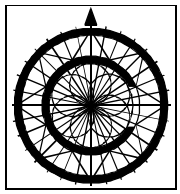

CHEMONICS INTERNATIONAL INC.

INDUSTRIAL INITIATIVES FOR A SUSTAINABLE ENVIRONMENT

Contract No. 492-C-00-98-00029-00

Contract Completion Report

Submitted to:
USAID

Submitted by:
Chemonics International Inc.

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ACRONYMS AND ABBREVIATIONS

AIM	Asian Institute for Management
ARMI	Assistance for Resource Monitoring and Information (USAID project)
BOI	Board of Investments
CD	compact disk
CEO	chief executive officer
CP	cleaner production
DAO	departmental administrative order
DBP	Development Bank of the Philippines
DENR	Department of Environment and Natural Resources
DOST	Department of Science and Technology
DTI	Department of Trade and Industry
EMB	Environmental Management Bureau (DENR)
EMS	environmental management systems
EMSAP	environmental management systems accreditation program
GIS	Geographic Information System
GOP	Government of the Philippines
IEC	information, education and communication
IEMP	Integrated Environmental Management Project (USAID)
IER	initial environmental review
IISE	Industrial Initiatives for a Sustainable Environment (USAID project)
ISO	International Organization for Standardization (Switzerland)
JIP	joint EMS implementation training program
KRA	key result area (EMB/DENR)
LBP	Land Bank of the Philippines
LGU	local government unit
M&E	monitoring and evaluation
MIS	management information system
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NCC	National Credit Council
NGA	national government agency
NGO	non-government organization
PATLEPAM	Philippine Association of Tertiary Level Educational Institutions on Environmental Planning and Management
PEPP	Philippine Environmental Partnership Program
PICPA	Philippine Institute of Certified Public Accountants

P2	pollution prevention
QA/QC	quality assessment/quality control
SME	small and medium enterprise
TA	technical assistance
ULAP	Union of Local Authorities of the Philippines
USAID	United States Agency for International Development
US-AEP	United States-Asia Environmental Partnership
USP	University of the Southern Philippines

Executive Summary

Executive Summary

1. Background

The strategic objective that guided the IISE project throughout its life was the "reduction of pollution among participating firms." Ultimately the success of the project was to be established by the achievement of some very specific results: a minimum of 400 industries practicing cleaner production/environmental management (including 200 businesses certified to ISO 14001 or an internationally recognized equivalent), and a 20 percent reduction of current levels of industrial pollution of participating industries in the 8 impact areas. In September 2000, the project was reduced in duration and budget, and the targeted results were reduced to 300 firms, 75 with EMS certification, with the pollution-reduction target of 20% remaining unchanged. At this time, the focus of the project was also re-directed much more to one of institutional capacity-building within selected government, training and private sectors, to increase their capability to promote cleaner production/environmental management. This summary will focus on the project's achievement of contractual targets, successes and impacts and some of the unique approaches and tools that were developed to support the project.

2. Achievement of Contractual Targets

EMS implementations. At the conclusion of the project, 297 organizations were implementing an EMS. This number represents well more than half of the current total EMS implementations in progress in the Philippines. A major impact of this accomplishment is that the Philippines now has nearly three hundred organizations that are now advocators of environmental self-regulation, as well as commitment to reduced environmental impact and pollution.

EMS certifications. Of the 297 firms, 25 have achieved ISO 14001 certification of their EMS. This represents more than one-quarter of total EMS certifications in the Philippines. Without question, IISE has had a greater single impact in promoting ISO- certified EMS in this country than any other program, corporate mandate or other motivating factor. IISE's awareness campaigns, auditor training, and hands-on support to firms solidified and expanded future demand for EMS throughout the Philippines.

Pollution reduction. Studies of the demonstration industries that participated in IISE have shown that a properly implemented EMS can result in pollution reduction. Sectors involved included power, cement, furniture manufacturing and food processing. All ten-demonstration industries completed their aspects/impacts assessment in conjunction with implementation of their EMS. Their initial P2/CP assessments identified a combined total of more than 60 P2/CP waste streams and options for pollution reduction. These included: heavy metals, used oils, acids, caustic substances, cyanide, hexavalent chromium, mercury, dissolved and suspended solids, volatile organic compounds, solids and plating wastes. All ten industries were implementing system-wide pollution-reduction and P2/CP actions scheduled in their EMS by the conclusion of the

project. Initial pollution-reduction rates achieved by some of these firms for individual waste streams targeted for reduction in their EMSs ranged from 7% to 82%.

3. Successes and Impacts

Box 1 on the following pages lists 21 activities supported by IISE. Each of these activities constitutes a new and continuing initiative of the project that directly promotes the adoption and spread of cleaner production and environmental management in the Philippines. Significantly, these initiatives have been incorporated into a wide range of Filipino agencies, institutions, organizations and industry, which ensures the institutionalization of key project activities, and continued progress towards IISE objectives.

Box 1. IISE Success and Impacts within Selected Sectors

Industry and Environmental Consulting Firms

- ✓ *175 firms implementing an EMS*. This represents at least one-half of the current total EMS in progress in the Philippines, and has greatly expanded the core group of EMS advocators within industry itself.
- ✓ *25 firms ISO-14001 certified*. This represents more than one-quarter of total EMS certifications in the Philippines, who themselves are now advocating certified EMS.
- ✓ *Verification that a properly implemented EMS can result in pollution reduction*. Pollution reduction has already been achieved by several of the IISE demonstration industries including those in the power, cement and furniture-manufacturing sectors. Through their EMSs, impacts (waste streams) were identified, reduction-targets and timelines were established, resources were committed, and the reductions were achieved, demonstrating the value of EMS in reducing pollution.
- ✓ *Verification that an EMS can produce savings well in excess of implementation costs*. The same demonstration industries have reported savings resulting from reductions in production materials, fuel, and associated waste-disposal costs, motivating other organizations to view EMS as a means of saving money.
- ✓ *49 environmental professionals trained in EMS, P2/CP and EMS auditing*. These professionals are now not only able to provide improved services themselves, but also serve as an effective EMS advocacy group through their efforts to promote their services. While the majority of these consultants are located in Luzon, some are also based in Cebu and eastern Mindanao, providing industry with access to local consultants
- ✓ *13 environmental consulting firms with expanded experience in EMS/CP*. These firms participated in IISE-sponsored training through the attendance of their technical staff. The majority of these firms were also subcontracted to provide EMS training and implementation assistance through the IISE JIP (see Appendix E for listing).
- ✓ *75% reduction in the cost of EMS implementation consulting*. The cost of EMS-implementation consulting has been dramatically lowered through the training and increased availability of Filipino consultants. They work at daily rates that are typically one-quarter of those of foreign consultants, and both international and in-country travel and per diem costs are greatly reduced through the use of locally based consultants.

Government Agencies (EMB/DENR, BOI & BPS/DTI)

- ✓ *EMB/DENR and BOI/DTI are the first NGAs to implement an EMS*. This establishes leadership and an example for the constituency (industries) they regulate, as well as enhanced understanding of benefits and hurdles to implementing EMS/CP and first-hand knowledge of how to promote this process.
- ✓ *EMB establishes a national industrial environmental management GIS*. This is a major step forward in developing a unified, accessible and user-friendly information-management system to support knowledgeable decision-making and environmental management.
- ✓ *Three national policies poised to promote EMS implementation*. EMS provisions have already been incorporated into the Clean Air Act and the reviewed Environmental Impact Assessment (EIA) DAO. A draft DAO that would provide regulatory assistance in exchange for EMS implementation awaits the signature of the Secretary. If/when implemented, these policies will greatly increase the adoption of EMS/CP in a wide range of industry sectors throughout the country.
- ✓ *One regional policy (Bohol Investment Code) promotes environmental investment*. This policy is already in effect in the Province and guides development investments in the direction of increased environmental responsibility and reduced impact.

- ✓ *DENR position paper on fiscal incentives to promote EMS*. This was developed from a study supported by IISE and was formulated to support House Bill 10596 that would restructure fiscal incentives under the Omnibus Investment Code of 1987 to stimulate the adoption of EMS/CP by industry through fiscal incentives.
- ✓ *Proposed DENR resolution on financial incentives*. This was developed from a study supported by IISE and was formulated as a resolution to the National Credit Council on "Revising the terms for the availment [sic] of the credit facilities for environmental projects by participating financial institutions," which would provide a mechanism for helping overcome the "cost barriers" to adoption of EMS/CP.
- ✓ *The Province of Bohol achieves ISO 14001 certification*. Bohol led the way as the first province to have its EMS certified. Eight departments under its supervision participated in the EMS program, which will be expanded to include additional departments. Since then, IISE consultants have been approached by other LGUs wishing to follow the example set by the Province of Bohol.

Professional and Academic Training Institutions

- ✓ *Asian Institute for Management achieved ISO 14001 certification*. AIM became the first EMS certified training institution in Philippines. This is significant in that AIM's clientele include chief executive officers (CEOs) and other senior executives who are in the position of deciding if their institutions will implement an EMS.
- ✓ *University of Southern Philippines (USP-Cebu) Environmental Management Program established*. IISE contributed to both the design of USP's new program, as well as providing senior technical staff who taught portions of the curriculum during the first year of the program's implementation. Through this, USP because the first university in the Philippines to incorporate EMS training into a degree program and to expand EMS training from the private to the public sector.

Private/Public Consortia and NGOs

- ✓ *National EMS Accreditation Program (EMSAP) promoted*. IISE advocated the formation of an EMSAP and provided support to the development of some of its components (Figure 2). If completed, this system will greatly lower the cost (and barrier) to EMS certification/re-certification, and through this promote EMS/CP.
- ✓ *EMS advocacy partnerships established with NGOs*. IISE worked with the consortium of NGOs under the ARMI project to promote EMS/CP. These NGOs are continuing this work in the project's primary implementation sites in Cebu, Bohol and Davao. The two groups also collaborated to produce the Communicators Training Manual that will be used by the IEC sections of the PEPP partners.
- ✓ *IISE website created and continued*. The website was designed to support the full range of project activities through IEC. At the conclusion of the project, stewardship of the website was transferred to the Ramon Aboitiz Foundation, which is continuing to promote EMS/CP through this vehicle.
- ✓ *PEPP conceived and formed with IISE support*. The purpose of the PEPP in promoting improved environmental management and IISE support to the program is documented in our quarterly reports and compact disc on the PEPP.
- ✓ *Earth Charter founded*. Designed and developed with the assistance of IISE, the Earth Charter is composed of more than 30 member organizations, primarily industry but also including professional organizations, chambers of commerce, and other interested organizations. Its purpose is to promote improved environmental management through a pyramid-training scheme designed to reach out to hundreds of firms throughout the Visayas.

Lowering the cost of EMS. The single most important hurdle to EMS implementation is cost. One of IISE's most significant achievements was lowering the cost of EMS and P2/CP consulting. By training local professionals to international standards, the project created a cadre of well qualified Filipino experts that has reduced the dependence of EMS implementers on foreign-based consultants. In some cases, daily consulting rates were reduced by 75%. This in turn, has stimulated the demand for EMS and P2/CP because these consulting services are now so much more affordable to SMEs.

Advocating EMS. IISE also greatly expanded and strengthened the scope and numbers of organizations that can advocate EMS and P2/CP. These include government agencies, financial and training institutions, NGOs, and private environmental consulting groups. At the conclusion of the project, these organizations are continuing to advocate improved environmental management in the Philippines.

Expanding EMS to the public sector. When IISE began in 1998, EMS was viewed as a primarily private-sector venture. But with the assistance of IISE, EMS implementation, and in some cases certification to ISO 14001 was expanded to the government sector (two agencies), the financial sector (one bank), the training sector, and very importantly to LGUs. With project support, the Province of Bohol became the first LGU in the Philippines to implement an ISO-certified EMS, and more than a dozen more LGUs are progressively implementing an EMS.

4. Innovative Approaches and Tools

When Chemonics was contracted by USAID in July 1998 to manage the IISE project, the ISO 14001 international standard had been in existence for less than two years (it was ratified by the International Organization for Standardization in September 1996). And when the project began, the target of 200 industries with an ISO-certified EMS constituted about one-third of the total ISO certifications, worldwide.

Chemonics and its partners faced serious barriers to assuring the adoption of such a new environmental standard by so many companies, and in particular SMEs operating on very limited budgets with no internal/external mandates to adopt and certify and EMS. To meet these challenges, Chemonics developed more than 30 unique approaches and tools for promoting the implementation and certification of EMS [Box 2 below]. These approaches and tools accelerate and ensure the process of successful EMS installation, while at the same time reduce the cost of implementing the EMS.

These approaches and tools addressed four areas of concern that will be generic and relevant to most programs that are intended to promote improved environmental management and pollution reduction. The areas are: EMS implementation and certification; IEC support to the program; measure for promoting policy support to EMS adoption; and, capacity-building within sectors that are well positioned to advocate EMS and P2.CP. The basic approach/tool and its significance to these areas are highlighted in Box 2 on the following page.

Chemonics also developed some practical and inexpensive techniques for measuring and quantifying pollution reduction and the concurrent reduction in environmental “risk.” These techniques are described in our technical publications. We also evaluated several sectors, including mining, and the overall system of public and private laboratories in the Philippines. Handbooks for EMS implementation in the private and LGU sectors are also being prepared for future publication.

In summary, despite the challenges faced by IISE in promoting an environmental management scheme new to the Philippines, meeting ambitious targets, and accomplishing all this within a greatly reduced timeframe and budget, the project can claim many successes and impacts. Our innovative approaches and tools can be used by others to promote EMS adoption, certification and pollution reduction. And, perhaps most significantly, the bulk of the project’s initiatives have been institutionalized into a wide range of public and private sectors, thereby assuring continued progress towards IISE’s strategic objective for years to come.

Box 2. Approaches and Tools Developed by Chemonics to Promote EMS implementation and Certification

EMS-Implementation Tools Developed by IISE	
Tool	**Significance**
➢ Joint EMS Implementation Program (JIP)	➢ Significantly reduces EMS training and implementation costs and promotes sharing of lessons learned
➢ Custom-tailored standard operating procedures (SOPs) for EMS implementation	➢ Ensures efficient and full implementation of EMS components
➢ Quality Assurance/Quality Control (QA/QC) processes	➢ Ensures that the EMS and document deliverables will meet certification standards
➢ Confidentiality and contracting agreements	➢ Promotes trust and protects individual interests among cooperating groups (e.g., consultants, firms, donors, regulators)
➢ Specialized understanding of environmental permitting process and regulatory standards for operation	➢ Reduces time and costs associated with obtaining environmental operating permits and establishing systems that meet regulatory standards
➢ Detailed knowledge of fiscal and financial programs/incentives available to support EMS	➢ Increases access of firms to fiscal and financial support for their EMS
➢ Custom-tailored MOUs/MOAs with national and local government agencies	➢ Streamlines inter-agency cooperation and action
➢ Teaming arrangements with Chambers of Commerce and professional organizations	➢ Enlists participation by networking and facilitates the sharing of EMS implementation experiences and best practices among industries
EMS Information, Education and Communication Tools Developed by IISE	
Tool	**Significance**
➢ Website (visit www.iise.org)	➢ Provides worldwide access to progress, methods, and findings related to EMS/CP
➢ List serve with more than 1000 entries	➢ Promotes wide base of interest and support to the project
➢ Monthly newsletter	➢ Keeps subscribers abreast of most recent developments in methods, findings, recommendations
➢ “Fact Sheets”	➢ Provides accurate and succinct summaries of key components of EMS, P2/CP, etc
➢ News Features”	➢ Focus interest on important issues
➢ “Success Stories”	➢ Advertises the value of EMS and promote EMS champions among implementing organizations
➢ Green Gauge Survey	➢ Measures current environmental awareness, priorities, and IEC needs among a wide range of influential political, industry, and social leaders
➢ Survey of ISO 14001 certified industries	➢ Identifies drivers, hurdles and solutions, and best practices among early EMS implementers

EMS Information, Education and Communication Tools Developed by IISE	
Tool	**Significance**
➢ Handbook for EMS implementation by industry	➢ Summarizes and provides an experience-based template for others to follow, capitalizing on best practices and reducing time and costs
➢ Handbook for EMS implementation by LGUs	➢ Highlights the success of LGU leaders and explains the process so others may emulate
➢ Summary of EMS drivers for Philippine industries	➢ Identifies what does/does not motivate Philippine industries to implement EMS/CP
➢ File clippings from media coverage of IISE	➢ Transferred to website to increase exposure of project and organizational successes
➢ CDs on EMS, PEPP, P2/CP and other topics	➢ Provides inexpensive and easily distributed information on a wide range of project activities
EMS Policy-Support Mechanisms and Tools Developed by IISE	
Tool	**Significance**
➢ Establishment of policy-development support groups in Manila, Cebu and Davao	➢ Focuses expertise and a wide base of support on policy issues and initiatives to promote EMS/CP
➢ Guidance in establishing the Philippine Environmental Partnership Program (PEPP)	➢ Created a base of support for EMS/CP among 8 key government, financial, training and advocacy organizations
➢ Development of MOUs/MOAs DENR, LGUs, and Chambers of Commerce	➢ Created the actual mechanisms for cooperation and outlined individual roles and responsibilities
➢ Assistance to DENR in modifying/developing DAOs to encourage EMS adoption by industry	➢ Provides the actual policy instrumentation instruments to enable the DENR to promote EMS/CP
➢ Production of “Policy Synopses” describing subjects such EMS and the Clean Air Act	➢ Provided accurate and succinct summaries of how EMS and policies interrelated, and publicized these programs
➢ Technical report and DENR position paper on fiscal incentives to promote EMS	➢ Supported DENR’s efforts to develop fiscal incentives to encourage EMS/CP
➢ Technical report and resolution for the National Credit Council on financial incentives to promote EMS	➢ Supported DENR’s efforts to develop financial incentives among financial institutions to encourage EMS/CP
EMS Institutional Capacity-Building Processes and Tools Developed by IISE	
Tool	**Significance**
➢ Support to the formation of the Philippine Environmental Partnership Program (PEPP)	➢ The PEPP is a collation of eight member organizations from government, financial, political, and training sectors that is focused on developing approaches to supporting EMS/CP
➢ Assistance to the design and development of components of a national EMS accreditation Program (EMSAP)	➢ A national EMSAP will greatly reduce of the cost of EMS certification and periodic surveillance and re-certification costs, thereby encouraging the spread of certified EMS
➢ Design and administration of an EMS-auditor training and supervised live-audit program	➢ A cadre of certified Filipino EMS auditors and EMS lead auditors will also reduce the cost of EMS certification/re-certification and promote EMS

EMS Institutional Capacity-Building Processes and Tools Developed by IISE	
Tool	**Significance**
➢ Assistance with the production of an EMS Communicators Training Manual	➢ This manual will be an effective means of training EMS advocators, based on hands-on experience with EMS in the Philippines
➢ Development of EMS training programs	➢ These programs were developed, tested and refined under IISE and can serve as templates for increasing the number of qualified consultants, as well as general understanding of EMS/CP

IISE Contract Completion Report

Industrial Initiatives for a Sustainable Environment

1. Perspective

This section provides a brief, but necessary overview of the project's background and the institutional context within which the project was envisioned, initiated and evolved.

1.1 Project Background, Objectives, and Evolution

Chemonics International was awarded the Municipal Coastal Environmental Initiative by the United States Agency for International Development (USAID) on 24 July 1998. MCEI was designed as a five-year effort to operate in the Visayas and Mindanao regions of the Philippines, and was to focus on small- and medium-sized industries (SMEs) emitting toxic and hazardous wastes. The project was later renamed Industrial Initiatives for a Sustainable Environment (IISE) to reflect the importance of working closely with industry and the relative reduction in the emphasis on municipalities.

The project was designed as a follow-on to the Industrial Environmental Management Project (IEMP). This $24 million project made substantial inroads implementing pollution prevention technologies at the firm level, but was unable to develop strategies or mechanisms for continuing project-initiated activities beyond the project's termination. Furthermore, these pollution-prevention interventions were not the result of a systematic and integrated internal review of all environmental aspects and impacts resulting from the firms operations, goods and services. It was assumed that a project emphasizing cleaner production and pollution prevention within an environmental management system, which harnessed market-based incentives, had a better chance of encouraging lasting environmental investments.

IISE was conducted as an activity within the USAID/Philippines Strategic Objective No. 4, which was to "promote enhanced management of renewable natural resources." The IISE activity was originally seen as a complementary component within the SO4's Intermediate Result 1: "sustainable management of coastal resources."

The Development Activity Approval Document (DAAD) – the seminal design document upon which the activity and contractor selection was based – included a similar results framework and specified many of the anticipated results and suggested indicators. Ultimately the success of the activity was to be established by the achievement of some very specific results that were the contractor's responsibility:

- A minimum of 400 industries practicing environmental management systems/ cleaner production (EMS/CP) (including 200 ISO 14001 certified businesses)

- A 20 percent reduction of current levels of industrial pollution of participating industries in the 8 impact areas

While the contract stipulated that final results for which the contractor was to be held accountable were to be "adjusted upward or downward as a result of baseline data obtained after the contract was awarded," Chemonics chose to honor these ambitious targets under the assumption that at least four years would be available to produce the primary results bulleted above.

The strategic objective, which guided the IISE project throughout its life, was the "reduction of pollution among participating firms." This was supported by an Activity objective supporting the development and implementation of environmental management systems (EMS). In turn, the Activity objective was supported by three essential and interrelated sub-results: 1) enhanced community awareness of EMS, 2) development of policy incentives, which favored EMS adoption, and by 3) installing the institutional capacity to support the adoption EMS (Table 1).

Table 1. IISE Results Framework

Strategic Objective. Reduction of pollution among participating firms		
Activity Result. EMS/CP implemented in designated sites and industries		
Sub-Result 1 Enhanced community awareness of EMS/CP through IEC	**Sub-Result 2** Policy incentives favoring adoptions of EMS/CP established	**Sub-Result 3** Institutional capacity (DENR, DTI, private sector) to support adoption of EMS/CP installed

Some confusion arose in that the contract language variously described the objectives of the IISE activity as "*promoting the spread of cleaner production technology, establishing the onset of sustainable industrial pollution management, promoting the spread of EMS/CP, and enhancing the Government of the Philippines management of renewable natural resources.*"

Also, within the first year of operations, several changes in technical direction and institutional changes within the Philippines led the USAID project management team to revisit the nature and scope of the project. It became apparent that it was neither likely nor desirable that the contractor single-handedly undertake all of the targets; real and lasting results could only be measured by the extent to which the contractor was able to establish the human capacity and enabling institutional environment for EMS implementation. Consequently, additional emphasis was needed on national policy and institutional strengthening within the Department of Environment and Natural Resources (DENR) and Department of Trade and Industry (DTI), which laid the groundwork for the establishment of the Philippine Environmental Partnership Program (PEPP).

In September 2000, approximately two years after project initiation, the contract was amended and reduced from four to three years in duration. Significantly, the budget was also reduced from $8.4 million to $6 million, and the contract type was changed from a cost reimbursement that used performance-based contracting methods, to a cost-plus-fixed-fee arrangement.

In the same contract modification the Philippines Coast Guard was removed as a principal project counterpart due to concerns about this agency's ability to internalize environmental management systems and resource constraints. The Environment Management Bureau (EMB) of the Department of Environment and Natural Resources (DENR) also assumed the GOP's titular responsibility for project execution.

To ensure that the project achieved its targets, the project's geographic focus was also expanded to cover all of the Philippines, and thematically enlarged to include any firm in the agro-industrial sector in which EMS could be implemented in a cost-effective manner. While the project continued its focus on SMEs, other targets of opportunity including large and multinational firms were allowed to participate. Furthermore, national government agencies (NGA) and local government units (LGU) that implemented EMS with IISE assistance could also be scored. In addition, organizations that were signatories to the PEPP, which IISE helped to create and manage, were also designated as eligible targets for meeting contract results. Finally, it was agreed that companies which established EMS programs, or received certification with assistance of private consultants who had completed and passed all of IISE's training components, could be counted. This was a true measure of institutionalization of supply and demand for EMS and services.

To achieve project results, the IISE team worked closely with USAID and GOP partners to create a self-sustaining, multi-stakeholder program that will encourage adoption of environmental management systems and application of cleaner production technologies.

1.2 Targets and Indicators

Initial targets were set within IISE but were to be finalized during the first year of project implementation. The targets and indicators for IISE provided a quantified measure as to what the project must do in order to foster more sustainable adoption of pollution prevention and clean production technologies and how best to measure improvements.

After considerable discussion and healthy debate within the project management team, the Chemonics contract was amended on 29 September 2000. Chemonics was contracted to achieve a final set of mutually agreed upon targets (Table 2).

Table 2. IISE Life-of-Project Targets

✓ 300 organizations implementing EMS
✓ 75 organizations achieving a certified EMS
✓ An average of 20% reduction in pollution among participating firms

The performance indicator for EMS implementation was the organization's production of an "environmental management plan," which for the joint implementation program was an output of module number two. The performance indicator for EMS certification was the organizations productions of outputs equivalent to those of module four of the JIP, which was the firm's conduct of an "internal EMS audit." The methods by which pollution reduction would be actually determined are described in Appendix A.

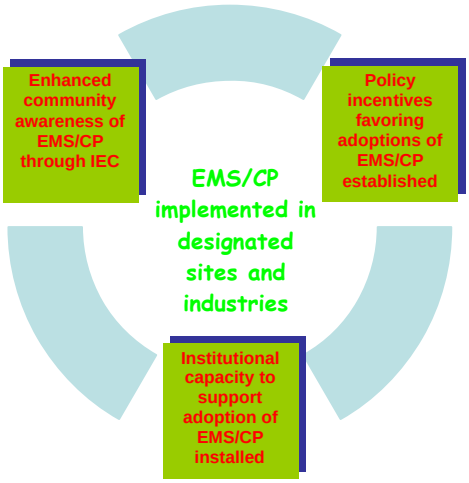
In conjunction with the 29 September 2000 contract amendment, a Year 3 Activity Plan was produced (Appendix A). This plan contained the five activities listed in Table 3 below. Each of these five activities had an associated set of sub-tasks and sub-task targets. Regular assessment of progress towards these sub-task targets served the mechanism for assessing progress towards achieving these activities and project sub-results.

Table 3. IISE Sub-Task Targets

Activity 1. EMS/CP implementation	9 targets
Activity 2. Public awareness	6 targets
Activity 3. Policy support	9 targets
Activity 4. Institutional capacity building	13 targets
Activity 5. Management & administration	3 targets

1.3 Relationship between the Results Framework and Activity Plan

This results framework illustrated in Table 1 above is dynamic and evolved during the first two years, serving as the basic roadmap for linking various activities, targets and results. The interdependency of the sub-results became clearer as the project proceeded and changes in emphasis occurred. The basic principle underlying this framework was that pollution reduction could be achieved through the type of voluntary environmental management achieved through (EMS). In turn, the adoption and spread of EMS could be promoted by the three sub-results: awareness and advocacy, policy support, and institutional capacity building to support all of these processes.



The 29 September 2000 contract amendment produced a realignment of the project Results Framework within the Year 3 Activity Plan. Correlation of the Results Framework with the Year 3 Activity Plan (Table 4) may be helpful to readers who are concerned with the relationship between project sub-results and activities.

Table 4. Correlation between IISE Results Framework and Year 3 Activity Plan

Results Framework	Year 3 Activity Plan
Strategic Objective	Activity 1, Task 1.2
Activity Result	Activity 1, Task 1.1
Sub-Result 1	Activity 2, Task 2.1
Sub-Result 2	Activity 3, Task 3.1
Sub-Result 3	Activity 4, Tasks 4.1-6

2. Activities and Approach

This section discusses the final set of activities that was approved as the contract entered its third and final year. The section describes the unique approaches and tools that Chemonics developed to meet time and resource constraints and achieve the expected results. This information will be particularly interesting to readers who are concerned with developing an understanding of best practices for supporting the adoption of EMS and P2/CP.

2.1 Activity 1 – Implementing EMS/CP in Designated Sites and Industries

This activity encompassed four tasks that were designed to reduce pollution at assisted industries and to test the relationship between establishment of EMS and actual pollution reduction.

Tasks include:

- Promote EMS and P2/CP within industries and LGUs
- Demonstrate the correlation between EMS-P2/CP and pollution reduction
- Demonstrate the benefits of an EMS accounting system
- Support database development and information management for EMS and P2 tracking purposes

Chemonics faced formidable challenges in accomplishing this activity and results. ISO 14001 was virtually new to the world in that it was not ratified by the Organization for International Standards until September 1996, less than two years before project inception. The project target of 200 certifications was equivalent to nearly one-half of the total number of certifications (about 550) worldwide at that time. Furthermore, nearly all certifications had been undertaken by large or multinational companies, in stark contrast to the Philippine SMEs targeted by IISE, most of which are barely viable financially. Finally, the SMEs targeted by IISE were among the worst polluters in the Philippines and those most reticent to environmental compliance and improvement.

To overcome these barriers and achieve the sub-results of this activity, Chemonics developed several tools for assisting EMS implementation that have been refined for the specific needs of each type of organization (Table 5). These tools accelerate and ensure the process of successful EMS installation, while at the same time reduce the cost of implementing EMS.

Chemonics developed some practical and inexpensive techniques for measuring and quantifying pollution reduction and the concurrent reduction in environmental “risk.” These techniques are described in several of our technical publications (see Appendix B). We also evaluated several sectors, including mining, and the overall system of public and private laboratories in the Philippines. Handbooks for EMS implementation in the private and local government unit (LGU) sectors are also being prepared for future publication.

Table 5. EMS-Implementation Tools developed by IISE

Tool	Significance
➢ Joint EMS Implementation Program (JIP)	➢ Significantly reduces EMS training and implementation costs and promotes sharing of lessons learned
➢ Custom-tailored standard operating procedures (SOPs) for EMS implementation	➢ Ensures efficient and full implementation of EMS components
➢ Quality Assurance/Quality Control (QA/QC) processes	➢ Ensures that the EMS and document deliverables will meet certification standards
➢ Confidentiality and contracting agreements	➢ Promotes trust and protects individual interests among cooperating groups (e.g., consultants, firms, donors, regulators)
➢ Specialized understanding of environmental permitting process and regulatory standards for operation	➢ Reduces time and costs associated with obtaining environmental operating permits and establishing systems that meet regulatory standards
➢ Detailed knowledge of fiscal and financial programs/incentives available to support EMS	➢ Increases access of firms to fiscal and financial support for their EMS
➢ Custom-tailored MOUs/MOAs with national and local government agencies	➢ Streamlines inter-agency cooperation and action
➢ Teaming arrangements with Chambers of Commerce and professional organizations	➢ Enlists participation by networking and facilitates the sharing of EMS implementation experiences and best practices among industries

Consistent with the original project design and Chemonics proposal, the most effective manner through which IISE enlisted organizations to implement EMS was by reducing the cost of EMS implementation consulting. Cost reductions were achieved on two fronts: training of local professionals, and creation of a joint EMS implementation-training program (JIP).

Forty-nine Filipino environmental professionals representing 13 consulting firms were trained in initial environmental review (IER) administration, EMS implementation, P2/CP assessments and EMS auditing. This training was administered by international experts and included classroom and on-the-job experience. Each training module concluded with a written examination, and those consultants that achieved a passing score were designated as "IISE Certified Consultants" in that particular technical area. The end result was a cadre of local professionals that were trained up to international standards, which greatly expanded the pool of highly competent environmental consultants.

This training had two immediate impacts on lowering the cost of EMS implementation. The first was that organizations were now able to hire local consultants whose service rates were about one-quarter of international consultant rates. Furthermore, the costs of international travel and per diem for foreign consultants were eliminated. The second impact was that the increased supply of qualified local consultants and firms created competition among them for clients, which further reduced consulting rates.

To further reduce the cost of EMS implementation consulting, Chemonics developed a joint EMS implementation-training program (JIP). This program involved the administration of five training modules as depicted in Figure 1, on the following page. Somewhere between 5 and 15 organizations requiring similar EMS participated in each JIP, and the cost of consulting to each firm was reduced to as much as 1/15 of one-on-one consulting.

Two additional sets of tools were created to ensure that each organization was able to implement its EMS as efficiently and effectively as possible, as well as to ensure that the EMS would pass a third-party certification audit. These tool-sets were our standard operating procedures (SOPs) for EMS implementation, and our EMS quality assurance/quality control (QA/QC) system. The SOPs detail the process for implementing each step of EMS, and the QA/QC system ensures that the outputs of each step meet ISO 14001 certification standards. The effectiveness of our SOPs and QA/QC systems was verified when seven of our demonstration industries and one LGU underwent the ISO 14001 certification audit which revealed very few non-conformities with the certification system requirements; and subsequently all organizations were certified.

To accomplish this activity and tasks, Chemonics worked in partnership with more than 250 private industries, approximately 50 LGUs, 5 PEPP partners (DENR, DTI, DOST, AIM and LandBank of the Philippines), 5 chambers of commerce, 8 professional organizations, and approximately 10 private environmental consulting companies distributed in eastern Mindanao, central Visayas and southern Luzon. More than one dozen memoranda of understandings/agreements (MOU/MOA) were developed and signed by the DENR, Chemonics and the recipients of IISE assistance to promote voluntary environmental management and pollution reduction throughout the Philippines.

2.2 Activity 2 – Enhancing Community Awareness of EMS/CP through Information and Education

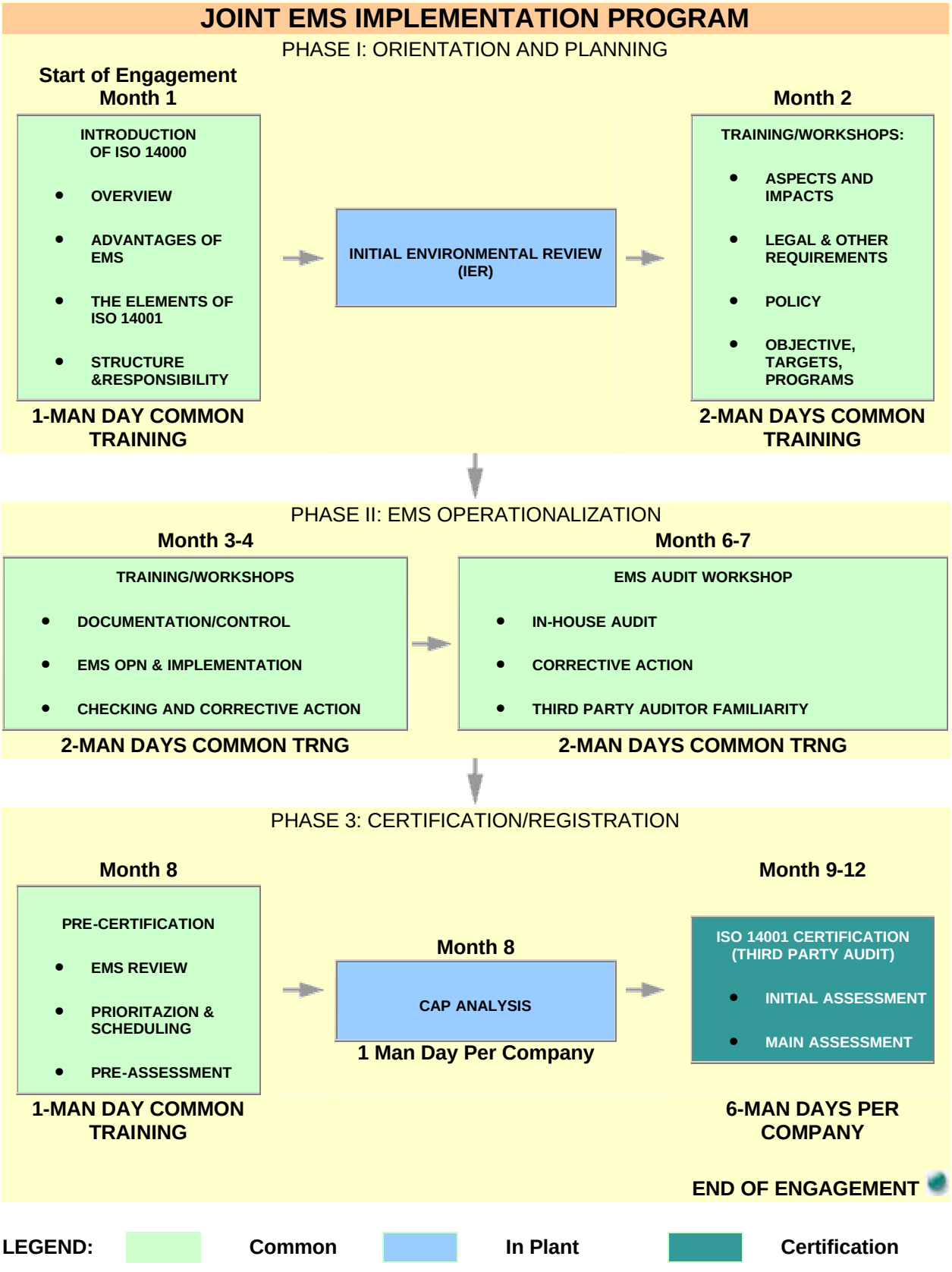
This activity contained two tasks designed to promote communication support to the project, and establish an IISE information-clearing house.

Tasks:

- Develop communication support to the project
- Establish an IISE information clearinghouse

To achieve the sub-results of this activity, Chemonics developed a number of communication tools designed to reach a wide audience in the Philippines including organizations that could implement EMS (industry, LGUs, NGAs), influential political, business and social leaders, NGOs and the public at large (Table 6). Chemonics used an effective blend of visual and written presentations coupled with an active outreach program conducted through our central and five regional offices located in the Visayas, Mindanao and Manila. These outreach activities included seminars, workshops, and public speaking engagements conducted by Chemonics' regional coordinators, training staff and senior consultants.

Figure 1. EMS Implementation Flow Chart



Training **Assistance** **Body Audits**

Table 6. EMS Information, Education and Communication Tools Developed by IISE

Tool	Significance
➢ Website (visit **www.iise.org**)	➢ Provides worldwide access to progress, methods, and findings related to EMS/CP
➢ List serve with more than 1000 entries	➢ Promotes wide base of interest and support to the project
➢ Monthly newsletter	➢ Keeps subscribers abreast of most recent developments in methods, findings, recommendations
➢ "Fact Sheets"	➢ Provides accurate and succinct summaries of key components of EMS, P2/CP, etc
➢ "News Features"	➢ Focuses interest on important issues
➢ "Success Stories"	➢ Advertises the value of EMS and promotes EMS champions among implementing organizations
➢ Green Gauge Survey	➢ Measures current environmental awareness, priorities, and IEC needs among a wide range of influential political, industry, and social leaders
➢ Survey of ISO 14001 certified industries	➢ Identifies drivers, hurdles and solutions, and best practices among early EMS implementers
➢ Handbook for EMS implementation by industry	➢ Summarizes and provides an experience-based template for others to follow, capitalizing on best practices and reducing time and costs
➢ Handbook for EMS implementation by LGUs	➢ Highlights the success of LGU leaders and explains the process so others may emulate
➢ Summary of EMS drivers for Philippine industries	➢ Identifies what does/does not motivate Philippine industries to implement EMS/CP
➢ File clippings from media coverage of IISE	➢ Transferred to website to increase exposure of project and organizational successes
➢ CDs on EMS, PEPP, P2/CP and other topics	➢ Provides inexpensive and easily distributed information on a wide range of project activities

Chemonics undertook two surveys to help guide our IEC program. A Green Gauge survey was conducted among 500 industries and 75 influential leaders. A questionnaire was designed, administered and the responses analyzed to determine environmental priorities among these groups, to identify best practices and pitfalls to advocating EMS/CP, and to enlist the support of these individuals in the IISE initiative. A survey of 28 companies that had already implemented EMS and achieved ISO 14001 certification was also conducted. The questionnaire for this survey was designed to help understand the motives for these companies to implement EMS, the hurdles and solutions they discovered in the implementation process, and the costs and benefits resulting from successful implementation and certification. The findings from these surveys were reported in technical publications (see Appendix F), and were used to guide our IEC program and methods for advocating environmental management and pollution reduction, as well as enlisting participants into IISE activities.

In addition to these initial surveys, Chemonics conducted follow-up surveys on the awareness retained and actions taken by participants at IISE training events. We determined that virtually all participants retained a high level of understanding of both the problems and approaches that the project was taking to address environmental management and pollution reduction. Furthermore, these informal follow-up surveys revealed that nearly half of the participants returned to their organizations and initiated some action, which included internal awareness and measures that led to their joining the IISE program.

Chemonics found the development of the website and associated IEC materials challenging. We had no difficulties in presenting discussions on general environmental problems that the project intended to address. The problem was that EMS and P2/CP are detailed technical processes, which in themselves are of limited interest to the general public or layman. Our challenge was to extract portions of these systems, generalize them, and present them in a manner that stimulated the interest of general readers. To do so, we selected subjects that were presented in various formats including “Fact Sheets,” “News Features” and “News Flashes.” These synopses were developed as stand-alone documents, and also included in the IISE Website. Topics included explanations of EMS, ISO 14001, P2/CP, a national EMS Accreditation System, and our training programs.

Another IEC product Chemonics developed was the “Success Stories” (see Appendix C). These one-page flyers summarized particularly notable achievements of individual organizations that became ISO 14001 certified with project assistance. We highlighted achievements such as cost savings, reduced environmental impacts and pollution reduction, and gains in system efficiencies. These success stories provided solid evidence of the effectiveness of the project and its systems. They also proved to be an excellent mechanism for attracting additional participants, as well as an advertisement and public-relations tool for the organizations themselves.

The primary implementation partner for this activity was the Assistance for Resource Monitoring and Information (ARMI) project – a consortium of four NGOs that were funded in parallel by USAID to augment the information, education and communication (IEC) component of IISE. Working together, the Chemonics and ARMI teams developed interactive IEC programs, prepared the EMS Communicators Training Manual, created and sustained the IISE website, and generated continuing industry/LGU-led EMS/CP initiatives in Cebu, Bohol and Mindanao.

2.3 Activity 3 – Supporting Policy Initiatives Favoring Adoption of EMS/CP

This activity contained one task designed to assist the Government of the Philippines (GOP) in developing policy support to EMS enactment.

Task:

- Assist the GOP in the development of policy implementation instruments

A multi-faceted approach was taken to effecting policy support to the promotion of EMS. This included the formation of policy-support groups, cooperative agreements such as MOUs, drafting of policy implementation instruments, and provision of information and

recommendations to policy makers. As illustrated in Table 7, to provide full and systematic support to policy makers, Chemonics analyzed existing policy instruments, identified gaps in existing policies and opportunities to develop new ones, compiled background information needed to modify/create these instruments, and in many cases then drafted language for the actual policy documents themselves.

Table 7. EMS Policy-Support Mechanisms and Tools Developed by IISE

Tool	Significance
➢ Establishment of policy-development support groups in Manila, Cebu and Davao	➢ Focuses expertise and a wide base of support on policy issues and initiatives to promote EMS/CP
➢ Guidance in establishing the Philippine Environmental Partnership Program (PEPP)	➢ Creates a base of support for EMS/CP among 8 key government, financial, training and advocacy organizations
➢ Development of MOUs/MOAs DENR, LGUs, and Chambers of Commerce	➢ Creates the actual mechanisms for cooperation and outlined individual roles and responsibilities
➢ Assistance to DENR in modifying/developing DAOs to encourage EMS adoption by industry	➢ Provides the actual policy instrumentation to enable the DENR to promote EMS/CP
➢ Production of "Policy Synopses" describing subjects such EMS and the Clean Air Act	➢ Provides accurate and succinct summaries of how EMS and policies are interrelated, and publicized these programs
➢ Technical report and DENR position paper on fiscal incentives to promote EMS	➢ Supports DENR's efforts to develop fiscal incentives to encourage EMS/CP
➢ Technical report and resolution for the National Credit Council on financial incentives to promote EMS	➢ Supports DENR's efforts to develop incentives among financial institutions to encourage EMS/CP

The leading implementation partner for this activity was the Environmental Management Bureau (EMB/DENR), with the assistance of other PEPP partners including the Board of Investments (BOI/DTI) and the Land Bank of the Philippines (LBP). Our consultants worked hand-in-hand with counterparts from these agencies, to ensure the closest possible interfacing between the consultants and the institutions responsible for enacting policies to support EMS/CP.

Also, Chemonics led the formation of Policy Working Groups in Manila, Cebu, and Davao. These groups provided a mechanism for drawing together key stakeholders from the government and donor sectors, and focusing their attention and efforts on critical policy needs related to advocating the spread of EMS and P2/CP. The policy working groups also provided a venue for the private sector to express its opinions regarding to hurdles and possible solutions to improved self-regulation and environmental management by firms.

2.4 Activity 4 – Expanding Institutional Capacity to Support Adoption of EMS/CP

This activity contained six tasks designed to increase the capacity of government agencies, training institutions and the private sector to promote EMS/CP. The underlying intent of this activity was to ensure sustainable institutionalization of selected components of the IISE initiative through their continuation by selected Philippine organizations. The expansion of this activity and re-direction of project resources to its completion also reflected the shift in the

project's paradigm from what was originally envisioned to be a private-sector initiative, to one of increased government leadership and support to complete IISE objectives.

Tasks:

- Support establishment of a national EMS accreditation system
- Support training of EMS auditors for international certification
- Support EMS implementation by selected PEPP partners
- Provide technical support to EMS regional KRA on EMS implementation by industry
- Build PEPP/NGO capacity to promote and advocate EMS
- Provide technical support to Department of Science and Technology (DOST) in P2-opportunity assessment

To achieve the sub-results of this activity, Chemonics provided key assistance to the development of several systems and institutions (Table 8).

Table 8. EMS Institutional Capacity-Building Processes and Tools Developed by IISE

Tool	Significance
➢ Support to the formation of the Philippine Environmental Partnership Program (PEPP)	➢ The PEPP is a coalition of eight member organizations, from government, financial, political, and training sectors, that is focused on developing approaches to supporting EMS/CP
➢ Assistance to the design and development of components of a national EMS accreditation Program (EMSAP)	➢ A national EMSAP will greatly reduce of the cost of EMS certification and periodic surveillance and re-certification costs, thereby encouraging the spread of certified EMS
Design and administration of EMS-auditor training and supervised live-audit program	➢ A cadre of certified Filipino EMS auditors and EMS lead auditors will also reduce the cost of EMS certification/re-certification and promote EMS
➢ Assistance with the production of an EMS Communicators Training Manual	➢ This manual will be an effective means of training EMS advocators, based on hands-on experience with EMS in the Philippines
➢ Development of EMS training programs	➢ These programs were developed, tested and refined under IISE and can serve as templates for increasing the number of qualified consultants, as well as general understanding of EMS/CP

IISE assistance to the formation and inauguration of the Philippine Environmental Partnership Program (PEPP) in June 2000 was instrumental in forging an alliance between selected government, financial, political and training organizations for the purpose of promoting EMS/CP. The PEPP is charged with developing policy and market-based instruments, as well as using its leadership and training capabilities to forward improved environmental performance in public and private organizations. Significantly, five of the eight members of the PEPP have, or are in the process of implementing an ISO 14001 certified EMS within their own organization, thereby demonstrating both commitment and leadership by example, as well as gaining first-hand experience in the EMS process. If endowed with continuing support (political,

administrative and financial), the PEPP is well positioned to continue aspects of the IISE initiative.

IISE made an important contribution to promoting EMS and ISO 14001 in the Philippines through its conceptualization and support to the development of a national EMS Accreditation Program (EMSAP). The EMSAP will be led by the Bureau of Product Standards acting as the national accreditation body, in cooperation with a not-for-profit Certification Body, an EMS Auditors Registrar, and a cadre of certified EMS auditors and EMS lead auditors. The roles of each component were defined in several technical reports (see Appendix B) and an IEC publication (Figure 2), and the groundwork (opportunity) was laid for continued support and completion of this program.

Chemonics recommends that the GOP continue to pursue the development and implementation of an EMSAP aggressively. When in place, a national EMSAP will greatly reduce the cost of initial certification and periodic surveillance/re-certifications through elimination of the current dependence on foreign-based certification mechanisms and their accompanying cost structures. This will compliment the pre-certification cost reductions already achieved via IISE assistance, and promote the adoption and spread of EMS/CP.

An equally important component of this activity was the assistance provided to help DENR and DTI develop the capacity to advocate and promote EMS through IEC. The primary effort here was the production of an EMS Communicators Training Manual that will be used by the regional IEC units of the PEPP to advocate EMS to the industries and LGUs in their respective regions. Assuming that the DENR departmental administrative order (DAO) promoting EMS is authorized, the PEPP IEC activity and advocacy capacity will be an important step forward for expanding EMS/CP throughout the country

Implementation partners for this activity were the NGAs (DENR, DTI and DOST) and the consortium of NGOs in the ARMI project. Through Activity 4, the capacity of several institutions to promote EMS/CP was enhanced, and several sustainable partnerships were established to continue this process.

2.5 Activity 5 – Project Management and Administration

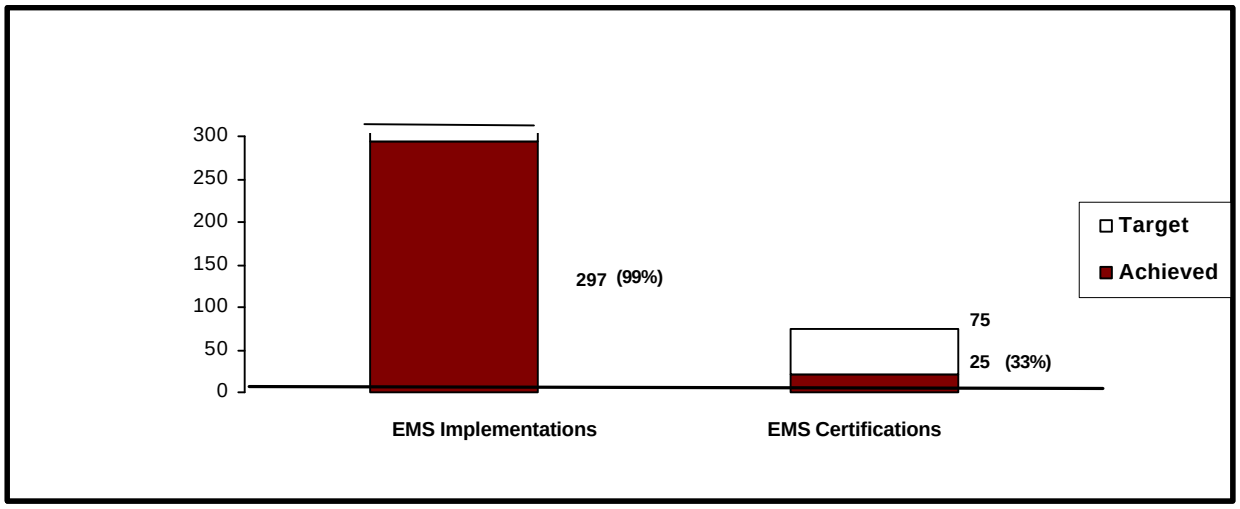
This activity contained three tasks, which were managing project activities, accomplishing the handover of activities and property, and completing the project closeout. Progress on this activity was discussed in every quarterly report, and all three tasks were completed by the end of September 2001. Lessons learned in association with the management and administration of IISE are presented from three perspectives – those of DENR, USAID and Chemonics – in Section 5 of this report.

3. Achievement of Contractual Targets

3.1 Life-of-Project Targets

At the conclusion of the project on 31 August 2001, the following cumulative progress had been achieved toward the primary targets (Figure 3):

Figure 3. IISE Score Card



3.1.1 EMS Implementations (target = 300)

232 EMS were in the process of being implemented when the project concluded in August 2001; 186 with IISE assistance and 46 by IISE-certified consultants without project assistance (Appendix D).

This constitutes an achievement rate of 77% towards the final target. These numbers, combined with the 65 EMS implementations achieved by UAS-AEP brought the total number of implementations to 297, or an achievement rate of 99%[1].

3.1.2 EMS Certifications (target = 75)

25 certifications had been achieved by December 2001; 12 with IISE assistance and 13 by IISE-certified consultants without project assistance (Appendix D). This constitutes an achievement rate of 33% towards the final target.

However, by decision of the Executive Committee, it was agreed that any firm that achieved the outputs of the JIP module 4 – conduct of an internal EMS audit – would be counted towards the target number of 75. The number of firms/organizations having conducted this internal audit by 31 August 2001 was estimated at about 50. The primary hurdle to achieving the target of 75 certifications was purely one of insufficient time. By the end of 2002 it is expected that that a

[1] By agreement of the Executive Committee, parallel EMS-implementation work conducted by the US-Asian Environmental Program (US-AEP) under funding from USAID was to be added to the IISE scores.

number of the 297 EMS implementations now in progress will have been completed and certified, well exceeding the target of 75. This expectation could be easily documented simply by contacting all participating organizations late next year to determine the status of their EMS implementation and certification efforts.

3.1.3 Pollution Reduction (target = 20% average for 300 firms)[2]

Demonstration Industries – IISE Early Achievers

All ten demonstration industries completed their aspects/impacts assessment in conjunction with implementation of their EMS. Their initial P2/CP assessments produced a combined total of more than 60 P2/CP waste streams and options for pollution reduction. These included: heavy metals, used oils, acids, caustic substances, cyanide, hexavalent chromium, mercury, dissolved and suspended solids, volatile organic compounds, solids, and plating wastes. All ten industries were implementing pollution-reduction and P2/CP actions scheduled in their EMS by the conclusion of the project. Initial pollution-reduction rates achieved by some of these firms for waste streams targeted for reduction in their EMS ranged from 7% to 82% (Table 9).

Table 9. Examples of Pollution-Reduction Successes among IISE Demonstration Industries

✓	A furniture manufacturing company achieved a 37% reduction in paint overspray. This resulted in both material cost savings and lowered negative impacts on the environment and health of workers and neighboring residents;
✓	A cement company reduced dust emissions by 22%. This resulted in significant progress toward compliance with environmental standards, as well as reductions in environmental and health impacts;
✓	A power company reduced its wastewater discharge by 85%, its consumption of sulfuric acid by 68-72%, its coal consumption by 4% and its stack emissions of carbon monoxide sulfur oxide and nitrogen oxide below the national standard limit of 500 mgm. Not only were these positive improvements produced, but the success of this company has encouraged other power facilities to explore EMS implementation;
✓	The Province of Bohol reduced its energy and water consumption by 10% and 7% respectively. In doing so, Bohol is setting an example and generating momentum among other LGU to achieve similar environmental-management successes.

Joint Implementation Program (JIP) Industries

Initial environmental reviews (IER) were conducted on 181 JIP industries, all of which have identified primary waste streams; results of these IERs were previously presented in the project Quarterly Reports. Of these 181 firms, 130 joined the IISE joint EMS implementation program (JIP) and identified waste streams and percentage reductions targeted for achievement within specified periods of time. Appendix F contains a listing of these targeted waste streams and pollution-reduction schedules.

The project concluded before the EMS and associated pollution-reduction actions of these firms could be sufficiently documented via on-site data collection, to quantify the impact of these

[2] The methods by which the amount of pollution reduction achieved by IISE participants would be determined were agreed to by the Executive Committee on 21 March 2001, and are summarized in Appendix E.

actions. Continued follow-up with these industries in the year(s) after project conclusion would undoubtedly confirm the effectiveness of EMS in promoting pollution reduction and the long-term objective of IISE.

3.2 Activity Sub-Task Targets

Each sub-task contained in the Year 3 Activity Plan had an associated target. These sub-task targets served as milestones for measuring progress towards achieving that particular activity (or sub-result). Table 10 summarizes the achievement of sub-tasks targets at the conclusion of the project on 31 August 2001.

Table 10. Summary of Achievement of Sub-Task Targets

Activity	Targets Exceeded	Targets Met	Targets partially Achieved
Activity 1. EMS/CP implemented in designated sites and industries[3]	**4** (1.1d; 1.2a-b; 1.4a)	**4** (1.1a,c; 1.4b-c)	**1** (1.1b)
Activity 2. Enhanced community awareness of EMS/CP through IEC		**6** (2.1a-d; 2.2a-b)	
Activity 3. Policy incentives favoring adoptions of EMS/CP established		**7** (3.1a-g)	**2** (3.1h-l)
Activity 4. Institutional capacity (DENR, DTI, private sector) to support adoption of EMS/CP installed		**11** (4.1a-c; 4.2a-b; 4.3a; 4.5a-d; 4.6a)	**12** (4.4a; 4.5e)
Activity 5. Management and administration		**3** (5.1, 5.2, 5.3)	

Of the 40 sub-tasks listed in the Year 3 Activity Plan:

- 4 sub-task targets were exceeded;
- 31 sub-task targets were met;
- 5 sub-tasks targets were partially achieved;
- 88% of the sub-task targets in the Year 3 Activity Plan were exceeded or achieved.

Table 11 below summarizes the status of sub-tasks at the completion of the contract. Some sub-tasks were completed and discontinued when the project ended. Other sub-tasks were continued by other project partners, thereby institutionalizing that component of the activity (sub-result). The remaining sub-results were those that continued throughout the project, and simply stopped when the project ended (e.g., tracking of pollution reduction).

Table 11. Status of Sub-Tasks at Completion of Contract

Sub-task Status	Activity 1	Activity 2	Activity 3	Activity 4	Activity 5	Totals
Completed	3	1	7	9	3	23
Institutionalized	1	4		2		7
Terminated	5	1	2	2		10

[3] Sub-tasks 1.3a-b were dropped by decision of the Executive Committee.

Table 11 documents that:

- 58% of all sub-tasks were completed
- 18% of all sub-tasks were completed and institutionalized

The data in Table 11 show that three-quarters of all the sub-tasks were completed and/or institutionalized by the conclusion of the project. Of the remaining activities, virtually all were scheduled for termination when funding support ended.

Chemonics is proud of its record of achievement of primary targets and sub-task targets. IISE was originally envisioned to be a 5-year $10 million project, and subsequently had both this time frame and budget reduced by 40%. Despite these reductions in resources and time, we made excellent progress towards achieving our primary and sub-task targets.

IISE might be described as “the project that has kept on giving.” At the time of this report’s publication, the majority of organizations that participated in IISE are continuing to complete their EMS and seek ISO 14001 certification. More importantly, they are realizing reductions in their environmental impact, pollution emissions, consumption of natural resources, and operating costs. We were able to document a few success stories before the project ended. But that number has, and will continue to increase over time, leaving a significant mark and legacy in the Philippines.

4. Major Successes and Impacts

It is impractical to attempt to list all of the accomplishments that IISE attained, so this discussion will highlight those achievements that ensured the sustainable institutionalization of EMS/CP. The strategic objective of this project was to reduce pollution using EMS as the primary commitment and tool for accomplishing this reduction. The three sub-results were designed to build capacity and momentum within a range of sectors to support EMS/CP. Therefore, project success must be measured not only in the numbers of companies implementing EMS/CP and pollution reduction achievements, but also in the extent to which components of the project's initiative and activities were institutionalized, continuing and expanding IISE's impact on the Philippines.

4.1 Promoting EMS/CP in the Private Sector

A core-group of industries representing a range of sectors and geographical areas joined IISE, implemented EMS, and achieved pollution reduction. These participants comprise a significant number of the total EMS and certifications in the Philippines. Furthermore, these organizations are now serving as "champions" and advocators of EMS/CP within their respective peer groups, which is a far more effective way to promote these processes.

Through the successes of the demonstration industries, IISE showed that a properly implemented EMS can reduce pollution and at the same time generate cost-savings for its implementers.

- ✓ *EMS implementation expanded*. 175 firms are implementing EMS. This represents at least one-half of the current total EMS in progress in the Philippines, and has greatly expanded the core group of EMS advocators within industry itself.

- ✓ *ISO 14001 certifications achieved.* 25 firms achieved ISO 14001 certification with IISE support by December 2001. This constitutes more than one-quarter of total EMS certifications in the Philippines, who themselves are now advocating certified EMS.

- ✓ *Pollution reduction attained via EMS.* The project demonstrated that a properly implemented EMS can result in pollution reduction. Pollution reduction has already been achieved by several of the IISE demonstration industries including those in the power, cement and furniture-manufacturing sectors. Through their EMS, impacts (waste streams) were identified, reduction-targets and timelines were established, resources were committed, and the reductions were achieved, demonstrating the value of EMS in reducing pollution.

- ✓ *Cost savings achieved via EMS*. The project verified that EMS can produce savings well in excess of implementation costs. The same demonstration industries have reported savings resulting from reductions in production materials, fuel, and associated waste-disposal costs, motivating other organizations to view EMS as a means of saving money.

- ✓ *Environmental professionals trained*. Forty-nine environmental professionals were trained in EMS, P2/CP and EMS auditing. These professionals are now not only able to provide improved services themselves, but also serve as an effective EMS advocacy group through their efforts to promote their services. While the majority of these consultants are located in

Luzon, some are also based in Cebu and eastern Mindanao, providing industry with access to local consultants (see Appendix G for listing).

- ✓ *Environmental consulting firms strengthened*. Thirteen environmental consulting firms gained experience in EMS/CP. These firms participated in IISE-sponsored training through the attendance of their technical staff. The majority of these firms were also subcontracted to provide EMS training and implementation assistance through the IISE JIP (see Appendix G for listing).

- ✓ *EMS implementation costs reduced*. The project improved the capacity of the private sector to lower the cost of EMS implementation consulting by 75%. The cost of EMS-implementation consulting was reduced through the training and increased availability of Filipino consultants. They work at daily rates that are typically one-quarter of those of foreign consultants, and both international and in-country travel and per diem costs are greatly reduced through the use of locally based consultants.

4.2 Strengthening the Public Sector

IISE soundly demonstrated that EMS can be promoted by regulatory and other government agencies. Furthermore, the project showed that these organizations themselves can implement EMS, thereby leading by example as well as achieving cost savings and reducing the environmental impact of their operations. In parallel with establishing industries champions, IISE also produced public-sector champions and developed partnerships between these (traditionally adversarial) groups. IISE demonstrated that the traditional command-and-control relationship between regulators and industries can be partially replaced by cooperation and promotion of voluntary self-regulation through EMS.

- ✓ *Government agencies implement EMS.* EMB/DENR and BOI/DTI became the first NGAs to implement EMS. This establishes leadership and an example for the constituency (industries) they regulate, as well as an enhanced understanding of benefits and hurdles to implementing EMS/CP and first-hand knowledge of how to promote this process.

- ✓ *Environmental Management Bureau (DENR) establishes GIS*. EMB established a national industrial environmental management GIS. This is a major step forward in developing a unified, accessible and user-friendly information-management system to support knowledgeable decision-making and environmental management.

- ✓ *National policies developed to promote EMS/CP*. Three national policies are poised to promote EMS implementation. EMS provisions have already been incorporated into the Clean Air Act and the reviewed Environmental Impact Assessment (EIA) departmental administrative order (DAO). A draft DAO that would provide regulatory assistance in exchange for EMS implementation awaits the signature of the Secretary. If/when implemented, these policies will greatly increase the adoption of EMS/CP in a wide range of industry sectors throughout the country.

- ✓ *Regional policies developed to promote EMS/CP*. One regional policy (Bohol Investment Code) promotes environmental investment. This policy is already in effect in the Province

and guides development investments in the direction of increased environmental responsibility and reduced impact.

- ✓ *DENR position announced on EMS*. DENR developed a position-paper on fiscal incentives to promote EMS. This was developed from a study supported by IISE and was formulated to support House Bill 10596 that would restructure fiscal incentives under the Omnibus Investment Code of 1987 to stimulate the adoption of EMS/CP by industry through fiscal incentives.

- ✓ *DENR resolution developed on financial incentives for EMS/CP*. DENR prepared a resolution on financial incentives. This was developed from a study supported by IISE and was formulated as a resolution to the National Credit Council on "Revising the terms for the availment [sic] of the credit facilities for environmental projects by participating financial institutions," which would provide a mechanism for helping overcome the "cost barriers" to adoption of EMS/CP.

- ✓ *Bohol achieves ISO 14001 certifications*. The Province of Bohol achieved ISO 14001 certification. Bohol led the way as the first province to have its EMS certified. Eight departments under its supervision participated in the EMS program, which will be expanded to include additional departments. Since then, IISE consultants have been approached by other LGUs wishing to follow the example set by the Province of Bohol.

4.3 Expanding the Scope and Capacity of the Training Sector

IISE promoted EMS/CP within two important training sectors in the Philippines. Through its assistance to the Asian Institute for Management (AIM), the project helped the leading training agency of senior industry and organizational leaders achieve certification and lead through example and speak from experience. AIM can now promote EMS from the position of a champion, not simply an advocator, which will greatly increase its credibility among clients.

University of Southern Philippines (USP-Cebu), because the first Filipino academic institution to include EMS training in a formal degree program. Inclusion in a university training program is a major forward in raising the profile of EMS from simply an internal management system to one of major environmental importance. Again, this expands both the credibility of EMS, as well as increasing access to affordable training to consultants and interested organizations.

- ✓ *Asian Institute for Management (AIM) ISO 14001 certified*. AIM became the first EMS certified training institution in Philippines. This is significant in that AIM's clientele include chief executive officers (CEOs) and other senior executives who are in the position of deciding if their institutions will implement EMS.

- ✓ *University of Southern Philippines – Cebu (USP-Cebu) Environmental Management Program established*. IISE contributed to both the design of USP-Cebu's new program, as well as providing senior technical staff who taught portions of the curriculum during the first year of the program's implementation. Through this, USP because the first university in the Philippines to incorporate EMS training into a degree program and to expand EMS training from the private to the public sector.

4.4 Building the Capacity of the EMS/CP Advocacy Sectors

In addition to creating core groups of EMS/CP champions among the private, public and training sectors, IISE also helped build capacity and momentum within a number of organizations positioned to advocate or push industries to implement EMS/CP.

IISE assisted progress towards the development of a national EMS Accreditation Program that will operate through cooperating government and private organizations. When operational, the program will simultaneously promote EMS/CP while at the same time reducing the cost of its implementation.

An important and enduring legacy of IISE is the Philippine Environmental Partnership Program (PEPP). Formally initiated in June 2000, this consortium of government, financial, training and political leaders, is positioned to become the premier advocacy group for EMS/CP in the Philippines. Its capacity to influence and effect far-reaching policy and incentives to promote EMS/CP has already been established in draft policy and related instruments.

IISE also worked closely with four existing NGOs and assisted the creation of another – all directed at promoting awareness and need for improved environmental management and pollution reduction in the Philippines. In the process, a website was developed, an EMS training manual produced and regional initiatives established in the Visayas and Mindanao. All of this work is continuing and expanding.

- ✓ *National EMS Accreditation Program (EMSAP) promoted*. IISE advocated the formation of an EMSAP and provided support to the development of some of its components (Figure 2). If completed, this system will greatly lower the cost (and barrier) to EMS certification/re-certification, and through this promote EMS/CP.

- ✓ *EMS-advocacy partnerships established with NGOs*. IISE worked with the consortium of NGOs under the ARMI project to promote EMS/CP. These NGOs are continuing this work in the project's primary implementation sites in Cebu, Bohol and Davao. The two groups also collaborated to produce the Communicators Training Manual that will be used by the IEC sections of PEPP partners.

- ✓ *IISE website created*. The website was designed to support the full range of project activities through IEC. At the conclusion of the project, stewardship of the website was transferred to the Ramon Aboitiz Foundation, which is continuing to promote EMS/CP through this vehicle.

- ✓ *Philippine Environmental Partnership Program (PEPP) formed*. The PEPP was conceived and formed with IISE support. The program is comprised of eight member organizations from the government, financial, political and training sectors. The objective of the PEPP is to promote improved environmental management. IISE support to the program is documented in our quarterly reports and in a compact disc that describes the PEPP.

- ✓ *Earth Charter founded*. This new organization was designed and developed with the assistance of IISE. Earth Charter is composed of more than 30 member organizations, primarily industry but also including professional organizations, chambers of commerce, and other interested organizations. Its purpose is to promote improved environmental management through a pyramid-training scheme designed to reach out to hundreds of firms throughout the Visayas.

The 21 activities described above directly promote the adoption and spread of EMS/CP in the Philippines. Importantly, these are initiatives that have been incorporated into a wide range of Filipino agencies, institutions, organizations and industry, which ensures the continuance and sustainability of progress towards IISE's primary objective – stated in Section 1.2: to promote EMS and P2/CP and pollution reduction.

5. Lessons Learned and Recommendations

The following section offers observations and recommendations from the perspective of the three project implementation partners. These summaries provide both general and specific suggestions on how to promote EMS/CP, as well as the management and interrelationships of the project's primary stakeholders. This information offers an extremely useful checklist of actions for achieving pollution reduction and improved environmental management via EMS and cleaner production.

5.1 DENR Perspective[4]

The experience of IISE clearly demonstrates that key government agencies and in particular the regulatory agency (EMB/DENR) can take an active role and make a major contribution to promoting EMS/CP in all organizations. These agencies are uniquely positioned to provide specific sets of incentives and disincentives ("carrots and sticks") to the organizations they regulate or influence. Without question, EMS/CP adoption and voluntary regulation promoted through partnerships and cooperation are favored over traditional command-and-control, adversarial relationships. EMS need not be a purely private sector activity, but as IISE showed, can encompass a wide range of public partners in the national and local governments.

Observation 1. DENR and its partner institutions can support EMS/CP implementation by industry.

Recommendations

1a. EMS should be used to reduce/prevent pollution and help conserve resources at the industry or organizational level.

1b. EMS should be applied to all types of organizations in both the private and government sectors.

1c. EMS adoption should be driven by cost savings and other internal benefits and as such can be used as a tool for industry self-regulation.

Observation 2. DENR can promote EMS/CP through a variety of mechanisms.

Recommendations

2a. Implement appropriate policy support including: #61623 – implementation of the EMS requirement in the Clean Air Act; #61623 - provision of recognition and other incentives to EMS/P2/CP; #61623 – provision of assistance to business especially SMEs (i.e., information, education and training, technical); #61623 - stricter enforcement of environmental regulations. Because of the cost of environmental litigation, clean up or

[4] Table 15 was developed from materials presented by Manual S. Sabater, IISE Assistance Project Manager, EMB/DENR, at the IISE Management Exit Conference held in Quezon City, Philippines on 6 December 2001.

shutdown, this action serves as disincentive to pollution and a driver to industry to look for and implement cost-effective environmental management solutions.

2b. Continue, strengthen and expand the network IISE has established. This network at present consists of the following: the Department of Science and Technology (DOST), the Bureau of Products Standards and the Board of Investments of the Department of Trade and Industry (DTI), Asian Institute of Management (AIM), Union of Local Authorities of the Philippines (ULAP), Development Bank of the Philippines (DBP), Land Bank and Philippine Association of Tertiary Level Educational Institutions on Environmental Planning and Management (PATLEPAM).

2c. Link other key support institutions to this network including the Philippine Institute of Certified Public Accountants (PICPA) and Business Agenda 21. PICPA has developed core competency in environmental cost accounting and can assist in providing training on environmental cost accounting to businesses. Business Agenda 21 is comprised of 73 member-industry associations which have made a commitment to improve on their environmental performance. These associations can influence their members to implement EMS/P2/CP through seminars and training.

Observation 3. Project implementation can be improved through clarification of roles and responsibility at the onset.

Recommendations

3a. Preparation of the Project Operational Framework in addition to the Results Framework to show the strategic directions that the government and the private sector should play in assisting attainment of performance objectives, and to provide the Directors of implementing agencies and other project stakeholders a view of their complementary roles and contributions to the project objectives.

3b. Preparation of a Joint Project Implementation Agreement (JPIL) at the outset of project implementation. This document should clearly delineate commitments, respective roles and responsibilities, along with shared and complementary activities that will contribute to the performance objectives in the short and long-term.

5.2 USAID Perspective[5]

Donor support to EMS/CP should begin by facilitating basic agreements on the roles, responsibilities and contributions of project partners and other stakeholders. Resources provided by the donor organization should be used to catalyze processes and augment capacities, and not to subsidize activities and costs that are the responsibility of, or best shouldered by other project partners or other stakeholders. Donor organizations can also function as “observers,” and contribute to identifying successful approaches to EMS/CP implementation.

[5] Table 16 was developed from materials presented by Priscilla P. Rubio, IISE Cognizant Technical Officer, USAID/Philippines, at the IISE Management Exit Conference.

Observation 1. EMS/CP can be most effectively promoted through a combination of actions.

Recommendations

1a. Promote regulatory policy incentives to encourage industries to implement cleaner production and meet environmental operating standards.

1b. Increase regulatory enforcement to motivate companies to take action.

1c. Enlist community participation in monitoring and pressuring industries and other organizations to meet environmental standards.

1d. Identify dynamic senior-management leaders who recognize the advantages of EMS including cost savings, competitive advantage, improved public image and reduced liability, and who will champion this in his/her organization.

1e. Reduce the cost of EMS implementation and certification through a combination of training, increased local supply and competition among environmental consultants/firms, and install a national EMS Accreditation Program.

1f. Promote partnerships with industry, local government units (LGUs), PVOs/NGOs and academe, to expand perspectives, experience and build cooperative momentum.

Observation 2. A combination of incentives and disincentives will help to promote the adoption of EMS/CP.

Recommendations

2a. Pass the DAO on regulatory policy/incentives for EMS adoption.

2b. Continue partnerships with Department of Trade and Industries, industries, LGUs, and NGOs to promote EMS.

2c. Encourage DENR staff to promote EMS.

2d. Encourage DTI to continue work towards establishing a national EMS accreditation program.

2e. Continue support to the DENR industrial environmental management Geographic Information System to help the EMB target strategic industries.

2f. Strengthen enforcement of regulations so that companies are working within environmental standards.

5.3 Contractor Perspective[6]

This section summarizes observations and recommendations based on the feedback that Chemonics received from the firms participating in IISE. This information is separated into three general categories related to: promoting EMS and P2/CP, increasing access to EMS/CP information, and strengthening relationships with the regulator. Recurrent messages are to reduce the cost of EMS implementation and certification, and clarify its financial, operational and promotional value to its implementers.

5.3.1 Promoting EMS and P2/CP

Observation 1. Cost is the primary barrier to EMS implementation for virtually all organizations (including industries and, in particular, SMEs).

Recommendations

1a. Promote joint EMS training and implementation programs. Sharing of consultant costs as well as sharing EMS implementation experiences reduces the cost of EMS implementation.

1b. Support the formation and operation of a national EMS Accreditation Program (EMSAP). Nationalizing the EMSAP will reduce the dependence of Philippine industries and organizations on foreign-based certification bodies and EMS auditors, and pass on cost-savings for certification/re-certification.

Observation 2. Currently, it is difficult to quantify the benefits or savings that can be achieved from a fully implemented and properly maintained EMS.

Recommendations

2a. Develop an EMSAP or some other mechanism to help quantify (a priori) the cost and the potential savings that will accrue from a firm implementing EMS.

2b. Document and distribute the experiences of firms that have realized savings from their EMS.

Observation 3. The primary reason for implementing EMS, cited by industries participating in IISE, was that their senior executives were concerned about the adverse environmental impacts of their company's operations and pollution, and they wanted to reduce this impact. They also wanted to be seen by others as taking proactive measures and exercising leadership in pollution reduction and environmentally friendly operations.

[6] Tables 17-19 were developed from materials presented by John A. Dorr, IISE Chief of Party, Chemonics International, at the IISE Management Exit Conference.

Recommendations

3a. Identify CEOs and other industry leaders who have implemented and support EMS to act as "EMS champions."

3b. Develop means to draw attention to the efforts and success of firms that have implemented EMS, particularly those which are ISO 14001 certified. This can be done via media, awards, and other forms of recognition.

Observation 4. Very few industries are currently influenced by corporate environmental mandates (e.g., "greening the supply chain," ISO 14001 EMS certification). The impact of this mandate is limited to only a few multinational firms and their first-tier suppliers, and with the current global economic downturn, the timeline for implementation of many of these mandates is flexible.

Recommendation

4a. Limit resources expended on this approach to multilateral and large industries that have received a fixed corporate mandate, and on their most immediately affected (e.g., first-tier) suppliers.

5.3.2 Increasing Access to EMS/CP Information

Observation 1. Most companies are aware of EMS but have little understanding of how the system works and its relationship to ISO 14001 certification.

Recommendations

1a. Continue/expand NGO and other EMS awareness efforts with a focus on developing simple explanations of EMS, ISO 14001, and the benefits of these systems.

1b. Develop EMS outreach methods and materials that are directed to organizations that promote the interests of industry (e.g., chambers of commerce, professional/industry organizations, export zones, industrial estates). Use these organizations as entry points to industry sectors or other groupings.

1c. Complete, publish, and revise as needed the IISE Communicators Training Manual. In conjunction with this, participants at workshops for regional IEC units of the PEPP partners should receive an introduction to these systems and instruction in the use of the manual.

Observation 2. Most companies listed insufficient information on pollution management technology as a major barrier to assessing options and taking action to reduce their environmental impacts.

Recommendations

2a. Support the expansion, promotion and availability of the DOST environmental technology information center.

2b. Awareness programs should compile and have available for distribution, information on environmental and pollution-management technology.

Observation 3. Most companies are quite unaware of any fiscal or financial incentives that may be available to them. The few that do realize these incentives exist rarely pursue them because of the time and cost required to investigate, apply, qualify and obtain them.

Recommendations

3a. The GOP should follow-up on the fiscal incentives position paper prepared by DENR to support House Bill 10596, and propose resolution to the National Credit Council (NCC) on financial incentives to support EMS.

3b. Awareness programs should compile and have available for distribution, information on fiscal and financial incentives and programs to support EMS, as well as contact information on specialists who understand these programs and their applicability to industry. This could be a particular focus of the IEC units of the regional PEPP partners.

5.3.3 Strengthening Relationships with the Regulator

Observation 1. Regulatory enforcement is not currently a strong driver for pollution reduction, environmental management or EMS implementation. For most firms, the current mode of operation is simply to hope that their compliance with regulatory standards will not be assessed or monitored.

Recommendations

1a. DENR should strengthen its regulatory enforcement capabilities, particularly in the areas of monitoring/surveillance, sampling programs and laboratory analysis/standardization.

1b. DENR should support the development of EMB new industrial environmental management GIS, to provide all stakeholders with improved scope and access to information on pollution generation, and promote more information-based decision-making and environmental management.

Observation 2. Most companies are not fully aware of environmental regulations that apply to them, and, in particular, changes in environmental standards.

Recommendation

2a. Awareness programs should have contact information on specialists who understand these regulations and their applicability to industry. Again, this could be a particular focus of the IEC units of the regional PEPP partners.

Observation 3. Most companies view the DENR with suspicion and fear regarding the possibility of unexpected visits, penalties and cease and desist orders, etc. They do not see the DENR as a source of support or positive partnership.

Recommendations

3a. DENR should authorize the draft DAO promoting regulatory assistance in conjunction with EMS implementation.

3b. When the above DAO is approved, the selected regional DENR offices should undertake joint EMS training programs similar to the pilot program that was conducted in Bicol.

5.3.4 Contract Administration and Management

IISE suffered from significant disagreements among the implementing organizations – GOP, USAID and Chemonics – regarding the focus and emphasis of the project. It also was heavily impacted by protracted uncertainties related to its available budget and the time period in which the project would operate. These disagreements and uncertainties resulted in a significant drain on the project's resources, and ultimately reduced the capacity of the project to achieve results.

Specific problems

1. As stated in both the DADD and contract, the original project design and targets were based on a 5-year performance-period and a $10 million budget. Subsequently, both the period of performance and budget were reduced by 40%, but the project's strategic objective and associated target remained unaltered. The Activity Result and Sub-results were modified, but not commensurately reduced with the reduction in time and budget.
2. USAID notified Chemonics informally in August 1999 that the contract budget would be reduced. However, a formal operating budget and associated Activity Plan were not agreed upon until September 29, 2000. Valuable time and a considerable amount of level-of-effort and money were expended during the 13 months of negotiation and contract-amendment submissions.
3. The original targets – 400 EMS, 200 ISO 14001 certifications and 20% average pollution reduction among participating firms – were purposely set high. The intent was to revise these targets once baseline data were compiled on the operating conditions and current pollution emissions of a broad range of industries that could participate in IISE. However, compilation of these baseline data was not accomplished during the first year of the project but instead delayed until years 2-3. As a result, the target numbers were not adjusted by the baseline data as originally intended, and expectations were not tempered by realities.
4. The roles and responsibilities of the counterpart agencies, USAID and the contractor were not clearly defined until the Joint Project Implementation Letter was signed in March 2000,

nearly 18 months after project inception and only 18 months before the project was terminated. This delay in formalizing the understandings and agreements resulted in confused expectations and misdirection of time and resources.

5. In the interim, changes in leadership in both government counterpart agencies (DENR and DTI) resulted in the reinterpretation and subsequent redirection of project priorities from what was originally designed as primarily a private-sector initiative, to one of GOP capacity-building. Whether or not this was a justifiable correction could be debated from many positions. The process of re-defining the thrust of the project resulted in both delays and financial expenditures, which reduced the overall pool of resources available to the project.
6. As a result of the above re-interpretation, Chemonics was directed to allocate a significantly increased level-of-effort, budget and other resources to support institutional capacity-building, which reduced our capacity to achieve the results and targets established in the contract. The end result was an expanded (rather than contracted and more focused) set of objectives, targets and activities that lacked sufficient time, level-of-effort and money, to be fully accomplished within the contract period and budget. The Chemonics team recognized this situation, but failed to gain support for a more tightly focused project and mistakenly propagated the misconception that the project could still achieve all objectives, targets, and expanded activities within the reduced budget and time period.
7. Several personnel who were fielded for key positions were not well suited to their jobs and responsibilities, and Chemonics failed to replace them quickly enough to avoid repercussions on the progress of project activities.

Most of the above difficulties resulted from generic weaknesses in the project design and management. Communications should have been more frequent and directed to all three primary implementation partners. Agreements should have been more detailed, clearly documented in writing and when signed, treated as binding life-of-project agreements regardless of changes in leadership. Changes in project timeframe and budget should have been communicated immediately to all partners, and project parameters modified as rapidly as possible to avoid misdirection and wasted resources.

APPENDIX A

Year 3 Activity Plan: August 2000-July 2001

Activity No.	Title of Activity, Task or Sub-task	Sub-task Target	Closeout Action
Activity 1	EMS/CP implemented in designated sites and industries		
Task 1.1	Promote EMS and P2/CP within industries and LGUs		
1.1a	Assist implementation of EMS and P2/CP by the demonstration industries	10 industries	Terminate
1.1b	Guide industry implementation of EMS and P2/CP through the Joint EMS Implementation Program (JIP) for industries	165 industries	Institutionalize
1.1c	Assist implementation of EMS and P2/CP by the demonstration LGUs	2 LGUs	Terminate
1.1 d	Guide LGU implementation of EMS and P2/CP through the Joint EMS Implementation Program (JIP) for LGUs	18 LGUs	Institutionalize
Task 1.2	Demonstrate the correlation between EMS-P2/CP and pollution reduction		
1.2a	Gather information among the targeted industries/LGUs for pollution reduction determination	10 databases	Terminate
1.2b	Determine pollution reduction among the targeted industries/LGUs	10 demonstrations	Complete
Task 1.3	Demonstrate the benefits of an EMS accounting system (EMSAS)		
1.3a	Design, test and refine the EMSAS	1 system	Complete
1.3b	Demonstrate the benefits of an EMSAS using selected demonstration industries	5 demonstrations	Compete
Task 1.4	Support database development and information management		
1.4a	Develop and expand technical databases on industries and LGUs	50 databases	Terminate
1.4b	Maintain and expand the PITAMS interactive information management system	As required	Terminate
1.4c	Support GOP development of an industrial environmental management geographic information system (IEM-GIS)	1 system	Institutionalize

Activity No.	Title of Activity, Task or Sub-task	Sub-task Target	Closeout Action
Activity 2	Title of Activity, Task or Sub-task		
Task 2.1	Develop communication support to project		
2.1a	Prepare IEC materials, e.g., fact/feature sheets, presentations, posters, display materials	20 items	Complete
2.1b	Continue IEC and promotion of EMS/CP to assist achieving targets for Tasks 1.1 a-d	As required	Institutionalize
2.1c	Prepare reports, success stories, special articles for the website or other forms of distribution	30 publications	Terminate
2.1d	Produce a monthly electronic newsletter for the website	8 newsletters	Institutionalize
Task 2.2	Establish IISE information clearinghouse		
2.2a	Expand, refine and maintain the IISE website	1 website	Institutionalize
2.2b	Maintain the IISE technical library	1 library	Institutionalize
Activity 3	Policy incentives favoring adoption of EMS/CP established		
Task 3.1	Assist GOP in the development of policy implementation instruments		
3.1a	Develop the operational guidelines of a 2-track EMS/PP Program	1 set of guidelines	Complete
3.1b	Develop the IRR's for a DENR-DAO on regulatory flexibility	1 set of IRRs	Complete
3.1c	Develop the guidelines and criteria to implement various forms of regulatory flexibility	1 set of guidelines	Complete
3.1d	Develop EMS design, baseline and update data protocols	1 set of guidelines	Complete
3.1e	Develop policy instruments for granting fiscal incentives	1 set of incentives	Complete
3.1f	Develop policy instruments for granting financial incentives	1 set of incentives	Complete

Activity No.	Title of Activity, Task or Sub-task	Sub-task Target	Closeout Action
3.1g	Develop DOST guidelines for availment of technical/technological assistance	1 set of guidelines	Complete
3.1h	Assist EMB with preparation of EMS/PP Program Procedural Handbook	1 handbook	Terminate
3.1I	Support regional seminars/training to assist regional EMB implementation of EMS/DAO	2 seminars	Terminate
Activity 4	Institutional capacity (DENR, DTI, private sector) to support adoption of EMS/CP installed		
Task 4.1	Support establishment of a national EMS accreditation program (EMSAP)		
4.1a	Provide technical assistance to the formation/accreditation of a national ISO 14001 Accreditation Body	1 program	Complete
4.1b	Provide technical assistance to the formation/accreditation of an indigenous ISO 14001 Certification Body	1 body	Terminate
4.1c	Provide technical assistance to the accreditation of an ISO 14001 EMS Auditor Registration Scheme	1 body	Terminate
Task 4.2	Support training of environmental EMS auditors for international certification		
4.2a	Arrange and conduct EMS auditor training	1 course	Complete
4.2b	Arrange and conduct supervised EMS live-audits	2 courses	Complete
Task 4.3	Support EMS implementation by selected PEPP partners		
4.3a	Assist selected PEPP partners with EMS implementation through joint training and technical guidance	5 partners	Institutionalize
Task 4.4	Provide technical support to EMB regional KRA on EMS implementation by industry		
4.4a	Assist EMB KRA with PEPP regional implementation	50 industries	Institutionalize
Task 4.5	Build PEPP/NGO capacity to promote and advocate EMS		
4.5a	Complete and pilot-test draft manual among IEC user groups	1 manual	Complete

Activity No.	Title of Activity, Task or Sub-task	Sub-task Target	Closeout Action
4.5b	Conduct orientation seminar for Communicators Training Manual IEC users	1 seminar	Complete
4.5c	Assist IEC-user groups to field-test manual	1 program	Complete
4.5d	Final review and revisions to manual	Revisions	Complete
4.5e	Publish and distribute manual	1 manual	Complete
Task 4.6	Provide technical support to DOST in P2-opportunity assessment		
4.6a	Provide technical resource speaker for seminar on P2-opportunity assessment	1 seminar	Complete
Activity 5	Management and administration		
Task 5.1	Project activities	All activities	Complete
Task 5.2	Handover of activities and property	As required	Complete
Task 5.3	Project closeout	All operations	Complete

APPENDIX B

List of Chemonics/IISE Publications

Appendix B. Summary of Chemonics/IISE Publications

	Report Reference			
Title/Description	**Administrative**	**Technical**	**Working**	**Submission**
	Report	**Report**	**Document**	**Date**
Quarterly Report No. 1(Jul-Dec 1998)	No. 99/1			February-99
Quarterly Report No. 2 (Jan-Mar 1999)	No. 99/2			April-99
Quarterly Report No. 3 (Apr-Jun 1999)	No. 99/3			July-99
Communications Strategy	No. 99/4			September-99
Quarterly Report No. 4 (Jul-Sep 1999)	No. 99/5			November-99
IISE Training Plan	No. 99/6			November-99
Year 2000 Provisional Work Plan	No.00/1			January-00
Quarterly Report No. 5 (Oct-Dec 1999)	No.00/2			missed
Performance Monitoring & Evaluation System	No. 00/2			April-00
Quarterly Report No. 6 (Jan-Mar 2000)	No. 00/3			April-00
Quarterly Report No. 7 (Apr-Jun 2000)	No. 00/4			July-00
Quarterly Report No. 8 (Jul-Sep 2000)	No. 00/5			November-00
Quarterly Report No. 9 (Oct-Dec 2000)	No. 00/6			March-01
Quarterly Report No. 10 (Jan-Mar 2001)	No. 01/1			August-01
Year 3 Work Plan: March-July 2001	No. 01/2			April-01
Activity Closeout Plan	No. 01/3			April-01
Quarterly Report No. 11 (Apr-Jun 2001)	No. 01/5			September-01
Property Disposition Plan	No. 01/6			June-01
Contract Completion Report	No. 01/7			December-01
Environmental Mangement Systems and the Role ISO 14000		No. 99/1		February-99
IISE (Philippines) Pollution Prevention / Cleaner Production Strategy Development		No. 99/2		July-99
Initial Environmental Review (IER) Pollution Prevention (CP) Training Component		No. 99/3		July-99
Briefing Documents on Development of an IISE Geographic Information Systems		No. 99/4		August-99
IISE Awareness Training on Quality and ISO 9000		No. 99/5		September-99
Environmental Safety and Health Management Training for Field Activities		No. 99/6		September-99
Implementing an Environmental Management Systems		No. 99/7		October-99
The Genesis of ISO 14000 from ISO 9000		No. 99/8		November-99
Inception Report on Benchmark Study of the Status of Environmental Laboratories in the Viasayas-Mindanao Area, Philippines		No. 99/9		November-99
Notes/Minutes/MOAs of IISE Policy Program		No. 99/10		November-99
Process Documentation for Sector Selection		No. 99/11		November-99
Pollution Prevention (P2)/Cleaner Production (CP) Assessment Training Course		No. 99/12		December-99
Cleaner Production/Pollution Prevention Risk Reduction Measurement Model Development		No. 99/13		December-99

	Report Reference			
Title/Description	**Administrative**	**Technical**	**Working**	**Submission**
	Report	**Report**	**Document**	**Date**
P2/CP Field Assessment Report		No. 00/1		July-00
Laboratory Benchmarking Survey		No. 00/2		July-00
Mining Sector Survey		No. 00/3		July-00
LGU Initial Environmental Review Protocol		No. 00/4		July-00
KAP Survey Report		No. 00/5		July-00
Philippine ISO 14001 Survey Report		No. 00/6		October-00
Feasibility Study for PhilExport		No. 00/7		July-00
Guidelines for EMS Auditor Registration		No. 00/8		July-00
Business marketing report		No. 01/2		August-01

APPENDIX C

Summary of EMS Implementations and Certifications

Appendix C.

Summary of IISE-supported EMS implementations and certifications

GROUPINGS		EMS IMPLEMENTATIONS (non-certified + certified)		EMS CERTIFICATIONS	
		Target*	Achieved	Target	Achieved
Chemonics	(sub-task)*				
IISE-DP for industry	(1.1.a)	10	10	10	7
IISE-JIP for industry	(1.1.b)	165	130	30	3
IISE- DP for LGUs	(1.1.c)	2	2	2	1
IISE- JIP for LGUs	(1.1.d)	18	40	10	0
PEPP EMS implementations	(4.4.a)	5	4	3	1
IISE-Certified Consultants		50	46	20	13
GOP(KRA) Programs	(4.4.b)	50	0	0	0
US-AEP		65	65	0	0
	Total	**365**	**297**	**75**	**25**

* As specified in the Year 3 Work Plan

APPENDIX D

Methods for Determining Pollution Reduction

APPENDIX D. Methods that Chemonics will Employ to 31 July 2001 to Obtain Pollution Reduction Information from Industries Participating in ISSE

Participant type	Procedures for Demonstrating Pollution-Reduction
1. Demonstration Industries	1.1. Pre/post intervention data and pollution-reduction calculations, using "hard" data and simple, IEMP-style computations; and, 1.2. Projected pollution reduction-based on measures described below for JIP industries. These data will be less quantitative than the pre/post intervention data referenced above, but in a sense more honest in that industries themselves are projecting changes which are key to "continual improvement and commitment to complying with local regulations and laws."
2. JIP industries	2.1. Projected pollution-reduction based on the environmental management plan (EMP) that each firm is required to submit under their contractual agreement with Chemonics. The EMP specifies: specific waste streams, targeted reductions (units and percentage) and time frames. These pollution reduction actions are also required in the EMS plan, and re-certification is dependent on demonstrating progress towards these targeted results. This represents a step beyond the approach that was used by IEMP in that (i) the industries themselves, not just consultants, will be identifying aspects/impacts, and (ii) this process will be continued and improved through time, as required to maintain EMS certification.
	2.2. Information produced through our quality assurance/quality control (QA/QC) program between now and 31 July 2001.
	2.3. Chemonics will obtain this information from JIP participants that are sufficiently advanced in their EMS implementation to have produced it by 31 July 2001.
3. IISE-certified consultant implementations	3.1. Prior to 15 April 2001, Chemonics will send a letter to all consultants that have received training through IISE. They will be asked to contact all firms to which they provided EMS implementation assistance after having received IISE training, and request the following information from their client firms; this information should be contained in their EMPs: **Area**: Luzon, Visayas, Mindanao **Sector**: Using IISE categories **Size of firm**: Large or SME **Targeted reductions**: Expressed as percent, waste stream, by time.
	3.2. In late April, we will follow up the letter with a telephone call urging them to obtain this information from their clients. We will stress the value to them and their clients in demonstrating the linkage between EMS and P2/CP, and the value of EMS as a means of meeting regulatory standards and demonstration pollution reduction and environmentally responsible management. We will assure them that this information will be used solely for reporting purposes to USAID.
	3.3. In early May, we will invite all IISE-trained consultants to a 1-day workshop at which we will discuss lessons learned from their experience in assisting EMS implementation/certification, as well as successes in obtain pollution reduction as a result of EMS and P2/CP.
	3.4. We will attempt to obtain this information from at least 5% of the firms assisted by the IISE-consultants and scored as part of the target 300 EMS implementation. However, Chemonics is not in a (contractual) position to require, or guarantee that any consultants or their clients will provide us with this information.

Participant type	Procedures for Demonstrating Pollution-Reduction
4. PEPP partners	4.1 Prior to 31 July 2001, Chemonics will request AIM, EMB and BOI to provide us with information similar to that described under point 2.1 above.
	4.2. Chemonics is not in a (contractual) position to require the PEPP partners to provide us with this information.
5. Industries participating the GOP key result area (KRA) program	5.1. Obtaining pollution reduction information from industries participating in the GOP KRA program will depend on the pollution-reporting agreements that are reached between the PEPP members (e.g., EMB, BOI) and the individual firms. We will work with the GOP and KRA industries to assist them in identifying what information is needed and how to produce it.
	5.2. Chemonics is not in a (contractual) position to require these industries to provide us with this information.

APPENDIX E

Pollution Reduction Targets and Schedule

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3060-137.7	PPPI (Production - PhilAdh)	Reduce air pollution	50.00%	12/31/01	Air emission	Air Emissions		
3054-085.2	PMC (Technical Admin)	Reduce TSP in ambient air during tile cutting	50.00%	12/31/01	Air Emission (suspended particles)	Dust emission causing air contamination		mg/L
3054-085.2	PMC (Technical Admin)	Reduce TSP in ambient air during concrete mixing	10.00%	06/30/02	Air Emission (suspended particles)	Emission of cement dust causing air pollution		mg/L
3076-075.2	ICC (Process Control/ Laboratory)	Control localized toxic fumes and gas emissions and prevent potential health risk	100.00%	03/31/01	Air emission (ambient gas/chemical fumes)			
3068-096.9	MDPAVI	Minimize emissions to air of chemical fumes during application	50.00%	12/31/02	Air emission (chemical [pesticide/fertilizer] mist)			
3068-082.5	MEPI	Minimize wastes and spillage and emission of fumes to air ; and protect human health in compliance with RA8749, DAO No.35 series of 1990, Article 162 of the Labor Code of the Philippines	60.00%	12/31/02	Air Emission (chemical [pesticide/fertilizer] mist)	Chemical mixing and application (for farm spraying operations)		
3068-095.12	MDAVAVC	Reduce or eliminate release of pollutants into the environment in compliance to legal regulations and requirements (PD856,Art.162 Labor Code of Phil., Rules and Regulation # 1:1997	90.00%	12/31/02	Air Emission (chemical fumes and mist)			
3068-098.7	MDNVMDC	Reduce emission/spillage of chemicals	80.00%	12/31/02	Air Emission (chemical fumes and mist)			
3076-081.3	ACC (Maintenance Services)	Reduce emission of chemical, gas, welding and cutting fumes	25.00%	12/31/01	Air Emission (Chemical fumes)			

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3076-081.3	ACC (Quality Assurance)	Eliminate fume emission at workplace	100.00%	12/31/01	Air Emission (chemical fumes)	Emission of chemical fume		
3067-083.3	MVC	Reduce unwanted gas emission to the atmosphere	30.00%	12/31/01	Air emission (chemical fumes)	From 3 to 1 complaints a month by end of 2001		
3068-090.8	MDIOBAVI	Establish buffer zone to prevent chemical discharges nearby bodies of water, communities & residence in compliance of DAO 96-37, RA 8749 Clean Air Act of 1999, OSH art. 162 Labor Code of the Philippines.	50.00%	12/31/02	Air Emission (chemical mist from pesticides and fertilizers)	Chemical Usage Aerial Spray		
3068-098.7	MDNVMDC	Reduce number of spray chemical application		07/31/02	Air Emission (chemical mists)	Use of agri-chemicals		
3060-143.10	FPI (Machine Maintenance				Air Emission (CO and SOx)	Emission of CO and SOX		
3067-035.1	MRII	Reduce emissions of CO/CO2	50.00%	01/00/00	Air Emission (CO/CO2/SOx, Nox)			
3081-133.11	FFHC (Energy Dept)	Reduce emission of CO2, NOx, CO to air	10.00%	12/31/01	Air Emission (CO2, NO, and COx)	Emission of CO2, NO, and CO x to air		
3065-184.3	EKP (Eng'g Dept)				Air Emission (Combustion gases - nitrogen oxide, sulfur oxide, soot, dust, particulate)			
3076-146.4	GFCC	Prevent/control pollution in compliance with regulatory standards	100.00%		Air Emission (Combustion gases - NOx and SOx)	Discharge of NO x and SO x		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3076-075.2	ICC (Dryer/ Material Storage)	Minimize air pollution and prevent acid rain and minimize global warming		12/31/00	Air emission (Combustion gases - NOx, SOx and CO2))	SO x Emission		
3076-075.2	ICC (Kiln/ Cooler/ Coal Grinding Mill)	Minimize air pollution and prevent acid rain	40.00%	12/31/00	Air emission (Combustion gases - NOx, SOx and CO2))	NO x Emission		
3073-016.1	CPA	Compliance to the Clean Air Act to protect workers from airborne health hazards	100.00%		Air Emission (Combustion gases [CO2 , SOx, CO, NOx, lead])	Exhaust gas (lead, carbon, SO2, NO2, and other pollutants) from truck engine/ air pollution/ health hazard		
3071-016.1	CPA	Minimize exhaust gas emitted from vessel's engine	50.00%	12/31/02	Air Emission (Combustion gases [CO2 , SOx, CO, NOx])	Exhaust gas (NO2, SO2) from vessel engine during berthing/ air pollution/ health hazard to workers and passengers		
3076-075.2	ICC (Quarry/ Mining Claims, Crusher, Motorpool)	Reduce air pollution			Air emission (combustion gases from diesel driven equipment)	Release of smoke		
3076-081.3	ACC (Production)	Regulate/control occurrence of abnormal smoke gas emission and improve maintenance	30.00%	12/31/02	Air Emission (combustion gases - NO x, SO x, CO, CO2)	Point source smoke gas emission (NO x, SO x, CO, CO2) [Production section]		
3067-083.3	MVC	To eliminate vehicle exhaust emission	100.00%	07/31/01	Air emission (combustion gases)	combustion gases		
	RE	Eliminate burning of materials	100.00%	08/31/01	Air Emission (Combustion gases)	Disposal of packaging materials by burning		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3074.4-015.1	SMIR	To enforce Best Practice for welding works	20.00%	06/30/01	Air emission (combustion gases)			
3076-041.1	UCC (Automation & Instrumentation Dept.)	Maintain a continuous emission monitoring equipment for line 2 & 3 stacks.	30.00%	12/31/00	Air Emission (combustion gases)	Release to air from facilities		
3076-075.2	ICC (Dryer/ Material Storage)	Reduce ambient air dust concentration	20.00%	12/31/00	Air Emission (dust [fugitive])	Point-source dust emission		
3076-075.2	ICC (Eng'g & Maintenance)	Reduce air pollution and conform to good environmental practices	100.00%	11/30/00	Air Emission (dust [fugitive])	Fugitive dust emission [Civil Eng'g section]		
3076-075.2	ICC (Finance/ Acctg, Purch'g, Warehousing)	Reduce air pollution and ambient air dust concentration	100.00%	12/31/00	Air Emission (dust [fugitive])	Fugitive dust emission		
3076-075.2	ICC (Finish Grinding Mill)	Minimize air pollution	25.00%	12/31/00	Air Emission (dust [fugitive])	Fugitive dust emission		
3076-075.2	ICC (Kiln/ Cooler/ Coal Grinding Mill)	Minimize air pollution	25.00%	12/31/00	Air Emission (dust [fugitive])	Fugitive dust emission		
3076-075.2	ICC (Packhouse/ Pier Operation)	Minimize air pollution and increase in ambient air dust concentration	25.00%	12/31/00	Air Emission (dust [fugitive])	Fugitive dust emission		
3076-075.2	ICC (Plant Offices/ Canteen/ Clinic/ etc.)	Minimize air pollution in the plant	100.00%	06/30/00	Air Emission (dust [fugitive])	Fugitive dust emission		
3076-075.2	ICC (Raw Grinding Mill/ Blending Silo/ Cooling Tower)	Reduce air pollution and conform to good environmental practices	50.00%	12/31/00	Air Emission (dust [fugitive])	Fugitive dust emission		
3076-075.2	ICC (Eng'g & Maintenance)	Reduce air pollution and conform to good environmental practices	100.00%	11/30/00	Air emission (dust [fugitive]) [Electrical]	Fugitive dust emission [Electrical]		
3076-075.2	ICC (Eng'g & Maintenance)	Reduce air pollution and conform to good environmental practices	25.00%	03/31/00	Air emission (dust [fugitive]) [Instrumentation]	Fugitive dust emission [Instrumentation]		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3076-041.1	UCC (Quality Assurance Dept.)	Reduce release of high Silica dust during Mortar preparation	25.00%	12/31/00	Air Emission (Dust-high silica)	Release of high Silica dust during Mortar Preparation		
3076-081.3	ACC (Product Handling & Distribution)	Reduce point source dust emission	20.00%	12/31/02	Air Emission (Dust)	Point source dust emission		
3076-081.3	ACC (Production)	Reduce dust emission incidents of Crusher L 1	50.00%	12/31/01	Air Emission (Dust)	Point source dust emission of Crusher L 1		
3064-157.16	ADI				Air emission (Dust)			
3054-085.2	PMC (Crushing/Sizing)	Reduce dust concentration coming from crushing/sizing	20.00%	12/31/02	Air Emission (Dust)	Dust Emission causing air pollution and respiratory illnesses		
3076-041.1	UCC (Packing & Loading Dept.)	Reduce dust emissions from Jet Pulse Collector	25.00%	09/30/00	Air Emission (Dust)	Dust from equipment stacks		
3076-041.1	UCC (Pyro-Processing Dept.)	Monitoring and maintenance of Jet Pulse Filter dust collector.	25.00%	11/30/00	Air Emission (Dust)	Dust Emission		
3076-146.4	GFCC	Reduce/Eliminate the release of pollutants in the environment based on TSP regulatory standards	100.00%		Air emission (Dust/particulate)	Emission of dust particulate to air		
3075-056.1	CCTFI	Prevent and control pollution		12/31/01	Air emission (exhaust gases from transport vehicle)			
3074-185.1	DON BOSCO	Comply with emission standard	100.00%	12/31/02	Air emission (exhaust gases from transport vehicle)	2) Exhaust emission of transport vehicle		
3068-096.9	MDPAVI	Adhere to Clean Air Act of 1999 to minimize/prevent pollution	20.00%	01/31/03	Air emission (exhaust gases from transport vehicle)	Smoke belching from vehicles		
3060-137.7	PPPI (Production - Emejota	Reduce emission of lubricant powder emission	50.00%	03/31/02	Air emission (Lubricant powder)	Lubricant powder emission		umg/ NCM

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3053-139.7	GE	Reduce/eliminate emission of Hg and lead vapors	50.00%	12/31/01	Air emission (mercury and lead vapors)	Mercury and lead vapors		
3067-035.1	MRII	Reduce emissions of mercury vapor	50.00%	12/31/02	Air emission (mercury vapor)	Air emission of stack gas from generator set, mercury vapor from lighting, ODS from air conditioning unit		
3068-093.6	MDBRC	Phase-out CFC-emitting cooling devices used in MDBRC offices and laboratories pursuant to DAO#18 series of 2000	100.00%	12/31/09	Air emission (ODS - CFC)	Release of CFC's to the atmosphere		
3074.4-015.1	SMIR	To eliminate, change, and remove all equipment, vessels (containers) and pressurized chemicals containing CFCs and implement changes based on the Montreal Protocol and Philippine Clean Air Act.	100.00%	12/31/01	Air emission (ODS - CFC)			19200 to 13,440 gal./ day
3076-081.3	ACC (Lugait/Makati Offices & ACTR)	Reduce the release of freon from the repair and maintenance of aircon	20.00%	12/31/01	Air Emission (ODS - freon)	Release of freon		
3074.5-152.2	Subic Water	To reduce the potential emission of Freon to air by gradual phase out of Freon		12/31/02	Air emission (ODS - freon)	Release on Freon		
3076-075.2	ICC (Eng'g & Maintenance)	Minimize/ prevent depletion of the ozone layer	100.00%	02/28/01	Air emission (ODS)	Release of ozone depleting substance [Instrumentation, Electrical]		
3076-075.2	ICC (Plant Offices/ Canteen/ Clinic/ etc.)	Phase-out all air conditioning units which are using freon gas # 11 and #12	100.00%	12/31/05	Air emission (ODS)	Release of ozone depleting substances		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3068-096.9	MDPAVI	Phase out Ozone Depleting substance Facilities in legal compliance with DAO No. 2000-18 on Chemical Control for Ozone Depleting Substances	100.00%	03/03/10	Air Emission (ODS)	Ozone Depleting Substance Facilities		
3068-082.5	MEPI	Phase-out ozone depleting substance facilities in legal compliance with DAO No. 2000-18 on chemical control for ODS	100.00%	12/31/10	Air emission (ODS)	Ozone Depleting Substance Facilities - Staggered replacement by Year 2003		
3067-035.1	MRII	Reduce emissions of ODS	50.00%	12/31/10	Air Emission (ODS)			
3081-116.8	CAT	Improve/Repair/Replace/Purchase equipment to comply with government regulatory requirement for NAASQSSP)		12/31/05	Air emission (particulate - fly ash)	Air emission		uc/ncm3
3052-047.7	JMX	To reduce emission of particulates	37.00%	06/30/01	Air emission (Particulates)			
3072-059.4	TPC	To reduce emission of particulates	20.00%	12/31/01	Air emission (Particulates)			
3062-148.6	ISAROG	Maintain an allowable smoke emission as per standard		09/30/02	Air emission (smoke)	Smoke emission		
3065-184.3	EKP (Quality Assurance)				Air emission (VOC, dust, vapor)			
3073-016.1	CPA	Prevent inhalation by/exposure of workers to paint fumes	80.00%	12/31/02	Air emission (VOCs and Paint Overspray)	Emission of fumes posing harm to health of workers		
3052-047.7	JMX	To reduce emision of volatile organic compounds	37.00%	06/30/01	Air emission (VOCs)			
3053-100.6	PTY	To eliminate the use of xylene and neorever	100.00%	03/31/02	Air emission (VOCs)			
3067-083.3	MVC	Reduce Chlorine Emissions	100.00%	12/31/01	Air emission of Chlorine gas	Chloring gas		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3072-059.4	TPC	To reduce the emission of combustioin gases	30.00%	12/12/01	Air emission of combustion gases (SOx)			
3068-096.9	MDPAVI	Phase out installed asbestos to eliminate particle emissions to air	100.00%	10/03/01	Asbestos	Asbestos walls at Packing House ; Asbestos walls and roofing at the warehouse		
3068-082.5	MEPI	Phase-out installed asbestos to eliminate particle emissions to air in compliance with ISO Standards	100.00%	12/31/02	Asbestos	Asbestos walls and roofs at the Warehouse		
3068-082.5	MEPI	Phase-out installed asbestos to eliminate particle emissions to air	100.00%	12/31/03	Asbestos	Asbestos walls at Packing Houses		
3068-082.5	MEPI	Eliminate asbestos particle emission to air	100.00%	12/31/08	Asbestos	Asbestos roofing of Multi-purpose gym		
3072-059.4	TPC	To reduce the emission of asbectos fibers	20.00%	12/03/01	Asbestos			
3076-041.1	UCC (Maintenance & Services Dept.)	Phase-out asbestos insulating materials	100.00%	06/30/01	Asbestos	Asbestos-insulating material & Askarel oil cooled transformer.		
3076-146.4	GFCC	Phase out asbestos containing materials	20.00%	12/31/01	Asbestos Containing Materials (ACM)	Asbestos Containing Materials (ACM)		
3060-143.10	FPI	To reduce discharge of chemicals by repairing leaks			Chemical leaks discharged to land	Chemical leaks discharged to land		
3060-143.10	FPI (Mold Maintenance)				Chemical leaks discharged to land	Chemical leaks discharged to land		
3060-143.10	FPI				Chemical leaks discharged to water	Chemical leaks discharged to water		
3060-143.10	FPI (Mold Maintenance)	To reduce discharge of chemicals by repairing leaks			Chemical leaks discharged to water	Chemical leaks discharged to water		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3068-096.9	MDPAVI	Minimize and prevent pollution with legal compliance to FPA requirement/regulations, and DAO No.35 series of 1990 (revised Effluent Regulations)	20.00%	February 29, 2003	Chemical residue	Chemical Residue from aerial spray		
3068-082.5	MEPI	Minimize and prevent pollution in legal compliance to FPA requirement, DAO#35 series of 1990	60.00%	01/31/02	Chemical residue	Chemical residue from aerial spray		
3081-116.8	CAT	To comply with government (DENR) required standards for inland water		12/31/01	Compliance	Discharge to water		
3075-056.1	CCTFI	To prevent spillage of chemicals to the ground		12/31/01	Compliance			
3076-075.2	ICC (Dryer/ Material Storage)	Minimize air pollution and prevent acid rain		12/31/00	Compliance	NO x Emission		
3076-075.2	ICC (Finish Grinding Mill)	Minimize air pollution			Compliance	Point-source dust emission		
3076-075.2	ICC (Kiln/ Cooler/ Coal Grinding Mill)	Minimize air pollution			Compliance	Point-source dust emission		
3076-075.2	ICC (Packhouse/ Pier Operation)	Reduce air pollution		12/31/00	Compliance	Point-source dust emission		
3076-075.2	ICC (Raw Grinding Mill/ Blending Silo/ Cooling Tower)	Reduce air pollution and conform to good environmental practices			Compliance	Point-source dust emission		
3068-095.12	MDAVAVC	Reduce or eliminate release of pollutants into the environment in compliance to legal regulations and requirements (PD856,Art.162 Labor Code of Phil., Rules and Regulation # 1:1997	100.00%	12/31/02	Compliance	Chemical exposure and health hazard to personnel		
3068-098.7	MDNVMDC	Comply with PD 1067; Disposal of rejected fruits		04/30/02	Compliance	Disposal of rejected fruits		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3068-096.9	MDPAVI	Comply to health and safety requirement of occupational health and safety, Rule 1965 on occupational device and Rule 1966 on Occupational health Program		05/25/03	Compliance	Spraymen's bathroom		
3068-082.5	MEPI	Comply to Rule 1080 OSHS		11/30/01	compliance	Health and safety of Engineering Workers		
3068-082.5	MEPI	Comply with RA 9003 on ecological solid waste management Act of 2000		12/31/01	Compliance	Plastic solid wastes		
3068-082.5	MEPI	Adhere to the Clean Air Act of 1999		06/30/02	Compliance	Smoke belching from vehicles		
3068-082.5	MEPI	To comply with CHSEC Dept. Order No. 20	100.00%	06/30/03	Compliance	Health and safety risks of workers		
3068-082.5	MEPI	To improve comfort room facilities		12/31/04	Compliance	Comfort rooms		
3067-035.1	MRII	Ensure consistent compliance with the requirement of DAO 35 and PD 1586		06/30/03	Compliance			
3074.4-015.1	SMIR	To comply with accreditation/certification requirements of applicable laws; To respond to biodiversity concerns		12/31/00	Compliance			
3074.4-015.1	SMIR	To comply with applicable laws and other requirements			Compliance			
3074.4-015.1	SMIR	To ensure proper handling and disposal of pathogenic wastes in accordance with legal requirements			Compliance			
3074.5-152.2	Subic Water	Comply to environmental regulation. Comply to implemented 55 Standards.		12/31/02	Compliance	Storage and disposal of used chemicals/chemical containers, scrap materials, and other hazardous wastes.		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3074.3-135.5	YKK	Comply with regulatory requirements		12/31/02	Compliance	Air quality		
3074.3-135.5	YKK	Comply with regulatory requirements of DAO #35		01/01/01	Compliance	Effluent		
3076-075.2	ICC (Kiln/ Cooler/ Coal Grinding Mill)	Minimize air pollution and prevent acid rain		12/31/00	Compliance (SOx emission standards)	SO x Emission		
3076-081.3	ACC (Process & Project Eng'g)	Ensure that all equipment purchases in the future are environment-friendly	100.00%	12/31/01	Conformance to EMS	Acquisition of Non-environment friendly technology/equipment		
3081-116.8	CAT EMS Training Committee	Provide sufficient EMS training, awareness and competence		06/30/03	Conformance to EMS	Personnel Awareness Training		
3074.4-015.1	SMIR	To inform suppliers, contractors, and concessionaires on the resort's environmental management system and environmental policy commitments	100.00%	06/30/01	Conformance to EMS			
3074.4-015.1	SMIR	To communicate major EMS elements to all concerned	100.00%	12/31/01	Conformance to EMS			
3074.4-015.1	SMIR	To reduce, track and monitor overall materials usage at efficient/effective levels			Conformance to EMS			
3074.4-015.1	SMIR	To conduct annual hydrostatic pressure test for Boiler pressure vessel			Conformance to EMS			
3074.4-015.1	SMIR	To ensure that all instrument for measurement and monitoring are properly calibrated			Conformance to EMS			
3074.4-015.1	SMIR	To establish 100% conformance of BEST PRACTICES in all departments			Conformance to EMS			
3074.4-015.1	SMIR	To contribute to the preservation of coastal resource			Degradation of coastal resource	One coastal preservation activity per year		
3076-146.4	GFCC	Prevent/control pollution in compliance with regulatory standards	100.00%		Discharge of dissolved solids	Dissolved Solids discharged to water		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3076-075.2	ICC (Eng'g & Maintenance)	Minimize adverse visual impact and possible land and water contamination	100.00%	12/31/10	Discharge of hazardous materials	Generation and disposal of hazardous materials		
3081-116.8	CAT Refinery	Reduce Melter Discharger	5.00%	06/30/03	Discharge of melter discharger to water	Discharge to land, Reduce Melter Discharger		
3054-085.2	PMC (Electrical)	Prevent contamination of underground water with oil/diesel from engine generator	100.00%	10/31/01	Discharge of oil (transformer)	Spillage of oil transformer to land thus land contamination		
3065-184.3	EKP (Eng'g Dept)				Discharge of oil (used)			
3060-143.10	FPI (Mold Maintenance)				Discharge of oil (used)	Generation of used oil		
3068-090.8	MDIOBAVI	Fabricate a device for cable lubrication to reduce discharges to land and in compliance with RA 6969.	40.00%	12/31/02	Discharge of oil (used)	Used oil		
3068-095.12	MDAVAVC	Minimize/Prevent oil and fuel discharge in compliance to RA9003, PD856, and Art. 162 of the Labor Code of Phil.	100.00%	12/31/02	Discharge of oil/Fuel	Oil and fuel discharges to land during issuance to users		
3074.5-152.2	Subic Water	Reduce the discharge of oil/fuel/lubricant	20.00%	12/31/02	Discharge of oil/Fuel/Lubricant	Discharge of fuel, oil, and lubricants.		
3068-096.9	MDPAVI	Prevent discharges of used oil, fuel, and lubricant to land and water in compliance with PD 984-NPC Decree of 1976	50.00%	07/31/02	Discharge of oil/Fuel/Lubricant (used)	Disposal of rinsates (oil, fuel, lubricant) from Auto Shop Maintenance activities		
3068-082.5	MEPI		50.00%	09/30/02	Discharge of oil/Fuel/Lubricant (used)	Disposal of rinsate (oil, fuel, lubricant) from Auto Shop Maintenance activities		
3076-075.2	ICC (Eng'g & Maintenance)	Prevent land and water contamination and injury to humans	100.00%	12/31/03	Discharge of PCB	Polychlorinated biphenyl (PCB)		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3074.4-015.1	SMIR	To maximize use of brine solution for salt making industry and minimize disposal of brine to the sea.	100.00%	12/31/02	Discharge of salt/brine from RO			
3076-081.3	ACC (Mining Services & Environmental Affairs)	Reduce volume of accumulated silt	50.00%	12/31/01	Discharge of Silt	Silt generated from quarry/ exploration drilling operation		
3076-081.3	ACC (Materials Management)	Reduce fuel spillage		12/31/01	Fuel spillage	Handling and storage of bunker fuel		
3081-133.11	FFHC (Materials Mgt. Dept.)	Eliminate fuel spills at the fuel filling station	100.00%	12/31/01	Fuel spillage	Fuel spills		
3062-148.6	ISAROG	Optimize use of Bunker Fuel Oil	100.00%		Fuel spillage	Fuel consumption		
3068-098.7	MDNVMDC	Reduce fuel spillage and minimize emission to air	80.00%	12/31/02	Fuel spillage	Fuel spillage and emission to air		
3068-092.14	MDOFI	Establish procedures in the prevention of fuel spillage in compliance with PD984 and PD 1152	50.00%	05/30/01	Fuel Spillage	Fuel spillage		
3060-143.10	FPI				Fuel spillage/leaks	Fuel leaks discharged to land		
3060-143.10	FPI				Fuel spillage/leaks	Fuel leaks discharged to water		
3076-146.4	UCC (AMD)	Prevent accidental spillage of fuel & lubricants on various storage & issuing areas		11/30/00	Fuel/Lubricant spillage	Discharges due to handling, storage of fuel, tubes & grease		
3076-081.3	ACC (Production)	Reduce grease spillage	50.00%	12/31/01	Grease spillage	Grease spillage		
3068-095.12	MDAVAVC	Reduce exposure of workers to pesticide fumes	90.00%	12/31/02	Human health effect			
3076-081.3	ACC (Process & Project Eng'g)	Eliminate accident hazard in construction and maintenance work	50.00%	12/31/01	human health effect	Hazard in construction and maintenance work		
3076-081.3	ACC (Production)	Reduce heat exposure	30.00%	12/31/01	Human health effect	Heat exposure		
3075-056.1	CCTFI	Prevent accidents	100.00%	11/30/00	Human health effect			

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3074-185.1	DON BOSCO	Prevent accidents	100.00%	12/31/01	human health effect	3) Fire due to leakage of oxy-acetylene tanks		
3081-133.11	FFHC (Refinery Dept.)	Minimize the human health effects of lime unloading		12/31/01	Human health effect	Health effects of lime unloading	from 1550g to 1000g	gram
3053-139.7	GE	Prevent workplace injuries and illnesses Provide employees with a safe and healthy environment	50.00%	12/31/01	Human health effect	Exposure of workers to health hazards and safety risks		
3053-139.7	GE	Prevent employee from exceeding the Permissible Exposure Limit from toxic vapors (Lead and Hg)	100.00%	12/31/01	Human health effect	Exposure of employees to toxic vapors		
3076-146.4	GFCC	Reduce heat generation		06/30/02	human health effect	Heat generation		
3076-146.4	GFCC	Reduce vibrations		06/30/02	human health effect	Vibrations		
3076-075.2	ICC (Dryer/ Material Storage)	Prevent hearing impairment	100.00%	06/30/02	Human health effect	Noise		
3076-075.2	ICC (Eng'g & Maintenance)	Prevent potential injury to humans during the conduct of Auto Cad and Blue Printing Operation	100.00%	11/30/00	Human health effect	Radiation exposure		
3076-075.2	ICC (Finance, Acctg, Purch'g, Warehousing)	Prevent injury to humans, damage to equipment and air pollution	100.00%	03/31/01	Human health effect	Explosive material		
3076-075.2	ICC (Finish Grinding Mill)	Minimize hearing impairment	100.00%	11/30/00	Human health effect	Noise		
3076-075.2	ICC (Kiln/ Cooler/ Coal Grinding Mill)	Prevent hearing impairment	100.00%	11/30/00	Human health effect	Noise		
3076-075.2	ICC (Kiln/ Cooler/ Coal Grinding Mill)	Minimize potential injuries to humans and damage to equipment	100.00%	12/31/05	Human health effect	Coal mill explosion		
3076-075.2	ICC (Plant Offices/ Canteen/ Clinic/ etc.)	Prevent potential injury to human caused by radioactive radiation when using photocopying machines and computers	100.00%	12/31/00	Human health effect	Radiation exposure		
3076-075.2	ICC (Process Control/ Laboratory)	Prevent potential injury to humans	100.00%	11/30/00	Human health effect			

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3076-075.2	ICC (Process Control/ Laboratory)	Minimize hearing impairment	100.00%	11/30/00	Human health effect	Noise		
3076-075.2	ICC (Process Control/ Laboratory)	Prevent potential injury to humans during the conduct of XRF analysis	100.00%	12/31/00	Human health effect	Radiation exposure		
3076-075.2	ICC (Process Control/ Laboratory)	Control localized toxic fumes and gas emissions and prevent potential health risk	100.00%	03/31/01	Human health effect	Release of toxic fumes and gases		
3076-075.2	ICC (Quarry/ Mining Claims, Crusher, Motorpool)	Prevent accidents	100.00%	11/30/00	Human health effect	Explosive material		
3076-075.2	ICC (Quarry/ Mining Claims, Crusher, Motorpool)	Comply with regulations on the allowable noise level	100.00%	11/30/00	Human health effect	Generation of noise		
3076-075.2	ICC (Quarry/ Mining Claims, Crusher, Motorpool)	Comply with the allowable vibration level	50.00%	12/31/00	Human health effect	Generation of Vibration		
3076-075.2	ICC (Raw Grinding Mill/ Blending Silo/ Cooling Tower)	Minimize exposure to high noise	100.00%	12/31/00	Human health effect	Noise		
3076-075.2	ICC (Raw Grinding Mill/ Blending Silo/ Cooling Tower)	Prevent potential injury to humans	100.00%	12/31/00	Human health effect	Chemical Spill		
3068-093.6	MDBRC	Reduce exposure of workers to pesticide fumes	100.00%	03/31/02	Human health effect	Exposure to pesticide fumes		
3068-093.6	MDBRC	Minimize exposure of laboratory personnel and field workers to chemical fumes in the field and laboratories	100.00%	12/31/02	Human health effect	Chemical fumes in field and laboratories		
3068-097.11	MDNCAVI	Provide safety warning and informative signage within the company premise in compliance with the CHSC Department Order No. 20.	100.00%	10/30/01	Human health effect	Safety Risk with in Company Premise		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3068-098.7	MDNVMDC	Adopt measure that will control human exposure to chemical fumes and prevent land and water contamination	50.00%	12/31/02	human health effect	Exposure to fungicide fumes during mixing and chemical spills		
3068-092.14	MDOFI	Protect employees and stakeholders from accidents		12/31/01	Human health effect	Safety risk		
3068-096.9	MDPAVI	Reduce exposure of plantation workers to chemicals during aerial spray in compliance with OSH, Article 162 of the Labor Code of the Philippines	60.00%	10/02/01	Human health effect	Human health hazard due to exposure to aerial spraying activities		
3068-096.9	MDPAVI	Improve the Current Practice of Protecting the health and safety of Engineering Workers		11/30/01	Human health effect	Health and safety of Engineering workers		
3068-096.9	MDPAVI	Reduce exposure of neighboring residents to chemicals during aerial spraying that is in compliance with DAO no. 96-37 on revised implementing rules and regulations to further strengthen the implementation of Environmental Impact assessment	75.00%	03/16/02	Human health effect	Health hazard to residents due to aerial spraying		
3068-096.9	MDPAVI	Improve the current practice of Protecting the Health and Safety of Workers	50.00%	06/30/03	Human health effect	Health and safety risks of workers		
3068-096.9	MDPAVI	Provide comfort rooms in legal compliance to the standard requirement of 1 comfort room for every 20 workers			Human health effect	Health and Safety of workers		
3068-094.10	MDRVAVI	Minimize chemical contamination and exposure of workers handling chemicals in the field, Mixing Plants and at the Packinghouse	20.00%	06/08/01	Human health effect	Chemical contamination and exposure		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3068-094.10	MDRVAVI	Prevent harmful effects of chemicals/ fuel if not handled or attended properly	20.00%	12/31/01	Human health effect	Harmful effects of chemicals/ fuel		
3068-082.5	MEPI	Comply with OSH Rule 1965 and 1966		12/31/01	Human health effect	Spraymen's bathroom		
3068-082.5	MEPI	Protect human health in compliance Art.162 of Labor Code	50.00%	12/31/01	Human health effect			
3054-085.2	PMC	Prevent flyrocks from reaching inhabited areas	100.00%	12/01/01	Human health effect	Generation of flyrocks endangering public safety		
3054-085.2	PMC (Accounting)	Minimize exposure of cashier to dust/odor from paper bills	50.00%	12/31/01	Human health effect	Exposure to odor/dust from old paper bills causing respiratory illness/allergies		mg/L
3054-085.2	PMC (General Affairs)	Reduce possibility of radiation exposure to the user	100.00%	12/31/01	Human health effect			
3054-085.2	PMC (Technical Admin)	Reduce exposure of workers to welding fumes and gases	50.00%	12/31/01	Human health effect	Exposure to welding fumes and gases cause eye and respiratory illness to workers		umg/ NCM
3054-085.2	PMC (Technical Admin)	Reduce exposure to TSP in ambient air during tile cutting	50.00%	12/31/01	Human health effect	Dust emission causing air contamination		umg/ NCM
3060-137.7	PPPI (Production - PhilAdh)	Prevent possible cases of respiratory diseases among employees	100.00%	12/31/01	Human health effect	Health hazard - exposure to chemicals		
3074.4-015.1	SMIR	To ensure and maintain a safe and healthy environment for both guest and staff of the resort	100.00%	12/31/01	Human health effect			
3076-146.4	UCC (HRD)	Ensure health safety in food handling and preparation		12/31/00	Human health effect	Health hazards: food poisoning		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3068-082.5	MEPI	Reduce exposure of plantation workers to chemicals during Aerial Spray in compliance with OSH, Art. 162 of Labor Code of the Philippines	60.00%	04/30/02	Human health effect (Inhalation of aerial spray chemicals)	Health hazard due to exposure to aerial spraying activities		
3068-082.5	MEPI	Reduce exposure of neighboring residents to chemicals during aerial spray in compliance with DAO no. 96-37	75.00%	04/30/02	Human health effect (Inhalation of aerial spray chemicals)	Health hazard due to aerial spraying		
3068-093.6	MDBRC	Prevent damage to properties, buildings and loss of lives	100.00%	09/30/01	Human health effect (loss of lives due to explosion)	Explosion due to leaking gas pipes		
3068-093.6	MDBRC	Minimize pathogenic contamination of all glassware and other materials used in the Plant Pathology Laboratory		06/30/02	Human health effect (pathogenic contamination)	Pathogenic contamination		
3054-085.2	PMC (Laboratory)	Reduce danger of frostbite	100.00%	12/31/01	Human health effect-Frostbite	Exposure to cold temperature posing danger of frostbite		
3074.4-015.1	SMIR	To implement FSMS		12/31/02	Improve implementation			
3054-085.2	PMC	Rehabilitate mined-out areas and convert into other land use		12/31/06	Natural resource depletion/damage			
3076-081.3	ACC (Mining Services & Environmental Affairs)	Reduce noise level	30.00%	12/31/01	Noise	Noise generation		
3076-081.3	ACC (Production)	Control noise emission of machines	10.00%	12/31/01	Noise	Noise emission/pollution within the plant		
3073-016.1	CPA	Prevent hearing impairment of workers in the fabrication shop	50.00%	12/31/02	Noise	Noise generated at fabrication shop that may cause hearing impairment of workers		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3076-146.4	GFCC	Reduce noise generation based on Noise Regulatory Standard	20.00%		Noise	Noise generation		
3068-094.10	MDRVAVI	Minimize noise level of vacuum pumps during Packing Operation	40.00%	12/31/01	Noise	Noise generated during packing operation		
3067-035.1	MRII	Implement noise-reduction measures and monitor noise level	30.00%	12/31/02	Noise	Emission of noise due to operation of RO trains and generator set and any noise-generating equipment		
3054-085.2	PMC	Reduce noise generation from secondary blasting activity	10.00%	11/30/01	Noise	Noise generation as public nuisance		
3054-085.2	PMC	Maintain existing vibration monitor reading data			Noise	Ground vibration damaging concrete structures		
3076-081.3	ACC (Mining Services & Environmental Affairs)	Reduction of ground vibration	25.00%	12/31/01	Noise/vibration	Ground vibration		
3062-148.6	ISAROG	Eliminate emission of foul odor	100.00%	03/31/02	Odor	Release of foul odor to the atmosphere		
3076-081.3	ACC (Production)	Recover used oil/ lubricants	100.00%	09/30/01	Oil (used) spillage	Disposal of used oil / lubricants in all sections		
3054-085.2	PMC (Maintenance)	Eliminate oil contamination of underground water	100.00%	06/30/02	Oil discharge	Discharge of oil to land contaminating underground water		
3060-143.10	FPI				Oil leaks discharged to land	Oil leaks discharged to land		
3060-143.10	FPI (Injection molding)				Oil leaks discharged to land	Oil leaks discharged to land		
3060-143.10	FPI (Machine Maintenance				Oil leaks discharged to land	Oil leaks discharged to land		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3060-143.10	FPI				Oil leaks discharged to water	Oil leaks discharged to water		
3060-143.10	FPI (Injection molding)				Oil leaks discharged to water	Oil leaks discharged to water		
3060-143.10	FPI (Machine Maintenance				Oil leaks discharged to water	Oil leaks discharged to water		
3076-081.3	ACC (Mining Services & Environmental Affairs)	Reduce oil spillage	50.00%	12/31/01	Oil spillage	Oil spillage from quarry mobile equipment		
3076-081.3	ACC (Maintenance Services)	Reduce cases/ incidents of oil/ grease spillage	50.00%	12/31/01	Oil spillage	Oil spillage		
3076-081.3	ACC (Production)	Reduce cases/incidents of oil spillage	50.00%	12/31/01	Oil spillage	Oil Spillage at process line 1 & 2		
3081-113.10	BMMC	To reduce oil contamination in water	100.00%	12/31/01	Oil spillage	Oil		
3081-113.10	BMMC	To reduce/minimize oil spillage	15.00%	12/31/01	Oil spillage	Oil		Liters
3073-016.1	CPA	Reduce oil pollution of sea/coastal area	50.00%	10/31/02	Oil spillage	Oil spillage from equipment/oil drums/ transport vehicles/engineering maintenance, ultimately, discharged to sea		
3073-016.1	CPA	Reduce oil pollution of coastal area/ water	5.00%	12/31/02	Oil spillage	Oil / Oil spill from truck		
3076-075.2	ICC (Dryer/ Material Storage)	Minimize adverse visual impact and land and water contamination	30.00%	12/31/00	Oil spillage	Oil leakage and spillage		
3076-075.2	ICC (Eng'g & Maintenance)		50.00%	11/30/00	Oil spillage	Oil leakage and spillage		
3076-075.2	ICC (Eng'g & Maintenance)		100.00%	12/31/00	Oil spillage	Oil leakage and spillage		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3076-075.2	ICC (Finance, Acctg, Purch'g, Warehousing)		100.00%	12/31/00	Oil spillage	Oil leakage and spillage		
3076-075.2	ICC (Finance, Acctg, Purch'g, Warehousing)	Eliminate potential release of pollutants to land and water	100.00%	12/31/00	Oil spillage	Oil spill		
3076-075.2	ICC (Finish Grinding Mill)	Minimize adverse visual impact and land and water contamination	30.00%	12/31/00	Oil spillage	Oil leakage and spillage		
3076-075.2	ICC (Kiln/ Cooler/ Coal Grinding Mill)	Minimize potential land and water contamination	25.00%	12/31/00	Oil spillage	Oil leakage and spillage		
3076-075.2	ICC (Packhouse/ Pier Operation)	Minimize adverse visual impact and potential land and water contamination	50.00%	12/31/00	Oil spillage	Oil leakage and spillage		
3076-075.2	ICC (Raw Grinding Mill/ Blending Silo/ Cooling Tower)		25.00%	12/31/00	Oil spillage	Oil leakage and spillage		
3068-095.12	MDAVAVC	Establish control mechanism in preventing oil spillage during cableway lubrication	40.00%	12/31/02	Oil spillage	Oil spillage during cableway lubrication		
3068-097.11	MDNCAVI	Prevent oil spillage	50.00%	11/30/01	Oil spillage	Oil Spillage		
3068-098.7	MDNVMDC	To implement proper application of lubricant on cables and Comply with PD 984 - NPC decree of 1976	40.00%	12/31/02	Oil spillage	Oil spillage		
3067-035.1	MRII	Prevent used oil leakage and spillage		12/31/02	Oil spillage	Chemical spillage of acids, and other dosing chemicals, and used/unused oils contributing to health risk and water pollution		
3067-083.3	MVC	Improve oil spill collection and recovery system	80.00%	12/31/01	Oil spillage			

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3054-085.2	PMC (Mining)	Reduce nitrates and oil contamination to underground water	10.00%	12/01/01	Oil spillage	Fuel oil spills contaminating land and eventually underground water		
3072-059.4	TPC	To reduce discharge of used oil/oil	50.00%	12/31/01	Oil spillage			
3076-146.4	UCC (EED)	Reduce discharges of used oil & oil spills to water	50.00%	12/30/00	Oil spillage	Discharges due to handling & disposal of used oils & oil spills to water		
3074-185.1	DON BOSCO	Eliminate spillage	100.00%	12/31/01	Oil, paint, and thinner spillage	1) Spillage of oil, paint, thinner to ground		
3068-095.12	MDAVAVC	Contain oil and fuel spillage during repair and servicing of motor vehicles	90.00%	12/31/02	Oil/Fuel spillage	Oil and fuel discharge during repair and servicing of motor vehicle and cable roller		
3076-081.3	ACC (Product Handling & Distribution)	Reduce cases/ incidents of oil / grease spillage	50.00%	12/31/01	Oil/grease spillage	Disposal of used oil/grease at pier area		
3054-085.2	PMC	Reduce discharge spillage from plant equipment	20.00%	12/31/02	Oil/Lubricant/Chemicals (used) spillage			dB
3072-059.4	TPC	To properly dispose PCB on transformers	100.00%	12/31/05	PCB			
3076-081.3	ACC (Maintenance Services)	Reduce radiation exposure	25.00%	12/31/01	Radiation	Radioactive materials		
3054-085.2	PMC (Laboratory)	Reduce the danger of radiation exposure			Radiation	Emission of radiation posing hazard to human health		
3068-095.12	MDAVAVC	Protect and conserve use of land resource eroded by construction of water easement drainage (PD 1067)	70.00%	12/31/02	Soil erosion	Land erosion at the water easement drainage embankment wall		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3068-096.9	MDPAVI	Minimize and prevent soil erosion in legal compliance with ISO 14001 requirements	100.00%	07/31/03	Soil erosion	Drainage system		
3068-082.5	MEPI	Prevent soil erosion and scouring of soil in compliance to DENR regulation	100.00%	12/31/05	Soil erosion	Probable soil erosion of riverbank		
3076-081.3	ACC (Production)	Reduce generation of solid waste	25.00%	12/31/01	Solid waste	Solid waste		
3076-081.3	ACC (Production)	Properly dispose solid waste	100.00%	12/31/01	Solid waste	Solid waste		
3076-081.3	ACC (Purchasing/Warehousing)	Improve disposal of solid waste by 100%		03/31/01	Solid waste	Solid waste		
3064-157.16	ADI				Solid waste			
3081-116.8	CAT (Finished Products Dept.)	Segregate and dispose of solid waste properly	100.00%	01/31/02	Solid waste	Solid and liquid waste disposal		Solid in kgs and liquid in liters
3081-116.8	CAT (Mill Dept)	Reduce solid waste	5.00%	01/01/02	solid waste	Disposal of solid and liquid waste		kgs gallons/ min.
3073-016.1	CPA	Control and minimize possible discharge of solid waste to sea-water while at berth	50.00%	12/31/02	Solid waste	Solid waste and possible sea-water/ land contamination		
3053-139.7	GE	Implement solid waste management	20.00%	12/31/01	Solid waste	Solid waste		
3076-146.4	GFCC	Improve solid waste management system			solid waste	Solid wastes		
3074.4-154.4	HTIP	Reduce the volume of waste materials to be discharged to landfill			Solid waste	Solid waste		
3076-075.2	ICC (Eng'g & Maintenance)	Reduce adverse visual impact and conform to good environmental practices	75.00%	12/31/03	Solid waste	Generation and disposal of solid waste		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3076-075.2	ICC (Finance/ Acctg, Purch'g, Warehousing)	Minimize potential land contamination and adverse visual impact by recycling	100.00%	12/31/01	Solid waste	Solid waste		
3076-075.2	ICC (Finish Grinding Mill)	Minimize adverse visual impact and conform to good environmental practices	50.00%	03/31/01	Solid waste	Generation and disposal of solid waste		
3076-075.2	ICC (Packhouse/ Pier Operation)	Minimize adverse visual impact and possible land contamination	50.00%	03/31/01	Solid waste	Generation and disposal of solid waste		
3076-075.2	ICC (Process Control/ Laboratory)	Minimize potential land contamination and reduce/eliminate the negative visual impact relative to improper disposal of waste	100.00%	11/30/00	Solid waste	Generation and disposal of solid wastes		
3076-075.2	ICC (Quarry/ Mining Claims, Crusher, Motorpool)	Generation and disposal of solid waste	50.00%	12/31/01	solid waste			
3076-075.2	ICC (Raw Grinding Mill/ Blending Silo/ Cooling Tower)	Reduce the disposal of solid waste	100.00%	12/31/01	Solid waste			
3068-097.11	MDNCAVI	Comply applicable legal laws to which the organization subscribes to (RA 9003 of 2000 on Ecological Solid Waste Management Act of 2000, PD 856 on Adopting the Landfill Site Identification and Screening Criteria for Municipal Solid Waste Disposal Facilities, by segregating waste and disposing it)	50.00%	12/31/01	Solid waste	Solid Waste		
3068-092.14	MDOFI	Implement proper waste segregation and disposal in compliance to RA9003:2000 , PD856 on Sanitation Code and DAO#98-50	100.00%	09/30/01	Solid waste	Solid waste		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3068-096.9	MDPAVI	Comply with applicable legal laws which the organization subscribes to (RA 9003 of 2000 on Ecological Solid Waste Management Act of 2000, PD 856 on the Sanitation Code of the Philippines, DAO No. 98-50 on Adopting the Landfill Site Identification and Screening Criteria for Municipal Solid Waste Disposal Facilities)	50.00%	08/31/02	Solid waste	Solid waste		
3068-094.10	MDRVAVI	Minimize land contamination/ pollution through proper management of generated solid wastes	80.00%	12/31/01	Solid waste	Solid wastes generated from field and packing operations		
3068- 082.5	MEPI	Segregate solid wastes in compliance to RA 9003 of 2000, PD856, DAO No.98-50	50.00%	08/31/02	Solid waste	Solid waste		
3060-137.7	PPPI (Production - PhilAdh)	Reduction of solid waste generation	75.00%	12/31/01	Solid waste	Solid waste		
3074.4-015.1	SMIR	Reduction of solid waste	5.00%	12/31/01	Solid waste			
3074.5-152.2	Subic Water	Comply to environmental regulation (Solid Waste Segregation)		12/31/02	Solid waste	Discharge/Disposal of solid wastes.		
3076-075.2	ICC (Kiln/ Cooler/ Coal Grinding Mill)	Reduce generation of solid waste, adverse visual impact and conform to good environmental practices	100.00%	11/30/00	Solid waste	Generation and disposal of solid waste		
3076-041.1	UCC (Maintenance & Services Dept.)	Phase-out Askarel-Oil Cooled Transformer	100.00%	06/30/01	Solid waste (Askarel-Oil cooled transformer)l			
3076-081.3	ACC (Lugait/Makati Offices & ACTR)	Reduce generation of biodegradable paper-based waste and Improve disposal of biodegradable paper-based material	50.00%	09/30/01	Solid waste (biodegradable paper-based materials)	Disposal of biodegradable paper-based materials		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3068-093.6	MDBRC	Comply with RA 9003 of 2000	100.00%	03/31/02	Solid waste (Biodegradable waste)	Solid waste		
3068-097.11	MDNCAVI	Build a Compost Pit for disposal of biodegradable waste.	50.00%	12/31/02	Solid waste (biodegradable)	Biodegradable Waste		
3068-096.9	MDPAVI	Implement measures to properly dispose of biodegradable waste by decomposition/composting	80.00%	08/31/01	Solid waste (Biodegradable)	Biodegradable waste		
	RMI	Stop disposal of chemical containers to dumpsite	100.00%	08/31/01	Solid waste (Chemical containers & packaging materials)	Disposal of packaging materials/ empty containers to dumpsite		
3054-085.2	PMC (Technical Admin)	Eliminate disposal of copper slag to land and sea	100.00%	12/31/01	Solid waste (Copper slag)	Discharge of copper slag to land and sea causing contamination of land and sea		
3060-143.10	FPI				Solid waste (dead batteries)	Disposal of 'dead' battery		
3060-143.10	FPI (General)				Solid waste (domestic garbage)	Generation of domestic garbage		
3074.4-015.1	SMIR	To reduce disposal of electrical and mechanical wastes to dumpsites	20.00%		Solid waste (electrical and mechanical)			
3076-081.3	ACC (Product Handling & Distribution)	Reduce/avoid generation of solid waste	50.00%	12/31/01	Solid waste (empty bags)	Solid waste		
3062-148.6	ISAROG	Minimize solid waste	50.00%		Solid waste (empty chemical bags)	Solid waste (empty chemical bags)		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3068-094.10	MDRVAVI	Minimize land contamination/ pollution and health risk through proper recycling and disposal of empty chemical containers and used fertilizer sacks	80.00%	12/31/01	Solid waste (empty chemical containers/sacks)	Empty chemical containers and used fertilizer sacks		
3081-133.11	FFHC (Materials Mgt. Dept.)	Reduce quantity of expired chemicals	35.00%	12/31/01	Solid waste (Expired chemicals)	Expired chemicals		
3054-085.2	PMC	Reduce siltation materials from Marine Quarry	20.00%	06/30/02	Solid waste (fine rock)	Discharge of fine rock materials causing siltation damaging marine life	Below 35mm/sec	mm/sec
3053-139.7	GE	Provide proper disposal for glass wastes generated at the plant	50.00%	09/01/01	Solid waste (glass)	Disposal of glass wastes		
3076-081.3	ACC (Production)	Proper disposal of hazardous bricks	100.00%	12/31/01	Solid waste (Hazardous bricks - chrome based)	Hazardous bricks (chrome base)		
3074.4-015.1	SMIR	Implement Best Practice in toxic waste handling and management; and reduce toxic waste generation; and comply to DAO 29, RA 6969, DAO 2000-18	20.00%	06/01/02	Solid waste (hazardous/toxic wastes)			
3068-097.11	MDNCAVI	Come up with program on the disposal of used leaded batteries from vehicles in legal compliance with RA 6969 on Toxic Substances, Hazardous and Nuclear Waste Control Act of 1990, DENR Administrative Order No. 29, series of 1992.	100.00%	12/31/01	Solid waste (leaded batteries)	Used Leaded Batteries From Vehicles		
3068-096.9	MDPAVI		100.00%	12/31/01	Solid waste (leaded batteries)	Disposal of used leaded batteries from vehicles		
3081-116.8	CAT (Raw Sugar Prod'n)	Re-use/recycle solid waste	80.00%	03/30/04	Solid waste (lime tailings, used sacks, sugar massecuite)	Solid waste: lime tailings and used sacks and sugar massecuite spillage		no. of bags

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3054-085.2	PMC (Maintenance)	Reduce solid waste discharges from maintenance	30.00%	12/31/01	Solid waste (Maintenance: filters, o-rings)	Discharge of solid wastes (filters, O-ring, etc.) to landfill causing land contamination		
3081-116.8	CAT Medical Services	Reduce waste generation	2.00%	01/31/02	Solid waste (medical)	Discharge to Land and Water		
3076-081.3	ACC (Purchasing/Warehousing)	Reduce scrap materials	50.00%	06/30/01	Solid waste (metal scrap)	Disposal of scrap		
3081-116.8	CAT (Machine Shop)	Reuse and/or recycle solid waste	50.00%	01/01/02	Solid waste (metal scrap)	discharge of solid waste to land		kgs
3081-133.11	FFHC (AM - Operations)	Reduce scattered metal scraps at the metal works and machine shop area		12/31/01	Solid waste (metal scraps)	Scattered metal scraps		
3081-113.10	BMMC	To reduce mud/cake spillage	20.00%	12/31/01	Solid waste (mud cake)	Mud/cake		Tons
3081-133.11	FFHC (BH-Raw Dept.)	Reduce discharge of mud	25.00%	12/31/01	Solid waste (Mud)	Discharge of mud and lime contaminated water		gallons/ day
3068-097.11	MDNCAVI	Collect, segregate used twines and other non-biodegradable waste during harvesting operation in compliance with 9003.	30.00%	12/31/01	Solid waste (nonbiodegradable)	Non-biodegradable Waste		
3054-085.2	PMC	Reduce non-biodegradable garbage	30.00%	12/31/01	Solid waste (non-biodegradable)	Disposal of non-biodegradable solid waste to landfill thus land contamination		
3076-081.3	ACC (Materials Management)	Reduction of obsolete office supplies, parts, and equipment	75.00%	06/30/01	Solid waste (obsolete office supplies, parts, and equipment)	Disposal of obsolete office supplies, parts, and equipment		
3075-056.1	CCTFI	Prevent and control pollution		12/31/01	Solid waste (packaging materials)			

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3052-047.7	JMX	To reduce generation of paint sludge	37.00%	06/30/01	Solid waste (paint sludge)			
3053-100.6	PTY	To reduce wastepaper generation	7.50%	03/31/02	Solid waste (paper)			
3078-098.7	MDNVMDC	Establish a procedure on the disposal and management of polyethylene plastic waste from bagging	50.00%	12/31/01	Solid waste (PE Plastic)	Polyethylene plastic waste		
3068-095.12	MDAVAVC	Reduce/Eliminate release of impregnated polybags into the environment	100.00%	12/31/02	Solid waste (Plastic bags with toxic chemicals)	Solid waste: used impregnated plastic waste		
3074.4-015.1	SMIR	To reduce disposal of solid waste by segregation and recycling	100.00%	12/31/01	Solid waste (plastic mineral bottles, glass bottles)			
3068-095.12	MDAVAVC	Establish waste segregation and recycling measures to cover proper disposal of wastes collected at Packing Stations in compliance with RA9003 and PD856	70.00%	12/31/02	Solid waste (Plastic polybags)	Solid waste: plastic waste (polybags/twines) and stalk and fruit waste		
3081-116.8	CAT (Material Ware - house)	Reduce disposal of waste, used plastic bags	93.00%	06/30/02	Solid waste (plastic)	Disposal of waste used plastics)	from 3000kgs to 200kgs	
3068-096.9	MDPAVI	Collect all plastic solid wastes found in the farms in legal compliance to RA 9003 on Ecological Solid Waste Management Act of 2000	20.00%	12/31/02	Solid waste (Plastic)	Plastic solid wastes (polybags, tiebacks, empty fertilizer bags and twines) scattered in the farms		
3052-047.7	JMX	To reduce the generation of plating sludge	20.00%	12/31/01	Solid waste (plating sludge)			
3068-092.14	MDOFI	Establish waste management and recycling procedures for waste collection at packing house in compliance with RA9003 and PD 856	50.00%	12/31/01	Solid waste (polybags and PE bags)	Used polybags		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3068-090.8	MDIOBAVI	Establish a procedure on the disposal and management of polyethylene plastic waste generated from bagging in compliance with RA 9003.	50.00%	12/31/01	Solid Waste (Polyethylene Plastic Bag)	Solid Waste: Polyethylene Plastic Bag in the Packing Houses		
3081-116.8	CAT (Alcohol Prod'n & Ancillary Prod'n)	Re-use/ re-cycle solid waste at distillery, CO2, and Yeast Plant	50.00%	06/30/03	Solid waste (Scrap materials, used paper, used sacks and containers and biodegradable solid wastes)	Discharge to land (solid waste)		
3054-085.2	PMC (Accounting)	Minimize accumulation of scrap from the scrap yard	30.00%	06/30/02	Solid waste (Scrap metal)	Scrap material disposal on land		
3065-184.3	EKP (Eng'g Dept)				Solid waste (sludge)			
3053-100.6	PTY	To reduce disposal of waste	46.90%	03/31/02	Solid waste (sludge, dross, lead pins, copper wires, etc)			
3068-095.12	MDAVAVC	Establish waste segregation and recycling measures to cover proper disposal of wastes collected at Packing Stations in compliance with RA9003 and PD856	100.00%	12/31/02	Solid waste (stalk and fruit waste)			
3074.4-015.1	SMIR	To reduce disposal of wastewater solid sludge disposed outside of the resort	70.00%	12/31/02	Solid waste (STP solid sludge)			
3081-133.11	FFHC (Quality Control)	Minimize spillage of canes from trucks	100.00%	12/31/01	Solid waste (sugar canes falling from trucks)	Spillage of canes from truck		liter
3081-116.8	CAT (Boiler Dept)	Reduce solid waste	5.00%	01/01/02	Solid waste (treatment chemicals)	Solid and liquid waste		kgs gallons/ min.
3068-090.8	MDIOBAVI	Entering a contact of used twine collector / buyers to reduce the discharges of solid waste in compliance to PD 825 & RA 9003.	60.00%	12/31/01	Solid Waste (Twine)	Solid Waste: Twine in the Farm		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3068-098.7	MDNVMDC	To recycle/sell twine and Comply with RA 9003 of 2000 - Ecological Waste Mgt Act of 2000	60.00%	12/31/01	Solid waste (twine)	Disposal of twine in the farm		
3062-148.6	ISAROG	Reduce solid waste	100.00%		Solid waste (use pulps, baling wires)	Solid waste		
3076-075.2	ICC (Dryer/ Material storage)	Minimize land and water contamination, and visual impact	100.00%	12/31/00	Solid waste (used bricks)	Generation and disposal of used bricks		
3076-075.2	ICC (Kiln/ Cooler/ Coal Grinding Mill)	Minimize potential land and water contamination	100.00%	12/31/00	Solid waste (used bricks)	Generation and disposal of used bricks		
3081-116.8	CAT (Laboratories)	Reduce solid waste	50.00%	03/23/02	Solid waste (used filter with lead subacetate, used sugar samples)	Discharge of solid and liquid waste to land and water		
3076-075.2	ICC (Dryer/ Material Storage)	Reduce adverse visual impact and conform to good environmental practices	100.00%	12/31/00	Solid waste (used gloves)	Generation and disposal of solid waste		
3068-091.13	MDAG	Dispose of all used leaded batteries for recycling	100.00%	10/30/02	Solid waste (used leaded batteries)	Disposal of used leaded batteries from vehicles		
3076-041.1	UCC (Quarry Dept.)	Reuse /Recycle used oil/filters		09/30/00	Solid waste (used oil filters)	Used oil/used filters		
3081-116.8	CAT General Services	Re-use and / or recycle paper, document, copier waste	50.00%	06/30/02	Solid waste (used paper)	Discharge to Land		
3067-083.3	MVC	Reduce generation of solid waste	80.00%	10/31/01	Solid waste (used paper, empty containers, scrap materials, biodegradable wastes)			
3076-081.3	ACC (Maintenance Services)	Reduce unplanned breakdown by proper preventive maintenance practices	20.00%	12/31/01	Solid waste (Used spare parts/materials)	Used spare parts/materials		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3074.5-152.2	Subic Water	Properly dispose used tires and minimize mosquito/rodent infestation.		12/31/02	Solid waste (used tires)	storage and disposal of used tires.		
3060-143.10	FPI (Mold Maintenance)				Solid waste (waste cloth)	Generation of waste cloth		
3076-075.2	ICC (Raw Grinding Mill/ Blending Silo/ Cooling Tower)	Reduce the generation of solid waste	50.00%	12/31/00	Solid waste (waste rags)	Generation and disposal of solid waste		
3076-081.3	ACC (Quality assurance)	Reduce accumulation of waste material at workplace	60.00%	12/31/01	Solid waste (Waste sample material)	Generation/ disposal of waste sample material		
3076-075.2	ICC (Plant Offices/ Canteen/ Clinic/ etc.)	Minimize land pollution and adverse visual impact	100.00%	11/30/00	Solid wastes	Generation and disposal of solid wastes		
3064-158.17	NQFC	Reduce pollution and waste generation	20.00%	12/31/01	Solid wastes	1. Pollution 2. Waste generation 3. Income (Waste Exchange)		
3074.3-135.5	YKK	Reduce generation of solid waste	5.00%	12/31/01	Solid wastes	Solid waste		
3065-184.3	EKP (Quality Assurance)				Solid wastes (aged raw materials, expired/spoiled retained samples)			
3065-184.3	EKP (Quality Assurance)				Solid wastes (Broken glass, mercury thermometer, decontaminated media/perishable biodegradable items)			
3060-143.10	FPI (Mold Maintenance)				Solid wastes (empty cans)	Disposal of empty cans from use of contact (spray) cleaner		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3065-184.3	EKP (Eng'g Dept)				Solid wastes (maintenance wastes)			
3065-184.3	EKP (Production Dept)				Solid wastes (nonrecyclable packaging materials)			
3065-184.3	EKP (Production Dept)				Solid wastes (plastic bags, paper, cartons, drums, pails, sacks)			
3065-184.3	EKP (Production Dept)				Solid wastes (process wastes)			
3065-184.3	EKP (Production Dept)				Solid wastes (scraps)			
3064-157.16	ADI				Spillage			
3067-083.3	MVC	Prevent/ reduce incidence of chemical spills	10.00%	12/31/01	Spillage of chemical			
3076-081.3	ACC (Materials Mgt.)	Improve proper handling and storage of chemicals at warehouse	100.00%	06/30/01	Spillage of chemicals	Handling and storage of chemicals at Warehouse		
3065-184.3	EKP (Production Dept)				Spillage of chemicals			
3076-075.2	ICC (Finance, Acctg, Purch'g, Warehousing)	Eliminate injury to humans and land and water contamination	100.00%	12/31/00	Spillage of chemicals	Chemical Spill		
3076-075.2	ICC (Process Control/ Laboratory)	Prevent potential land & water contamination	100.00%	11/30/00	Spillage of chemicals	Chemical Spill		
3076-075.2	ICC (Raw Grinding Mill/ Blending Silo/ Cooling Tower)	Prevent potential land & water contamination	100.00%	12/31/00	Spillage of chemicals			
3068-098.7	MDNVMDC	Reduce emission/spillage of chemicals	80.00%	12/31/02	Spillage of Chemicals	Exposure to toxic chemicals		
3068-096.9	MDPAVI	Build a containment structure for Warehouse that would best contain major spillage when accidents occur.	100.00%	12/03/01	Spillage of chemicals	Chemical spills and dumping		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3068-096.9	MDPAVI	Minimize wastes and spillage and emissions of fumes to air in compliance with RA 8749 (Philippine Clean Air Act of 1999), DAO No. 35 Series of 1990 (Revised effluent Regulation of 1990), Article 162 of the Labor Code of the Philippines	50.00%	12/31/02	Spillage of chemicals	Chemical wastes, spillage and fumes from chemical mixing and application (Bud spray, Bud/Bunch Spray, Baggable spray, Weed spray)		
3068-094.10	MDRVAVI	Minimize spillage of chemical solution at Mixing Area for Fruit Care Operations	90.00%	12/31/02	Spillage of chemicals	Chemical spillage at Mixing area for Fruit Care Operations		
3068-082.5	MEPI	Minimize wastes and spillage and emission of fumes to air ; and protect human health in compliance with RA8749, DAO No.35 series of 1990, Article 162 of the Labor Code of the Philippines	60.00%	12/31/02	Spillage of chemicals	Chemical mixing and application (for farm spraying operations)		
	RE	Contain chemical spillage in the area	100.00%	11/30/01	Spillage of chemicals	spillage of chemicals to the ground		
	THI	Collect chemical spillage in the area	100.00%		Spillage of chemicals	Chemical and wastewater spillage		
3068-098.7	MDNVMDC	Reduce chemical spillage	80.00%	08/31/02	Spillage of Chemicals (Agri-chemicals)	Agri-chemical spillage		
3076-075.2	ICC (Quarry/ Mining Claims, Crusher, Motorpool)	Reduce land and water contamination	33.00%	12/31/00	Spillage of Chemicals (ANFO)	ANFO spillage		
3068-097.11	MDNCAVI	Build a containment structure for Warehouse that would best contain major spillage when accidents occur.	100.00%	12/31/03	Spillage of chemicals (bio-agents, fungicides)	Bio-agent / Bio-fungicides Spills & Dumping		
3076-075.2	ICC (Eng'g & Maintenance)	Minimize potential land and water contamination	100.00%	12/31/00	Spillage of chemicals (descaling)	Spillage of descaling chemicals		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3065-184.3	EKP (Eng'g Dept)				Spillage of chemicals (lime, enzyme, polymer, etc)			
3081-113.10	BMMC	To reduce/minimize milk of lime spillage	20.00%	12/31/01	Spillage of chemicals (milk of lime)	Milk of lime		Kilogram
3054-085.2	PMC (Mining)	Reduce nitrates and oil contamination to underground water	10.00%	12/01/01	Spillage of chemicals (nitrate spills)	Ammonium nitrate spills contaminating land and eventually underground water		
3068-095.12	MDAVAVC	Reduce and control release of chemical spillage during the mixing and washing of mixing drum and spray cans of Plant and Fruit Care Operators	10.00%	12/31/02	Spillage of chemicals (pesticides/fertilizers)			
3068-095.12	MDAVAVC	Reduce or eliminate the release of pollutants into the environment in case of emergency spillage and decontamination of containers	95.00%	12/31/02	Spillage of chemicals (pesticides/fertilizers)	Chemical discharges to land during emergency spillage and washing of containers		
3068-095.12	MDAVAVC	Reduce or eliminate the release of pollutants into the environment from storage and washing of empty containers and package	90.00%	12/31/02	Spillage of chemicals (pesticides/fertilizers)	Chemical waste discharged to land and water		
3068-095.12	MDAVAVC	Prevent chemical spillage from aircraft loading	98.00%	12/31/02	Spillage of chemicals (pesticides/fertilizers)	Chemical spillage during aircraft loading		
3075-056.1	CCTFI	Prevent and control pollution	100.00%	12/31/01	Spillage of chemicals (spent)			

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3074.4-015.1	SMIR	Implement Best Practice for the proper Desalination Plant Chemicals	100.00%	02/28/01	Spillage of chemicals [Chlorine, Ferric chlorite(FeCl3), Sodium bisulfate(NaSO4), Sulfuric acid(H2SO4)]			
	RMI	Prevent chemical spills	100.00%		Spillage of Chemicals/ spent chemicals to ground	Spillage of Chemicals/ spent chemicals to ground		
3065-184.3	EKP (Eng'g Dept)				Spillage of fuel			
3053-139.7	GE	Prevent spillage of hazardous wastes and materials	100.00%	12/31/01	Spillage of hazardous materials/wastes	Spillage/leakage of hazardous materials/ wastes		
3076-075.2	ICC (Dryer/ Material Storage)	Reduce material spillage and minimize adverse visual impact	50.00%	12/31/00	Spillage of materials	Material spillage	From 23 to 17 source	
3081-133.11	FFHC (Refinery Dept.)	Eliminate discharges of premium sugar spills	100.00%	12/31/01	Spillage of materials (premium sugar)	Premium sugar spills		
3076-081.3	ACC (Product Handling & Distribution)	Reduce material spillage	50.00%	12/31/01	Spillage of raw materials	Material spillage		
3076-081.3	ACC (Product Handling & Distribution)	Reduce spillage of raw materials at pier area	50.00%	12/31/01	Spillage of raw materials	Material spillage at pier area		
3076-081.3	ACC (Production)	Reduce material spillage along process line 1 & 2	60.00%	12/31/01	Spillage of raw materials	Material spillage along process line 1 & 2		
3076-081.3	ACC (Purchasing/Warehousing)	Reduce raw material spillage	100.00%	06/30/01	Spillage of raw materials	Raw material spillage at storage area		
3076-075.2	ICC (Finance/ Acctg, Purch'g, Warehousing)	Minimize adverse visual impact	25.00%	12/31/00	Spillage of raw materials	Material spillage		
3076-075.2	ICC (Finish Grinding Mill)	Minimize adverse visual impact, land contamination and siltation	50.00%	06/31/2001	Spillage of raw materials	Material spillage		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3076-075.2	ICC (Kiln/ Cooler/ Coal Grinding Mill)	Minimize potential land and water contamination and to minimize depletion of natural resources	25.00%	12/31/00	Spillage of raw materials	Material spillage		
3076-075.2	ICC (Packhouse/ Pier Operation)	Reduce adverse visual impact and seawater contamination	50.00%	12/31/00	Spillage of raw materials	Material spillage (cement)		
3076-075.2	ICC (Raw Grinding Mill/ Blending Silo/ Cooling Tower)	Reduce cases of material spillage in plant areas and minimize adverse visual effect	30.00%	12/31/00	Spillage of raw materials	Material spillage		
3060-137.7	PPPI (Warehouse/ raw Materials)	Leak-free SM pipeline during SM receiving at pier	100.00%	12/31/01	Spillage of raw materials	Raw material spillage		
3076-075.2	ICC (Quarry/ Mining Claims, Crusher, Motorpool)	Reduce siltation, sea water contamination and minimize adverse visual impact	50.00%	12/31/00	Spillage of raw materials (Suspended solids)	Raw material spillage	1080	kg
3067-035.1	MRII	Implement measures to reduce solid waste.		12/31/00	Suspended solid	Generation of residue from Generator Set operation and other solid wastes from expansion, modification and/or under normal operation.		
3054-085.2	PMC (Sales/ Shipping)	Reduce siltation of sea water along shiploader area	50.00%	12/31/03	Suspended solids	Spillage discharged to sea cause siltation which degrade/damage marine flora and fauna		mg/l
3054-085.2	PMC (Sales/ Shipping)	Trap and filter out suspended silts at the stockyard	30.00%	12/31/02	Suspended solids (materials)	Discharge of spillage material to land then to sea by run-off water cause siltation which degrade/damage marine flora and fauna		mg/l
3067-083.3	MVC	To optimize use of boiler oil	20.00%	12/31/01	Use of boiler oil	Boiler Oil		
3076-081.3	ACC (Quality assurance)	Reduce excessive use of chemicals for sample analysis	50.00%	12/31/01	Use of chemicals	Use of chemical		
3062-148.6	ISAROG	Optimize usage of chemicals	30.00%		Use of chemicals	Chemical consumption		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3076-081.3	ACC (Quality assurance)	Increase proportion of pozzolan additive for Type-P cement grinding	5.00%	12/31/01	Use of clinker	Use of clinker		
3074-185.1	DON BOSCO	Reduce power consumption	15.00%	12/31/01	Use of electricity	6) Power consumption		
3065-184.3	EKP (Production Dept)				Use of electricity			
3065-184.3	EKP (Quality Assurance)				use of electricity			
3060-143.10	FPI (General)				Use of electricity	Use of electricity		
3076-146.4	GFCC	Reduce overall power consumption	10.00%	07/31/02	use of electricity	Power consumption		
3076-075.2	ICC (Dryer/ Material Storage)	Conserve electrical energy	3.59%	12/31/00	Use of electricity	Electrical energy consumption		
3076-075.2	ICC (Finance/ Acctg, Purch'g, Warehousing)	Reduce power consumption and depletion of natural resources		03/31/01	Use of electricity	Electrical energy consumption		
3076-075.2	ICC (Finish Grinding Mill)	Minimize electrical energy consumption and depletion of power resources	2.88%	12/31/00	Use of electricity	Electrical energy consumption		
3076-075.2	ICC (Kiln/ Cooler/ Coal Grinding Mill)	Reduce electrical energy consumption	4.82%	12/31/00	Use of electricity	Electrical energy consumption		
3076-075.2	ICC (Kiln/ Cooler/ Coal Grinding Mill)	Minimize depletion of water reserve	50.00%	12/31/00	Use of electricity	Water Usage and spillage		
3076-075.2	ICC (Packhouse/ Pier Operation)	Minimize electrical energy consumption	5.23%	12/31/00	Use of electricity	Electrical energy consumption		
3076-075.2	ICC (Plant Offices/ Canteen/ Clinic/ General Surroundings/ Security/ Janitorial)	Minimize consumption of electrical energy	9.24%	03/31/01	Use of electricity	Electrical energy consumption		
3076-075.2	ICC (Process Control/ Laboratory)	Reduce depletion of natural resources	9.24%	03/31/01	Use of electricity	Electrical energy consumption		
3076-075.2	ICC (Quarry/ Mining Claims, Crusher, Motorpool)	Reduce depletion of power reserve	3.70%	12/31/00	Use of electricity	Electrical energy consumption		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3076-075.2	ICC (Raw Grinding Mill/ Blending Silo/ Cooling Tower)	Reduce depletion of natural resources and conform to good environmental practices	4.70%	12/31/00	Use of electricity	Electrical energy consumption		
3062-148.6	ISAROG	Optimize usage of power	20.00%	12/31/01	Use of electricity	Power consumption		
3068-095.12	MDAVAVC	Conserve energy in Packing Stations in compliance with PD1067	20.00%	12/31/02	Use of electricity			
3068-093.6	MDBRC	Reduce the temperature inside the sterilization room	20.00%	12/31/01	Use of electricity	Generation of intense heat		
3068-092.14	MDOFI	Monitor and determine exact usage of electricity		01/31/01	Use of electricity	Usage of energy/electricity		
3067-035.1	MRII	Minimize electrical consumption	10.00%	01/31/01	Use of electricity	Resources - Water/ Electricity		
3053-100.6	PTY	To reduce energy consumption	29.70%	03/31/03	Use of electricity			
3074.4-015.1	SMIR	To reduce total electricity usage at the resort	10.00%	12/31/01	Use of electricity			
3074.3-135.5	YKK	Reduce electricity consumption		10/30/01	Use of electricity	energy conservation		
3076-081.3	ACC (Maintenance Services)	Reduce power/ water utilization	10.00%	12/31/01	Use of energy	Use of power and water		
3076-081.3	ACC (Process & Project Eng'g)	Reasonable use of power	20.00%	12/31/01	Use of energy	Use of power		
3076-081.3	ACC (Production)	Reduce power utilization by preventive maintenance, repair and reconstruction)	25.00%	12/31/01	Use of energy	Use of power		
3081-183.16	DPCMAI	Reduce energy consumption	20.00%	12/31/01	Use of energy	Energy consumption		
3074.4-154.4	HTIP	Reduce energy consumption		12/31/01	Use of energy	Energy consumption		
3068-095.12	MDAVAVC	Regulate and conserve energy consumption during aerial spray operation	20.00%	12/31/02	use of energy			

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3067-083.3	MVC	Ensure continuity of existing Energy Conservation Activities and institute programs to reduce energy usage and material wastage (diaphragm cells)	20.00%	12/31/01	Use of energy	Energy consumption		
3060-137.7	PPPI (Production - PhilAdh)	Reduce energy use	10.00%	12/31/01	Use of energy	Energy consumption		
3076-081.3	ACC (Production)	Reduce specific heat consumption	20.00%	12/31/01	Use of fuel	Use of fuel 2 kcal/clinker by 2001		kcal/kg
3076-075.2	ICC (Packhouse/ Pier Operation)	Minimize depletion of fossil fuel reserve	40.50%	12/31/00	Use of fuel	Fuel consumption		
3076-075.2	ICC (Eng'g & Maintenance)	Reduce fuel consumption depletion of natural reserve	5.00%	12/31/01	Use of Fuel	Fuel consumption		
3076-075.2	ICC (Plant Offices/ Canteen/ Clinic/ General Surroundings/ Security/ Janitorial)	Reduce depletion of fossil fuel reserve caused by company vehicles	10.00%	12/31/00	Use of Fuel	Fuel consumption		
3076-075.2	ICC (Production)	Reduce fuel consumption and depletion of natural resources	67.00%	01/02/00	Use of Fuel	Fuel consumption at Dryer/ Material storage		
3076-075.2	ICC (Production)	Fuel consumption at Kiln/ Cooler/ Coal Grinding Mill	4.17%	12/31/01	Use of fuel			
3076-075.2	ICC (Quarry/ Mining Claims, Crusher, Motorpool)	Reduce depletion of fossil fuel reserve	19.48%	12/31/00	Use of Fuel	Fuel consumption		
3081-113.10	BMMC	To conserve energy	10.00%	12/31/01	Use of fuel oil	Steam		Kilogram
3065-184.3	EKP (Eng'g Dept)				Use of fuel/electricity			
3068-097.11	MDNCAVI	Build a Land Fill site for disposal of solid waste materials.	50.00%	12/31/02	Use of Landfill site facility	Solid Waste		
3076-146.4	GFCC	Optimize use and re-use of supplies/ materials		05/01/02	Use of materials/supplies	Use of materials/supplies		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3076-075.2	ICC (Quarry/ Mining Claims, Crusher, Motorpool)	Minimize soil and surface erosion and depletion of natural resources		12/31/01	Use of mineral resources	Mineral extraction and usage		
3076-081.3	ACC (Quality assurance)	Use of synthetic (lime-treated) gypsum in lieu of natural gypsum	100.00%	06/30/01	Use of natural gypsum	Use of gypsum		
3081-183.16	DPCMAI	Reduce oil/lubricant consumption	10.00%	12/31/01	Use of oil	Oil consumption		
3060-143.10	FPI (General)				Use of paper products	Use of paper products		
3062-148.6	ISAROG	Optimize use of abaca fiber; Replenish used abaca plant	100.00%	09/30/01	Use of resource (abaca)	Resource use - abaca		
3076-041.1	UCC (Quarry Dept.)	Minimize Mining recovery of limestone.		01/31/01	use of resource (limestone)	Extraction of mineral resources.		
3076-081.3	ACC (Quality assurance)	Use of iron concentrate in lieu of pyrite	100.00%	09/30/01	Use of resource (pyrite)	Use of pyrite on Line 1		
3067-083.3	MVC	Optimize use of natural resources (salt) and other raw materials and develop programs to reduce wastage of natural resources	3.00%	12/31/01	Use of resource (salt)	Resources conservation	75.00	L/MT
3076-081.3	ACC (Mining Services & Environmental Affairs)	Reduce water usage	10.00%	12/31/01	Use of water	Use of water		
3076-081.3	ACC (Maintenance Services)	Reduce power/ water utilization	10.00%	12/31/01	Use of water	Use of power and water		
3076-081.3	ACC (Process & Project Eng'g)	Reasonable use of water	20.00%	12/31/01	Use of water	Use of water		
3081-113.10	BMMC	To reduce water consumption	10.00%	12/31/01	Use of water			Cubic meter
3081-116.8	CAT (Electrical Dept)	Reduce volume water leaks for cooling of turbine generator set	50.00%	06/30/03	Use of water	Use of water resource		cubic meters
3081-116.8	CAT Refinery	Reduce water used in Carbon / Kiln Area	10.00%	06/30/03	Use of water	Discharge to Water		
3074-185.1	DON BOSCO	Reduce water consumption	15.00%	12/31/01	Use of water	5) Water consumption		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3065-184.3	EKP (Production Dept)				Use of water			
3065-184.3	EKP (Quality Assurance)				Use of water			
3076-146.4	GFCC	Reduce overall water consumption	10.00%	07/31/02	Use of water	Water consumption		
3076-075.2	ICC - Grinding Mill/ Blending Silo/ Cooling Tower	Minimize depletion of water reserve	50.00%	12/31/00	Use of water	Water Usage and spillage		
3076-075.2	ICC (Finish Grinding Mill)	Minimize depletion of water reserve	50.00%	12/31/00	Use of water	Water Usage and spillage		
3076-075.2	ICC (Packhouse/ Pier Operation)	Minimize depletion of water reserve	100.00%	11/31/2000	Use of water	Water Usage and spillage		
3076-075.2	ICC (Plant Offices/ Canteen/ Clinic/ General surroundings/ Security/ Janitorial)	Optimize water consumption and prevent potential water wastage	100.00%	12/31/00	Use of water	Water Usage and spillage		
3076-075.2	ICC (Process Control/ Laboratory)	Minimize depletion of water reserve	100.00%	12/31/00	Use of water	Water Usage and spillage		
3076-075.2	ICC (Quarry, Mining Claims, Crusher, Motor - pool)	Minimize depletion of water reserve	50.00%	12/31/00	Use of water	Water Usage and spillage		
3062-148.6	ISAROG	Optimize usage of process water	50.00%	12/31/01	Use of water	Water consumption		
3068-095.12	MDAVAVC	Conserve water Packing Stations in compliance with PD1067	30.00%	12/31/02	Use of water	Use of water and energy resources		
3068-095.12	MDAVAVC	Regulate and conserve water consumption during aerial spray operation	20.00%	12/31/02	Use of water	Water and energy consumption during aerial spray operation		
3068-093.6	MDBRC	Reduce water consumption	50.00%	12/31/01	Use of water	Water use		
3068-093.6	MDBRC	Reduce water consumption	50.00%	12/31/02	Use of water	Water usage		
3068-097.11	MDNCAVI	Conserve water in compliance with Phil. Water Code and Implementing rules and regulations, article 68.	20.00%	08/31/02	Use of water	Water Utilization in all Departments		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3068-097.11	MDNCAVI	Monitor volume of water discharged from deepwell operation in compliance with PD1067, Water Code of the Philippines on Water Resources Management	30.00%	10/30/02	Use of Water	Use Of Water Resources		
3068-092.14	MDOFI	Monitor water consumption		12/31/01	Use of water	Water consumption		
3068-096.9	MDPAVI	Conserve water in compliance with Phil. Water Code and Implementing rules and regulations, Article 68	20.00%	04/30/02	Use of water	Water Resources		
3068-096.9	MDPAVI	Minimize water consumption and monitor volume of water discharged from deepwell operation	20.00%	01/31/03	Use of water	Water resource generated by deepwell operations		
3068-096.9	MDPAVI	Recycle wastewater from Packing Houses' flotation tanks in compliance with PD 1067, Water Code of the Phil. On Water Resource Management	50.00%	04/30/03	Use of water	Water resource at packing houses		
3068-094.10	MDRVAVI	Minimize water consumption by means of conservation and recycling	30.00%	01/31/02	Use of water	Water consumption		
3068-082.5	MEPI	Minimize water consumption	20.00%	01/31/02	Use of water	Water resource generated by deepwell operations		
3068-082.5	MEPI	Uphold the practice of efficient utilization of water resources and water conservation in all departments	100.00%	04/30/02	Use of water	Use of water resources in all departments		
3067-035.1	MRII	Reduce water consumption by implementing water reduction measures	10.00%	04/30/02	Use of water			
3060-137.7	PPPI (Production - Emejota	Recycle water from strand bath	100.00%	12/31/02	Use of water	Water usage		
3053-100.6	PTY	To reduce water consumption	20.00%	03/31/02	Use of water			
	RMI	Reduce water consumption	5.00%	12/31/01	Use of water	Water consumption		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3064-165.23	SI	Reduce water usage in cleaning of pigs	30.00%	12/31/01	Use of water	Water usage		
3074.4-015.1	SMIR	To reduce the amount of water usage	10.00%	12/31/01	Use of water			
3076-041.1	UCC (Finish Grinding Dept.)	Minimize, if not eliminate, the overflow of Finish Mill No.2 cooling water supply.	75.00%	12/31/00	Use of water	Usage of water		
3074.3-135.5	YKK	Reduce water consumption	5.00%	12/31/01	Use of water	Water conservation		
3081-116.8	CAT (Mill Dept)	Reduce Unigrator and Mill Turbines live steam consumption	1.00%	03/31/02	Use of water (steam)	Steam consumption		
3064-157.16	ADI				Use of water/electricity			
3081-116.8	CAT (Laboratories)	Reduce liquid waste	50.00%	03/23/02	wastewater			
3075-056.1	CCTFI	Prevent and control pollution		12/31/01	Wastewater			
3060-137.7	PPPI (Production - Cosden)	Reduce liquid waste generation	30.00%	12/31/02	Wastewater	Liquid waste generation		
	RE	Collect waste water in the area	100.00%	11/30/01	Wastewater	Disposal of wastewater to ground		
	RMI	Collect all rinsewater from zinc plating line to a sump	100.00%	12/31/02	Wastewater	Release of wastewater to canal		
3064-157.16	ADI	Develop, maintain, and improve the Environmental Management in all aspects of its operational activities			Wastewater			
3068-098.7	MDNVMDC	Proper Disposal of aerial spray rinsate and Comply with DAO 29 series of 1992, RA 6969 and PD 1144	100.00%	12/31/01	Wastewater (aerial spray rinsate)	Disposal of aerial spray rinsate		
3062-148.6	ISAROG	Prevent potential water pollution	100.00%	12/31/01	Wastewater (Black liquor)	Black liquor discharge to treatment plant		MT/day
3081-116.8	CAT (Laboratories)	Reduce waste generation in the regeneration of Zeolite softeners	20.00%	03/23/02	Wastewater (boiler treatment/ maintenance)	Wastewater discharge to land and water (Boiler Treatment Water)		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3081-116.8	CAT (Raw Sugar Prod'n)	Re-use/recycle Continuous Vacuum Pan Boil-out juice	90.00%	03/31/04	Wastewater (boil-out juice)	Boil-out juice discharged to canal		cubic meter
3068-098.7	MDNVMDC	Reduce discharges of chemicals for aerial spray	90.00%	08/31/02	Wastewater (Chemical [pesticides /fertilizers])	Chemical discharge to nearby body of water		
3067-083.3	MVC	Prevent/reduce chemical contaminants in effluent water	10.00%	12/31/01	Wastewater (chemical pollutants)	Chemical spills		
3068-082.5	MEPI	Minimize wastes and spillage in compliance to RA8749, DAO#35, , RA 6969 and PD 1144	50.00%	12/31/02	Wastewater (chemical rinsate [Fertilizers/Pesticides] spillage)	Chemical hazard		
3068-082.5	MEPI	Contain chemical waste rinsate to comply with ISO requirement , RA 6969 of 1990, and PD 1144	100.00%	08/18/01	Wastewater (Chemical rinsate)	Chemical waste rinsate pit mixing plant of SFS		
3068-092.14	MDOFI	Establish procedures in recycling water effluent from flotation and dehanding tank during Packing House Operations	40.00%	06/30/01	Wastewater (chemical washings)	Usage of water at Packinghouse		
3068-082.5	MEPI	Recycle wastewater from Packing Houses' flotation tanks in compliance with PD 1067, Water Code of the Phil. On Water Resource Management	30.00%	12/31/02	Wastewater (chemicals)	Wastewater from Packing Houses		
3081-113.10	BMMC	To reduce/minimize condensate discharge to canal	10.00%	12/31/01	Wastewater (condensate)	Condensate		Liters/ TCM
3081-116.8	CAT General Services	Reduce domestic water waste from leaking pipes and faucets.	50.00%	06/30/02	Wastewater (domestic)	Resource use, Domestic Water Waste from Leaking Pipes and Faucets		
3076-075.2	ICC (Plant Offices/ Canteen/ Clinic/ etc.)	Minimize potential water pollution	50.00%	12/31/00	Wastewater (domestic)	Discharge of effluent		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3076-075.2	ICC (Process Control/ Laboratory)	Minimize potential water pollution	100.00%	10/31/00	Wastewater (effluent contaminated with detergent soap/ cleaning solutions and small amount of chemicals)			
3076-075.2	ICC (Quarry/ Mining Claims, Crusher, Motorpool)	Minimize potential land and water pollution	50.00%	12/31/00	Wastewater (effluent contaminated with detergent soaps, cleaning solvent, solutions, fuel & oil at the motorpool)			
3076-075.2	ICC (Eng'g & Maintenance)	Minimize potential water pollution	100.00%	12/31/00	Wastewater (Effluent)	Discharge of effluent		
3076-075.2	ICC (Packhouse/ Pier Operation)	Minimize potential land and water contamination	50.00%	12/31/00	Wastewater (Effluent)	Discharge of effluent		
3072-059.4	TPC	To reduce the generation of toxic and hazardous wastewater	50.00%	12/31/01	Wastewater (Hazardous and toxic substances: mercury, spent solutions with Ag, Cr6+, acids, toluene)			
3076-075.2	ICC (Packhouse/ Pier Operation)	Minimize adverse visual impact and possible land and water contamination	100.00%	12/31/00	Wastewater (hazardous substances)	Generation and disposal of hazardous materials		
3081-133.11	FFHC (Mill & Boiler Dept.)	Eliminate juice contamination in water	100.00%	12/31/01	Wastewater (juice contaminated)	Juice contamination in water		
3081-113.10	BMMC	To reduce spillage	10.00%	12/31/01	Wastewater (Juice spillage)	Juice		
3081-113.10	BMMC	To reduce/minimize juice spillage	10.00%	12/31/01	Wastewater (Juice spillage)	Juice spillage		Tons

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3081-116.8	CAT (Mill Dept)	Reduce liquid waste	5.00%	01/01/02	wastewater (juice, used oil)			
3074.5-152.2	Subic Water	Reduce the discharge of oil containing kitchen wastewater	20.00%	10/30/01	Wastewater (kitchen)	Discharge of oil contaminated kitchen wastewater.		
3060-137.7	PPPI (Technical Serve.)	Reduce liquid wastes	50.00%	12/31/01	Wastewater (laboratory)	Liquid waste generation		
3081-116.8	CAT Medical Services	Reduce waste generation	2.00%	01/31/02	Wastewater (medical with toxic chemicals)			
3081-116.8	CAT (Boiler Dept)	Reduce liquid waste	5.00%	01/01/02	wastewater (oil leaks, used oil)			
3076-146.4	GFCC	Control oil/grease water contamination			Wastewater (oil/grease)	Industrial wastewater		
3052-047.7	JMX	To reduce the generation of toxic and hazardous wastewater	20.00%	12/31/01	Wastewater (plating wastewater)			
3060-137.7	PPPI (Production - PhilAdh)	Reduce water contamination with liquid wastes	50.00%	12/31/01	Wastewater (process)	Water contamination		
3067-083.3	MVC	Prevent residual chemical in containers to spill anywhere	100.00%	12/31/01	Wastewater (residual chemical)			0.057 MT
3054-085.2	PMC	Reduce desilted material from Weirs and Catch basin	20.00%	06/30/02	Wastewater (run off with suspended solid)	Disposal of silts to waste dump area are carried by water run-off to seawater destroying marine life		mg/L
3076-081.3	ACC (Safety & Pollution Control)	Increase time between the Descaling Period from 4 months to 24 months	80.00%	12/31/02	Wastewater (spent chemicals - descaling activities)	Use of HCl		
3081-133.11	FFHC (BH-Raw Dept.)	Reduce discharge lime contaminated water	25.00%	12/31/01	Wastewater (spent chemicals - lime contaminated)			

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3081-133.11	FFHC (BH-Raw Dept.)	Reduce spillage due to pump and lime leakage and to improper handling and preparation	25.00%	12/31/01	Wastewater (spent chemicals - lime contaminated, flocs, & acid)	Flocculants, lime and phosphoric acid solution		Gallon
3068-094.10	MDRVAVI	Minimize spillage and wastage of chemicals	90.00%	09/30/01	Wastewater (spent chemicals - pesticides/fertilizers)	Chemical spillage and wastage during Post-Harvest Application		
3074.4-015.1	SMIR	To reduce toxic contamination of the environment by using less commercial fertilizers and pesticides	20.00%	12/31/01	Wastewater (spent chemicals - toxic)			
3068-095.12	MDAVAVC	Contain banana oil and chemical rinsate discharges/spillage	100.00%	12/31/02	Wastewater (spent chemicals and banana oil)	Banana oil and chemical discharges		
3074.4-015.1	SMIR	To ensure proper handling and storage of chemicals used in the resort			Wastewater (spent chemicals and waste chemicals)			
3074.3-135.5	YKK	Minimize chemical waste	2.00%	12/31/01	Wastewater (spent chemicals and waste chemicals)	Chemical management		
3068-095.12	MDAVAVC	Reduce and control release of effluent during the mixing and washing of mixing drum and spray cans of Plant and Fruit Care Operators	90.00%	12/31/02	Wastewater (spent chemicals)	Chemical spillage and effluent in the environment		
3068-095.12	MDAVAVC	Prevent overflow of chemical rinsate to the environment due to faulty installation of mixing and septic tanks	95.00%	12/31/02	Wastewater (spent chemicals)	Overflow of chemical rinsate incurring land and water contamination and increase in water consumption		
3068-093.6	MDBRC	Reduce pollutant concentration in compliance to DENR Administrative Order 90-35	10.00%	03/31/02	Wastewater (spent chemicals)	Chemical pollutants to water		

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3068-097.11	MDNCAVI	Recycle 30% of waste water from Packing Houses' floatation tanks in compliance with PD 1067 Water Code of the Philippines on Water Resources Management by installing re-cycling facility.	30.00%	12/31/02	Wastewater (spent chemicals)	Use of Water Resources at Packing Houses		
3068-096.9	MDPAVI	Implement a measure to properly dispose of chemical waste and materials	85.00%	11/30/01	Wastewater (spent chemicals)	Disposal of chemical waste and materials		
3068-096.9	MDPAVI	Provide solar evaporator rinsate pit to conform with ISO requirement and RA 6969 on Toxic Substances and in compliance with Hazardous and Nuclear Waste Control Act of 1990 and PD 1144	100.00%	08/31/03	Wastewater (spent chemicals)	Chemical waste rinsate		
3054-085.2	PMC (Laboratory)	Eliminate discharge of used chemicals to the sink then to the land	100.00%	12/31/01	Wastewater (spent chemicals)	Discharge of spent/used chemicals to the sink then to land causing pollution		
	THI	Collect wastewater spillage in the area	100.00%		Wastewater (spent chemicals)	Chemical and wastewater spillage		
3067-035.1	MRII	Prevent dosing chemicals/acids spillage		01/00/00	Wastewater (spent chemicals/ acids for dosing)			
3065-184.3	EKP (Eng'g Dept)				Wastewater (spent chemicals/washings-maintenance)			
3053-100.6	PTY	To eliminate the use of xylene and neorever	100.00%	03/31/02	Wastewater (spent toxic chemicals)			
3081-113.10	BMMC	To reduce/minimize sugar entrained discharge to canal	10.00%	12/31/01	Wastewater (sugar entrained wastewater)	Sugar entrained discharge		Liters/ TCM

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3081-116.8	CAT Water Supply	Reduce Volume of Contaminated Water Being Discharged to Treatment Lagoons	50.00%	06/30/04	Wastewater (sugar, lime contaminated and suspended solids)	Release to water and Land		
3081-116.8	CAT (Finished Products Dept.)	Segregate and dispose of liquid waste properly	100.00%	01/31/02	wastewater (used oil)			
3076-075.2	ICC (Quarry/ Mining Claims, Crusher, Motorpool)	Minimize generation and disposal of hazardous materials	56.40%		Wastewater (used oil)	Hazardous Materials Mgt		
3076-041.1	UCC (Quarry Dept.)	Prevent pollution of waterways		11/30/00	Wastewater (used oil)	Oil contamination of waterways.		
3068-095.12	MDAVAVC	Conserve water Packing Stations in compliance with PD1067	30.00%	12/31/02	Wastewater (washwater)			
3065-184.3	EKP (Eng'g Dept)				Wastewater (water condensate)			
3062-148.6	ISAROG	Maximize use of whitewater as process water	100.00%		Wastewater (whitewater Discharge)	White water discharge		m3/day
3067-083.3	MVC	Reduce contaminants in effluent water	95.00%	12/31/01	Wastewater effluent	Water pollution		
3071-182.5	CCH	Increase community awareness on the effects of pollution and the need to impose stricter control				Hospital waste and potential hazardous materials		
3071-182.5	CCH	Ensure effective implementation of rules and regulations concerning pollution prevention						
3071-182.5	CCH	Prevent contamination and transmission of disease resulting from unsanitary handling, storage, transporting of waste, and improper disposal practices						

Company Code	Company	Objective	Target (%)	Target (Time)	Pollutant of Concern	Pollutant of Concern/ Environ'tal Aspect/Impact	Quantity per Year	Unit
3071-182.5	CCH	Ensure effective regular monitoring of activities on emissions and discharges						
3071-182.5	CCH	Provide adequate supplies to maintain sanitary condition of hospital						
3064-155.15	CGC	Reduce energy consumption		05/31/02		Consumption of electricity, water, and LPG		
	Pxsons							
3074.4-015.1	SMIR	To study and evaluate other environmentally sound collection and disposal methods		12/31/00				
3074.4-015.1	SMIR	Identify recycling and reuse opportunities						

APPENDIX F

List of IISE-Trained Consultants and Firms

APPENDIX F.						
List of IISE-trained Consultants and Firms						
		IISE CERTIFIED				
Organization	Consultant	IER	EMS	P2/CP		
Alexis Consultancy	Belen, Alice	YES	YES	YES		
Aquagem	Besa, Melissa	YES	YES	YES		
	Corlonocito, Cecil	YES	YES	NO		
	Perez, Edwin	YES	YES	NO		
ASK Consultancy	Catalo-Guerzon, Emelita	YES	YES	NO		
Filteknik	Mendoza, Teodoro	YES	YES	YES		
Hydronet	Delfin-Homez, Christine	YES	NO	YES		
	Diola, Jonathan	YES	YES	YES		
	Malaluan, Roberto	YES	YES	YES		
	Sevilla, Jose	YES	YES	YES		
JV Baring	Baring, Jessie	YES	NO	YES		
MEMSI	Baes, Aloysius	YES	YES	YES		
	Casas, Edgardo	YES	YES	NO		
	Castro, Ruby	YES	YES	NO		
	Endaya, Adalia	YES	YES	YES		
	Flavier, Ernesto	YES	YES	YES		
	Pascua, Mira-mar	YES	YES	NO		
	Ramirez, Corazon	YES	YES	YES		
	Rodriguez, Evelyn	YES	YES	NO		
	Santos, Jose	YES	YES	YES		
	Tumlos, Elvira	YES	YES	NO		
Molyb Consultancy	Revilla, Albert	YES	NO	NO		
Rosehall Mngt.	Bercasio, Gesila	YES	YES	NO		
	Geniston, Antonino	YES	YES	NO		
	Mercado, Carlos	YES	YES	YES		
Schema	Adecer, Victoria	YES	YES	YES		
	Ajaban, Robert	YES	NO	YES		
	Ballesteros, Florencio	YES	YES	YES		
	Camaclang, Marissa	YES	YES	YES		
	Cruda, Helen	YES	YES	NO		
	Cruz, Cherileen	YES	YES	NO		
	Culaba, Alvin	YES	YES	YES		
	Dalida, Ma. Lourdes	YES	YES	YES		
	Feliciano, Marietta	YES	YES	YES		
	Juan-Sto.Domingo, Andreli	YES	NO	YES		
	Matuguina, William	YES	YES	YES		
	Navarro, Ronnie	YES	NO	YES		
Sentrotek	Bedano, Jocelyn	YES	NO	NO		
	Lasmarias, Rubylene	YES	YES	YES		
SNI	Alvarez, Allan	YES	YES	YES		
	Bautista, Susan	YES	YES	YES		
Woodward-Clyde	Layug, Elizabeth	YES	YES	YES		
World Bank	Villaluz, Maya	YES	YES	YES		
Independent	Araza, Dioni	YES	YES	YES		
	Marinay, Adonis	YES	YES	YES		
	Pono, Analisa	YES	YES	NO		
	Quisumbing, Lourdes	YES	YES	NO		
	Alvarado, Catherine	YES	YES	NO		
	Limtin, Jacqueline	YES	YES	NO		
TOTAL	49	49	42	31		