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A WORKSHOP ON WASTE MINIMIZATION: AN EMERGING CORPORATE STRATEGY
MANILA, PHILIPPINES

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TABLE OF CONTENTS

I. Executive Summary	1
II. Introduction	3
III.Workshop Content	4
IV. Conclusions and Findings	6
V. Follow-On Activities	14
Appendix A: Functional Definition of "Waste Minimization"	21
Appendix B: Travel Itinerary	23
Appendix C: Persons and Organizations Visited	27
Appendix D: Business Cards of Persons Contacted	29
Appendix E: Curriculum Vitae - Burton Hamner	30
Annex 1:Report on Waste Minimization Workshop Written by: Alan J. Gagnet Environmental Quality Corporation (EQC)	31

DISCLAIMER

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I. EXECUTIVE SUMMARY

From January 9-23, 1993, the author visited Manila, Philippines to participate as Course Instructor for the **Workshop on Waste Minimization: An Emerging Corporate Strategy**. The workshop was organized by the Environmental Management Bureau (EMB) of the Philippine Department of Environment and Natural Resources (DENR). The sponsors included the World Environment Center and the US Agency for International Development (USAID) / Philippines. The trip included a week of preparation and a week of teaching.

The workshop purpose was to teach waste minimization (WM) concepts and techniques both to industry and government, and help the two groups find options and make recommendations for "win-win" promotion of WM through discussion. About 150 people attended the various portions of the workshop.

The workshop was very successful. Group participation and discussion was very active. Industry teams successfully applied training on site visits to industrial facilities and reported that the training was very useful. Government representatives agreed they could work with industry to promote WM. Industry and government participants worked together to recommend action steps to create a "win-win" future for WM in the Philippines. A committee was formed to promote WM nationally.

The author found that WM is readily understood as a concept by Philippine industry and government, that WM training is effective as practiced in the workshop, that there are numerous resources available to promote and institutionalize WM, that government has existing authority to require WM planning from industry using various existing regulatory mechanisms and that workshop participants could agree on priority action steps to make WM a reality in the Philippines.

The author also found that WM problems in the Philippines are dominated by high Biological Oxygen Demand (BOD) wastewater concerns and that water conservation and reclamation should be a major focus of future work. Most progress in WM will be made by transferring WM knowledge, not technology. The technologies that are most important for WM include sensors, automation, information systems and recycling systems such as solvent distillers and wastewater reclamation.

WM in the Philippines appears to be largely a management issue, just as it is in the United States (US). Efforts to promote it should resemble methods used by those who market executive business education, such as Non-Governmental Organizations (NGO's), universities, professional societies, etc. Since the solution to waste generation problems is often better overall management, all the management tools (such as full cost accounting, quality control, employee involvement and participation, performance-based goals, etc.) should be promoted.

The following recommendations are made:

o Act on workshop results, particularly in establishing a WM oversight committee.

o Establish an official functional definition of WM that includes source reduction, waste reduction and recycling.

o Establish WM as formal government policy in both environmental management and in economic development.

o Conduct a capability assessment of Philippine institutions, including business, public NGO's, academia, and government agencies to determine how to best promote WM in the long term. Perform assessment at the same time as implementing actions based on the workshop results, not before.

o Provide training in WM assessment procedures, program development and implementation and total quality environmental management. Make training highly participatory using adult instruction techniques.

o Implement at least one WM project in each DENR region, supervised by the Regional Technical Director, which has a high chance of success. Make the projects highly visible with good publicity and recognition for the businesses involved. Use the IEMP's Pollution Management Appraisal teams to assist the participants.

o Ensure linkage of WM policies and projects to other government efforts such as lower and higher education, occupational safety and health, quality management for exporters and science and technology development.

o Work with one business NGO, such as the Philippine Business for the Environment, to establish a WM resource center until the capability assessment determines a permanent home for it. Provide funding to obtain documents, hire an organizer/assistance provider, and copy and distribute materials. Assist the NGO in marketing the resource center to business (and increasing membership).

II. INTRODUCTION

This is based on the author's experience as Course Instructor for the **Workshop on Waste Minimization: An Emerging Corporate Strategy**, held in Manila, Philippines, from January 18-23, 1993. The assignment included a week of meetings and preparation in Manila. Travel dates were January 9-23, 1993. See Appendix B for itinerary and workshop description.

The workshop sponsors included the World Environment Center (WEC), the U.S. Agency on International Development (USAID), the Environmental Management Bureau (EMB) of the Philippines, and the Department of Environment and Natural Resources (DENR). See Appendices C and D for contact information.

The workshop purpose was to provide waste minimization (WM) concepts and techniques to both industry and government, and to help the two groups find options and make recommendations for "win-win" promotion of WM through discussion. Objectives of the US AID country staff, expressed in meetings, were to learn how to develop the capability of Philippine business organizations and NGOs to provide WM assistance to business, and what options exist to set up a WM assistance center in government.

The instructors spent the first week conducting site visits, meeting with individuals involved with WM and finalizing the agenda. The workshop was held the second week. A general seminar on WM was held for industry on the workshop's first day. Separate sessions focusing on WM specifics were held for industry and government in mid-week. The industry group conducted one-day WM assessments at local companies. The industry and government group met together on the last day to discuss the future of WM in the Philippines. See Appendix B, Part 2, for Workshop Agenda.

The author was Course Instructor for the workshop. He is the senior Environmental Planner, Toxics Reduction program, Washington Department of Ecology, Northwest Regional Office, Bellevue, Washington USA. His major professional responsibilities are helping industrial facilities prepare Pollution Prevention Plans, reviewing plans for compliance, and teaching and speaking on pollution prevention. See Appendix D for Curriculum Vitae.

Alan Gagnet, Vice President, Environmental Quality Consultants of Dallas, Texas, was Course Director. Mr. Gagnet's trip report is included as Annex 1 of this report.

III. WORKSHOP CONTENT

Agenda

The Workshop had a complex agenda:

Monday:General presentation to a group of approximately 100 industry and government leaders.

Tuesday: 1)Training subgroup from Monday of approximately 20 industry engineers on how to conduct a WM assessment and elements of a WM program.

Wednesday: 1) The industry group performed WM assessment visits to three companies.

A group of 20 government representatives joined the instructors for training in concepts and methods, and to review the scope of their authorities for promoting or requiring WM.

Thursday: 1) The industry group debriefed with one instructor (Gagnet)

The government group learned more concepts and discussed WM success stories.

Friday:Industry group presented site visit reports to government group and each other, then groups were mixed into teams for discussion of further steps to promote WM.

All aspects of the workshop were well received with excellent participation and were a lot of fun. Specifics are discussed below.

Training Methods and Results

The instructors found it necessary to somewhat divide the subjects. In general, Alan Gagnet gave overviews of WM, general philosophies, and led most of the exercises. Burt Hamner laid out WM specifics, including the WM Hierarchy for opportunity identification, key elements of a WM program, steps in a WM assessment, and a wide variety of case studies illustrating WM methods. He also led most of the group discussions.

The participants appeared to appreciate both the general and specific topics. Based on the amount of note-taking, the presentation of key elements in a specific order was of great interest.

Group discussions were used to illustrate several key concepts of WM. In "The Costs of Waste", the group identified the many costs of using chemicals and generating wastes to illustrate the concept of expanded cost accounting for WM. In "Why Waste Happens" the group offered many reasons and identified whether the source of the problem was "people" or "technology". This helped stimulate discussion of departmental and individual responsibility for WM, and emphasized the concept of team building for environmental management.

The group discussions were very productive. Little prompting from the instructor was needed. One participant informed the instructor that he very much enjoyed the style of having the group "teach itself".

The groups broke up into teams for several exercises. Two "brain-teaser" puzzles were worked out in groups to get people talking. Another exercise was held with teams using a Play-Doh Fun Factory to make "products" according to "customer specifications".

The team exercises generated much talk and laughter. They served as good ice-breakers and kept the workshop tone very positive. The Play-Doh Fun Factory exercise was designed to teach how difficult it can be to avoid creating waste in manufacturing. Several of the teams made many attempts to distract the "inspector" in efforts to hide waste in eery possible location. To their glee, they were largely successful.

The industry group split into three teams to perform their site visits and prepare and present reports. The government group engaged in team discussions on what they could do with existing authority to promote WM. The industry and government groups were mixed on the last day for team discussions to create an action agenda. The teams generally consisted of four to eight people. The instructors helped teams individually as needed, then moderated the team reports.

The team discussions were productive as each team nominated one member to give a report to the group. Each reporter received much commentary and commendation from the audience. The reports showed that the team discussions had been on target and largely useful to the teams.

The industry group split into three teams and visited three companies: Mobil Philippines, Inc. (asphalt), Chemphil, Inc. (chemicals), and Fastbrite, Inc. (electroplating). Their task was to evaluate the waste-producing processes at the facilities, apply the WM methodology from their training, identify opportunities for WM, and present a report to the host facility and the assembled workshop participants.

The visits went smoothly. The teams applied many of the procedures they had learned in the previous two days, and each team was able to identify several

cost-saving opportunities for the host company. They also identified critical areas where more data would probably lead to an efficiency-based waste reduction project. Representatives from the host companies who listened to the team reports agreed that filling the identified data gaps would be a good business practice and probably would help save resources and money.

Three Philippine business people presented environmental success stories on the first, general session day. The stories demonstrated both organizational and technical approaches to WM. US case studies were used to illustrate various ways to succeed in WM, from purchasing and inventory control to chemical substitution and waste segregation. A draft collection of short (one paragraph) success stories was obtained from IEMP and was used in discussion with the government group. Each short story was read and the group was asked to determine what kind of WM method it was, if any (some were actually waste treatment stories).

Participants clearly stated that they appreciated hearing local businesses could be and were WM successes, and that the workshop recognized that fact. The list of short stories was very useful for promoting group discussion and illustrating the large range of management and business practice opportunities available for WM.

IV. CONCLUSIONS AND FINDINGS

Workshop Results and Output

On the fifth and last day of the Workshop, industry and government representatives who had been instructed separately came together to hear industry site visit reports, discuss the next steps for promoting WM in the Philippines. The instructors presented an overview of the types of WM promotion used by government in the United States. The attendees were then separated into random groups (using a count-off sequence) and eight teams were formed. The teams were presented with a topic for discussion: "How to Achieve a Win-Win Future for WM in the Philippines." They were asked to consider action steps, performance goals, schedules, available resources, and obstacles to implementation. The teams talked for about 90 minutes after which each team presented their reports.

The conclusions below are based on the author's experience with these groups, in which the most common or original elements of reports are summarized. The instructors facilitated the discussion and used microphones to tape all the speakers. The session was recorded by EMB on audio tape.

Based on feedback from attendees and the quality of group and team work, the workshop was a success. The instructor's training methods were well received by the groups, especially the highly interactive approach. The WM methodology, especially as used by the author and his co-workers in Washington state, can be

effectively transferred in a workshop format. This is partly dependent on the instructors' having a well organized, sequential presentation with elements clearly defined. The use of success stories, especially brief local ones, was especially helpful to increase enthusiasm and appreciation of WM. Use of team exercises was very good for increasing the enjoyment of participants and the amount of discussion of topics. The author received many personal comments from participants about how they enjoyed the workshop and that it was professionally very helpful and timely.

Conclusions

The government representatives, including 12 of the 14 Regional Technical Directors of the DENR, agreed that they did not need any new authority. A number of existing mechanisms, such as the Environmental Impact Assessment and the Environmental Compliance Certificate, can be used to encourage or require WM planning from industry. No industry representatives argued that new authority would have to be created.

Such a conclusion would be very unlikely in the United States and shows how developing countries have a big advantage to the US in WM. Their WM rules are not yet so complex that there are major bureaucratic obstacles to WM, especially recycling. National waste management programs should be implemented as early as possible.

One team concluded that a major need existed was for an oversight WM committee, composed ideally of people in the Workshop who appreciated the real value of WM. The idea was well-received, and the Workshop Coordinator, Bebet Guzon, acted on this at the end of the day. She called for volunteers and came up with approximately nine who would meet in a month or two to evaluate progress and promote further action.

Several teams mentioned the need to start teaching WM concepts in primary and secondary education. They heard from the author about Washington State's award-winning Away-With-Waste school curriculum, which promotes WM in schools (copy attached).

Several teams pointed out the difficulty of getting a program started and suggested that experiments or pilot projects as good action steps. In general discussion it was pointed out that each Philippine region has a "Dirty Dozen" list of polluting companies, which would be good targets for a cooperative WM project with DENR. The ability to obtain a Pollution Management Appraisal (PMA) from IEMP was seen as critical to such a program.

Most of the teams stated that a database or center of information was needed. Several commented that it was expertise, more than technical specifics, that were needed first.

All of the teams thought further training in WM methods were very important. There seemed to be a consensus that WM is common sense, and that it is not necessarily a technical issue at all. They agreed that the training they had received over 3 to four days during the Workshop had been effective for them. Regional training needs were stressed.

Nature of Waste Minimization Problem in Philippines

Priority Wastes

Rather than solid toxic waste, the main industrial waste problem in the Philippines appears to be wastewater with high BOD or thermal gradients. This opinion is based on the volume and nature of the wastes and their immediate threat to health and the environment. While there certainly is substantial generation of toxic waste, a major means of disposal appears to be through water flushing or rinsing. This has several implications. The first is that WM needs to explicitly promote water conservation and wastewater reduction, as well as solid waste minimization. Second, Toxics Use Reduction (TUR) may be a smaller priority for WM training and transfer in the Philippines than the US, since use reduction is not as applicable a concept for industries with high-BOD waste streams derived from food processing or agriculture.

Management Transfer vs. Technology Transfer

Based on the author's site visits, discussions, and interpretation of industry site visit reports, Philippine industries operate with significantly less management information about and control over industrial processes. In the US, automation, computers and sensors make it possible to collect and process information about inputs and outputs, including wastes. Additionally, a long history of regulation ensures that most businesses can at least quantify and characterize their hazardous wastes. In the Philippines, the lack of process control technology and the lack of reporting requirements for wastes means that cost-effective WM opportunities are often not even noticed by management.

There was wide recognition among workshop participants that, in the end, WM is mostly a common sense and logical approach. The site visits confirmed a major argument of the author, that lack of process data and management control over production is a major reason why wastes are not being reduced significantly. This is a most important distinction for WM: it is largely a management problem, not a technology problem. This means that technical transfer should focus on management tools and basic process controls, not on equipment sales and new technology. Of course, transferring management expertise is much less costly than transferring technology, although it may take longer.

The implication for Philippine industry is that WM efforts should start by looking for improvements in existing processes, especially in management information about wasted resources. This is the least costly, highest payback way to start. Information about new technology and processes should be made available, but assistance efforts should not focus on significantly changing processes or equipment.

Regulation vs. Cooperation

There is a clear window for the Philippines to choose between a strong regulatory approach or a cooperative approach to industrial environmental management. A regulatory approach along US/European lines has a proven result: WM is made more difficult by regulations, especially ones regarding waste recycling. The author's own agency currently has a project to identify government regulatory obstacles to WM because they are such a perceived problem for industry. There was a clear feeling in the workshop among both industry and government that a cooperative approach is preferred to strict regulation. The local economic benefits of WM vs. regulation were particularly noticed. Government can use the current regulatory system to promote cooperative WM with industry, and help reduce the need for more stringent regulation.

Training Needs

The main WM training need appears to be in concepts and methodology. Much WM starts to happen on its own when waste costs and causes are fully understood by management. In particular, production efficiencies are implemented that significantly conserve resources and reduce wastes. The workshop demonstrated that the concepts and methodology are both readily understood and (relatively) easily transferred. The workshop participants felt that two days, like they had, was enough training time. One participant commented to me that he had attended all the PMA classes held by IEMP, and this workshop was a better, more efficient education. This may have been due to training style; the participant was very active in group discussions.

The training needs that appear to be most important are: WM concepts and methods; production benchmarking; use of Total Quality Management tools; and cost analysis for projects with environmental consequences.

Government Policy/Terminology

The IEMP staff felt strongly that they preferred the term WM to Pollution Prevention (PP). This appears due to the relatively long use of the term and its incorporation into documents and projects. The instructors did not care whether the key word was WM or PP, as long as it had a function definition, namely , the Pollution Prevention Hierarchy. There appears to be no reason why the Philippines cannot continue using

"WM" as its key word for pollution prevention, if the definition is clearly communicated. Policies should establish the functional definition of WM.

Use of Existing Authority

The government representatives in the workshop felt they did not need to expand their existing authorities to promote or order WM. The EIS and ECC process were both suggested as points in which WM planning and reporting can be made an industry requirement. A clear need is to develop a model WM report for industries, like an environmental checklist, that government can require to be completed. The model would need to address the particular difficulty that the Philippines has in acquiring much of the management data needed for WM; more effort would need to be dedicated to understanding existing processes and mass balances. They have the authority, now what should they ask industry to do?

Waste Minimization Incentives and Barriers

The incentives for WM were clearly and quickly realized by the workshop participants. The group discussion on the real short term and long term costs of waste was enough to get participants seriously motivated, especially in industry. Industry representatives clearly felt that WM would benefit them and also help alleviate regulatory pressures, through agreements such as phased compliance dependent on WM success. WM was clearly seen as a win-win situation for industry and government on all levels. WM is therefore much easier to sell politically than waste management and regulation.

Barriers to WM in the Philippines include industry's lack of knowledge about existing waste streams, lack of WM concepts and methods, and lack of model government / industry cooperative projects. Interestingly, government regulation is not a barrier to WM like it is in developed countries. This in turn points out the importance of building WM concepts into regulatory programs at the earliest phase.

Philippine Resources for Waste Minimization

Business

At least two NGO's, Philippine Business for the Environment (PBE) and the Voluntary Organization of Industry Concerned for the Environment (VOICE), appear to have potential for playing a major role in WM. PBE can mobilize higher-level corporate interest in WM. VOICE is an organization created "in self defense" by a group of 40 companies under government pressure for environmental action. With this many members, VOICE could use dues to hire a WM consultant to serve all the members. This could be a model for other regional businesses.

The business people whom the author met seemed very interested in WM and eager to apply its concepts to the extent feasible. Cost savings were of particular interest.

Government

The government group with the most obvious potential impact for WM are the Regional Technical Directors and inspectors of DENR. As the permitting and inspecting agents, they can wield regulation as a bargaining chip to obtain WM results from companies. The workshop experience encouraged the possibilities for developing a relatively short (2-3 day) standard training curriculum for inspectors. With proper training, making WM a part of their on-site inspection responsibilities would be effective.

The IEMP project and its Pollution Management Appraisals (PMAs) is another major resource. The PMAs appear to be close to the pollution prevention assessments performed by many state agency staff. The time given on-site for a PMA, up to two months in some cases, is an adequate service. Other beneficial services might include: short (1-2 days) PMAs which focus on "low hanging fruit" and very long-term (over one year) PMAs which focus on changes in management control and employee awareness. The PMA manual prepared by IEMP appears similar to US efforts. It could be substantially condensed.

We were informed that the Department of Trade and Industry has a program to promote application of the ISO 9000 Quality Assurance standard. This standard program for manufacturing quality has many elements that apply to WM. If it provides training, then WM could be incorporated into it.

Government departments that promote science and technology are potential resources for environmentally sound design. They do not need to be concerned about "clean technology" and equipment at this time, since there are so many opportunities to improve existing processes for WM.

Non-Governmental Organizations

NGOs have great potential for promoting WM. The number of NGOs concerned about the environment appears to have exploded in the last five years. Using community pressure as well as regulatory appeals, US NGOs have had good results in promoting WM. DENR appears to have a policy of promoting NGOs; this should be strongly encouraged. The Philippine Business for the Environment (PBE) appears to be a promising place to promote WM and its linkage to competitiveness.

The other most promising NGO for WM is the Pollution Control Officers Association of the Philippines, Inc. (PCOAPI). Membership in this NGO is required (?) for PCOs and it offers three levels of accreditation to members based on experience and

training. WM training could be made a requirement for PCOAPI and a specific certification item. In Massachusetts, US the state has already implemented a requirement that facility TUR plans be prepared by a certified Toxics Use Reduction Planner. They have developed a certification course including testing to ensure qualification (contact Ken Geisert, Mass. Toxics Use Reduction Institute, One University Avenue, Lowell, MA 01854; 508-934-3275).

Academia

The University of the Philippines, College of Engineering, has great potential for providing WM assistance in the form of Continuing Education course and providing a supply of student interns for project assistance. The National Technology Center appears to have potential as an information transfer center,
especially for publications and industry-specific technical material.

The Asian Institute of Management (AIM) can provide management training in WM as part of its existing environmental class, taught by Prof. Benjy Bagadion. AIM could and should be a center of information about WM management techniques, especially total cost accounting and green marketing.

Community

Community groups can be a significant resource for WM. The author is an advisor and instructor for the "Chemical-Free Fremont Campaign", a community-sponsored and managed project to promote WM to local businesses and mobilize residents about reducing their own wastes. WM training to community groups can create self-started programs.

Transfer of Waste Minimization Know-How

Technology vs. Knowledge

WM in the Philippines does not need technology transfer. It needs knowledge transfer. Much of the industrial waste problem in the Philippines, just as in the USA, is due to lack of management control of information and access to information regarding production processes. To date, US experience shows that with the proper combination of regulatory requirements and technical assistance, industries will find significant WM opportunities without spending large amounts of capital, and permanent awareness
of WM can be created in organizations. An organized management approach to WM will generate results. This should be the focus of knowledge transfer to the Philippines.

Two kinds of manufacturing technology are very important for WM in the Philippines: sensors and automation. Sensors for flow rates, chemical concentrations, temperature, etc. are basic assumptions in efficient US manufacturing but may not be common in Philippine industry, especially smaller industries. Automation can greatly improve production efficiency and reduce wastes when combined with benchmarking and statistical analysis of the process.

Recycling technology is also important. Solvent distillation and recovery units are not technically complex and could be manufactured in the Philippines. Filtration technology is very important for waste water recovery. Philippine industries could be surveyed to identify the kinds of recycling technology that are most applicable and attention concentrated on these.

Receptiveness of Host Culture

The Philippine culture appears very receptive to WM concepts. Making do with less is a common need and virtue in developing countries, and WM promotes the virtues of thrift. It also is based on open-minded problem solving and the workshop experience convinced the instructors that there is no lack of inventiveness or energy among government or industry when it comes to WM.

Use of Workshops

The workshop approach appears to work well for training. Only three days would be needed to provide significant training to a well organized, motivated group, and one-day workshops are enough to stimulate creative thinking and actions among individuals. They also capitalize on the good nature of the Filipino people who clearly enjoy personal interactions and mutual problem solving exercises.

Utility of Various Resources

Training

Training appears to be a very effective means of promoting WM especially if focused on management and top engineers. These audiences need to make a major shift in mindset if WM is to occur. Training lower level staff is unlikely to achieve organizational change.

Case Studies

Case studies, especially of Philippine businesses, are an excellent source of motivation for WM. Case studies presented in the workshop were received with great interest. They validate the theory of WM that is being taught and encourage self reliance. It is not possible to have enough case studies to promote WM.

General and Industry-Specific Literature

The available WM literature appears generally applicable to WM in the Philippines. This is due again to the fact that not much of it focuses on new technology, but focuses instead on changes to a few key elements in a complex process and on management and employee involvement. There are many industry specific checklists of WM ideas in the literature and these should be available to industry. The workshop participants appeared to be extremely interested in the literature provided by the author and numerous requests for copies were given to EMB.

Commercial Channels

Chemical vendors and selected equipment vendors should receive promotional efforts for WM. They have a vested interest in providing "green" products to their customers. The vendors of sensor, automation, cleaning, solvent recycling and water filtration equipment have particular interests in WM as a sales aid. Working with vendors is an excellent way to multiply WM promotions as the vendors themselves will perform much of the knowledge transfer

V. FOLLOW-ON ACTIVITIES

Act on Workshop Results

NOTE: Several of the actions listed below would benefit from first conducting an institutional WM capability assessment, discussed later. The actions below are given first priority in this report because they were created by workshop participants with strong consensus, and the participants were energized about WM. Everything possible should be done to capitalize on momentum from the workshop. A serious capability assessment could be conducted at the same time that initial efforts on the workshop action items are underway. One the capability assessment has been completed, the projects underway can be transferred to the locations that would be the best long-term hosts. But action should not be delayed until a capability assessment is completed!

Use Existing Authorities

Provide clear guidance from DENR to regional environmental staff that staff possess the authority to require WM planning from industries they regulate. WM plans should be made a required part of the EIS process and the annual Environmental Compliance Certification. This can be accomplished by having WM planning be a part of EIS development, and WM implementation be a part of annual certification. Required plans should follow the format developed in Washington State or several other US states; these plan formats have been proven to obtain good results when done

correctly (a draft report on first-wave Pollution Prevention Planning results from Washington state is attached).

Work with PCOAPI to create a WM planner certification program for its members. Make certification in WM a requirement for PCOAPI members.

Create a WM Advisory Committee

Use the initial volunteers from the workshop to establish a WM advisory or oversight committee. The initial volunteers should form an executive steering group. The membership should be expanded eventually to include NGOs, state economic development agencies and academics, particularly from the University of the Philippines and the Asian Institute of Management. Give the committee official recognition and provide resources and support so they can meet quarterly to continue promoting WM. Special effort should be made to enlist active, energetic people as members so they will take personal initiative in promoting WM projects.

Establish Training Mechanism

Establish a standard course in WM that is shorter than the current PMA training available. Several workshop participants commented that the workshop training was just as good if not better than their PMA classes, and the workshop was a lot shorter and more efficient. The training class should not be more than four days total, including a site visit to practice facility assessments. The training class should be thoroughly documented so that class participants can go back to their organizations and become trainers themselves. Refer to the EPA Pollution Prevention Training manual copy provided by the author to EMB staff.

Identify Philippine Success Stories

Clearly document the success stories presented at the workshop's first day, particularly the Magnolia Corp. story. Also document more thoroughly the "mini" success stories which were provided by IEMP to the instructors about mid-week through the workshop. Refer to the booklet, Success Through Waste Reduction in Washington State, provided by the author to EMB staff. It contains a standard format that has proven itself concise and useful. Also refer to the case study format developed by EPA for use in its Pollution Prevention Information and Exchange System (PPIES) computer bulletin board and database. Contact Elizabeth Anderson at EPA (202-260-2602) for the format, which was developed after extensive consultation.

Success stories should be promoted as strongly as possible to the local media, especially television. Talk shows are a very good format for communicating the WM message, since industrial processes don't make particularly interesting film footage. Talk shows also give successful business leaders a chance to shine.

Establish a Resource Center

A resource center or library, focused on documents and training materials, should be developed. A logical place for such a center is the National Technology Center, which would have an appreciation for managing technical materials. Funding for the center could be generated by a small fee imposed on all manufacturers who stand to benefit from it. In Washington State, all potential hazardous waste generators (defined by industry type) pay an annual $35.00 fee to the state to support WM education. Resource centers need to be staffed by aggressively curious individuals who are personally interested in the materials. Hiring someone who thinks they are there merely to catalog materials is a waste of potential for the position; the center staff need to be technical advisors to business.

Several other locations have potential for resource centers. The PBE could be given a grant to establish and operate a center. So could the Asian Institute of Management, whose management library and executive classes would be an excellent complement to the resource center. A key issue is that DENR should NOT be the resource center location because many business people will be reluctant to use the resources due to the association with a regulatory agency. There are no particular reasons why DENR would be a good location, and an obvious reason why it would be less than satisfactory.

Develop an Educational Curriculum

Model curricula in WM for elementary, high school and college students should be developed. A copy of Washington state's *Away With Waste* WM school curriculum is enclosed. The University of Michigan is developing WM curricula for college students and several US NGOs have published WM exercises for college engineering students. The curricula should be tailored to Philippine needs, with particular emphasis on Design for the Environment using local materials, process control and management, total cost accounting, and water conservation and wastewater minimization. Targeting of the curricula should be to students likely to enter business at a medium to high level.

Clarify Definition of WM for Philippines

The definition of WM for the Philippines should be articulated as a series of actions or functions. The figure below shows the Pollution Prevention Hierarchy as used in Washington State. Note that the definition of WM includes both a priority of order and a list of elements in each order. The "code word" used for this hierarchy is not that important as long as everyone knows it means applying the hierarchy actively. It is recommended that this functional definition be officially adopted in the Philippines.

There continues to be an argument in the US by environmentalists that WM should only include source reduction and in-process recycling. This is too extreme a position for the Philippines and does not maximize benefit to the environment. A "waste" is something that is discarded. Anything that can be done to eliminate the need to discard something, including off-site recycling, is justifiably called WM. This is particularly important for developing countries where resources are scarce, waste exchange is even more valuable than it is in the US, and where the problem is not largely toxics use but high-BOD wastewater discharges. Toxics use reduction is clearly a part of the functional definition below and would not be overlooked necessarily.

Constant vigilance is necessary to ensure that waste treatment is not being disguised as WM. Many US companies have proposed waste treatment as their solution to WM without doing an adequate job of "going upstream" to source reduction. This is why the functional definition needs to include a specific analysis order as well as a list of elements to consider.

Government

Government needs to express the importance of WM in both environmental and economic development policies. Specific language promoting WM should be adopted into existing policies; additionally, a national statement about environmental and economic priority of WM and clean and high-quality manufacturing should be developed, similar to the 1990 US Pollution Prevention Act.

Business

With government assistance, model policy statement on WM should be developed by business. The policy statement should address the goals, procedures and incentives for WM that will be implemented by businesses which adopt it. The PBE would be a logical organization to develop such a model. The policy statement needs to have supporting text explaining why each policy element is important; this text would be a logical part of the WM
training and educational projects discussed above.

Do a Capability Assessment

The existing resources available for WM in the Philippines, particularly business, public NGOs, and academic institutions, should be evaluated for their true capability to promote WM. The author did not have enough time to learn about the true capabilities of any of the organizations contacted. Capability evaluations should include alignment of WM with the mission of the organization, resources available, linkage to other resources and organizations, and potential output including a proposal

for action by the resource organization. This will help determine the location of technical assistance and resource centers.

It was noted at the beginning of this section on Conclusions that a capability assessment should be started at the same time that action on workshop recommendations is being taken. Capability assessments are time consuming and action should not be postponed until the results are in. It is much less difficult to "roll over" a project into another host institution than it is to get the project started much later when momentum has been lost.

Provide Further Training

Training should be provided in three areas: WM assessment procedures, WM program development and implementation, and linkage of WM to Total Quality Management. Based on the author's experience, no training class should need to exceed three or four days. Training needs to be made highly participatory using adult instruction principles of group discussion, team problem solving, and field exercises. The classes should be taught by people who have done actual site visits themselves and can discuss the basic issues as well as personnel and sociological issues involved in WM.

Training should be provided on a regional basis. An excellent start would be establishing/implementing a training sequence in each of the DENR's 14 regions. The training should be attended by DENR inspectors and officials, local NGOs and economic development authorities. It must be re-emphasized that WM training is not very complicated and it must be delivered with enthusiasm and vision as a new way of improving both profits and the environment.

Implement Regional WM Projects

A pilot WM project should be implemented in each DENR region under the supervision of the Regional Technical Director. The projects should be linked to compliance and certification to give all parties practice in institutionalizing the mechanisms for achieving WM. The ideal recommended project would have a priority facility with good WM potential, and have prepared a thorough WM action plan similar to US state plans such as Washington's. A year should be given to complete the plan, and support for planning should be provided to each facility from the IEMP PMA team. The PMA team should only teach and suggest; the facility has to come up with the answers on their own for the concepts to be truly internalized. A key focus of the PMA team should be on current and alternative costs so that at the end of the project the facility is motivated to implement WM actions in the interest of potential cost savings. The projects should be well documented to ensure that quality success stories can be written at the end. High recognition should be given to facility managers throughout the pilot project to keep them motivated and concerned about their success.

Success Stories

Success stories of WM in industry need to be collected as much as possible. Many businesses are quite willing to share their successes if it results in marketable publicity. Local media sources are a particularly good way to collect success stories. A contest could be held for reporters who write about success stories, with a prize of some kind to the top three or four. Even those who don't win would provide good material for promoting WM. Another resource is university journalism students, who may be eager to take advantage of the relative newness of WM to establish a niche in this area. Under faculty supervision, students can write success stories as class projects.

A standard format should be established into which success stories can be adapted (don't ask reporters to use a standard format for their stories). Format issues were discussed earlier (see **III. Workshop Content,** Training Methods and Results). The standard format should be used for stories distributed by the government or a WM resource center. It is preferable to have the original story, from a newspaper for example, attached to the standard format story.

Regional Priorities

Regional priorities for WM projects should be established by DENR's regional technical directors. Each region has a "dirty dozen" list of industries that could easily provide a good place to start. Attention must be paid to facilities with good WM potential so significant successes can be demonstrated.

Promote Linkage

WM should be clearly linked to programs for occupational safety and health, quality management, and research and development. For each of these areas it is recommended that DENR establish an inter-agency memorandum of agreement to share information and promote mutual interests in each participating program. Significant results in WM have been achieved in the US through occupational safety and health programs which focused on reducing worker exposure to toxics. There are other ways to "slip WM in" to existing government projects focused on industry. Each potential avenue of linkage should be documented and a contact person in the organization identified.

Establish an Interim WM Resource Center in a Business NGO

Establish a clear objective of building industry's capability to help itself with WM. The best way to do this is to encourage industry NGOs to adopt WM as a message they can use to market themselves to potential members. Their self-interest will provide the energy to continue marketing WM. In the US, industry NGOs advise their

members on WM techniques, research clean technologies, work with government to encourage WM before waste regulation, sponsor conferences and seminars, and provide databases and information systems. These activities have almost all been generated by the NGO's themselves with little government encouragement because the members are extremely interested in using a mutually-funded resource.

Work with one business NGO, such as PBE, to establish a WM resource center there until the capability assessment determines the best long-term location. Obtain direct support from the NGO's board of directors. Provide funding to obtain documents, hire an organizer / assistance provider, and copy and distribute materials. Assist the NGO in marketing the resource center to business (and increasing membership). Make up a WM newsletter that the NGO can distribute, focusing on the basics of WM (repeat in every issue!), resources available and the benefits of membership in the NGO.

APPENDIX A: Functional Definition of "Waste Minimization"

Analysis Order
Recommended Elements

Source Reduction:
Purchasing and Handling
End Product Re-Design
Change Product Design
Change Customer Preferences
Hazardous Substance Substitution
Hazardous Substance Modification
Reduce Concentration
Reduce Components
Purchasing and Inventory Management
Requisition Review
Just-in-Time Purchasing
Distribution Control
Best Management Practices
Leak and Spill Prevention
Evaporation Prevention
Complete Usage

Source Reduction: Production

Employee Training
Maintenance
Process Control
Benchmarking
Measurement
Process Modification
Equipment Modification
Closed-Loop Recycling

Waste Reduction

Waste Stream Segregation
Re-Use Wastes
On Site Re-Use
Off-Site Re-Use / Waste Exchange

Recycling

Reclaim Wastes
Reclaim On-Site
Reclaim Off-Site

Articulate Waste Minimization Policy

APPENDIX B: ITINERARY

Saturday, 1/9/93
Taxi to airport. Left Seattle on 1:30 pm flight, Northwest Airlines.

Sunday, 1/10
Arrived Manila, 10:30 pm. Taxi to Nikko Hotel Manila Garden, outrageous charge added to hotel bill.

NOTE: From Monday through Friday, I and Alan Gagnet were escorted and chauffeured between visits around Manila by Bebet Guzon, workshop coordinator, and her driver, Rey. Ms. Guzon is one of the best organized and best informed meeting organizers I have had the pleasure to work with. She should be recruited by AID and WEC if possible. She's busy, though. Her driver Rey has nerves of steel and a careful eye. I appreciate him.

Monday, 1/11
Met Course Director, Alan Gagnet, at hotel. Taxi to office of Environmental Management Bureau, Department of Environment and Natural Resources, in Philippine Heart Center Building. Met with Angie Brabante and Marissa David of EMB and Bebet Gozon, consultant and workshop coordinator. Received overview of Philippines environmental management, with emphasis on workshop context.

Had lunch with Paul Shimada and other members of PRC Consultants' subsidiary, Environmental Management, Inc., which performs Industrial Environmental Management Project on behalf of USAID. Focused on need to have consistent definition of WM or pollution prevention. PRC has produced Pollution Management Appraisal (PMA) project, which performs industrial environmental audits with emphasis on WM.

Visited IMF Finishers, an electroplating company. They are WM success story, using counter current rinsing to reduce water use and wastewater generation, and are willing to talk about it publicly. (Success story was later presented at workshop on Day 1 by company's chemical engineer. Bebet Guzon has write-up or recording).

Visited Editha Cabrera at Magnolia Corp. headquarters in Manila. She led wastewater minimization project at ice cream factories and earned P$100,000 as bonus for major achievements (success story was presented on Day 1 of workshop; copy attached).

Tuesday, 1/12
Met with USAID staff Kevin Rushing, Kenneth Prussner and Jomar Ochoa at their office. Discussed presentation and cultural issues for workshop, as well as management and function of IEMP project. AID objectives, among others, are to develop capability of business organizations to provide environmental technical

assistance to industry, and to understand options for a technical assistance center in government. Also learned about awesome scuba diving opportunities in the Philippines (potential WEC volunteers take note!).

Met with Tony Oposa, president of the NGO, Philippines Environmental Network (PEN). Learned that PEN started in 1988, as one of perhaps 20 environmental NGOs. Now, Tony says, there may be more than 1000. Implication for community and legal pressure on polluting companies is obvious. PEN seeks to develop a databank of contacts for environmental action as well as a technical and political action library. Localized or community-based NGO activity was emphasized.

Met with Ben Malayang, Deputy Undersecretary for the DENR. Discussed Filipino cultural character, and its implications for the workshop. We were advised to emphasize bottom line results, avoid regulation, and place less emphasis on being "good businessmen".

Met with Domingo J. Dy, President, Fastbrite Inc. He volunteered to host a visit by workshop trainees practicing WM assessment procedures (his son and the company's chemical engineer both attended the industry workshop). Toured the plant and made several recommendations regarding waste water minimization. Plant changes are seriously constrained by lack of space; the plant is tucked into a dense urban neighborhood with houses on three to four sides.

Met with Professor Ibarra Cruz, Dept. of Mechanical Engineering, University of the Philippines. Professor Cruz is an alternative energy specialist. The university has an engineering summer intern program, consulting projects by faculty, and continuing education program for professional engineers.

Met with Vincente "Buddy" Lava, Jr. He is president of the Philippine Institute of Chemical Engineers and chairman of a chemical distribution company. Learned that Philippines Dept. of Trade and Industry has an ISO 9000 Quality Assurance program for manufacturers of export products to Europe. Discussed how well quality management and environmental management work together and possible economic and trade assistance as a vehicle for WM assistance.

Wednesday, 1/13

Met at EMB with the four site visit leaders for the upcoming workshop. Discussed companies to be visited, assessment procedures, team roles and workshop procedures.

Met with the Board of the Voluntary Organization of Industries for a Clean Environment (VOICE), an industry NGO representing approximately some 40 companies which discharge to a North Manila river system covering four towns. They created VOICE due to pressure from a government project to revive the river.

Had dinner and meeting with PRC Consultants' IEMP staff at their office. Discussed terminology. Gagnet and I agreed that we didn't care whether it was called WM or Pollution Prevention, as long as it as long as it was functionally defined as (Source Reduction, Waste Reduction, and Recycling).

Thursday, 1/14
Met with Mobil Philippines executives Marcelo F. Ayesa, Executive Vice President, and Ernesto C. Cruz, Manager - Operations. Discussed site visit to their asphalt plant by workshop attendees.

Met with Porfirio "Mac" Macatangay, President of Philippine Pollution Control Officers of the Philippines, Inc. (PCOPPI) and PCO of one of General Milling Corporation's Manila plants. PCOPPI has 250 members and, based on training and experience, certifies three levels of accreditation.

Friday, 1/15
Met with executives of Century Canning, a sardine canner. They were proposed as a site visit host but backed out that day because the person who had arranged it had resigned and no one else knew about the impending commitment.

Had lunch with Grace Favila, Executive Director of PBE, an industry NGO, and Cora ??, representing the Philippine Chamber of Commerce and Industry (PCCI). Obtained useful advice for workshop presentations.

Monday, 1/18
We presented full-day seminar on WM to approximately 100 invitees from industry and government (see Appendix for full workshop agendas, as planned and presented). Audience participation was good, three local success stories were presented. Positive feedback.

Tuesday, 1/19
Gave full-day training to approximately 20 people, mostly industry pollution control officers, on conducting a waste minimization assessment, and setting up a program in their own companies. Formed group into three teams to conduct site visits the next day.

Wednesday, 1/20
The industry site visit teams go to their host companies for the day.
We taught about 20 government officials, mostly Regional Technical Directors of DENR, about WM. Exercises include group participation, Mock Industrial Process (making products out of Play - Dough), and Creative Problem Solving.

Thursday, 1/21
The industry site visit teams return to the hotel and work with Alan Gagnet to evaluate their findings and develop their reports.
I work with the government group during the morning. Exercises include Product Life Cycle Analysis, assessment steps and WM program elements.
In afternoon I present US government approaches to promoting WM. Joined by Gagnet, I ask group to form teams and come up with a report: their options, priorities, obstacles, and best ideas. Excellent group discussion and reporting ensues.

Friday, 1/22
Industry and government groups meet together. The three industry teams present the results of their Wednesday site visit and comment on the approach. There is much discussion among all parties of procedures and findings and a general conclusion that the methodology taught by the instructors is successful.
In the afternoon, the audience was broken up into eight teams using a "count-off" procedure and some additional shuffling by Bebet Guzon. The teams were presented with a group challenge: "Identify Win-Win Options for Promoting WM in the Philippines". Teams talked for an hour then each nominated a member to give a report to the whole group. See the Findings and Recommendations sections for a summary.

NOTE: During the group reports the instructors moderated the very active discussions and recorded all comments. Consequently no personal notes on this session were taken by this instructor. A full audio transcript is available from EMB.

APPENDIX C: PERSONS AND ORGANIZATIONS VISITED

The individuals listed below were interviewed personally during this assignment. Their business cards are copied in Appendix 8. Roughly a dozen other individuals not listed here were interviewed as well but their full identification was not obtained. Refer to the report for information about additional contacts.

Marcelo F. Ayesa, Executive Vice President, Mobil Philippines, Inc.

Angie Brabante, Environmental Management Bureau

Isaac Cabales, Chief Engineer, IMF International Corporation

Editha G. Cabrera, Head, Environmental Management and Safety, Corporate Engineering, Magolia Corporation

Ibarra Cruz, Ph.D., Professor, Department of Mechanical Engineering, College of Engineering, University of the Philippines.

Ernesto C. Cruz, Manager - Operations, Mobil Philippines, Inc.

Ledicia T. Dela Cruz, Technical Services Manager, Environmental Primemovers of Asia, Inc.

Marissa David, Environmental Management Bureau

Edward Doce, Engineer, Century Canning Corporation

Domingo J. Dy, President, Fastbrite Plating Industrial Corporation

Grace Favila, Executive Director, Philippine Business for the Environment, Inc.

Rodrigo Fuentes, Director, Environmental Management Bureau, Department of Environment and Natural Resources

Arthur Garcia, Regional Technical Director, Environment Sector, DENR National Capital Region

Marivic A. Garcia, Assistant Plant Manager and Production Officer, Bayer Philippines, Inc.

Lionel M. Gillston, Deputy Director, ASEAN Environmental Improvement Project

Wayne H. Harrington, Chemical Safety Advisor, World Health Organization

Richard Johnson, Deputy Director, USAID

Vincent "Buddy" Lava, Jr., Chairman of the Board, VGL Industries

Porfirio C. Macatangay, President, Pollution Control Association of the Philippines, Inc.

Jose M.K. Ochoa, Regional Development Specialist, Office of Natural Development, Agriculture and Decentralization, USAID

Antonio A. Oposa, Jr. President, Philippines Environmental Network
Attorney, Oposa Law Office

Kenneth Prussner, Chief, Office of Natural Development, Agriculture and Decentralization, USAID

Baltazar Ramirez, Pollution Control Officer, Polo Brewery, San Miguel Corporation

Kevin Allyn Rushing, DVM, Environmental and Natural Resources Officer, USAID

Diana Santiago, Development Bank of the Philippines

Paul Y. Shimada, Vice President / Chief of Party Environmental Management (PRC), Inc.

Maria Victoria L. Yao, President, Solar Textile Finishing Corporation
President, Volunteer Organization of Industry for a Cleaner Environment (VOICE)

Lawrence Yang, General Manager, Aquarose Bijouterie, Inc., Cebu City

APPENDIX D: BUSINESS CARDS OF PERSONS CONTACTED

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Tel. No. 78-69-11 to 16 Fax No. 721-4303
Send Terry FS
ISAAC CABALES paper

Member:
NAMF — The National Association of Metal Finishers — USA
PEA — Philippine Electroplaters Association

Magnolia
EDITHA G. CABRERA, MsEn.E.
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CORPORATE ENGINEERING

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29A

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Chief of Party, Industrial Environmental Management Project

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FASTBRITE

INDUSTRIAL PLATING CORPORATION

Specializing in
Electroplating Services
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APPENDIX E: CURRICULUM VITAE

BURTON HAMNER

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(206)-784-4023

EDUCATION

6/1988 **Master of Business Administration** **University of Washington** *Seattle, WA*
Majors: Marketing, Business Policy

6/1988 **Master of Marine Affairs** **University of Washington** *Seattle, WA*
Majors: Marine Technology Assessment, Environmental Policy Analysis

6/1983 **AB *cum laude*** **Harvard University** *Cambridge, MA*
Major: History of Science. Minor: Marine Ecology

TRAINING

2/92 ***Pollution Prevention Assessment*** *Bellevue, WA*
32-Hour Course. How to identify pollution prevention opportunities inside industrial facilities.
Instructors: Washington Dept. of Ecology, US EPA Region X, Waste Reduction Institute.

12/91 ***Hazardous Materials Safety and Emergency Response*** *Bellevue, WA*
40-Hour Course. Hazardous materials identification, hazard assessment, safety equipment and procedures, emergency response, toxicology. Meets OSHA requirements.
Instructors: Washington Dept. of Ecology, CADRE Group, Inc.

12/91 ***Basic Inspector Training*** *Seattle, WA*
24-Hour Course. Procedures for conducting regulatory inspections of industrial facilities.
Instructor: US EPA Region X.

8/91 ***Pollution Prevention Instructor Training*** *Seattle, WA*
24-Hour Course. Techniques for adult group instruction and training. Pollution prevention training tips.
Instructor: US EPA Training Institute.

9/89 ***Fisheries Hydroacoustic Assessment Techniques*** *Seattle, WA*
40-Hour Course. Use of hydroacoustic technology for assessment of fish populations and behavior.
Instructor: BioSonics, Inc.

EXPERIENCE

5/91- *Environmental Planner* **Washington Dept. of Ecology** *Bellevue, WA*
Industrial pollution prevention specialist. Provide on-site planning and technical assistance. Conduct facility pollution prevention and water conservation audits. Review pollution prevention plans from industrial facilities for compliance with regulatory requirements. Develop planning guidelines. Specialist in wastewater reduction, environmental finance and accounting, public speaking.

4/90 - 5/91 *President* **Aqua Marine Enterprises, Inc.** *Seattle, WA*
Communications and public relations consultant to marine and environmental companies and organizations. Conducted market research; designed and installed marketing information systems; wrote articles, press releases, business plans, brochures, and other communications materials.

6/88 - 4/90 ***Marketing Manager*** **BioSonics, Inc.,** *Seattle, WA*
Managed new marketing department in $3 million/yr marine consulting and sonar engineering firm. Recruited and managed staff, interns and contractors. Managed department budget. Developed marketing information system. Wrote business plans. Designed and produced company marketing materials. Represented company at conferences and shows.

5/84 - 5/86 *Environmental Planner* **US Army Corps of Engineers** *Seattle, WA*
Managed environmental studies for Seattle Harbor Navigation Project and other Corps marine projects. Prepared EISs and environmental assessments. Designed, negotiated and managed studies conducted by contractors; made presentations to public; chaired interagency work groups; managed environmental chemical testing. Developed expertise in wetlands, contaminated sediments, and chemical pollution.

2/84 - 5/84 *Marine Policy Analyst* **Washington Environmental Council** *Seattle, WA*
Researched and prepared technical briefs and articles on marine environmental issues. Obtained grants.

9/80 - 7/82 *Research Assistant* **Harvard Museum of Comparative Zoology** *Cambridge, MA*
Conducted laboratory and field studies of marine biology and icthyology.

continued on reverse

BURTON HAMNER

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SELECTED PUBLICATIONS

Commercial Publications

"Pollution Prevention Afloat"
Sea Magazine, November 1991

"Fishermen Affected by Radio Frequency Changes"
Pacific Fishing, June 1991

"Fish Size Representation for Sonar Displays."
Marine Electronics Magazine, Jan/Feb 1990

"Hydroacoustics: The New Wave in Fish Finding?"
Marlin Magazine, May 1989

"Smart Sonar Shopping."
Sea Magazine, April 1989

Sonar for Fisheries Research: An Introductory Guide to Hydroacoustics
BioSonics, Inc. Seattle, Washington 1990

Non-Commercial Publications

An Integrated Model for Analyzing a Technology-Based Marine Industry: The Tourist Submersible Industry.
Master of Marine Affairs Thesis, University of Washington, Seattle, Washington 1988

Introduction to Dredged Material Management: An Illustrated Guide
U.S. Army Corps of Engineers, 1987.

"Quantifying Chemicals in Coastal Environments: The Numbers Game."
Proceedings, Coastal Zone '87 (conference). ASCE 1987.

Seattle Harbor Operations and Maintenance Dredging.
Environmental Impact Statement,
US Army Corps of Engineers, 1986

"Puget Sound: EcoSystem or Septic System?"
The Washington Environmental Council *ALERT!*, May 1984

SELECTED PRESENTATIONS

Association of Northwest Environmental Professionals
Pollution Prevention Planning
Bellingham Rotary Club
Pollution Prevention Planning
Coastal Zone '87 Conference
Quantifying Chemicals in Coastal Environments: The Numbers Game
Coastal Zone '87 Conference
Dredged Material Management Strategy
University of Washington, Graduate School of Business
Environmental Management in Business
University of Washington, School of Marine Affairs
Structural Analysis of Marine Industries
Northwest Conference on Wetlands and the Public Interest
Private Choices, Public Decisions

ACTIVITIES AND HONORS

Director,	Seattle Aquarium Society.
Officer,	Marine Technology Society, Puget Sound.
Director,	Puget Sound Alliance.
Co-Chair,	The NW WetlandsConference.
Green Tree Award,	Washington Environmental Council.
Bradner Scholarship,	University of Washington.

SKILLS

IBM and Macintosh computers
financial and scientific analysis
technical and popular writing
public speaking and presentations
negotiation and contract management
public and community relations

PERSONAL

Born 10 / 1961; married; interested in the oceans (NAUI-certified SCUBA instructor), environmental politics, making music. Lived in the Bahamas, Mexico, Australia, and Micronesia for over eight years.

References available upon request.

ANNEX 1

REPORT ON WASTE MINIMIZATION WORKSHOP
WORLD ENVIRONMENT CENTER
JANUARY 18-22, 1993
MANILA, THE PHILIPPINES

Submitted by Alan J. Gagnet
Vice President
EQC-Environmental Quality Corporation
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I. INTRODUCTION

The Philippine Government had expressed an interest in developing the capability to provide waste minimization technical assistance to industry. This workshop was developed (see Annex A, Scope of Work of Workshop Leader contract) to introduce the concept of waste minimization to senior plant managers, government officials, and executive directors of non-governmental organizations (NGO's). The workshop was also intended to add support for another US AID project, the Industrial Environment Management Project (IEMP).

As the Workshop Leader, I had developed seven objectives, that the attendees would: 1. Understand the difference between pollution control and pollution prevention and the importance of that difference; 2. Recognize the types of pollution prevention; 3. Understand and practice transcending the barriers to pollution prevention; 4. Recognize waste and the associated opportunity; 5. Quantify the true cost of wasting; 6. Practice asking the right questions, questions that go to the source; and 7. Identify resources needed.

There were some unstated objectives of the conference that evolved during our week of on-site preparation, January 11th-15th: 1. Demonstrate to industry attendees that key government staff had received the same training; and, 2. Get both government and industry to engage in a cooperative "future search" on what action steps will make waste minimization happen.

II. SUMMARY OF RESULTS

The workshop clearly introduced the concept of waste minimization to the attendees and broadened the interest in waste minimization within the Philippines. By working closely with PRC's Chicago, IL and Manila offices, we were able to maintain consistency in our terminology (using waste minimization instead of pollution prevention). The workshop took advantage of several opportunities to provide encouragement for the IEMP by providing speaking time and recommending that those facilities outside of Metro Manila sign up right away for a free Pollution Management Appraisal (PMA).

I feel that the workshop achieved all seven of the goals to varying degrees. I am very confident that we were able to convince the attendees that waste minimization was quite different from pollution control and that waste minimization merited extra attention, resources, and action. Our interactive exercises were able to achieve the other objectives adequately in the time available.

On the last day of the workshop, industry and government worked together in eight separate groups to create a win-win future for Filipinos by developing action steps to promote waste minimization. At the close of the workshop, the groups agreed that a committee should be formed to carry on, beyond the workshop. An industry representative noted that this unofficial committee had four members from industry and six from government. When the discussion was steered to the need for action, not equality of representation, the group nodded in agreement. As a result, several people who had been selected for the committee as a courtesy to their organization's status were replaced with people who would make something happen. If this attitude can prevail, the workshop can be considered an outstanding success.

III. CONCLUSIONS AND RECOMMENDATIONS

The workshop attendees were an excellent audience to work with. On the industry side, they were relatively small and almost wholly without power to affect meaningful change at their places of employment without top management support. On the government side they were excellent, although their managers also need the training. Positive results only happen when the commitment is to measurable action. I recommend another workshop, quite similar to this one, should be developed for the top decision-makers of Philippine industry and government.

There were a number of highly qualified Filipinos who would make excellent trainers. While I would encourage them to begin as soon as possible to develop this talent, it was obvious that continued support from US-based pollution prevention specialists will be necessary for some time to come. Many attendees said that our hands-on experience was what set this workshop apart from others that they had attended. Based on these comments by the attendees and similar comments from Ms. Bebet Gozun, the Workshop Coordinator, I recommend that two new workshops be developed. One would be to train Filipino trainers (8-12) to carry on waste minimization/pollution prevention training. The second workshop would target a host company which would agree to waste minimization/pollution prevention training for its employees (hourly and salaried) with a commitment to implement any pollution prevention improvements that were technically and economically feasible. This will serve as a critically needed model to demonstrate the value of pollution prevention and how to overcome the obstacles to implementation in the Philippines.

Specific recommendations about staffing and running a "resource center" should be deferred until a funding source is available and its goals are established. There were many groups (NGO's) who would be eager to function as the "pollution prevention resource center for the Philippines". Of all the NGO's we were able to work with, I recommend the Pollution Control Association of the Philippines, Inc. (PCAPI) as the best home for such a service because they have the most active access to those who initially need the output of a "resource center".

The most important conclusion I could draw is that without Ms. Gozun's ability and energy, that we resource personnel would have had a much reduced chance of success. Therefore, I recommend that the WEC attempt to contract with Ms. Gozun for assistance in any project planned for the Philippines.

IV. DISCUSSION

The workshop was very well coordinated, planned, and catered. It was easy to communicate with the audience. On Monday, there were approximately 100 attendees in a room that was properly sized and equipped. On Tuesday we had about 30 attendees in a more appropriately sized room that was fine for the interactive style of this portion of the workshop. The same was true for Wednesday, Thursday, and Friday when there were approximately 30, 50, and 45 attendees, respectively.

Some of the key issues/questions were: "Who goes first?; What's in it for me?; and, How can I look good?". We made an effort to encourage both industry and government to go first, together. The other two questions dealt with the reality that even though most reasonable people will agree that pollution prevention is essential, it is not without risks for both industry and government. It was difficult to do more than acknowledge the risk and encourage action without access to a great deal of information on the exact production process or governmental procedure which caused the anxiety.

The three presentations by Philippine companies were excellent, both technically and stylistically. A list of unedited "success stories" compiled by the Department of Environment and Natural Resources personnel was a pleasant surprise and proved very useful in an interactive session.

Some training techniques worked better than others. In general, the interactive ones the were most enjoyable for an adult audience. The creative problem solving sessions, the mock industrial process, the case studies, the data gathering guidelines, the business strategy vs. environmental strategy session, and the closing call to action were the most effective parts of the training once the pollution prevention philosophy and its definitions were developed.

APPENDIX C: PERSONS AND ORGANIZATIONS VISITED

The individuals listed below were interviewed personally during this assignment. Their business cards are copied in Appendix 8. Roughly a dozen other individuals not listed here were interviewed as well but their full identification was not obtained. Refer to the report for information about additional contacts.

Marcelo F. Ayesa, Executive Vice President, Mobil Philippines, Inc.

Angie Brabante, Environmental Management Bureau

Isaac Cabales, Chief Engineer, IMF International Corporation

Editha G. Cabrera, Head, Environmental Management and Safety, Corporate Engineering, Magolia Corporation

Ibarra Cruz, Ph.D., Professor, Department of Mechanical Engineering, College of Engineering, University of the Philippines.

Ernesto C. Cruz, Manager - Operations, Mobil Philippines, Inc.

Ledicia T. Dela Cruz, Technical Services Manager, Environmental Primemovers of Asia, Inc.

Marissa David, Environmental Management Bureau

Edward Doce, Engineer, Century Canning Corporation

Domingo J. Dy, President, Fastbrite Plating Industrial Corporation

Grace Favila, Executive Director, Philippine Business for the Environment, Inc.

Rodrigo Fuentes, Director, Environmental Management Bureau, Department of Environment and Natural Resources

Arthur Garcia, Regional Technical Director, Environment Sector, DENR National Capital Region

Marivic A. Garcia, Assistant Plant Manager and Production Officer, Bayer Philippines, Inc.

Lionel M. Gillston, Deputy Director, ASEAN Environmental Improvement Project

Wayne H. Harrington, Chemical Safety Advisor, World Health Organization

Richard Johnson, Deputy Director, USAID

Vincent "Buddy" Lava, Jr., Chairman of the Board, VGL Industries

Porfirio C. Macatangay, President, Pollution Control Association of the Philippines, Inc.

Jose M.K. Ochoa, Regional Development Specialist, Office of Natural Development, Agriculture and Decentralization, USAID

Antonio A. Oposa, Jr. President, Philippines Environmental Network
Attorney, Oposa Law Office

Kenneth Prussner, Chief, Office of Natural Development, Agriculture and Decentralization, USAID

Baltazar Ramirez, Pollution Control Officer, Polo Brewery, San Miguel Corporation

Kevin Allyn Rushing, DVM, Environmental and Natural Resources Officer, USAID

Diana Santiago, Development Bank of the Philippines

Paul Y. Shimada, Vice President / Chief of Party Environmental Management (PRC), Inc.

Maria Victoria L. Yao, President, Solar Textile Finishing Corporation
President, Volunteer Organization of Industry for a Cleaner Environment (VOICE)

Lawrence Yang, General Manager, Aquarose Bijouterie, Inc., Cebu City