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ACRONYMS & ABBREVIATIONS USED

ASEAN	Association of Southeast Asian Nations
CAR	Cordillera Administrative Region
CBPEMM	Capacity Building Project for Environmental Management
CLRF	Contingency Liability and Rehabilitation Fund
CO	Central Office
DAC-OECD	Development Assistance Committee-Overseas Economic Cooperation and Development
DENR	Department of Environment and Natural Resources
EO	Executive Order
EPEP	Environmental Protection and Enhancement Program
GOJ	Government of Japan
GOP	Government of the Philippines
ICTP	In-Country Training Program
IRR	Implementing Rules and Regulations
JFY	Japanese Fiscal Year
LGU	Local Government Unit
MGB	Mines and Geosciences Bureau
MMT	Multi-partite Monitoring Team
MRFC	Mine Rehabilitation Fund Committee
MTF	Monitoring Trust Fund
MWTRF	Mine Waste and Tailings Fees Reserve Fund
MOOE	Maintenance and Other Operating Expenses
NEDA	National Economic Development Authority
NGO	Non-Government Organization
PDMe	Project Design Matrix for Evaluation
PS	Personal Services
PTTC	Project Type Technical Cooperation
R/D	Records of Discussions
SIDA	Swedish International Development Agency
UNDP	United Nations Development Programme

Ex-Post Evaluation Summary Sheet

1. Outline of the project	
Country: Philippines	Project Title: Capacity Building Project for Environmental Management in Mining
Issue/sector: Mining/environment	Cooperation scheme: Project Type Technical Cooperation (PTTC)
Division in charge: Second Technical Cooperation Division, Mining and Industrial Development Study Department	Total cost: 504 million Yen
Period of cooperation: 1 July 1999- 30 June 2002 (R/D)	Partner Country's Implementing Organization: Mines and Geo-Sciences Bureau, Department of Environment and Natural Resources (MGB-DENR)
	Supporting organization in Japan:
Related cooperation: Construction and Equipping of the Petrological, Mineralogical and Geochronological Services Laboratory (PETROLAB) of the MGB, General Grant Aid, 1982	
<p>1-1. Background of the project:</p> <p>In an attempt to address the frequent occurrence of mining accidents, the Government of the Philippines, in the 1990s, gave utmost priority to environmental management including the adoption of measures to address problems related to environmental pollution. Such measures included the passing into law of the Philippine Mining Act in 1995 (Republic Act No. 7942), which, among others, effectively transformed the MGB into a line bureau of the DENR, and the signing of a Memorandum of Agreement (MOA) between the MGB and the EMB (Environmental Management Bureau) in 1998 that provided MGB higher levels of authority in terms of mine environmental regulation and monitoring. Mine environmental management was then highlighted in the Medium-Term Philippine Development Plan (MTPD) 1992-1998 and even in the "Philippines 2000 plan" that envisioned Philippines as one of the newly industrializing countries (NIC) in Asia in the 21st century.</p> <p>However, the knowledge and techniques available at the government through the MGB in preventing environmental pollution particularly in the fields of environmental assessment and monitoring of pollution in mining industries were insufficient. Recognizing this limitation and the urgency of acquiring such capacity, JICA dispatched a study team in October 1998 and January 1999 to conduct discussions with Philippine authorities about possibilities of technical cooperation. In March 1999, the GOP made an official request to the Government of Japan (GOJ) for a technical cooperation to implement a 3-year Capacity Building Project for Environmental Management in Mining. In response to the request, the GOJ, through JICA, dispatched an Implementation Design Study team in May 1999, through which the Records of Discussion (R/D) about the implementation of the project cooperation was produced and signed by both the GOP and GOJ authorities. The technical cooperation project commenced in July 1999 and ended in June 2002. A Mid-Term Evaluation study was conducted in February 2001, while the Terminal Evaluation study was carried out in April 2002.</p> <p>This Ex-post evaluation study is conducted to determine impact and sustainability of the project as well as extract lessons from the project cooperation and formulate recommendations to improve planning and implementation of similar projects in the future.</p>	
<p>1-2. Project overview:</p> <p>The project cooperation was aimed at transferring necessary techniques in order for MGB to develop human resources needed for mine environmental management in the field of water and soil pollution caused by mining activities</p> <p>(1) Overall goal</p> <p>The capacity of MGB (central and all Regional offices) in mine environmental management in the field of water and soil pollution caused by mining activities will be enhanced.</p>	

(2) Project purpose

The staff for mine environmental management in the field of water and soil pollution caused by mining activities will be fostered at MGB.

(3) Outputs

- 0) The management system of the project will be established
- 1) The operation and maintenance of the machinery and equipment used for chemical analysis, measurements and experiments will be undertaken by the technical staff of MGB (central office)
- 2) MGB’s functions of mine environmental monitoring in the field of water and soil pollution will be strengthened
- 3) MGB’s functions of evaluation for the environmental management technologies in the field of soil and water pollution will be strengthened
- 4) MGB’s function of evaluation on the environmental assessment impact report will be strengthened
- 5) MGB’s function of staff training in the field of mine environmental management will be strengthened

(4) Inputs

<Japanese side>

Long-term experts	-	5	Equipment	-	180 million Yen
Short-term experts	-	13	Local cost	-	24 million Yen
Trainees received in Japan	-	8	Others	-	

<Philippine side>

Assignment of counterparts	-	23	Land and facilities	-	
Equipment	-	5 million Yen	Local cost	-	87million Yen

2. Evaluation team

Members of evaluation team	JICA-Philippines office	
	Commissioned to Center for Local Development Studies (CLDS)	JICA In-house Consultants providing technical guidance and supervision to the study: Engr Nick Baoy & Engr Rey Gerona
Period of evaluation	October 24, 2005 to December 22, 2005	Type of evaluation: Ex-Post Evaluation

3. Results of evaluation

3.1 Summary of evaluation results

(1) Impact

The project contributed to the enhancement of the capacity of MGB for mine environmental management. At the staff level, the additional knowledge and skills gained by project counterparts from the intensive trainings (e.g., on-the-job coaching by Japanese experts, in-country seminars and counterpart training in Japan) conducted during the project improved the capability and boosted the confidence of MGB staff in performing mine environmental management functions including mine environmental monitoring, evaluation of environmental management technologies and evaluation of environmental impact assessment reports on mine projects. Apart from skills improvement, the state-of-the-art equipment provided by the project enhanced the capacity of MGB Central Office to conduct environmental chemical analysis and field monitoring of mine environments. Non-project counterparts based in the MGB-CO, on the other hand, benefited from the project through on-the-job coaching by former project counterparts. Moreover, the techniques learned from the project by former project counterparts have been useful in such other works as geo-hazard mapping, geological assessment of solid waste disposal sites and water quality assessments of river systems.

At the organizational level, the project contributed in enhancing the credibility and reputation of MGB in the field of mine environmental management. For instance, ASEAN counterparts have started to recognize the Philippines as a “knowledge base” in the field of mine environmental management. In August 2005, the Philippines signed an agreement with Malaysia regarding continued linkage of human resource development efforts in mine environmental management. Moreover, some donors such as UNDP, Swedish International Development Agency (SIDA) and the Netherlands Government have provided grants to MGB for the development and conduct of trainings related mine environmental management after the project cooperation ended in 2002. The expected impact at the MGB Regional Offices, however, remains limited owing to the agency’s poor financial capacity to conduct trainings for the regional staff and upgrade the facilities and equipment of regional offices for mine environmental management. There was no negative impact generated by the project after completion.

(2) Sustainability

Institutional

The institutional sustainability of the project is secured as the MGB remains as the primary government agency mandated to perform mine environmental management functions in the country. The MGB’s role in mine environmental management is further secured by the Philippine Mining Act of 1995 which mandates MGB to “manage, administer, and promote responsible exploration, development, utilization and conservation of the country’s mineral lands and resources.” The present MGB organizational structures of the Central and Regional offices have two divisions, namely: the Mining Environment and Safety Division and Mining Technology Division, directly responsible for mine environmental management. Both divisions have sustained the project activities after the technical cooperation ended in 2002. Out of the 33 former project counterparts, 28 remain working with MGB and continue to be directly involved in sustaining project activities. Moreover, the institutional mechanisms (e.g., Multipartite Monitoring Team or MMT and Mine Rehabilitation Fund Committee or MRFC) provided for by the Philippine Mining Act of 1995 are in place. These inter-agency bodies, composed of representatives of the MGB, Local Government Units (LGUs), non-government organizations (NGOs) and mining companies, are formed in each mining project to ensure compliance to environmental protection objectives by mining companies. MGB, however, needs to strengthen its partnership with LGUs and NGOs for the latter to be able to independently perform mine environment monitoring functions at the local level.

Technical

The technical sustainability aspect of the project is likewise secured. Except for those 5 who resigned or retired from government service, all 28 former project counterparts including the pool of technical trainers formed during the project continue to work on mine environmental management at the MGB. Former project counterparts are able to apply the skills they have acquired through the project not only in their mine environmental management functions but also in other fields such as geo-hazard mapping, water quality assessment of river systems, among others. Although the MGB failed to fully implement its long-term staff development program and was able to conduct only one (1) seminar-workshop after the project cooperation, the former project counterparts were able to upgrade their skills acquired by attending symposiums/seminars, learning from colleagues, learning on the job and reviewing technical literature. Proper O&M is being provided by MGB to the donated equipment. However, due to financial constraints, the MGB was not able to upgrade the equipment of its regional offices.

Financial

The MGB’s budget for performing its regular mine environmental management functions is secured through the annual allocations received from the government which amounts to about 403 million pesos. While about 75 percent

of its budget goes to personnel salaries and only 25 percent is available for maintenance and other operating expenses (MOOE), MGB is able to conduct its mine environmental management functions through funding mechanisms prescribed by the Mining Act of 1995. These funding mechanisms which include the Mine Rehabilitation Fund (MRF) and the Monitoring Trust Fund (MTF) have been institutionalized and have supplemented the limited MOOE budget of the MGB.

Due to the financial constraints faced by the Philippine government, MGB was not able to secure funds for the conduct of training and seminars for the MGB Regional staff and purchase of monitoring and laboratory equipment for MGB Regional offices. Although there is no budget allocated for capital outlay (or for the purchase of new equipment), the budget for the maintenance of existing equipment is fairly adequate. The MGB generates an average income of 70 million pesos every year from royalties and other fees from mining companies. However, this income is, by law, directly remitted to the national treasury (Bureau of Treasury of the Department of Finance).

Recognizing MGB's role and expertise in mine environmental management, the UNDP provided grants to intensify information campaign on proper mine environmental management practices and to develop training programs related to mine environmental monitoring suited for the local governments. The Swedish government (through the SIDA) likewise invited MGB to deliver lectures on mine environmental management in Sweden. In addition, the World Bank is presently discussing with MGB possibilities of financial cooperation in the future.

3.2 Factors that have promoted the project

(1) Impact

The shift in government policy from "tolerance to active promotion" of the mining sector and the recent decision of the Supreme Court upholding the constitutionality of the Mining Act of 1995 brought about a significant increase in mining investments in 2005. Given this positive development in the mining industry, enhancement of mine environmental management capacity becomes more relevant as MGB central and regional offices will have to cope with increased demand for monitoring and evaluation of environmental plans of mining investors. In addition, the continued employment of former project counterparts trained by the project to act as trainers on mine environmental management for MGB regional staff is a key factor that will promote the achievement of the goal of enhancing the capacity of MGB central and regional offices on mine environmental management.

(2) Sustainability

The sustained support by Government and the mining industry to the mine environmental policy defined by the Mining Act of 1995 has highlighted the need for MGB to strengthen its capacity for mine environmental management. Such support is manifested by the sustained budgetary support to MGB by the Government and compliance by mining companies to the rules and regulations of the Mining Act. Moreover, 28 out of the 33 former project counterparts remain working with MGB and continue to practice the knowledge and skills learned through the project. All the 8 project counterparts trained in Japan during the project cooperation remain working with MGB.

3.3 Factors that have inhibited the project

The inability of the MGB to fully implement the long-term training program for regional staff and the equipment upgrading program for the regional offices owing to budgetary constraints is impeding the impact and sustainability of the project. Staff development training and equipment upgrading are essential requirements for enhancing the capacity of MGB in mine environmental management in the field of water and soil pollution.

3.4 Conclusion

The project has generated positive impacts particularly on the capacity of the MGB Central Office for mine environmental management. Because of the equipment and skills transfer provided by the project, the capability of MGB Central Office to perform mine environmental management particularly in the field of mine environmental monitoring and chemical analysis, evaluation of mine environmental technologies, evaluation of environmental impact assessment reports, has been strengthened. Impact generated by the project in the MGB regional offices is by far limited on account of the MGB's inability to fully implement the programs for staff development and equipment upgrading envisioned by the project for the MGB regional offices. The continued support by the government and the mining industry to the mine environmental policy defined by the Mining Act of 1995 and related laws and the recent increase in mining investments brought about by the active promotion by government of the minerals industry are contributory factors to the sustainability of the project. The MGB, however, needs to improve its financial capacity to implement staff development program and acquire needed equipment for its regional offices to sustain the effects of the project.

3.5 Recommendations

To GOP-MGB

- (i) Given its budgetary limitations, MGB needs to tap external financial resources to be able to implement the staff development and equipment upgrading programs for the regional offices. In line with this, MGB may need to explore ways of utilizing the funds available through the Contingency Liability and Rehabilitation Fund (CLRF), Mine Waste and Tailings Fees Reserve Fund (MWTRF) and Mine Rehabilitation Fund (MRF). In addition, MGB should prepare a financial plan for the capacity building program for its regional offices and identify which components of the program will be financed by external resources.
- (ii) To ensure that mining companies comply with environmental safety standards, future capacity building plans of MGB should include review and updating of existing protocols for mine environmental management in response to the more advanced technologies being adopted in the mining industry.
- (iii) MGB needs to strengthen its partnership with other government agencies and the private sector considering that mine environmental management is an enormous task. Specifically, more active involvement of LGUs and the private sector including NGOs in the review and monitoring of environmental protection plans should be encouraged. In this regard, a capacity building program for LGUs and NGOs aimed at developing mine environmental monitoring skills of concerned LGU/NGO staff is necessary.

To GOJ-JICA

- (i) To further enhance project sustainability, JICA may consider providing follow-up support to capacity building plans of MGB for its regional offices through its existing assistance schemes such as In-Country Training Program (ICTP), follow-up support for ex-training participants, etc.;
- (ii) JICA may also consider dispatching a Japanese expert to assist MGB in the review and development of mine environmental management protocols that can respond to advanced mining technologies being introduced by foreign mining investors.

3.6 Lessons learned

- (i) Appropriate selection of equipment to be provided under the project and special importance given to training of counterparts on the O&M of equipment have resulted in effective management of equipment O&M after the technical cooperation. In this project, proper consultations with concerned MGB counterparts were made for the selection and procurement of equipment.

EX-POST EVALUATION STUDY OF THE CAPACITY BUILDING PROJECT FOR ENVIRONMENTAL MANAGEMENT IN MINING

1. Outline of the Ex-post Evaluation Study

1.1 Background and Purpose of the Study

Based on the mutual agreement between the Government of the Philippines (GOP) and the Government of Japan (GOJ), the Mines and Geosciences Bureau (MGB) and JICA implemented a Project Type Technical Cooperation (PTTC) on Capacity Building Project for Environmental Management in Mining from July 1, 1999 to June 30, 2002. Three years after the cooperation ended, JICA selected the project as one of those to be subjected to Ex-post Evaluation Study for Japanese fiscal year (JFY) 2005.

With a view towards improving the quality and ensuring the transparency of JICA-assisted projects, this ex-post evaluation study aims at determining the impact and sustainability of the project. The study also seeks to extract lessons from the project cooperation and formulate recommendations to improve the planning and implementation of similar projects in the future.

1.2 Evaluation Team and Study Period

In order to ensure the objectivity of the evaluation, JICA commissioned the Center for Local Development Studies (CLDS), a local consulting firm, to undertake the study from October 24, 2005 to December 22, 2005. CLDS assigned Dr. Danilo Jaque and Mr. Fernando de Villa to carry out the ex-post evaluation study, as Team Leader and Survey Assistant, respectively. JICA assigned its In-house Consultants, Engr. Nick Baoy and Engr. Rey Gerona, to provide technical guidance and supervision to the study team.

1.3 Study Scope and Methodology

The study areas covered MGB-DENR Central Office in Quezon City and its Regional Offices in Regions CAR, I and IV where former project counterparts are based. Field visits were conducted in Pangasinan province (Region 1), Benguet and Abra provinces (CAR) where large mining operations in the Philippines are found.

In conducting the study, the evaluation team was guided by the following DAC-OECD definition of impact and sustainability:

Impact – the foreseen or unforeseen, favorable or adverse effect of the project on the target groups and persons possibly affected by the project. The study team examined the impact attained at the Overall Goal level of the project and those impacts not anticipated at project completion.

Sustainability – the extent to which the positive effects, as a result of the project, will still continue after the external assistance has been concluded. The study team examined the technical, institutional and financial sustainability aspects of the project as well as the sustainability of project effects.

The study methods used in the ex-post evaluation study are outlined below:

Table 1. Study Methods Adopted in the Ex-post Evaluation

Stakeholders	Respondents	Methods
Implementing Agency		
MGB Central Office	Assistant Director/Project Manager (1) Project Coordinator (2) Former Project Counterparts (15)	Interview Group discussion Questionnaire Document collection
Beneficiaries – direct		
MGB Central Office	Key Technical staff (5)	Interview Group Discussion Questionnaire
MGB Regional Office (CAR, Region I, Region IV)	Key Technical staff (6) Project counterparts (3)	Interview Group Discussion Questionnaire
Beneficiaries – indirect		
Mining companies	Mine Environment Officers (3) Key technical staff (5)	Interview Group Discussion
Mining communities	Key informants (7)	Interview

Note: Numbers in () denote number of respondents.



Interview with MGB Region 1 technical staff in charge of mine environment safety monitoring



Former project counterparts from MGB-CO accomplishing the survey questionnaires

2. Overview of the Project

2.1 Background of the Project

In 1992, the Government of the Philippines (GOP) launched the “Medium Term Philippine Development Plan, 1992-1998” or the “Philippines 2000” which gave priority to environmental management including adoption of measures to address problems related to environmental pollution. However, the GOP had limited capacity to cope with environmental pollution particularly in the fields of environmental assessment and monitoring of pollution in the mining industries.

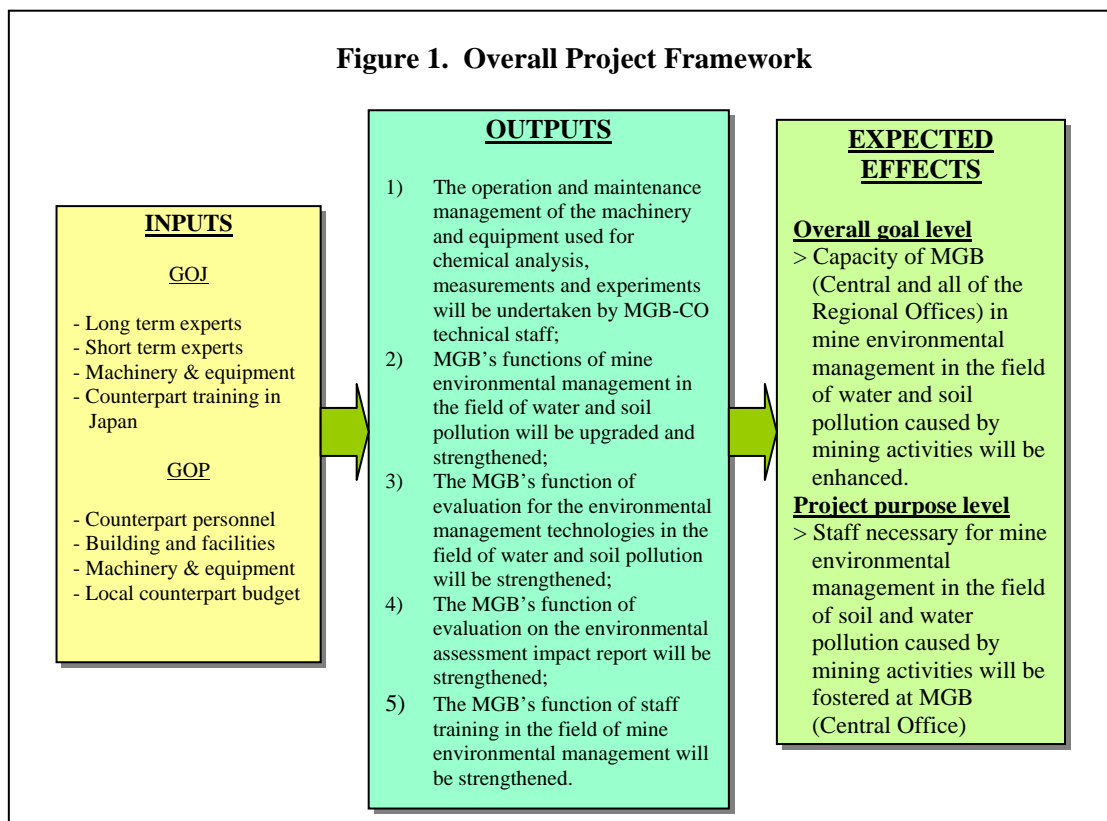
Recognizing the problem, JICA dispatched a Study Team in October 1998 and in January 1999 to conduct discussions with GOP authorities. Based on the findings of the Study Team, JICA decided to carry out a technical cooperation project to improve the capability of GOP to manage environmental problems under the scheme of “offer-based project type technical cooperation (PTTC).”

In March 1999, the GOP made an official request to the GOJ for a technical cooperation in the implementation of a three-year PTTC on the Capacity Building Project for Environmental Management in Mining (CPBEMM), In response to the request, JICA dispatched an Implementation Study Team in May 1999 which signed the Records of Discussion (R/D) with the MGB of the Department of Environment and Natural Resources (DENR). The PTTC was

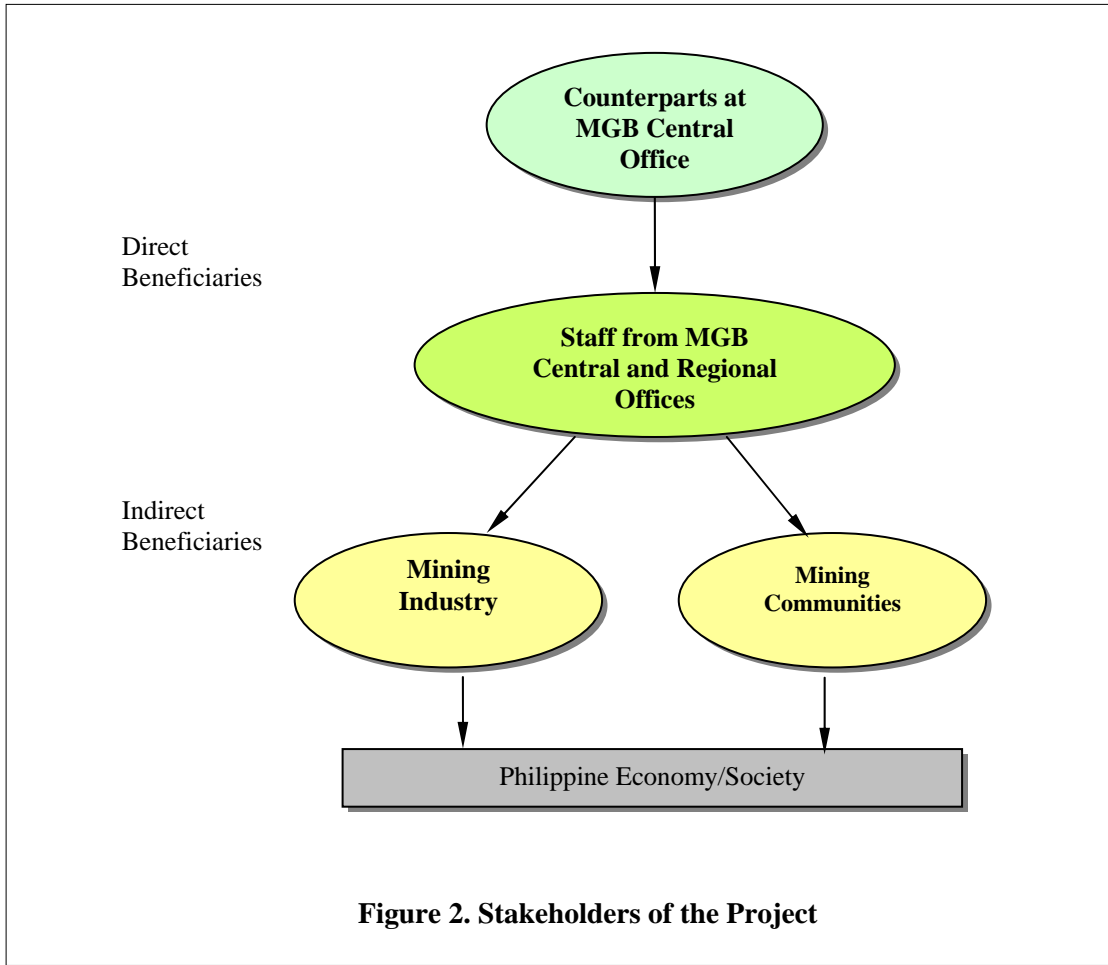
implemented over a period of three (3) years from July 1, 1999 to June 30, 2002 with the MGB as the implementing agency.

2.2 Project framework

In line with the Overall Goal of building the capacity of MGB in mine environmental management in the field of water and soil pollution caused by mining activities, the CBPEMM aimed at enhancing the technical expertise of MGB staff in the following key areas: a) mine environmental monitoring; b) environmental chemical analysis; c) evaluation of mine environmental management technologies; and d) evaluation of environmental assessment reports for mining projects. To ensure continuity of skills transfer activities after completion of the PTTC, the project developed a pool of trainers from among the project counterparts from the MGB Central Office to train other staff at the MGB central and regional offices. (Please refer to Annex 1 for the Project Design Matrix). The overall framework and stakeholders of the project are described by Figures 1 and 2 below.



Source: CBPEMM-PDMe, April 2002



3. Study Results

3.1 Sustainability

3.1.1 Institutional sustainability

The institutional sustainability of the project is secured as the Mines and Geosciences Bureau (MGB) remains as the primary government agency mandated to perform mine environmental management functions in the Philippines. The MGB's role in mine environmental management is further secured by the Republic Act 7942 otherwise known as the Philippine Mining Act of 1995 which mandates the MGB "to manage, administer, and promote responsible exploration, development, utilization, and conservation of the country's mineral lands and resources."

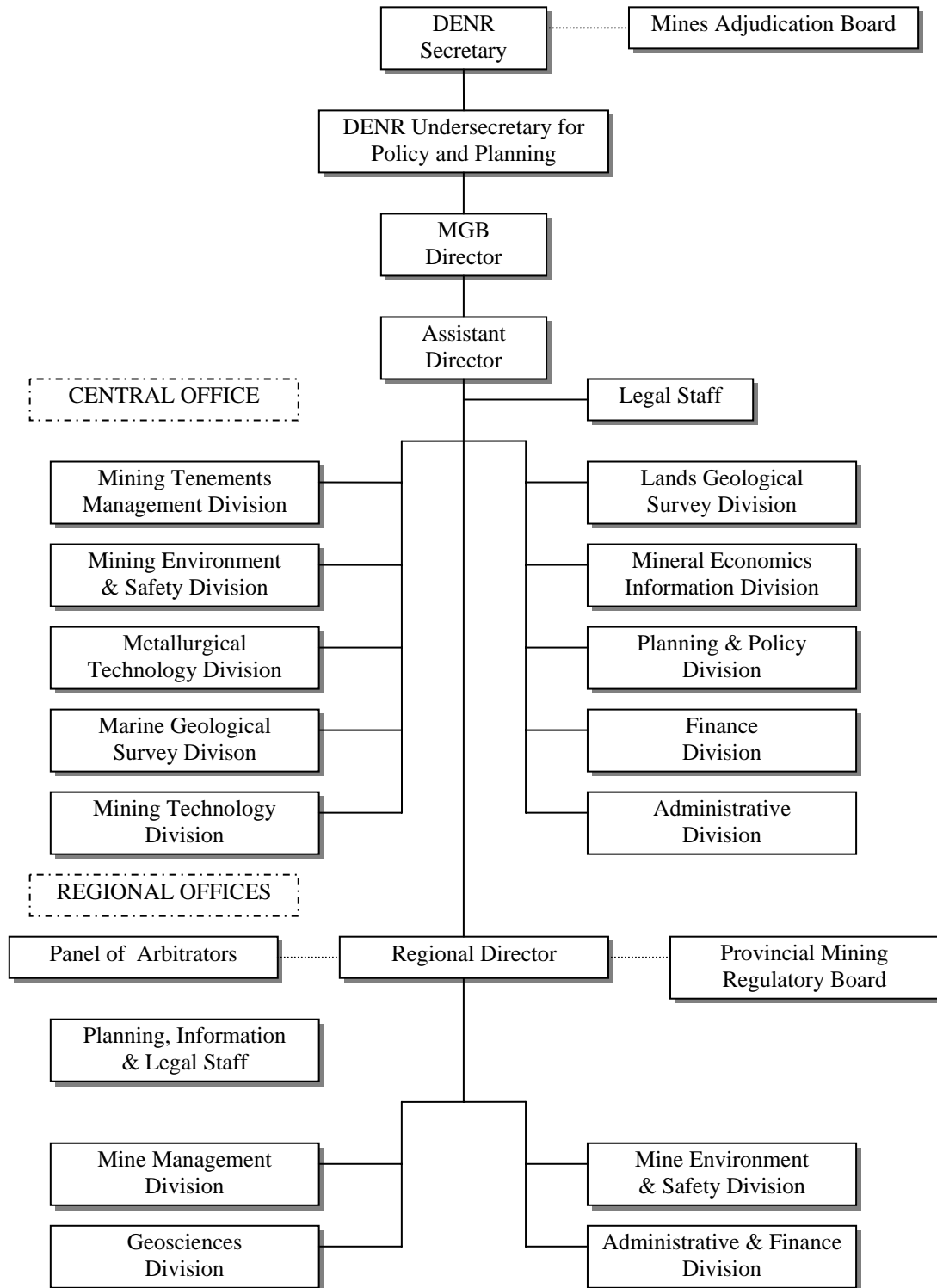
Moreover, Republic Act 7942 transformed the MGB into a line bureau of the DENR composed of a Central Office and 15 Regional Offices situated in major regional centers of the country. The Central Office Director reports directly to the Secretary of DENR through the Undersecretary for Policy and Planning, and at the same time exercises administrative supervision over the Regional Offices. At the regional level, the MGB Regional Director is autonomous from the DENR Regional Offices. A coordinative relationship, however, exists between them as far as planning and implementation of DENR national programs that involve MGB's functions and expertise are concerned.

Mine environmental management is an inherent function of the MGB. As such, it has a Mining Environment and Safety Division both at the Central and Regional Offices that is responsible for monitoring and assessment of environment concerns of the mining industry (see Figure 3 for the MGB Organizational Structure) although other units within the MGB like the Mining Technology Division and Metallurgical Division are directly or indirectly performing mine environmental management functions.

Currently, the MGB has a total of 1,373 personnel about 75 percent of which are deployed in the regional offices. About 65 percent of the total personnel

occupy second-level positions (professional or technical positions) which require tertiary level of education.

Figure 3. MGB Organizational Structure



Source: MGB

The Mining Act of 1995 and its IRR outline the institutional mechanisms for ensuring that measures to protect the mine environment are put in place before, during and after mining operations. In line with this, the Act requires the submission of an Environmental Protection and Enhancement Program (EPEP) defining the environmental management strategies to be adopted by the applicants for mining permits and operating mining companies. Moreover, the Act institutionalizes an environmental guarantee fund mechanism collectively known as the Contingency Liability and Rehabilitation Fund (CLRF).

To ensure proper compliance to environmental protection objectives, the Act provides for the creation of the Mine Rehabilitation Fund Committee (MRFC) chaired by the MGB Regional Director and composed of representatives of the Local Government Units (LGUs), non-government organizations (NGOs) and mining companies. In addition, a Multipartite Monitoring Team (MMT) composed of representatives of the members of the MRFC is formed for each mining project to serve as the monitoring arm of the MRFC.

The survey conducted in MGB regional offices and mining communities revealed that these multi-stakeholder institutional arrangements are functioning and are being appreciated by the affected communities. Sustainability of these organizational structures is ensured by the mining law and the persistent demand of mining communities for adequate protection of the environment.

Status of Former Project Counterparts

At the time evaluation, 28 out of the 33 project counterparts are still connected with the MGB performing functions related to mine environmental management (see Annex 2 for Status of Project Counterparts). Of the five who left MGB, one was reassigned to another office within the DENR while four opted to resign or retire from government service. Of the eight project counterparts sent to Japan for training, six remain working at the MGB Central Office.

3.1.2 Technical sustainability

The training of a pool of technical trainers among the project counterparts who were supposed to implement the staff development program and the provision of equipment necessary for mine environmental management were key inputs to ensure technical sustainability of the project. Except for the five staff After the project ended in June 2002, however, the MGB Central Office was unable to fully implement the staff development program designed to enhance the skills of other MGB staff from the Central and regional offices due to lack of training funds. In the absence of the staff development program, MGB staff upgraded their skills by attending symposiums/seminars sponsored by other agencies, learning from colleagues, learning on the job and reviewing technical literature.

Table 2. Ways of Acquiring/Upgrading Skills by MGB Staff

Ways of acquiring/ upgrading Skills	Frequency of responses	% of total responses
a. Attend symposium/seminar by other agencies	16	31
b. Active participation in program/project implementation	12	23
b. Learn from colleagues	10	19
c. Literature review (books, internet, etc)	10	19
d. Take graduate studies	4	8
Total responses	52	100

Note: Total respondents: 20; most respondents had multiple responses.

Moreover, former project counterparts revealed that they were able to apply the skills they have acquired during the project in their present work. Skills learned during the project were particularly useful in their regular mine monitoring functions which include laboratory analysis of field monitoring samples, review of mining project feasibility studies, river assessments, among others. When asked if their skills improved after the project, 12 out of 20 former project counterparts surveyed gave the opinion that their skills “greatly improved” while the rest assessed their skills to have “improved to some extent.”

Table 3. Degree of improvement of skills

Degree	Frequency	% of Total
Greatly improved	12	60
Improved to some extent	8	40
Same level as in 1999	0	0
Skills acquired were not utilized	0	0
Total	20	100

Source: Results of questionnaire survey among 20 respondents

Most of the equipment provided to MGB under the project are in good condition and are regularly being used in the conduct of mine environment management activities. Except for a few minor equipment which were given to the MGB-CAR (e.g., spectrophotometer and ISE meter), all the major equipment are well kept in the MGB-CO laboratories (see Annex 3 for the Equipment Inventory Sheet). The appropriate selection of equipment to be provided under the project has resulted in regular utilization and effective management of equipment O&M after the technical cooperation.

While the MGB-CO is well equipped with modern laboratory and field equipment, MGB regional offices visited are conducting their environmental monitoring functions with dilapidated laboratories and outmoded equipment. Because of inadequate equipment, regional offices either bring their field samples to the Petrolab of MGB-CO or to the laboratories of mining companies for analysis which requires more time and entails additional cost.

3.1.3 Financial sustainability

The MGB receives an annual budgetary allocation from the national government. From 2002 to 2005, the MGB had an average annual budget of Php 402.7 million. About 75 percent of the MGB's budget goes to salaries of personnel and only 25 percent is available for maintenance and other operating expenses (MOOE). No budget for capital expenditures was allocated to MGB over the last four years. While MGB earns revenues from its operations in the

form of royalties and fees, these revenues are entirely remitted to the National Treasury.

Table 4. Summary of annual budget of MGB, 2002-2005, in million Php

Year	PS	MOOE	CO	Total
2002	309.3	94.5	0	403.8
2003	309.3	102.1	0	411.4
2004	309.3	89.4	0	398.7
2005	306.6	90.1	0	396.7

Legend: PS – personal services; MOOE – maintenance & other operating expenses; CO – capital outlay

Source: MGB

Despite its limited MOOE allocation, MGB is able to perform its mine environmental management function through the funding mechanisms prescribed by the Mining Act of 1995. While these funding mechanisms do not explicitly provide budgets for capacity building, the conduct of mine environmental monitoring activities by the MMT is supported by the Monitoring Trust Fund (MTF) which is built into the MRF. Under the IRR of the Mining Act of 1995, each operating mine contractor or permit holder is required to deposit the amount of P50,000 in a government depository bank to cover the maintenance and other operating expenses (e.g., travel expenses, per diem, cost of consultancy work, etc.) incurred by the MMT.

In the regions visited, the funding mechanisms provided by the Mining Act have been institutionalized and have supplemented the limited MOOE budgets being allocated to MGB regional offices.

3.1.4 Sustainability of project effects

The terminal evaluation of CBPEMM conducted in 2002 arrived at the conclusion that the Project fully attained the Project Purpose of enhancing the skills of MGB-CO staff in mine environmental management in the field of water and soil pollution. To sustain the effects of the project, the evaluation team recommended to the MGB to put into practice the technology transferred

by the project and to secure funds for the purchase of equipment for the regional offices.

In terms of application of skills transferred by the project to the MGB staff, it is learned from the survey that project counterparts had several opportunities to apply their acquired skills in view of the increase in investments and activities in the mining sector over the last two years. Skills on mine environment management will find more application in the next few years with the full implementation of EO 270 which outlines the government policy to revitalize the mining sector.

The MGB has not been able to secure budget for upgrading of equipment of regional offices since the project ended in 2002. Without the necessary equipment, sustainability of the project effects at the regional offices is unlikely.

3.2 Impact of the Project

3.2.1 Impact attained at the overall goal level

Based on the PDMe, the overall goal of the Project is to enhance the capacity of MGB Central and Regional Offices in mine environmental management in the fields of water and soil pollution. To achieve this Goal, the project was designed to transfer skills to project counterparts on mine environmental monitoring, chemical analysis techniques, environmental management technologies, evaluation of environmental impact assessment reports and staff training. Key to the achievement of the Overall Goal is the execution by MGB of a long-term and mid-term training program on mine environmental management for its central and regional office staff and upgrading of facilities and equipment of the five priority regional offices.

More than three years after the CBPEMM ended, the project continues to contribute to the enhancement of the capacity of the MGB on mine

environmental management. At the staff level, the additional knowledge and skills gained by project counterparts from the intensive trainings (e.g., on-the-job coaching by Japanese experts, in-country seminars and counterpart training in Japan) conducted during the project improved the capability and boosted the confidence of MGB staff in performing their functions particularly in the field of mine environmental monitoring, evaluation of environmental management technologies and evaluation of mine environmental impact assessment reports. Apart from skills improvement, because of the state-of-the-art equipment provided by the project enhanced the capacity of the MGB Central Office to conduct environmental chemical analysis and field monitoring of mine environments. Non-project counterparts based in the MGB-CO also benefited from the project through on-the-job coaching done by project counterparts.

Moreover, the techniques learned from the project by former project counterparts have been useful in such other works as geohazard mapping, geological assessment of solid waste disposal sites and water quality assessment of river systems. The questionnaire survey conducted among MGB staff based in the Central Office revealed the following results:

Table 5. Perceived Effects/Impact of CBPEMM on MGB

Perceived Impact/Effect	Frequency	% of total responses
Increased capacity for laboratory analysis	12	27
Improved skills of staff on mine environmental management	10	23
Increased capability to conduct environmental assessments and monitoring	7	16
MGB is able to implement policies more effectively	5	11
MGB acquired good reputation with other government agencies	4	9
Improved collaboration with other agencies and mining sector in addressing mine environmental issues	3	7
Better perception about MGB by anti-mining sector	2	5
Delivery of more effective services to the public	1	2

Note: Most respondents had multiple responses

Source: Questionnaire survey among 20 respondents from MGB-CO

At the organizational level, the project contributed to the enhancement of credibility and reputation of MGB in the field of mine environmental management. For instance, ASEAN counterparts have started to recognize the Philippines as a “knowledge base” in the field of mine environmental management. In August 2005, the Philippines signed an agreement with Malaysia regarding continued linkage of human resource development efforts in mine environmental management. Moreover, some donors such as UNDP, Swedish International Development Agency (SIDA) and the Netherlands Government have provided grants to MGB for the development and conduct of trainings related mine environmental management after the project cooperation ended in 2002. The expected impact at the MGB Regional Offices, however, remains limited owing to the agency’s poor financial capacity to conduct trainings for the regional staff and upgrade the facilities and equipment of regional offices for mine environmental management. There was no negative impact generated by the project after completion.

Impact attained by the Project in the MGB regional offices, however, are very limited on account of the inability of MGB to implement the staff development program on mine environmental management and equipment upgrading program for priority regional offices envisioned at the end of the project. Interviews with MGB regional staff revealed that the present capacity of the regional offices for mine environmental management is constrained by the inadequacy of facilities and equipment and lack of training.

3.2.2 Impact not anticipated at Project completion

Positive impact

A few impacts not anticipated at project completion may be attributed to the Project. Because of the enhanced skills of project counterparts and availability of field monitoring equipment, MGB-CO was able to quickly respond to pressing mine environmental issues like in the case of the recent Rapu-rapu

mining incident¹ and effectively perform its other mandated functions such as geohazard mapping, geological assessment of solid waste disposal, and water quality assessments of river systems.

The survey conducted at the Philex Mines revealed that the participation of their technical staff in the on-site training on evaluating the stability of tailing dams exposed them to more effective techniques in monitoring important parameters to measure soil stability and assessing water quality.

Negative impact

There is no negative impact observed by the study team during the evaluation period. Also, the study team does not foresee any negative impact arising from the project in the future.

3.3 Analysis of Factors of Impact and Sustainability

3.3.1 Factors promoting impact

Recent increase in investments in the mining sector

The shift in government policy from tolerance to active promotion of the mining sector and the recent decision of the Supreme Court upholding the constitutionality of the Mining Act brought about a significant increase in mining investments in 2005. Given this positive development in the mining industry, enhancement of mine environmental management capacity becomes more relevant as MGB central and regional offices will have to cope with increased demand for monitoring and evaluation of environmental plans of mining investors.

Recent government policy to revitalize the mining sector

In 2004, the government issued EO 270 which sets the national policy agenda for revitalizing the mining sector in the Philippines. While the Order seeks to

¹ In 2005, the mine wastes of the Rapu-rapu mining operation in the Bicol region was found to have caused fish kills in the nearby marine waters.

promote mining as an engine of economic growth, it also calls for strict adherence to the government policies on environmental protection. This EO highlights the need to strengthen the capacity of MGB in mine environmental management.

Table 6. Philippine Mining Industry Statistics, 2000-2005

	2000	2001	2002	2003	2004
Gross Production Value					
Metallic Mining	9.2 B	7.7 B	6.6 B	7.9 B	8.0 B
SSM Gold Mining	8.3 B	10.0 B	14.3 B	19.9 B	21.5 B
Non-Metallics	<u>12.7 B</u>	<u>11.2 B</u>	<u>14.2 B</u>	<u>13.7 B</u>	<u>13.7 B</u>
Total	30.2 B	28.9 B	35.1 B	41.5 B	43.2 B
Gross Value Added (incl. Energy Sector)	10.8 B	10.1 B	15.2 B	17.5 B	18.8 B
<i>Contributions to GDP</i>	1.1 %	1.0 %	1.5 %	1.6 %	1.6 %
Total Mineral Exports	\$650 M	\$ 537 M	\$ 519 M	\$ 638 M	\$ 817 M
<i>Contribution to Total Philippine Exports</i>	1.7 %	1.6 %	1.5 %	1.8 %	2.1 %
Paid-up Local Investments	1.1 B	223.6 M	360.4 M	73.8 M	104.5 M
<i>Paid-up Foreign Investments</i>	30.4 M	38.1 M	6.6 M	6.9 M	37.3 M
Taxes Collectible	2.65 B	1.95 B	2.05 B	2.61 B	3.70 B
Employment in Mining/Quarrying	110,000	104,000	101,000	104,000	118,000
<i>Contribution to Total Phil. Employment</i>	0.34 %	0.32 %	0.30 %	0.30%	0.33%

Source: MGB

Pool of trainers developed by the project are still at MGB

The continued employment of former project counterparts trained by the project to act as trainers and resource persons in various fields of mine environmental management is a key factor that will promote the achievement of the goal of enhancing the capacity of MGB central and regional offices on mine environmental management.

3.3.2 Factors promoting sustainability

Mine environmental policy is sustained by Government and industry

The mine environmental policy defined under the Mining Act of 1995 and related laws are being sustained by the Government through the implementation of various programs and projects designed to protect the

mining communities. As the key agency mandated under the law to enforce this policy, MGB needs to strengthen its capacity for mine environment management.

Trained counterparts remain working at MGB

The counterparts trained by the project to act as trainers in the staff development program for regional offices are still working at the MGB. Their permanent employment status and commitment to train other MGB staff are key to sustaining the effects of the Project and achieving the goal of enhancing the capacity of MGB for mine environmental management.



Former project counterpart Ms. Tess Balmes MGB Petrolab explaining the function and Capability of the XRF Spectrophotometer provided by the project.

Trust funds for mine environmental management

The Mining Act of 1995 provides funding mechanisms (e.g., MRF and MTF) which promotes financial sustainability of mine environmental management. The existence of the MTF, for instance, enables the MGB regional offices to conduct their mine monitoring functions in spite of limited operating budgets.

3.3.3 Factor inhibiting impact and sustainability

Budgetary constraints of MGB

Staff development training and equipment upgrading particularly in the field offices are essential for sustaining the effects of the project. The budgetary constraints currently faced by MGB inhibit the full implementation of the capacity building program on mine environmental management for its regional staff. Moreover, due to the lack of budgetary allocation for capital expenditures, MGB is unable to acquire equipment for mine environmental monitoring for its regional offices.

3.4 Issues/Problems

3.4.1 Limited financial resources of MGB

While MGB receives an annual budgetary allocation of about Php 400 million from the national government, about 75 percent of this amount goes to salaries of personnel and only 25 percent is available to finance its regular operations. While MGB earns income from royalties and fees, these revenues are remitted to the national government.

3.4.2 Inadequate facilities and equipment of the MGB regional offices

The MGB regional offices need to be provided with basic equipment to enable its staff to effectively perform its functions in mine environmental management. In CAR where the biggest mines in the county are located, the MGB laboratory is very ill-equipped and some of its laboratory personnel continue to work in a building damaged by the big earthquake in 1990.

3.4.3 Need to review protocols for mine environmental management

With the opening of new mine sites and the use of sophisticated mining technology, the current protocols used in mine environmental management need to be reviewed to ensure that mining operations comply with environment safety standards.

Figure 4. Profile of the Palawan Nickel Project of the Coral Bay Nickel Corporation



Source: MGB

3.5 Conclusion

Based on the above findings, it can be concluded that the project has generated positive impacts on the capacity of MGB for mine environmental management in the field of water and soil pollution caused by mining activities. Because of the equipment and skills transfer provided by the project, the capability of MGB central office to perform mine environmental management particularly in the fields of mine environmental monitoring and chemical analysis, evaluation of mine environmental technologies, evaluation of environmental assessment impact reports has been strengthened. Impact generated by the project in the MGB regional offices, however, is by far limited on account of MGB's inability to fully implement the programs for staff development and equipment upgrading as envisioned by the project. The continued support by the government and the mining industry to the mine environmental policy defined by the Mining Act of 1995 and related laws and the recent increase on mining investments brought about by the active promotion by the government of the minerals industry are contributory factors to the sustainability of the project. The MGB, however, needs to improve its financial capacity to implement staff development program and acquire needed equipment for its regional offices in order to sustain the effects of the project.

4. Recommendations and Lessons Learned

4.1 Recommendations

4.1.1 For MGB

- Given its budgetary limitations, MGB needs to mobilize external financial resources to be able to implement the staff development and equipment upgrading programs for the regional offices. In line with this, MGB may need to explore ways of utilizing the funds available through the Contingency Liability and Rehabilitation Fund (CLRF), Mine Waste and Tailings Fees Reserve Fund (MWTRF) and Mine Rehabilitation Fund (MRF). In addition, MGB should prepare a financial plan for the capacity

building program for its regional offices and identify which components of the program will require financing from external sources.

- To ensure that mining companies comply with environmental management standards, future capacity building plans of MGB should include review and updating of existing standards and protocols for mine environmental management in response to the more advanced technologies being adopted in the mining industry.
- MGB also needs to strengthen its partnership with other government agencies and the private sector considering that mine environmental management is an enormous task. Specifically, more active involvement of LGUs and the private sector including NGOs should be encouraged. In this regard, a local capacity building program aimed at developing mine environmental monitoring skills of concerned LGU/NGO staff is necessary.

4.1.2 For JICA

- To further enhance project sustainability, JICA may consider providing follow-up support to capacity building initiatives of MGB through existing assistance schemes such as follow-up support for ex-trainees, In-Country Training Program (ICTP), etc
- JICA may also consider the dispatch of expert to assist MGB in review and development of standards and protocols for mine environmental management that are responsive to advanced mining technologies being introduced by foreign mining investors.

4.2 Lessons Learned

- Appropriate selection of equipment to be provided under the project and special importance given to training of counterparts on the O&M of equipment after the technical cooperation. In this project, proper consultations with concerned MGB counterparts were made for the selection and procurement of equipment.

ANNEX 1

Project Design Matrix for Evaluation (PDMe)

CAPABILITY BUILDING PROJECT FOR ENVIRONMENTAL MANAGEMENT IN MINING

Project Duration: July 1, 1999-June 30, 2002

Target Country: Republic of the Philippines

Implementing Agency: Mines and Geosciences Bureau (MGB)

Target Group: MGB staff

Narrative Summary	Verifiable Indicators	Means of Verification	Important Assumption
<p>Overall Goal</p> <p>The capacity of MGB (central and all of the regional offices) 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"> 1. Enough number of staff who completed the staff training programs on mine environmental management of MGB central and regional offices 2. The rules and regulations of mine environmental management in the field of water and soil pollution are reviewed, and MGB's organizational system are prepared 3. The equipment and laboratory facilities of the five Priority Regional Offices are upgraded. 4. The frequency, measurement and analysis of the mine environmental monitoring which are carried out by MGB are improved and failing mines/plants are put under MGB's guidance, then countermeasure is taken. 5. The occurrence of the numbers of violations on water and soil pollution caused by mines and plants decrease 	<ol style="list-style-type: none"> 1. Record on training courses and seminars for mine environmental management of MGB 2. Rules/regulations of the mine environmental management; organization and system of MGB 3. Equipment and machinery list of MGB central and regional offices 4. Implementation records on administrative guideline in mine environmental management for mines and plants of MGB (Central & regional) 5. Records on implementation of water and soil pollution control conducted by MGB and LGU. 	<ol style="list-style-type: none"> a. The mine environmental policy is sustained by the Government and industry b. Coordination between MGB and EMB sustained appropriately c. Services of technical staff who completed the staff training program on mine environmental management of MGB are continued at MGB
<p>Project Purpose</p> <p>The staff necessary for mine environmental management in the field of water and soil pollution caused by mining activities will be fostered at MGB (Central Office)</p>	<ol style="list-style-type: none"> 1. The C/Ps technical expertise level of mine environmental management in the field of water and soil pollution is enhanced to a level that C/P can train other MGB technical staff by themselves by 2002. 2. MGB plans the long and mid-term staff training assignment program on mine environmental management in the field of water and soil pollution. 	<ol style="list-style-type: none"> 1. C/Ps implement the preliminary trainers' training 2. MGB's long and mid-term staff training and staff assignment program 	<ol style="list-style-type: none"> a. The services of C/Ps who are trained by the project are continued at MGB. b. The expenses and staff necessary for mine environmental management activities are assured

Narrative Summary	Verifiable Indicators	Means of Verification	Important Assumption
<p>Outputs</p> <p>(0) The management system of the project will be established.</p> <p>(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 (Central Office)</p> <p>(2) The MGB's functions of mine environmental monitoring in the field of water and soil pollution will be upgraded and strengthened.</p> <p>(3) The MGB's function of evaluation for the environmental management technologies in the field of water and soil pollution will be strengthened.</p> <p>(4) The MGB's function of evaluation on the environmental assessment impact report will be strengthened</p> <p>(5) The MGB's function of staff development training in the field of mine environmental management will be strengthened</p>	<p>0-1 MGB personnel are allocated according to plan</p> <p>0-2 Local budgets from MGB are supplied according to the plan</p> <p>1-1 C/P acquire enough skills in O&M management for machinery used for chemical analysis, onsite measurement and experiments by 2002;</p> <p>1-2 Records and manuals required for O&M for machinery and equipment are completed by 2002;</p> <p>2-1 C/Ps acquire knowledge and practical technique of mine environmental monitoring in the field of water and soil pollution by 2002</p> <p>2-2 Training materials required for the C/Ps skills acquisition of the environmental monitoring technology, by 2002</p> <p>3-1 C/Ps acquire knowledge and practical technique of mine environmental management and its evaluation in the field of water and soil pollution by 2002</p> <p>3-2 Training materials required for the C/Ps skill acquisition of mine environmental management evaluation technology by 2002</p> <p>4-1 C/Ps acquire knowledge and practical technique of mine environmental impact assessment and its evaluation in the field of water and soil pollution by 2002</p> <p>4-2 Training manuals required for the C/Ps skill acquisition of the evaluation on the environmental impact assessment prepared by 2002</p> <p>5-1 C/Ps acquire knowledge and practical technique of staff training by 2002</p> <p>5-2 Training materials required for the technology transfer to MGB staff (other than C/P) in each field are prepared by 2002</p> <p>5-3 The technical staff of MGB acquires the basic information on mine environmental management in the field of water and soil pollution by 2002</p>	<p>0-1 Records on personnel of MGB</p> <p>0-2 Records on budget of MGB</p> <p>1-1a Records on monitoring and evaluation</p> <p>1-1b Interview and questionnaire to the C/P</p> <p>1-2a Manuals on O&M of equipment</p> <p>1-2b Record on O&M and management of the equipment</p> <p>2-1a Records on monitoring and evaluation</p> <p>2-1b Interview and questionnaire to the C/P</p> <p>2-2 Training materials</p> <p>3-1a Records on monitoring and evaluation</p> <p>3-1b Interview and questionnaire to C/P</p> <p>3-2 Training materials</p> <p>4-1a Records on monitoring and evaluation</p> <p>4-1b Interview and questionnaire to C/P</p> <p>4-2 Training materials</p> <p>5-1a Records on monitoring and evaluation</p> <p>5-1b Interview and questionnaire to C/P</p> <p>5-2 Training materials</p> <p>5-3a Records on implementation of training courses and seminars and number of participants</p> <p>5-3b Questionnaire to the trainees</p>	<p>a. The C/P are arranged appropriately in accordance with the specialty concerning technology transfer.</p> <p>b. The operational cost of the project is assured appropriately.</p>

Narrative Summary	Verifiable Indicators	Means of Verification	Important Assumption
<p>Activities</p> <p>0-1 Allocate the staff based on the plan</p> <p>0-2 Formulate the operational plan</p> <p>1-1 Formulate the preparation plan and implement the procurement and maintenance of equipment and facilities</p> <p>1-2 Implement the installation and guide in the O&M 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 environmental monitoring in the field of water and soil pollution</p> <p>2-2 Acquire the techniques and prepare the training materials of water and soil sampling for environmental analysis</p> <p>2-3 Acquire the technology and prepare the training materials of on-site measurements and analysis for water and soil quality</p> <p>2-4 Acquire the technology and prepare the training materials of laboratory measurements and analysis for water and soil quality</p> <p>2-5 Acquire the techniques and prepare the training materials on the environmental evaluation of the result of measurement and analysis of water and soil quality</p> <p>3-1 Acquire the technical information for environmental management technology</p> <p>3-2 Acquire techniques of environmental management for mine wastewater and tailing and prepare training materials</p>	<p style="text-align: center;">Inputs</p> <p>(Philippine side)</p> <ol style="list-style-type: none"> 1. Preparation of building and facilities <ul style="list-style-type: none"> - Renovation of building and facilities - Installation of the equipment - Office of experts - Office of counterparts - Training rooms 2. Allocation of staff <ul style="list-style-type: none"> - Project director (1) - Project manager (1) - Technical consultants(4) - Project coordinator (1) - Technical C/P (21) - Support staff (9) 3. Procurement of equipment, machinery and materials 4. Expenses of Local Counterpart Budget 	<p>(Philippine side)</p> <ol style="list-style-type: none"> 1. Dispatch of experts <ol style="list-style-type: none"> 1.1 Longterm experts <ul style="list-style-type: none"> - Chief advisor - Coordinator - Experts (3) 1,2 Short term experts (as required) 2. Counterpart training in Japan (2 persons each year) 3. Provision of machinery and equipment 	<ol style="list-style-type: none"> a. Supports of the MGB CBPEMM by the central and local governments, the mining industry and other related organizations are sustained. b. The customs clearance of the machinery and equipment provided by the Japanese side are processed smoothly.

<p>Activities, cont'n.</p> <p>4-1 Acquire the information on the process of environmental impact assessment report for mining project</p> <p>4-2 Acquire the technical information on the evaluation of environmental impact assessment report for mining project</p> <p>5-1 Formulate the training program</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>		<p><u>Pre-condition</u></p> <p>Agreement between MGB and EMB concerning the mine environmental management is sustained</p>
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ANNEX 2

Equipment Inventory Sheet

No.	Item/Description	Qty.	Date of Delivery	Location	Condition (0 - working; x - not working)	Frequency of use (rarely, regularly, never)	Problems Encountered/Remarks
Laboratory Equipment							
E-01	Atomic absorption spectrometer (AAS)	3	2000/3/31	Dry	O	Regularly	1 monitor replaced
E-01-1	Pump tube 080	1	2001/4/5	Dry	consumable	Regularly	
E-01-2	Pump tube 130	1	2001/4/5	Dry	consumable	Regularly	
E-01-3	Reaction coil	1	2001/4/5	Dry	consumable	Regularly	
E-01-4	Aspiration tube for NaBH ₄	3	2001/4/5	Dry	consumable	Regularly	
E-01-5	Aspiration tube for HCl	3	2001/4/5	Dry	consumable	Regularly	
E-01-6	O-ring	2	2001/4/5	Dry	consumable	Regularly	
E-01-7	Fitting	1	2001/4/5	Dry	consumable	Regularly	
E-01-8	Fluorinated rubber tube	1	2001/4/5	Dry	consumable	Regularly	
E-01-9	Joint for reagent	3	2001/4/5	Dry	consumable	Regularly	
E-01-10	D2 lamp	2	2001/4/5	Dry	consumable	Regularly	MGB purchased 2
E-01-11	Hamilton microliter syringe	3	2001/4/5	Dry	consumable	Regularly	MGB purchased several
E-01-12	Absorption cell	4	2001/8/10	Dry	consumable	Regularly	MGB purchased several
E-02	AAS vapore generation	1	2000/3/31	Dry	O	Regularly	
E-03	AAS graphite tube analyzer	1	2000/3/31	Dry	O	Regularly	
E-04-A	Hollow cathode lamp Cu	2	2000/4/26	Dry	consumable	Regularly	
E-04-B	Hollow cathode lamp Pb	2	2000/4/26	Dry	consumable	Regularly	
E-04-C	Hollow cathode lamp Cd	2	2000/4/26	Dry	consumable	Regularly	
E-04-D	Hollow cathode lamp As	2	2000/4/26	Dry	consumable	Regularly	
E-04-E	Hollow cathode lamp Cr	2	2000/4/26	Dry	consumable	Regularly	
E-04-F	Hollow cathode lamp Hg	2	2000/4/26	Dry	consumable	Regularly	
E-05-D	Cooling water circulating unit	1	2002/3/8	Dry	consumable	Regularly	
E-10	X-ray fluorescence (XRF) spectrophotometer	1	2000/4/18	X-ray room	O	Regularly	
E-05	Ion selective electrode (ISE) meter	3	2000/3/16	Dry	O	Regularly	Given to MGB CAR
E-06	Ion selective electrode (ISE) for CN	3	2000/3/16	Dry	O	Regularly	MGB purchased
E-07	Cynide distillation apparatus	3	2000/1/18	Wet	O	Regularly	
E-08	pH meter	3	2000/3/23	Wet	O	Regularly	
E-09	Temperature tester	2	2000/6/6	Wet	O	Regularly	
E-10	Fumehood	2	2000/5/3	Wet	O	Regularly	
E-11	Stirrer, magnetic	2	2000/1/31	Wet	O	Regularly	1 - Given to MGB CAR
E-12	Hot plate (large)	4	2000/4/28	Wet	O	Regularly	1 - Given to MetTD
E-13	Centrifugal ball mill (compact mill)	1	2000/6/8	MetTD	O	Regularly	
E-14	Grinding container tungsten carbide	1	2000/6/8	MetTD	O	Regularly	

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No.	Item/Description	Qty.	Date of Delivery	Location	Condition (0 - working; x - not working)	Frequency of use (rarely, regularly, never)	Problems Encountered/Remarks
E-15	Grinding jar (container)	5	2000/6/8	MetTD	O	Regularly	
E-16	Laboratory test sieves	4	2000/6/5	MetTD	O	Regularly	
E-18-A	Analytical balance	2	2000/2/2	Bal. Room	O	Regularly	1 - Given to MetTD
E-18-B	Top loading balance	1	2000/2/2	Wet	O	Regularly	
E-19	Refrigerator	1	2000/5/19	Dry	O	Regularly	
E-20	Muffle furnace	2	2000/4/12	Wet	O	Regularly	
E-21	Ion chromatograph system	1	2000/3/31	Dry	O	Regularly	
E-21-1	Autosampler for ion chromatograph system	1	2001/3/29	Dry	O	Regularly	
E-22	Hexavalen Cr meter	4	2000/3/2	Dry	O	Regularly	
E-23	Turbidity meter	4	2000/3/31	Wet	O	Regularly	
E-24	Water distillation system	2	2000/4/12	Wet	O	Regularly	
E-25	Mercury analyzer	2	2000/3/31	Wet	O	Regularly	
E-25-1	Sample boat	200	2001/3/28	Wet	consumable	Regularly	MGB purchased
E-25-2	Catalytical tube	1	2001/3/28	Wet	consumable	Regularly	MGB purchased
E-25-3	Amalgamator	1	2001/3/28	Wet	consumable	Regularly	MGB purchased
E-25-4	Silicon Joint of amalgamator	4	2001/3/28	Wet	consumable	Regularly	MGB purchased
E-25-5	Amalgamator gasket	4	2001/3/28	Wet	consumable	Regularly	MGB purchased
E-25-6	Stainless steel spoiler	3	2001/3/28	Wet	consumable	Regularly	MGB purchased
E-25-7	Kanthal coiling of combustion chamber	2	2001/3/28	Wet	consumable	Regularly	MGB purchased
E-25-8	Kanthal coiling of amalgamator	2	2001/3/28	Wet	consumable	Regularly	MGB purchased
E-25-9	Stainless steel boat beam	2	2001/3/28	Wet	consumable	Regularly	MGB purchased
E-25-10	PWB A1-95 board	1	2001/3/28	Wet	O	Regularly	
E-25-11	PWB A2-95 board	1	2001/3/28	Wet	O	Regularly	
E-25-12	Autosampler for mercury analyzer	1	2001/3/28	Wet	O	Regularly	
E-26	Spectrophotometer UV-VIS	2	2000/4/11	Wet	O	Regularly	1 - Given to MetTD
E-27	Platinum crucibles	6	2000/4/17	Petrolab	O	Regularly	
E-28	Platinum dish	6	2000/4/17	Petrolab	O	Regularly	
E-29	Hazardous chemical dispenser	4	2000/6/6	Wet	O	Regularly	
E-31	Air drying oven	2	2000/3/23	Wet	O	Regularly	
E-32	Hot plate (small)	2	2000/4/12	Wet	O	Regularly	1 - Given to MetTD
E-33	Ultrasonic cleaning systems	2	2000/6/19	Wet	O	Regularly	
E-34	Centrifuge 12 x 15 ml	1	2000/4/25	Wet	O	Regularly	
E-35	Centrifuge 6 x 50 ml	1	2000/2/18	Dry	O	Regularly	
E-36	Shaker for separatory funnel	2	2000/2/12	Dry	O	Regularly	

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Equipment Inventory Sheet

No.	Item/Description	Qty.	Date of Delivery	Location	Condition (0 - working; x - not working)	Frequency of use (rarely, regularly, never)	Problems Encountered/Remarks
E-36-1	Shaker holder	14	2000/7/28	Wet	0	Regularly	
E-37	Mixer for test tube	2	2000/2/15	Wet	0	Regularly	
E-38	Aspirator pump fisher	2	2000/3/31	Wet	0	Regularly	
E-39	Mantle heater for 1000 ml flask	4	2000/2/14	Dry	0	Regularly	
E-40	Dispenser 10-100 ml	4	2000/6/5	Wet	0	Regularly	
E-41	Dispenser 2500 ml	4	2000/6/5	Wet	0	Regularly	
E-45	Graphite Tube for AAS	100	2000/4/26	Dry	0	Regularly	
E-47	Nanopure infinity base system	2	2000/4/13	Wet	0	Regularly	
E-48	Chart recorder	1	2000/6/7	Wet	consumable	Regularly	
E-48-1	Chart paper	5	2001/8/29	Wet	consumable	Regularly	
E-48-2	Chart pins	5	2001/8/29	Wet	consumable	Regularly	
E-49	Screw driver, Philips	1	2000/9/28	Sample	0	Regularly	
E-50	Screw driver, standard	1	2000/9/28	Sample	0	Regularly	
E-51	Open wrench	1	2000/9/28	Maintenance	0	Regularly	
E-52	Back wrench	1	2000/9/28	Maintenance	0	Regularly	
E-53	Digital multimeter	1	2000/9/28	Sample	0	Regularly	
E-54	Clamp meter tester	1	2000/9/28	Maintenance	0	Regularly	
E-55	Diagonal cutting pliers (side cutter), 7"	1	2000/9/28	Sample	0	Regularly	
E-56	Pliers, long nose plier, 8"	1	2000/9/28	Sample	0	Regularly	
E-57	Pliers, flat nose, 8"	1	2000/9/28	Sample	0	Regularly	
E-58	Pliers, 10"	1	2000/9/28	Maintenance	0	Regularly	
E-59	Crimping pliers, 9"	1	2000/9/28	Sample	0	Regularly	
E-60	Locking pliers (vise grip), 7"	1	2000/9/28	Sample	0	Regularly	
E-61	Locking pliers (vise grip), 10"	1	2000/9/28	Maintenance	0	Regularly	
E-62	Wood cutting saw, 20"	1	2000/9/28	Maintenance	0	Regularly	
E-63	Hammer, claw	1	2000/9/28	Sample	0	Regularly	
E-64	Ball peen hammer	1	2000/9/28	Sample	0	Regularly	
E-65	Aluminum ladder, 10 ft	1	2000/9/28	Maintenance	0	Regularly	
E-66	Portable welding machine	1	2000/9/28	Maintenance	0	Regularly	
E-67	Hack saw	1	2000/9/28	Sample	0	Regularly	
E-68	Pipe wrench, 10"	1	2000/9/28	Sample	0	Regularly	
E-69	Pipe wrench, 14"	1	2000/9/28	Sample	0	Regularly	
E-70	Adjustable hook spanner (monkey wrench), 10"	1	2000/9/28	Sample	0	Regularly	
E-71	Adjustable hook spanner (monkey wrench), 15"	1	2000/9/28	Sample	0	Regularly	

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Equipment Inventory Sheet

No.	Item/Description	Qty.	Date of Delivery	Location	Condition (0 - working; x - not working)	Frequency of use (rarely, regularly, never)	Problems Encountered/Remarks
E-72	Wood chisel	1	2000/9/28	Sample	O	Regularly	
E-73	Planer, std. size, electric	1	2000/9/28	Sample	O	Regularly	
E-74	Pipe threader (machine), 1"	1	2000/9/28	Maintenance	O	Regularly	
E-75	Taps and die	1	2000/9/28	Maintenance	O	Regularly	
E-76	Steel tape, 5 m	1	2000/9/28	Sample	O	Regularly	
E-77	Tool box	1	2000/9/28	Sample	O	Regularly	
E-78	Bosch hammer	1	2000/9/28	Maintenance	O	Regularly	
E-79	Auto voltage regulator	2	2000/10/18	Wet	O	Regularly	1 - broke down
E-80	Cylinder tube with Teflon valve 515-17-83-16	1	2000/10/19	Wet	consumable	Regularly	
E-81	Cylinder tube with Teflon valve 5002	3	2000/10/19	Wet	consumable	Regularly	
E-82	Cylinder tube with Teflon valve 5003	3	2000/10/19	Wet	consumable	Regularly	
E-83	Surge killer	3	2001/2/15	Wet	O	Regularly	
E-84	Surge killer	3	2001/2/15	Wet	O	Regularly	
E-85	Parafilm	2	2001/1/22	Wet	consumable	Regularly	
E-86	Filter paper No. 41	10	2001/1/22	Wet	consumable	Regularly	
E-87	Suction pump	1	2001/8/3	Wet	O	Regularly	
Field Equipment							
F-01	Multiparameter water quality monitoring system	6	2000/4/10	Sample	O	Regularly	1 - Given to MGB CAR; 1 - Given to MGB RII
F-02	Filter holder with receiver	10	2000/3/10	Sample	consumable	Regularly	1 - Given to MGB RIV
F-03	Hand-operated vacuum pump	10	2000/3/10	Sample	consumable	Regularly	1 - Given to MGB RIV
F-04	Spectrophotometer	5	2000/4/28	Sample	O	Regularly	1 - Given to MGB CAR
F-04-13	Cylinder, graduated, 25 ml	3	2000/8/11	Sample	consumable	Regularly	
F-04-14	Cylinder, graduated, 250 ml	3	2000/8/11	Sample	consumable	Regularly	
F-04-17	Flask, volumetric, 100 ml	3	2000/8/11	Sample	consumable	Regularly	
F-04-18	Flask, volumetric, 200 ml	3	2000/8/11	Sample	consumable	Regularly	
F-04-19	Flask, volumetric, 250 ml	3	2000/8/11	Sample	consumable	Regularly	
F-04-20	Bel-art safety bulb	3	2000/8/11	Sample	consumable	Regularly	
F-04-21	Pipet, serological, 5 ml	3	2000/8/11	Sample	consumable	Regularly	
F-04-22	Pipet, volumetric, 1 ml	3	2000/8/11	Sample	consumable	Regularly	
F-04-23	Pipette, volumetric, 2 ml	3	2000/8/11	Sample	consumable	Regularly	
F-04-24	Pipette, volumetric, 3 ml	3	2000/8/11	Sample	consumable	Regularly	
F-04-25	Pipette, volumetric, 4 ml	3	2000/8/11	Sample	consumable	Regularly	
F-04-31	Cylinder, graduated, mixing 50 ml w/ glass stopper	3	2000/8/11	Sample	consumable	Regularly	
F-04-38	Funnel, separatory, 500 ml	3	2000/8/11	Sample	consumable	Regularly	

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Equipment Inventory Sheet

No.	Item/Description	Qty.	Date of Delivery	Location	Condition (0 - working; x - not working)	Frequency of use (rarely, regularly, never)	Problems Encountered/Remarks
F-05	Stream flow velocity meter	1	2000/4/12	Sample	O	Regularly	
F-06	Portable laboratory (colorimeter, etc.)	3	2000/6/16	Sample	O	Regularly	
F-07	Grab sampler	6	2000/4/17	Sample	O	Regularly	
F-08	Sludge sampler	6	2000/4/17	Sample	O	Regularly	
F-09	Miners light (UV) lamp	6	2000/5/23	Sample	O	Regularly	
F-10	Florescent dye tracer	6	2000/5/23	Sample	consumable	Regularly	
F-11	Head light system	5	2000/5/4	Sample	O	Regularly	
F-12	Global positioning system, hand-held	4	2000/1/30	Sample	O	Regularly	
F-14-A	Motor (field) vehicle (Nissan Patrol)	2	2000/2/29	MGB	O	Regularly	
F-14-B	Motor vehicle (van), L-300	1	2000/1/27	MGB	O	Regularly	
F-15	Toxic gas monitor (multi gas monitor)	1	2000/2/29	Sample	O	Regularly	
F-16	High-volume air sampler	1	2000/4/5	MGB RVI	O	Regularly	
F-17	Digital video camera	2	2000/2/8	Petrolab	O	Regularly	
F-18	Radio (VHF)	1	2000/2/3	MGB	O	Never	lack necessary permits to be functional
F-19	Constant head permeability test apparatus	1	2000/5/12	Sample	O	Regularly	
F-20	Humboldt universal (standard) penetrometer	1	2000/4/7	Sample	O	Regularly	
F-21	Pneumatic pressure indicator (piezometer)	1	2000/5/4	Sample	O	Regularly	
F-22	Test hammer, Schmidt	1	2000/3/27	Sample	O	Regularly	
F-25	Roof Rack	2	2000/9/4	MGB	O	Regularly	
F-32	Ladder (step board)	2	2000/9/4	MGB	O	Regularly	
F-33	Fog lamp	2	2000/9/4	MGB	O	Regularly	
F-34	Warm (power) winch	1	2000/9/4	MGB	O	Regularly	
F34-1	Chrome combo kit	1	2000/9/4	MGB	O	Regularly	
F-35-A	Radio transmitter/transceiver for base station	1	2000/8/28	MGB	X	Never	lack necessary permits to be functional
F-35-B	Radio transmitter/transceiver for mobile station	1	2000/8/28	Red patrol	X	Never	
F-36	Mirror stereoscope (aerial photo miller)	1	2000/4/7	Sample	O	Regularly	
F-37	Surveying compass	2	2000/4/7	Sample	O	Regularly	
F-38	Hand auger set for heterogenous soils	1	2000/4/7	Sample	O	Regularly	
F-39	Pocket compass	1	2000/7/4	Monito.	O	Regularly	
F-39	Wide mouth sample bottle, 1000 ml	10	2000/8/15	Sample	consumable	Regularly	
F-25	pH test strip, range 0-14	29	2000/8/15	Sample	consumable	Regularly	
F-32	Narrow mouth bottle, 60 ml	200	2000/8/18	Sample	consumable	Regularly	
F-33	Narrow mouth bottle, 125 ml	200	2000/8/18	Sample	consumable	Regularly	
F-34	Narrow mouth bottle, 250 ml	200	2000/8/18	Sample	consumable	Regularly	

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Equipment Inventory Sheet

No.	Item/Description	Qty.	Date of Delivery	Location	Condition (0 - working; x - not working)	Frequency of use (rarely, regularly, never)	Problems Encountered/Remarks
F-35	Narrow mouth bottle, 500 ml	200	2000/8/18	Sample	consumable	Regularly	
F-39	Wide mouth sample bottle, 1000 ml	100	2001/3/27	Sample	consumable	Regularly	
F-40	Economy wash bottle, 250 ml	36	2001/1/22	Sample	consumable	Regularly	
F-41	Economy wash bottle, 500 ml	36	2001/1/22	Sample	consumable	Regularly	
F-42	Slope/W, Geoslope	1	2001/2/19	Sample	O	Regularly	
F-43	Refrigerator	1	2001/9/17	Sample	O	Regularly	
F-44	Chiller (beverage cooler)	1	2001/0/17	MetTD	O	Regularly	
F-45	Air compressor	1	2001/9/16	MetTD	O	Regularly	
F-46	Air conditioner	2	2001/9/17	Sample	O	Regularly	
F-47	Trinocular microscope	1		Sample	O	Regularly	
F-48	Portable ductless fume hood	1		MetTD	O	Regularly	
F-48-1	Optional lighting fixture	1		MetTD	O	Regularly	
F-48-2	Filter saturation alarm	1		MetTD	O	Regularly	
F-48-3	Glass work surface/Spill tray	1		MetTD	O	Regularly	
F-48-4	Replacement filter	1		MetTD	consumable	Regularly	
F-48-5	Replacement filter	1		MetTD	consumable	Regularly	
F-J-1	Mercury analyzer PM-2	1	2000/6/24	Sample	O	Regularly	
F-J-2	Mercury analyzer EPM-1	2	2000/6/24	Sample	O	Regularly	
F-J-3	Pack test, Cu	3500	2000/7/4	Sample	consumable	Regularly	
F-J-4	Pack test, Cr	3500	2000/7/4	Sample	consumable	Regularly	
F-J-5	Pack test, CN	3500	2000/7/4	Sample	consumable	Regularly	
F-J-6	Pack test, As	3500	2000/7/4	Sample	consumable	Regularly	
F-J-7	Pack test, Fe	3500	2000/7/4	Sample	consumable	Regularly	
F-J-8	Pack test, Zn	3500	2000/7/4	Sample	consumable	Regularly	
F-J-9	Surveying compass	1	2000/7/4	Sample	O	Regularly	
F-J-11	Measure, stainless 50m	1	2000/7/4	Sample	O	Regularly	
F-J-12	Measure, tape 50m	1	2000/7/4	Sample	O	Regularly	
F-J-13	Clino compass	1	2000/7/4	Sample	O	Regularly	
F-J-14	Water quality checker	1	2000/7/4	MetTD	O	Regularly	
F-J-15	Soil pH meter	1	2000/7/4	Sample	O	Regularly	
F-J-16	Altimeter	1	2000/7/4	Sample	O	Regularly	
F-J-17	Pack test, pH	3500	2000/7/4	Sample	consumable	Regularly	
F-J-18	Pack test, pH-BCG	3500	2000/7/4	Sample	consumable	Regularly	
F-J-19	Pack test, pH-TBL	3500	2000/7/4	Sample	consumable	Regularly	

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Equipment Inventory Sheet

No.	Item/Description	Qty.	Date of Delivery	Location	Condition (0 - working; x - not working)	Frequency of use (rarely, regularly, never)	Problems Encountered/Remarks
F-J-20	Pack test, Fe ²⁺	3500	2000/7/4	Sample	consumable	Regularly	
F-J-21	Sample bag 15*30cm	1000	2000/7/4	Sample	consumable	Regularly	
F-J-22	Sample bag 20*40cm	500	2000/7/4	Sample	consumable	Regularly	
F-J-23	Sample bag 30*45cm	500	2000/7/4	Sample	consumable	Regularly	
F-J-24	Sample bag 10*20cm	1000	2000/7/4	Sample	consumable	Regularly	
F-J-25	pH/conductivity meter	2	1999/8/20	Sample	O	Regularly	
F-J-26	Tin (II) Chloride Dihydrate (100g)	1	2001/1/11	Sample	consumable	Regularly	
F-J-27	Consumable apparatus for Mercury analyzer PM-2	1	2001/1/11	Sample	consumable	Regularly	
F-J-28	Sludge sampler eggman	1	2001/1/11	Sample	O	Regularly	
F-J-29	Color comparison set (water color meter)	1	2001/1/11	Sample	O	Regularly	
F-J-30	Ekman-Berge dredge (bottom) sampler	1	2001/1/27	Sample	O	Regularly	
F-J-31	Van Dorn water sampler	1	2001/7/27	Sample	O	Regularly	
F-J-32	Water tester "Simple Pack"	3		Sample	consumable	Regularly	
F-J-33	pH Meter	1	2001/7/27	Sample	O	Regularly	
F-J-34	pH test strip, roll-type	2	2001/7/27	Sample	consumable	Regularly	
F-J-35	Thermometer, digital	1	2001/7/27	Sample	O	Regularly	
F-J-36	Thermometer	3	2001/7/27	Sample	O	Regularly	
F-J-37	Slide glass	3	2001/7/27	Sample	consumable	Regularly	
F-J-38	Micro cover glass	5	2001/7/27	Sample	consumable	Regularly	
F-J-39	Hot plate	1	2001/7/27	Sample	O	Regularly	
F-J-40	Centrifuge	1	2001/7/27	Sample	O	Regularly	
F-J-41	Tube, centrifuge	1	2001/7/27	Sample	O	Regularly	
F-J-42	Test tubes	1	2001/7/27	Sample	consumable	Regularly	
F-J-43	Test tubes Stand	5	2001/7/27	Sample	O	Regularly	
F-J-44	Pipette	1	2001/7/27	Wet	consumable	Regularly	
F-J-45	Mountmedia	1	2001/8/2	Sample	consumable	Regularly	
F-J-46	Parts kit for mercury measurement	1	2001/10/30	Sample	consumable	Regularly	
F-J-47	Impinger outer pipe	1	2001/10/30	Sample	consumable	Regularly	
F-J-48	Impinger inner pipe	1	2001/10/30	Sample	consumable	Regularly	
F-J-49	6-4 dia. joint	2	2001/10/30	Sample	consumable	Regularly	
F-J-50	Joint for filter	1	2001/10/30	Sample	consumable	Regularly	
F-J-51	Filter	1	2001/10/30	Sample	consumable	Regularly	
F-J-52	Tube	2	2001/10/30	Sample	O	Regularly	
F-J-53	Standard gas box	1	2001/10/30	Sample	O	Regularly	

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Equipment Inventory Sheet

No.	Item/Description	Qty.	Date of Delivery	Location	Condition (0 - working; x - not working)	Frequency of use (rarely, regularly, never)	Problems Encountered/Remarks
F-J-54	Field notebook	100	2001/10/30	Sample	consumable	Regularly	
Office Equipment							
G-01	Desktop computer	6	2000/2/23	Petrolab	O	Regularly	
G-02	Laptop computer	3	2000/2/23	Petrolab	X	Regularly	
G-03	Color printer	2	2000/2/23	Petrolab	O	Regularly	
G-04	Laser printer	2	2000/2/23	Petrolab	O	Regularly	
G-05	Scanner	2	2000/2/23	Petrolab	O	Regularly	
G-07	Copy machine	1	2000/1/14	Petrolab	O	Regularly	
G-09	Multimedia projector	1	2000/1/20	MESD	O	Regularly	
G-10	Opaque projector	1	2000/1/20	Petrolab	O	Regularly	
G-13	Glass cabinet	14	2000/4/11	Petrolab	O	Regularly	
G-14	Sliding door cabinet	7	2000/4/17	Petrolab	O	Regularly	
G-15	Drawer cabinet	7	2000/4/17	Petrolab	O	Regularly	
G-16	Air conditioner	3	2000/3/15	Petrolab	O	Regularly	
G-17	Printer kit for Able 3221	1	2000/8/17	Petrolab	O	Regularly	
G-19-1	D-Link 16 port hub 10 base T	2	2000/8/17	Petrolab	O	Regularly	
G-19-2	Category 5 pair twist cable	1	2000/8/17	Petrolab	O	Regularly	
G-19-3	Network installation	1	2000/8/17	Petrolab	O	Regularly	
G-20	D-Link 10 base T LAN card	5	2000/8/17	Petrolab	O	Regularly	
G-21	Flash pass for digital camera	2	2000/8/11	Petrolab	O	Regularly	
G-23	Norton Antivirus 2000 Ver. 6.0	5	2000/8/30	Petrolab	O	Regularly	
G-24	Paper cutter	2	2000/8/11	Petrolab	consumable	Regularly	
G-25	Binding machine	2	2000/8/11	Petrolab	O	Regularly	
G-26	CD RW 9100i, HP	1	2000/8/26	Petrolab	O	Regularly	
G-27	Hi-Fi stereo VCR	1	2000/8/3	Petrolab	O	Regularly	
G-28	Windows 2000 Fujii product	5	2000/8/26	Petrolab	O	Regularly	
G-29	MS Office 2000 Fujii product Professional	5	2000/8/26	Petrolab	O	Regularly	
G-30	Double door cabinet	2	2000/12/5	Petrolab	O	Regularly	
G-31	Sliding glass door cabinet	2	2000/12/5	Petrolab	O	Regularly	
G-32	Uninterrupted power supply (UPS)	6	2001/1/30	Petrolab	O	Regularly	
G-33	Mimio de luxe set (computer board)	1	2001/7/26	Petrolab	O	Regularly	
G-34	Visual system presenter	1	2001/8/1	Petrolab	O	Regularly	
G-J-01	Laptop computer	5	1999/8/20	Petrolab	X	Regularly	
G-J-02	Digital camera	2	1999/8/20	Petrolab	O	Regularly	

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Equipment Inventory Sheet

No.	Item/Description	Qty.	Date of Delivery	Location	Condition (0 - working; x - not working)	Frequency of use (rarely, regularly, never)	Problems Encountered/Remarks
G-J-03	Camera (EOS Kiss II)	1	1999/8/20	Petrolab	X	Regularly	
G-J-04	Camera lens 20-80 mm	1	1999/8/20	Petrolab	X	Regularly	
G-J-05	Compact camera	1	1999/8/20	Petrolab	O	Regularly	
G-J-06	PCMCIA LAN card	5	1999/8/20	Petrolab	O	Regularly	
G-J-07	Helmet	5	1999/8/20	Sample	O	Regularly	
G-J-08	Mask	5	1999/8/20	Sample	O	Regularly	
G-J-09	Transformer, input: AC 110-240V	5	1999/8/20	Petrolab	O	Regularly	
G-J-10	IO data Hub	1	1999/8/20	Petrolab	O	Regularly	
G-J-11	Printer Epson PM-770	1	1999/8/20	Petrolab	O	Regularly	
G-J-12	Scanner, FB620U	1	1999/8/20	Petrolab	O	Regularly	
G-J-13	Digital camera C-2000 zoom	1	1999/8/20	Petrolab	O	Regularly	
G-J-14	Software Logovistax	1	1999/8/20	Petrolab	O	Regularly	
G-J-15	Software Access '97 Japanese	1	1999/8/20	Petrolab	O	Regularly	
G-J-16	Software Power Point '97 Japanese	1	1999/8/20	Petrolab	O	Regularly	
G-J-17	Software Ichitaro Japanese	1	1999/8/20	Petrolab	O	Regularly	
G-J-18	Software Windows '98 Japanese	1	2000/11/10	Petrolab	O	Regularly	
G-J-19	Desktop computer	5	2001/3/28	Petrolab	O	Regularly	
G-L-01	Windows type air conditioners	12	2001/6/13	Petrolab	O	Regularly	
G-L-02	Air conditioner	1	2001/6/13	XRF	O	Regularly	
G-L-03	Air conditioner	1	2001/6/13	Wet	O	Regularly	
G-L-04	Water pump	2	2001/6/13	Petrolab	O	Regularly	

Note:

Present Location:

Wet : Wet chemical laboratory

Dry : Dry chemical laboratory

Sample : Sample preparation room

MetTD : Metallurgical Technology Division

MESD : Mining Environment and Safety Division

ANNEX 3

List of Philippine Counterpart Personnel

Counterpart Personnel	Position During Project	Current Position Within MGB	Trained in Japan? (Yes or No)
Administrative Counterparts			
Horacio Ramos	Director, MGB (Project Director)	Reassigned Within DENR	No
Edwin Domingo	Asst. Director (Project Manager)	Same	No
Reynaldo Zabala	SSRS, MESD (Project Coordinator)	SSRS	No
Geronimo Badulis, Jr.	SSRS (Project Coordinator)	SSRS	Yes
Michael Cabalda	Division Chief, MESD (Technical Consultant – Environment)	Division Chief, MESD	No
Romeo Almeda	Division Chief, LGD Technical Consultant – Geology	Migrated to USA	No
Juancho Pablo Calves	Division Chief, METD Technical Consultant – Metallurgy	Division Chief, METD	No
Roland De Jesus	Division Chief, Finance (Financial Advisor)	Division Chief, Mining Tech. Division	No
Technical Counterparts			
Teresita Balmes	SSRS, Petrolab (Team Leader, Envi Chemical Analysis Group)	SSRS	Yes
Eleonor Lobendino	SSRS, Petrolab	SRS II	No
Sylvia Alcantara	SSRS, CAR	SSRS	No
Helen Carbonnel	SSRS, CAR	Head, Analytical Lab, Reg. 1	No
Joycelyn Taal	SSRS, MTD	Sr.SRS	No
Leticia Santos	SSRS, Petrolab	Sr.SRS	Yes-Shimadzu Factory
Leonisa Lecitivo	Chemist IV, Reg IV	Chemist IV	No
Edmon Dino	SSRS, MESD	Migrated to Australia	Yes
Virgilio Soriano	Engineer III, METD	Supervising Metallurgist	Yes
Alvin Lucio Fernando	SSRS, LGSD	Sr.SRS	Yes

Lolit Broces	SSRS, LGSD	Supervising SRS	No
Jamesie Yadao	Eng. III, Reg IV		
David Pagalilauan	SSRS, MESD		
Juliet Miguel	SSRS, MESD	Migrated to USA	Yes
Rey Perucho	Engineer III, METD		
Cyril Viscano	SSRS, MESD	Sr. SRS	Yes
Paulo Tidalgo	SSRS, MESD	Resigned	Yes
Mario Alban	SSRS, Reg IV	Engineer III	No
Jeremiah Benito	SSRS, MESD		No
Lilian Rollan	SSRS, Petrolab	SSRS	Yes
Ellen Grace Galiste	Engineer IV, MEID	Engineer IV	No
Digna Evangelista	SSRS, Petrolab	Sr.SRS	No
Alicia Umerez	HRMO III, Admin	Retired	No
Rodolfo Sestene	Lab Tech II	Lab Tech II	No
Virginia Briones	SEMS	SEMS	No