubing(vinyl)	2/4(15m)	1	0
A-127	Tubing(vinyl)	4/6(15m)	1	0
A-128	Tubing(vinyl)	6/8(15m)	1	0
A-129	Tubing(vinyl)	8/11(15m)	1	0
A-130	Tubing(vinyl)	10/14(15m)	1	0
A-131	Sample bag	A-4	1	0
A-132	Sample bag	B-4	1	0
A-133	Sample bag	D-4	1	0
A-134	Sample bag	E-4	1	0
A-135	Sample bag	H-4	1	0
A-136	Sample bag	I-4	1	0
A-137	Sample bag	J-4	1	0
A-138	Safe pipetter		5	0
A-139	Spoit for komagome-pipette	1ml X 10	2	0
A-140	Spoit for komagome-pipette	2ml X 10	2	0
A-141	Spoit for komagome-pipette	5ml X 10	2	0
A-142	Spoit for komagome-pipette	10ml X 10	2	0
A-143	Washing bottle(polyethylene)	100ml	20	0
A-144	Washing bottle(polyethylene)	500ml	20	0
A-145	Bottle(polyethylene)	100ml X 10	2	0
A-146	Bottle(polyethylene)	500ml X 10	2	0
A-147	Bottle(polyethylene)	1000ml X 10	2	0

L 2R M/D

Item No.	Item of Machinery , Equipment and Materials	Specification and/or Description	Quantity		
			1st year	2 & 3 year	
A-148	Pinchcock,hofman-type, size-middle		10	0	
A-149	Separating funnel support(PVC)	100mlX10	4	0	
A-150	Separating funnel support(PVC)	300mlx5	4	0	
A-151	Buret support with stopper(PVC)		2	0	
A-152	Cork borer, 12pair		2	0	
A-153	Test tube support(16mm $\phi$ x24)		10	0	
A-154	Brush for beaker (4x5)		4	0	
A-155	Brush for test tube(4X10)		4	0	
A-156	Aspirator(metal-made)+parts		2	0	
<b>B. Standards</b>					
B-1	Cu Standard solution	for 1,000 ppm element	100ml pack	4	0
B-2	Pb Standard solution	for 1,000 ppm element	100ml pack	4	0
B-3	Cd Standard solution	for 1,000 ppm element	100ml pack	4	0
B-4	Cr Standard solution	for 1,000 ppm element	100ml pack	4	0
B-5	Hg Standard solution	for 1,000 ppm element	100ml pack	4	0
B-6	As Standard solution	for 1,000 ppm element	100ml pack	4	0
B-7	CN Standard solution	for 1,000 ppm element	100ml pack	4	0
B-8	KNO <sub>3</sub> , Primary standard		10gram pac	4	0
<b>C.Reagents (Analytical Grade)</b>					
C-1	Buffer solutions	Merck , ph4	litter	8	8
C-2	Buffer solutions	Merck , ph7	litter	8	8
C-3	Buffer solutions	Merck , ph10	litter	8	8
C-4	HCl		25-liter bott	8	8
C-5	HNO <sub>3</sub>		10-liter bou	16	8
C-6	Stannous chloride		500-gram b	8	8
C-7	Salicylic acid		500-gram b	8	8
C-8	H <sub>2</sub> SO <sub>4</sub>	Nitrate Free	2.5-liter	8	8
C-9	Ammonium amino sulfate		100-gram	8	8
C-10	EDTA		5-Kg	8	8
C-11	Dotite - Trion		100-gram	32	8
C-12	NaHPO <sub>4</sub>		100-gram	32	8
C-13	KH <sub>2</sub> PO <sub>4</sub>		250-gram	32	8
C-14	Chloramine T	4-pyridine carboxylic acid	5-gram	48	8
C-15	Isonicotinic acid		10-gram	8	8
C-16	1-pheny , 1-3 meaty , 5 pyrozolone		5-gram	16	8
C-17	Dimity formale		500ml pack	8	8
C-18	Hydrogen peroxide(30%)	H <sub>2</sub> O <sub>2</sub>	500ml	10	0
C-19	Iron(III) chloride hexahydrate	FeCl <sub>3</sub> .6H <sub>2</sub> O	500g	5	0
C-20	Metacresol Purple		25g	5	0
C-21	Potassium iodide	KI	500g	5	0
C-22	Lead(II) acetate trihydrate	(CH <sub>3</sub> COO) <sub>2</sub> Pb.3H <sub>2</sub> O	500g	5	0
C-23	Zinc granular(for As)	Zn	500g	5	0
C-24	Silver N,N-diethylthiocarbamate	(C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> NCS <sub>2</sub> Ag	25g	5	0
C-25	Brucine dehydrate	C <sub>23</sub> H <sub>26</sub> N <sub>2</sub> O <sub>4</sub> .2H <sub>2</sub> O	25g	5	0
C-26	Chloroform	CHCl <sub>3</sub>	3liter	10	0
C-27	Arsenic(II) oxide	As <sub>2</sub> O <sub>3</sub>	500g	2	0
C-28	Potassium permanganate	KMnO <sub>4</sub>	500g	5	0
C-29	Sodium nitrite	NaNO <sub>2</sub>	500g	5	0
C-30	Urea	NH <sub>2</sub> CONH <sub>2</sub>	500g	5	0
C-31	Diphenylcarbazine		25g	5	0

M/D

Item No.	Item of Machinery, Equipment and Materials	Specification and/or Description	Quantity	
			1st year	2 & 3 year
C-32	Potassium bichromate	$K_2Cr_2O_7$ 500g	5	0
C-33	Potassium sodium tartrate tetrahydrate	$KCOOCCH(OH)CH(OH)COONa \cdot 4H_2O$ 500g	5	0
C-34	Hydroxylammonium chloride	$NH_2OH \cdot HCl$ 500g	5	0
C-35	Thymol Blue	25g	2	0
C-36	Ammonium chloride	$NH_4Cl$ 500g	5	0
C-37	Dithizone	$C_{13}H_{12}N_4S$ 25g	5	0
C-38	Lead granular	Pb 500g	1	0
C-39	Cadmium granular	500g	1	0
C-40	Lanthanum(III) oxide	$La_2O_3$ 500g	2	0
C-41	Acetic acid	$CH_3COOH$ 3litre	5	0
C-42	Phenolphthalein	500g	1	0
C-43	Bis-(3-Methyl-1-Phenyl-5Pyrozolne)	25g	2	0
C-44	Pyridine	$C_5H_5N$ 500ml	10	0
C-45	Silver nitrate	$AgNO_3$ 500g	5	0
C-46	Potassium cyanide	$KCN$ 500g	1	0
C-47	Sodium hydroxide	$NaOH$ 5kg	5	0
C-48	Potassium persulfate	$K_2S_2O_8$ 500g	5	0
C-49	Mercury(II) Chloride	$HgCl_2$ 500g	1	0
C-50	Sulfanilic acid	$NH_2C_6H_4SO_3H$ 500g	2	0
C-51	Potassium nitrate	$KNO_3$ 500g	2	0
C-52	Phenol	$C_6H_6O$ 500g	2	0
C-53	Acetone	$CH_3COCH_3$ 3litre	2	0
C-54	Sodium hypochlorite	$NaClO$ 500g	2	0
C-55	Magnesium oxide	$MgO$ 250g	2	0
C-56	Ammonium molybdate tetrahydrate	$(NH_4)_6Mo_7O_{24} \cdot 4H_2O$ 500g	3	0
C-57	Isoamyl alcohol	500ml	5	0
C-58	Manganese(II) sulfate pentahydrate	$MnSO_4 \cdot 5H_2O$ 500g	2	0
C-59	Sodium thiosulfate pentahydrate	$Na_2S_2O_3 \cdot 5H_2O$ 500g	2	0
C-60	Potassium iodate	$KIO_3$ 500g	2	0
C-61	Starch, soluble	500g	2	0
C-62	Sodium azide	$NaN_3$ 500g	2	0
C-63	Ammonium chloride	$NH_4Cl$ 500g	2	0
C-64	Sodium sulfite	$Na_2SO_3$ 500g	2	0
C-65	Potassium trihydrogen dioxalate dihydrate	$KH_3(C_2O_4)_2 \cdot 2H_2O$ 100g	2	0
C-66	Potassium hydrogen phthalate	$HOOC_6H_4COOK$ 500g	2	0
C-67	Disodium hydrogen phosphate	$Na_2HPO_4$ 500g	2	0
C-68	Sodium tetraborate decahydrate	$Na_2B_4O_7 \cdot 10H_2O$ 500g	2	0
C-69	Sodium hydrogen carbonate	$NaHCO_3$ 500g	2	0
C-70	Sodium carbonate	$Na_2CO_3$ 500g	2	0
C-71	Methyl orange	25g	2	0
C-72	Barium chloride dihydrate	$BaCl_2 \cdot 2H_2O$ 500g	5	0
C-73	Iodine	I 500g	2	0
C-74	L(+) Ascorbic acid	Vitamin C 500g	2	0
C-75	4-Nitrophenol	25g	2	0
C-76	Calcium carbonate	$CaCO_3$ 500g	2	0
C-77	Diammonium hydrogen citrate	$HOC(COOH)(CH_2COONH_4)_2$ 500g	2	0




M/D

Item No.	Item of Machinery , Equipment and Materials	Specification and/or Description	Quantity	
			1st year	2 & 3 year
C-78	Sodium N,N-diethyldithiocarbamate trihydrate	(C <sub>2</sub> H <sub>5</sub> ) <sub>2</sub> NCS <sub>2</sub> Na·3H <sub>2</sub> O 500g	5	0
C-79	Buetyl acetate	500ml	10	0
C-80	Potassium perchlorate	KClO <sub>4</sub> 500g	2	0
C-81	Ammonium iron (III) sulfate 12-water	FeNH <sub>4</sub> (SO <sub>4</sub> ) <sub>2</sub> ·12H <sub>2</sub> O 500g	2	0
C-82	Bromothymol Blue(BTB)	25g	2	0
C-83	3,3-Diaminobenzidine	5g	2	0
C-84	Tellurium powder	25g	1	0
C-85	Methyl isobutyl ketone	500ml	10	0
C-86	Perchloric acid(60%)	HClO <sub>4</sub> (60%) 500g	10	0
C-87	Hydrofluoric acid(55%)	HF(55%) 500g	10	0
C-88	Copper metal	20g	2	0
<b>D. Field Supplies</b>				
D-1	Microfiltration membrane	Cellulose nitrate , 0.45 um pore size	15	10
D-2	Narrow-mouth bottles	Polyethylene (HDPE) 500ml. or Teflon	100	100
D-3	Narrow-mouth bottles	Polyethylene (HDPE) 1000ml. or Teflon(for H <sub>2</sub> O samples)	200	200
D-4	Washing bottle	Polyethylene with narrow-mouth 250	10	10
D-5	Washing bottle	Polyethylene with narrow-mouth 500	10	10
D-6	Setting tubes		10	10
D-7	Coleman cooler		5	4
D-8	Niskin bottle or Van Dorn Kemmer sampler	for seawater, lake , river sampling at depth	10	10
D-9	Secchi disk	for transparency determinations	10	10
<b>E. Laboratory Equipment</b>				
E-01	Atomic absorption spectrometer	Varian Techtron	3	0
E-02	Vapour hydride generator	assembly for ASS, Varian Techtron	1	0
E-03	Graphite furnace assembly	for ASS, Varian Techtron	1	0
E-04	Hollow cathode lamps	for Varian Techtron ASS(set of 5 lamps for Cu, Pb, Cd, As, Cr)	10	0
E-05	Ion selective electrode (SE) meter	for cyanide (with ph meter), TOA	3	0
E-06	Ion selective electrode	for cyanide, TOA Brand , CN-125B	3	0
E-07	Cyanide distillation apparatus	(Cole-Palmer catalogue)	3	0
E-08	ph meter	Corning , benchtop	3	0
E-09	Temperature tester	with probe	2	0
E-10	Fume hood	perchloric acid resistant	2	0
E-11	Magnetic stirrer	YAMAMOTO Mag-Mixer, type MH-61, max 300oC ,220V	2	0
E-12	Hot plate	cast aluminium 300C , 24"*12", 220V Catalogue No.E-03462, Cole Palmer	4	0
E-13	Digital video microscope	high-resolution, Keyence/VH-6300 with 900,000	0	1
E-14	Compact mill	for sample preparation, SPEX Shatterbox Model 8500-230/50	1	0
E-15	Grinding container	Tungsten carbide, SPEX	1	0
E-16	Grinding container	Alumina ceramic laboratory hand mill with grinding plate, SPEX	1	0

M/D



Item No.	Item of Machinery, Equipment and Materials	Specification and/or Description	Quantity	
			1st year	2 & 3 year
E-17	Set of sieves	for sample preparation, 8" dia., stainless steel rim (3" to 400mesh)	4	0
E-18	Microwave oven	for sample preparation and drying	4	0
E-19	Electronic analytical balance	Mettler	3	0
E-20	Refrigerator	for sample storage, 16 cu.ft.	2	0
E-21	Furnace	1300oC max temp	2	0
E-22	Ion chromatograph	DIONEX DX-500, with complete accessories	2	0
E-23	Hexavalent chromium meter	complete set	4	0
E-24	Turbidity meter	lab use	4	0
E-25	Water distillation System	Barnstead 5gal/hr, electrically heated with automatic water cut-off and replacement jading units	2	0
E-26	Mercury analyser	Hiranuma, with recorder and printer	4	0
E-27	Spectrophotometer UV-VIS	Shimazu /Hach	2	0
E-28	Platinum crucibles with cover	30ml capacity	6	0
E-29	Platinum dish	100ml capacity	6	0
E-30	Hazardous chemical dispenser	for dispensing HF acid safely, with dispenser bottle adaptors, Co:e Palmer HO7827-00	4	0
E-31	X-ray fluorescence spectrometer(XRF)	Rigaku, RIX3100	1	0
E-32	Air drying oven	digital temp. control, operating temp. 30 to 105oC with built-in 24 hour timer for heater, six shelves	2	0
E-33	Hot plate	gas heated, 18" X 24"	2	0
E-34	Ultrasonic cleaner	Complete with generator tank and accessories	2	0
E-35	Centrifuge	15mlx8	1	0
E-36	Centrifuge	50mlx4	1	0
E-37	Shaker for separating funnel		2	0
E-38	Mixer for test tube		2	0
E-39	Aspirator and pump		2	0
E-40	Mantle heater, for 1000ml flask		4	0
E-41	Dispenser	1000ml	4	0
E-42	Dispenser	2500ml	4	0
E-43	Bomb vessel	10ml	10	0
E-44	Bomb vessel	25ml	10	0
E-45	Tools for lab		2	0
E-46	graphite tube	for AAS furnace	100	0
E-47	high temperature burner		6	0
E-48	Deionized water assembly	SV-100type, 4litre	2	0
E-49	Chart recoder		1	0
<b>F Field Equipment</b>				
F-01	Water quality checker	HORIBA U-10, for pH, dissolved oxygen, electrolytic conductivity, turbidity & salinity	10	0
F-02	PSF Filter Holder with receiver	Nalgene	10	0
F-03	Hand-operated vacuum-pressure pump, with repair kit	with repair kit, Nalgene	10	0

M/D

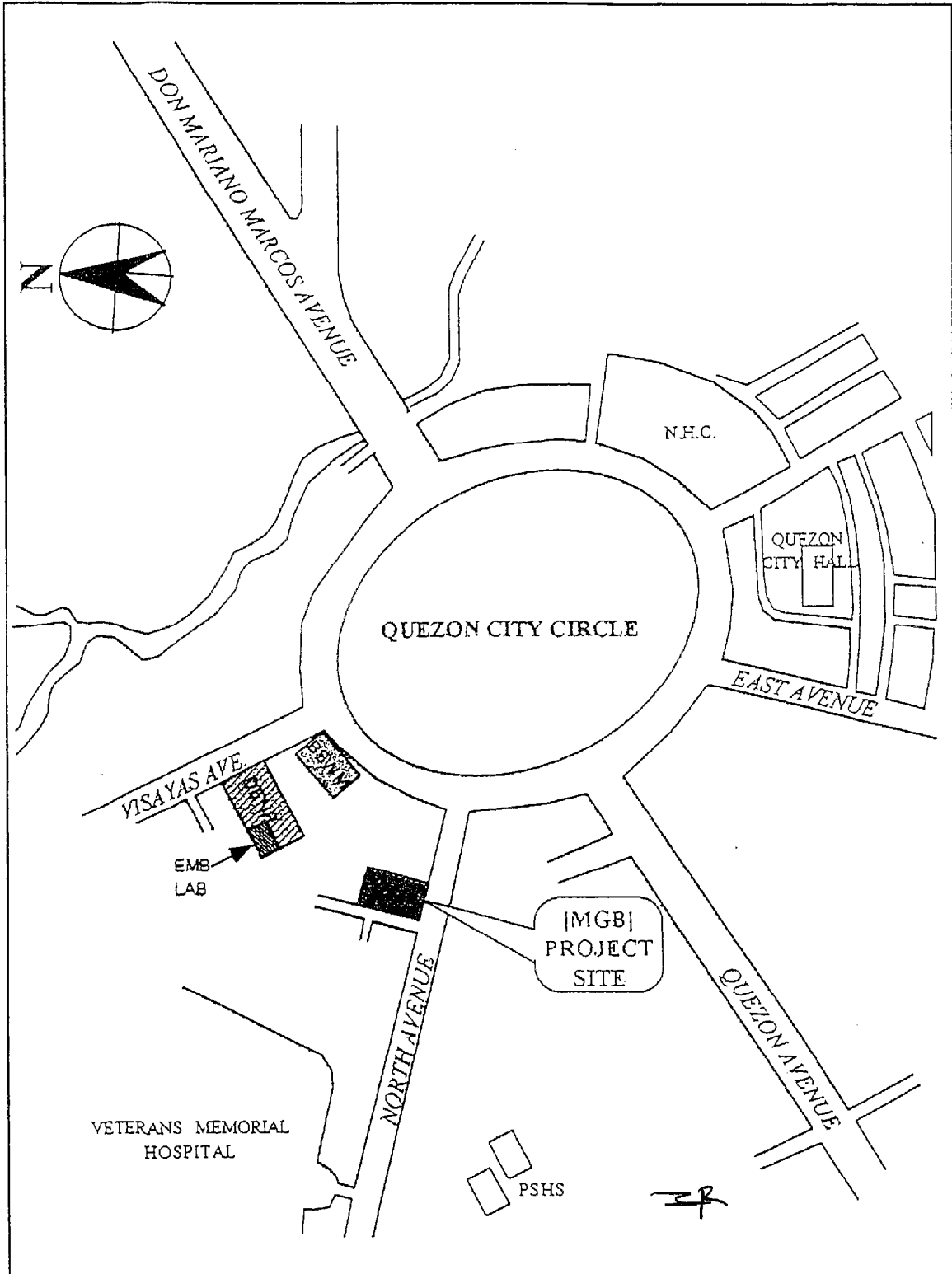
Item No.	Item of Machinery , Equipment and Materials	Specification and/or Description	Quantity	
			1st year	2 & 3 year
F-04	Spectrophotometer monitor with portable printer	with operational kits, for water quality testing, w/ parameters such as alkalinity, acidity, CN, Cr, As, Hg, Pb, Cd, Cu,SS, TDS, etc., HACH DR/2010	5	0
F-05	Stream flow velocity meter		8	0
F-06	Colorimeter	HACH DR/800 Model MEL/850 for water portability testing, and water quality parameters including microbiological (e.g. bacteria)	3	0
F-07	Grab sampler	with replacement bottle	8	0
F-08	Sludge sampler	with replacement bottle and retainer	8	0
F-09	UV lamp	with rechargeable battery pack and charger	6	0
F-10	Florescent dye tracer	for water flow	6	0
F-11	Cap lamp	w/ charger	5	0
F-12	Hand-held global positioning system (GPS)	for determining exact location of sampling points and other field locations, MAGELLAN	4	0
F-13	Digital Camera	for field documentation	4	0
F-14	Field vehicle	4-wheel drive , for field surveys, & in sample collection & on-site measurements during field monitoring	3	0
F-15	Multi-gas tester		4	0
F-16	Dust sampler		2	0
F-17	Video camera		2	0
F-18	Two-way hand-held radio		4	0
F-19	Permeameters		1	0
F-20	Standard penetrometer		1	0
F-21	Piezometers	Pneumatic w/ electronic read-out	3	0
F-22	Schmidt hammer		1	0
F-23	Core gauge		0	1
F-24	Triaxial cell	HOCK, complete w/ pressure system	0	1
F-25	Direct shear box(rock)	complete w/ pressure system	0	1
F-26	Direct shear box(soil)	w/ pressure system	0	1
F-27	Diamond saw rock cutter	wet cutting, circular blade, electric driven, 220 V, 60Hz	0	1
F-28	Mercury measuring instrument	Japan Instrument,PM2	1	0
F-29	Mercury measuring instrument	Japan Instrument,EMP-1	2	0
F-30	ph test paper		100	60
F-31	Pack test(As,Fe,Zn,Cr,Cu,CN)		120	200
F-32	Sample bag	15X30cm	1000	0
F-33	Sample bag	20X40cm	500	0
F-34	Sample bag	30X45cm	500	0
F-35	Paper Sample bag	10X20cm	1000	0
F-36	Air photo miller		3	0
F-37	Air photo miller handy type		10	0
F-38	Bottle for soil sample	500cc	200	0
F-39	Bottle for soil sample	200cc	200	0
F-40	Bottle for soil sample	120cc	200	0

Item No.	Item of Machinery , Equipment and Materials	Specification and/or Description	Quantity	
			1st year	2 & 3 year
F-41	Bottle for soil sample	70cc	200	0
F-42	Compass pocket type		3	0
F-43	Hand auger handy type	2 meters	5	0
<b>G.Office equipment</b>				
G-01	Computer,PC	Desktop, Intel Pentium MMX, 300 MHz, 32MB SDRAM, 8GB HDD, with internal fax modem and full multimedia capability, with standard software's	6	0
G-02	Computer, laptop	laptop, Intel Pentium MMX, 300 MHz, 32MB SDRAM, 8GB HDD, with internal fax modem and full multimedia capability, with standard software's	4	0
G-03	Colour printer	HP Professional Series	2	0
G-04	Laser printer	HP	2	0
G-05	Scanner	Set of the flat-bed type & the big type, HP	1	0
G-06	Fax machine		2	0
G-07	Xerox (photocopying) machine		1	0
G-08	Air conditioner	Window type, 2 hp	7	0
G-09	Microphone set	for chairman in conference system, SESAKU, model TS-701	0	2
G-10	Microphone set	for delegates in conference system, SESAKU, model TS-701	0	20
G-11	Automatic paper cutting machine	HORIZON, Model PC-64II or better	0	1
G-12	Motorised screen	BRETFORD, size 7 ft X 7 ft or larger	0	1
G-13	Multi-media projector	EIKE or equivalent	1	0
G-14	Over head projector	Portable type	1	0
<b>H.Laboratory and office Equipment for Upgrading /Repair</b>				
H-01	Automatic document feeder	(ADF) for GESTETNER Digital Copy Printer Model 5329L	0	1
H-02	Colour drum for GESTETNER digital copy printer	Model 5329L(blue, green, red, yellow, orange, brown, purple)	0	3
H-03	Computer interface controller and accessories	for GESTETNER Digital Copy Printer Model 5329L	0	1

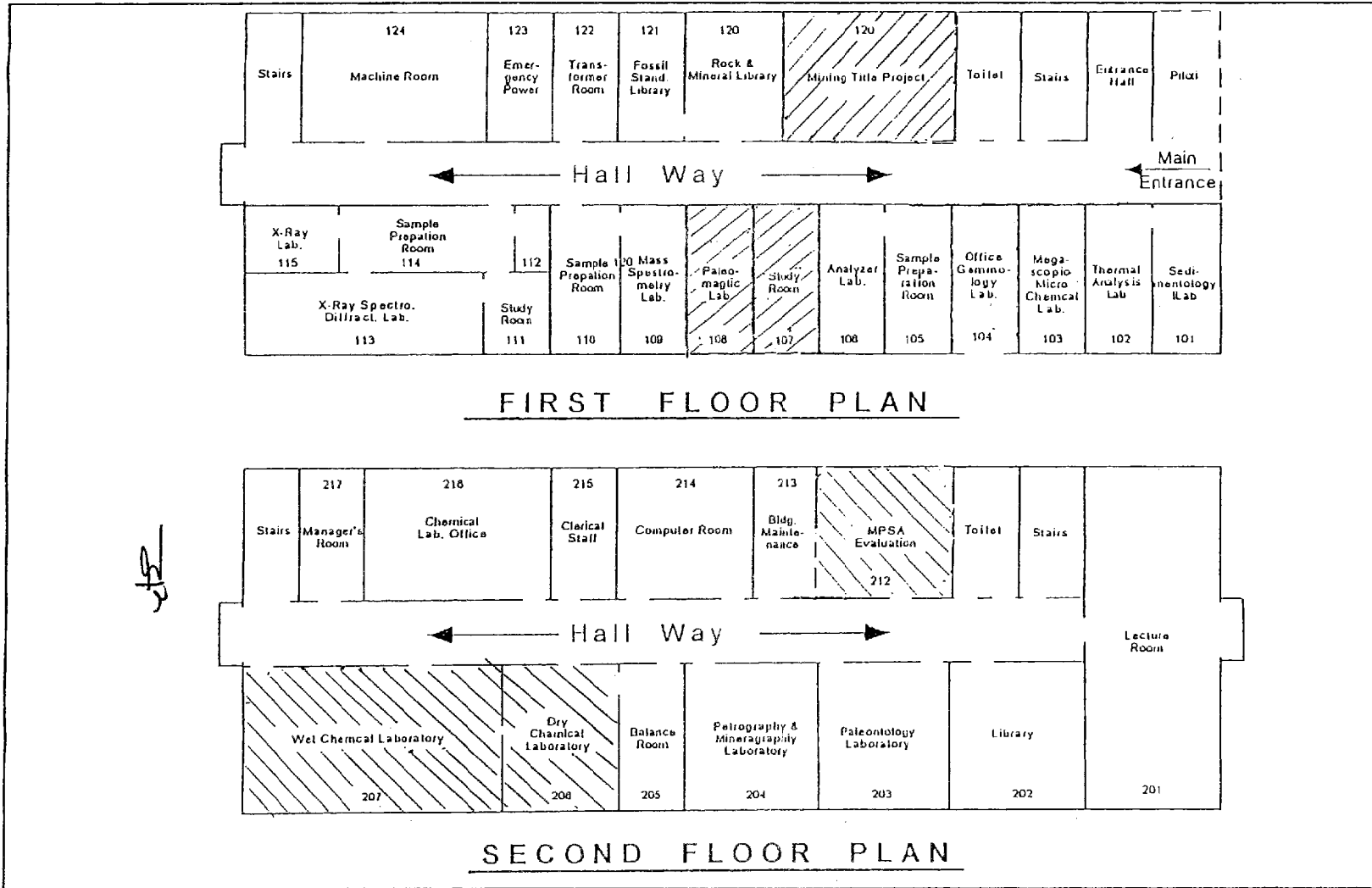
Handwritten signatures and initials are present below the table, including a large signature on the left and initials 'JR' and 'th' on the right.

M/D

ANNEX 7  
Location Map of the Project Site



ANNEX 8  
Layout Plan of the Facilities for the Project


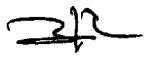
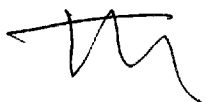


--09--

Handwritten initials and scribbles.

ANNEX 9  
Allocation Plan of Supporting Staff


Staff Allocation	Number of Counterparts	Number of Supporting Staff
Project Director	1	-
Project Manager	1	-
Project Coordinator	1	-
Counterparts in Charge of Environmental Chemical Analysis	4	3
Counterparts in Charge of Mine Environmental Monitoring	4	0
Counterparts in Charge of Mine Environmental Managemet	4	0
Counterparts in Charge of Training	4	0
Other Supporting Staff	5	-

M/D

ANNEX 10

Allocation Plan of Counterparts

Functional Category	Assigned Personnel
<p>[Administrative Counterpart]</p> <ol style="list-style-type: none"> <li>1. Project Director</li> <li>2. Project Manager</li> <li>3. Project Coordinator</li> </ol>	<p>Horacio C. Ramos, Director, MGB                      Edwin G. Domingo, Assistant Director, MGB                      Geromimo Badulis, Jr., Supervising Science Research Specialist</p>
<p>[Technical Counterpart]</p> <ol style="list-style-type: none"> <li>1. Counterparts in Charge of Environmental Chemical Analysis</li> <li>2. Counterparts in Charge of Mine Environmental Monitoring</li> <li>3. Counterparts in Charge of Mine Environmental Management Technology</li> <li>4. Counterparts in Charge of Training</li> </ol>	<p>[The following technical counterpart personnel will be assigned at the preliminary stage of the Project, and the necessary number of the additional technical staff will be allocated from the Central Offices of MGB in accordance with the progress of the Project.]</p> <ol style="list-style-type: none"> <li>1) Edita M. Macalalad, Chemist, PETROLAB</li> <li>2) Teresita Balmes Chemist, PETROLAB</li> <li>3) Sylvia Alcantara, Chemist, Mining Environment and Safety Division</li> <li>4) Josefina Quiambao, Chemist, MGB-CAR</li> </ol> <ol style="list-style-type: none"> <li>1) Virgilio P. Soriano, Engineer III, Metallurgical Technology Division</li> <li>2) Paulo Tidalgo, Senior Science Research Specialist, Mining Environment and Safety Division</li> <li>3) Alvin Fernando, Senior Science Research Specialist, Lands Geological Survey Division</li> <li>4) Lolit Broces, Supervising Science Specialist, Senior Environmental Lands Geological Survey Division</li> </ol> <ol style="list-style-type: none"> <li>1) Edmon Dino, Senior Science Research Specialist, Mining Environment and Safety Division</li> <li>2) Rey Perucho, Engineer III, Metallurgical Technology Division</li> <li>3) Cyril Vizcayno, Senior Science Research Specialist, Mining Environment and Safety Division</li> <li>4) Juliet M. Miguel, Supervising Science Research Specialist, Mining Environment and Safety Division</li> </ol> <ol style="list-style-type: none"> <li>1) Lilian Rollan, Supervising Science Research Specialist, PETROLAB</li> <li>2) Ellen Grace Galiste, Engineer IV, Mineral Economics and Information Division</li> <li>3) Digna Evangelista, Senior Science Research Specialist, PETROLAB</li> <li>4) Alice Umerez, Human Resources Management Officer, Administrative Services Division</li> </ol> <p style="text-align: center;"></p>

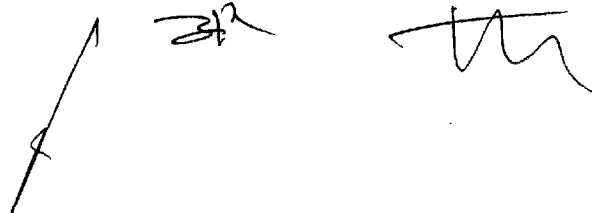
 

M/D

ANNEX 11  
Local Cost for the Project

(in US Dollars)

No.	Item	1999	2000	2001	2002
1.	Salaries and Wages of C/P	95,000	95,000	95,000	95,000
2.	Travel Expenses	2,500	2,600	2,725	2,850
3.	Maintenance Cost (Preparation of Laboratory and Office Supplies and Maintenance of Laboratory Facility)	9,250	10,150	10,625	11,075
4.	Supplies and Materials	13,300	18,775	19,725	20,500
	Grand Total	120,050	126,525	128,075	129,425



M/D



ANNEX12  
FIVE (5) BASIC EVALUATION COMPONENTS

1. Five (5) Basic Evaluation Components

The five basic evaluation components defined by JICA as mentioned below are in line with those used for the evaluation works by DAC and other international assistance organization.

Introduction of these components has enabled a consistent well-balanced evaluation, and lessons with other aid organizations, since we are using common components and can discuss with them from the same viewpoints.

(1) Efficiency

Evaluate the method, procedure, term and cost of the project with a view to productivity.

(2) Effectiveness

Evaluate the results in comparison with the goals (or revised one) defined at the initial or intermediate stage, and evaluate the attributes (factors and conditions) of the results.

(3) Impact

Evaluate the positive and negative effects of the project, extent of the effect and beneficiaries.

(4) Relevance

Evaluate whether the needs in the country have been correctly identified, the national and/or master plan.

(5) Sustainability


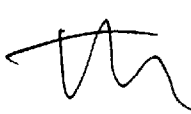
Evaluate the autonomy and sustainability of the project after the terminate of cooperation, from the perspective of operation, management, economy, finance and technology.

2. Relation between Five Basic Components and PDM

The following five components are used for the evaluation and a selection of a project.

- (1) Efficiency
- (2) Effectiveness
- (3) Impact
- (4) Relevance
- (5) Sustainability

The component "efficiency" is a measure to qualitatively and quantitatively compare all resource (input) to the results (output) of the project in order to evaluate the economic efficiency or conversion from input to output.

  
  
M/D

The parameter "effectiveness" is a measure to evaluate whether the purpose has been achieved or not, or to evaluate how much the outputs contributed to the achievement of the purpose, or to evaluate whether or not the characteristics of the outputs were as expected.

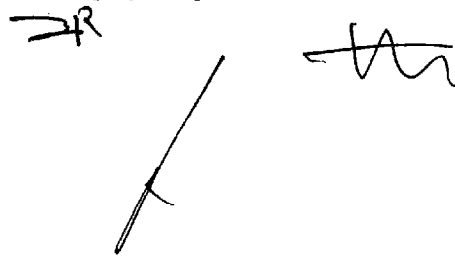
The parameter "Impact" is a foreseeable or unforeseeable, and a favorable or adverse effect of the project upon society. To evaluate it, both the goal and project purpose should be referred to in the beginning of the evaluation. Evaluation with this component could lead to more than the confirmation as whether or not the goal has been obtained. Evaluation with this component requires comprehensive surveys in many cases.

The parameter "Relevance" is to comprehensively evaluate whether or not the project meets the overall goals, politics of both the donor and recipient, local needs and given priority levels, in order to decide whether the project should be continued, reformulated or terminated.

The component "Sustainability" is to comprehensively evaluate how long the favorable effect as a result of the project can continue after the project has been terminated. Evaluation with this component is required to decide how much the local resources should continue to be used for the project, and to evaluate how much the country receiving the assistance has been considering important. According to OECF (1989), "Sustainability" is the component to be used for the final test of the success of a development project.

All five components are essential for any of the projects or programs. The five components give necessary information to the decision maker so that he/she can decide how to approach the next step. Since each of the five components build on the intervention strategy, they also lay the foundation for standardization in monitoring and information handling within and among organizations and agencies.

In practice, each of the five parameters should also contain project-specific information.

Handwritten initials 'JR' and 'M/D' with a diagonal line between them.

M/D

## ANNEX 13(1/2) Plan of Operations (PO)

Calendar Year	1999				2000				2001				2002			
Quarter	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Duration of the Project																
0.	The management system of the Project will be established.															
0-1	Allocate the staff based on the plan.															
0-2	Formulate the operational plan.															
0-3	Formulate the budgetary plan.															
1. The operation and maintenance management of the machinery and equipment used for chemical analysis, measurements and experiments will be undertaken by the technical staff of MGB.																
1-1	Formulate the preparation plan and implement the procurement and maintenance of machinery, equipment and facilities.															
1-2	Implement the installation, and guide in the operation and maintenance of the machinery and equipment provided by JICA.															
1-3	Prepare the manuals on maintenance of the machinery and equipment.															
2. The MGB's functions of mine environmental monitoring in the fields of water and soil pollution will be upgraded and strengthened.																
2-1	Acquire the technical and administrative outline of mine monitoring in the field of water and soil pollution.															
2-2	Acquire the techniques and prepare the manuals of water and soil sampling for environmental analysis.															
2-3	Acquire the technology and prepare the manuals of on-site measurements and analysis for water and soil qualities.															
2-4	Acquire the technology and prepare the manuals of laboratory measurements and analysis for water and soil qualities.															
2-5	Acquire the techniques and prepare the manuals on the environmental evaluation of the results of measurements and analysis for water and soil qualities.															



## ANNEX 13(2/2) Plan of Operations (PO)

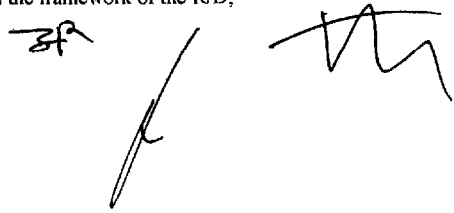
Calendar Year	1999				2000				2001				2002				
Quarter	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
Duration of the Project																	
3. The MGB's functions of evaluation and guidance on the environmental management technologies in the fields of water and soil pollution will be strengthened.																	
3-1 Acquire the technical information on the environmental management technologies.			_____														
3-2 Acquire the technical information on the environmental treatment technology of waste water and tailing.				_____													
4. The MGB's functions of evaluation on the environmental impact assessment reports for mining project will be strengthened.																	
4-1 Acquire the technical information on the process of environmental impact assessment for mining projects.				_____													
4-2 Acquire the technical information on the evaluation of the environmental impact assessment reports for mining projects.					_____												
5. The MGB's functions of staff training in the fields of mine environmental management will be strengthening.																	
5-1 Formulate the training programs.			_____														
5-2 Prepare the training materials.					_____												
5-3 Implement the training.									_____								
5-4 Implement the questionnaire survey to the trainees.										_____							

[Notes] This plan is subject to amendment based on the mutual agreement, according to the situation on the progress of the Project.

## ANNEX 14 Tentative Schedule of Implementation(TSI)

Calendar Year	1998		1999				2000				2001				2002			
Quarter	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Duration of the Project																		
I. Undertakings of the Japanese Side																		
1.1 Dispatch of Study Teams																		
(1) Project Formulation Advisors for Industrial Pollution Protection		-	-															
(2) Implementation Study Team				-														
(3) Management Consultation Team										-								
(4) Evaluation Study Team														-				
1.2 Dispatch of Japanese Experts																		
(1) Long-term Experts																		
a. Chief Advisor																		
b. Coordinator																		
c. Expert in Charge of Mine Environmental Monitoring																		
d. Expert in Charge of Environmental Chemical Analysis																		
e. Expert in Charge of Mine Environmental Management																		
(2) Short-term Experts																		
a. Environmental Monitoring																		
b. Environmental Chemical Analysis																		
c. Mine Environmental Management																		
d. Environmental Impact Assessment																		
1.3 Acceptance of Counterpart Personnel for Training in Japan																		
1.4 Provision of Machinery and Equipment																		
II Undertakings of the Philippine side																		
2.1 Establishment of the Unit necessary for Management and Operation of the Project																		
2.2 Preparation of Building and Facilities																		
2.3 Assignment of Counterpart Personnel and Administrative & Supporting Staff																		
2.4 Expense of Operational Costs																		
2.5 Procurement of Machinery, Equipment and Materials																		

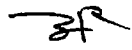
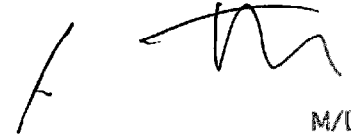
[Notes] This schedule is subject to amendment based on the mutual agreement and the framework of the R/D, according to the progress of the Project.



M/D

ANNEX 15(1/4)  
Annual Plan of Operations (APO)  
for the Japanese Fiscal Year 1999

Activities	Target	Japanese Fiscal Year 1999												Re-sponsible Person**	Input*	
		1999														
		4	5	6	7	8	9	10	11	12	1	2	3			
<b>Output 0 : Establishment of the Project management system.</b>																
0-1 Allocation of staff based on the plan.	Full allocation of C/P.														PD,PM, PC & CA.	C/P, JPC & LE.
0-1-1 Review of staff allocation plan.																
0-1-2 Assignment of staff.																
0-2 Formulation of operational plans.	Full implementation based on the plan.													PD,PM, PC & CA.	C/P, JPC & LE.	
0-2-1 Review of PDM, TSI, PO, APO, etc.																
0-2-2 Formulation of APO-2000.																
0-2-3 Formulation of monitoring and Evaluation Plan																
0-3 Formulate the budgetary Plan.	Smooth implementation of the Project.													PD,PM, PC & CA.	C/P, JPC & LE.	
0-3-1 Disburse of budget 1999.																
0-3-2 Planning of budget 2000.																
<b>Output 1 : Operation and maintenance management of the Equipment by the technical staff of MGB.</b>																
1-1 Formulate the preparation plan and implement procurement maintenance of the equipment and facilities.	Preparation of Environmental chemical laboratory, Offices for C/P & experts, Training rooms, etc.													PD,PM, PC & CA.	C/P, JPC & LE.	
1-1-1 Planning of building and facilities renovation.																
1-1-2 Implementation of renovation works.																
1-1-3 Planning of procurement & maintenance of the equipment																
1-1-4 Implementation of procurement and maintenance of the equipment.																
1-2 Installation, operation guidance and maintenance of the equipment provided by JICA.	Preparation of Environmental chemical laboratory												PD,PM, PC & CA.	C/P, JPC, LE, SE & ME.		
1-2-1 Installation and adjustment of the equipment.																
1-2-2 Learning of the operation of the equipment.																
1-2-3 Learning of the maintenance of the equipment.																
1-3 Preparation of manuals on maintenance of the equipment	Full maintenance of the Equipment.												PM,PC, & CA.	C/P, JPC, LE & SE.		
1-3-1 Preparation of manuals on maintenance of the equipment																

  
  
M/D



May 30, 1999

## ANNEX 15 (3/4) Annual Plan of Operations (APO)

Activities	Target	Japanese Fiscal Year 1999												Re-spon- sible Person**	Input*	
		1999														
		1999						2000								
		4	5	6	7	8	9	10	11	12	1	2	3			
<b>Output 3 : Strengthening of the MGB's functions of evaluation for the environmental management technologies in the fields of water and soil pollution.</b>																
3-1	Acquisition of technical information on guidance of the mine environmental management	Acquisition of basic information.													PM,PC, & CA.	C/P, JPC & LE.
3-2	Acquisition of technical information on evaluation of the mine environmental management	Acquisition of basic information.													PM,PC, & CA.	C/P, JPC & LE.
<b>Output 4: Strengthening of the MGB's functions of evaluation on the environmental impact assessment reports.</b>																
4-1	Acquisition of technical information on the process of environmental impact assessment in mining projects.	Acquisition of basic information.													PM,PC, & CA.	C/P, JPC, LE & SE.
4-2	Acquisition of technical information on evaluation of the environmental impact assessment reports for mining projects.	Acquisition of basic information.													PM,PC, & CA.	C/P, JPC, LE & SE.

Handwritten signatures and initials are present below the table, including a signature that appears to be 'JR' and another that looks like 'M'.

M/D



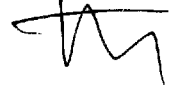
## ANNEX 15(4/4) Annual Plan of Operations (APO)

Activities	Target	Japanese Fiscal Year 1999												Re-spon- sible Person**	Input*		
		1999															
								2000									
		4	5	6	7	8	9	10	11	12	1	2	3				
<b>Output 5 : Strengthening of the MGB's functions of staff training in the fields of mine environmental management</b>																	
5-1	Formulation of training program.	Effective training.														PM,PC, & CA.	C/P, JPC,LE
5-2	Preparation of training materials.	Smooth training.	[From: July 2000]													PM,PC, & CA.	C/P,LE JPC,SE
5-3	Implementation of training.	Human resources development in the field of mine environmental management	[From: January 2001]													PM,PC, & CA.	C/P, JPC, LE & SE.
5-3-1	Training on on-site measurements and analysis.																
5-3-2	Training on measurement & analysis at the laboratory																
5-3-3	Training on evaluation of environmental monitoring.																
5-3-4	Training on evaluation & guidance of mining and milling practice.																
5-3-5	Training on evaluation & guidance of wastes treatment practice.																
5-3-6	Seminar on mine environmental management.																
5-4	Implementation of the questionnaire survey to the trainees.	Evaluation of training plan.	[From: January 2001]												PM,PC, & CA.	C/P, JPC & LE.	

[Notes] \* Input : Person, equipment and other input necessary for implementing the activities.

\*\* PD: Project Director, PM: Project Manager, PC: Project Coordinator, C/P: Counterpart personnel,  
CA: Chief Advisor, JPC: Japanese Project Coordinator, LE: Long-term Experts, SE: Short-term Experts,  
ME: Machinery and Equipment provided by the Japanese Side.

BR

ANNEX 16  
LIST OF ATTENDANCE

The Japanese side

- |   |  |
|---|--|
| 1) Norinobu Hayashi<br>(Leader)                       | Managing Director<br>Mining & Industrial Cooperation<br>Development Dept. JICA                               |
| 2) Takeshi Usami<br>(Technical Cooperation Planning)  | Councilor<br>Technology Dept. Overseas Mineral<br>Development Resources                                      |
| 3) Yoshikazu Kojima<br>(Equipment Provision Planning) | Councilor<br>Technology Dept. Overseas Mineral<br>Development Resources                                      |
| 4) Atsushi Aoki<br>(Technology Transfer Planning)     | Deputy Director<br>Mine Safety Div. , Environmental<br>Protection & Industrial Location Bureau ,<br>MITI     |
| 5) Takeo Watabe<br>(Training Planning)                | Councilor<br>Technology Dept. Overseas Mineral<br>Development Resources                                      |
| 6) Yasuo Kondo<br>(Project Cooperation Planning)      | Specialist<br>2nd Technical Cooperation Div. , Mining<br>& Industrial Development Cooperation<br>Dept., JICA |
| 7) Hideo Ono  | Resident Representative<br>JICA Philippine Office  |
| 8) Noriko Bamba                                       | Assistant Resident Representative<br>JICA Philippine Office  |

The Philippines side

- |                         |   |
|-------------------------|---|
| 1) Antonio H. Cerilles  | Secretary<br>Department of Environment and Natural<br>Resources   |
| 2) Mario S. Rono        | Undersecretary for International<br>Commitment and Local Government<br>Department of Environment and Natural<br>Resources |
| 3) Pedro C. Caleon      | Assistant Secretary for Mines and<br>EAGA Affairs<br>Department of Environment and Natural<br>Resources                   |
| 4) Horacio C. Ramos     | Director<br>Mines and Geosciences Bureau  |
| 5) Edwin G. Domingo     | Assistant Director<br>Mines and Geosciences Bureau  |
| 6) Taizo Yamada         | JICA Expert<br>Department of Environment Natural<br>Resources   |
| 7) R.L. Almeda          | Chief<br>Lands Geology Div.<br>Mines and Geosciences Bureau   |
| 8) Geronima Badulis Jr. | Supervisor science Research Specialist<br>Mine Environment and Safety Div.<br>Mines and Geosciences Bureau                |





9) Lilian A. Rollan

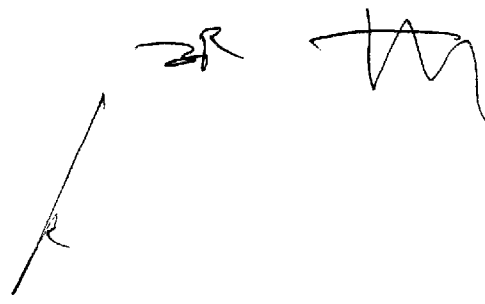
Manager  
PETROLAB  
Mines and Geosciences Bureau

ANNEX 16 2/2

Observer

1) Yoshimasa Sakai

Second Secretary  
Embassy of Japan

Handwritten signatures and an arrow. On the left, a diagonal line with an arrowhead pointing up and to the right, with a small 'r' written below it. To the right of this are two distinct handwritten signatures: one that looks like 'SR' and another that is a more complex scribble.

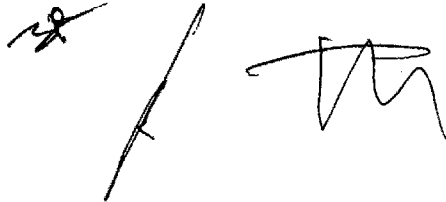
M/D

ANNEX 17

Article for the Project

"The cost which the Government of Japan will bear thorough JICA for the Technical cooperation for the Project is tentatively estimated at approximately four hundred ten million Japanese yen, or one hundred twenty seven million Philippine peso."

" The above mentioned estimate merely represents preliminary and provisional planning figure based on the average cost for such projects through JICA and should NOT be interpreted as an actual and binding financial commitment by the Government of Japan; the actual amount of funds to be disbursed through JICA is subject, among other factors, to the progress of the Project which will be carried out under the due owner ship on the part of the Government of the Republic of the Philippines, and to annual approval of the relevant budget by the Japanese Diet."

Handwritten signatures and initials in black ink, including a small mark resembling a pair of scissors, a long diagonal stroke, and a stylized signature.

M/D