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# TERMINAL Philippine German Project Industrial Pollution Control Cebu REPORT

**First Project Phase**

July 1993

Cebu City, Philippines

# **Terminal Report**

(first draft)

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## **1.0 Background**

**T**he Philippine German Project Industrial Pollution Control Cebu aims at supporting the Philippine Strategy for Sustainable Development by directing efforts at the reduction of industrial pollutants at minimum costs. Its purpose is to establish mechanisms for proper and adequate disposal of toxic and hazardous waste (THW) in Metro Cebu.

The project commenced in July 1991 and is expected to have a duration of five years. It is divided into two phases, the second phase is supposed to begin in July 1993 but since the bilateral agreement is yet to be signed in November 1993; a transition period will set implementation and operational strategies for the second project phase.

The purpose of the project for the first phase was to formulate the basic requirements for more adequate and proper treatment of THW in Metro Cebu.

The Project's operation during its first phase was guided by an implementation document and a plan of operation developed and duly consulted with concerned sectors through an Object Oriented Planning Workshop (ZOPP-4). (see annex A)

This report will present and discuss the progress and achievements of the project during the first phase and is limited only to the results it has identified. The plus and minus chart was applied to present what the Project perceived as its strengths or weaknesses on each activities. Major decisions made and unresolved issues are also presented for discussion, that recommendations be made to modify operational strategies and implementation policies during the second project phase.

## 2.0 ***Achievements and Experiences***

The first project phase developed five key results to achieve its goal. The methods were not confined to the technical solution of the THW problem by designing and constructing a treatment facility, but that the necessary infrastructure and personnel know-how was also considered.

### 2.1 ***Enhanced Capability of DENR-EQD Staff In Region 7***

The Project intended to improve and enhance the environmental agency's capability in recognizing, regulating and managing THW, and the method of its proper treatment by providing opportunities for the EQD staff in knowledge enhancement and skill development. The institutional development, although equally important, was considered a means to meet the goal rather than goals in themselves.

2.1.1 **Process.** A training needs assessment was conducted within the DENR-EQD Region 7 staff and indicated a deficiency in THW Management, Environmental Impact Assessment, waste water technology, and air quality management to reinforce their proficiency in environmental management thereby enhancing effective regulation and enforcement.

A survey was initiated to gather information about training possibilities in the Philippines and Southeast Asia. The Continuing Education Center and the CDG-South East Asia Project Office at the Asian Institute of Technology in Bangkok, Thailand were tapped for the training because it was found out that they offer relevant courses in THW Management which were not yet available in the Philippines during this period. But for other courses, the National Engineering Center of UP-Dilliman was being considered.

2.1.2 **Milestone.** A total of 7 training/workshops were conducted by the project, participated by EQD staff and representatives from various involved sectors and the academe. 22 were enrolled in special courses here and abroad. Three were sent on a study tour to Germany.

The DENR-EQD Region 7 was able to initiate a survey of THW in support of Republic Act 6969 otherwise known as the Toxic Act of the Philippines.

Workshop and seminars which involved members of the Philippine Electroplaters Association (PEA) resulted in a more enthusiastic participation of this industry in managing industrial waste. Strategies are now developed by trained participants to control pollution, like their decision to come up for practical solutions to minimize THW generated by the electroplating industry.

Table 1. *Capability Enhancement*

Plus	Minus
<p>Training attended by DENR-EQD and project staff effected better knowledge, and the development of THW management skills.</p>	<p>EQD Staff were not able to accept additional tasks in line with THW management. Their present workload and expanded task limits the incorporation of newly acquired skills</p> <p>Lack in monitoring and evaluation of knowledge utilization and skills enhancement.</p>
<p>Realizing that THW management is not only a task of the environmental agency but also of affected and concerned, the Project involved the academe and the industry in local training which resulted to an increased level of awareness and participation in the development of THW researches and studies.</p>	<p>The preparation of the seminar modules were not assessed to respond to the actual needs of expected participants.</p> <p><i>an. life v. d. d.</i>            Any evaluation was not conducted to measure the impact of the seminars/workshops.</p> <p>A follow-up seminar/workshop cannot be drafted due to inadequate documentation</p>
<p>Foreign study/tour provided the participants better perspective in environmental management by an interchange of experiences and technologies with other countries such as Germany, Thailand and Malaysia.</p>	<p>Although an evaluation or assessment of the study/tour was conducted, but recommendations to improve the impact and effectivity of this activity need to be documented.</p>

**2.1.3 Lessons Learned..** The Project failed to hire a Training Officer/Coordinator, either contracted or designated, to administer the training needs assessment survey, module preparations, training documentation and post evaluation. These things are necessary for the project report as training is one of the key result areas.

Tape/cassette recorders or video cameras are not enough tools to document training, seminar or workshop proceedings, it also needs a stenographer to capture specific issues/problems being presented.

## **2.2 Environmental Profiling of Metro Cebu**

The Project proposed to establish a baseline data necessary to effectively plan and implement strategies for environmental planning and industrial pollution control. The Geographic Information System. (GIS) was utilized to construct the graphical representation of data. A computer or EDP-based data bank would be operated to facilitate data retrieval and interpretation.

**2.2.1 Process.** A rough validation of the existing data of DENR-EQD was made to determine its deficiencies, and plan the structure for an EDP-based data bank. Other sources of secondary data were listed.

To fill in some missing figures necessary, a list of industries considered as potential generators of THW was established; and a survey/inventory/sampling plan was developed. Data on the type, characteristics, volume, handling, storage, treatment and disposal of THW were gathered through questionnaires and actual surveys.

To effectively monitor surface and ground water quality, a sampling plan was also developed.

**2.2.2 Milestones.** A total of 24 surface sampling stations and 30 groundwater sampling stations were established and monitored.

Analysis of water samples were done by both DENR-7 and USC Laboratories.

The monitoring, actual sampling and analysis of water quality both in surface waters and groundwaters provided significant information on waste discharge. The data gathered were also used by the Metropolitan Cebu Water District (MCWD) in recognizing safe wells for Metro Cebu. The Project gave special attention to groundwater which is presently unprotected, because it is a limiting factor in developing Cebu's industry and tourism.

Survey of industrial pollutants and THW substances in the environment resulted in six (6) status reports, specifically on lead and spent acids from recycling of used car batteries; heavy metal wastes from metal-finishing, galvanizing, semi-conductor and electroplating industries; pesticide residues from the furniture industries; waste oil from oil depots, gas stations, motor repair shops and used oil industries; chemicals from photo-finishing industries; and

A map overlay depicting groundwater sensitivity to pollution was produced. This was assisted by the Geographic Information System of Cebu Province, ground truthing was done by the Project Staff and a German researcher. This map and all other baseline maps will be incorporated in the Environmental Profile of Metro Cebu.

Facts and figures contained in the Environmental Profile of Metro Cebu would soon promote among local planners, proper zoning and land-use regulations. The first draft was substantiated and verified by the GTZ Team Leader, the Project staff and some local experts. Final copies of the report will be furnished to all concerned sectors and local government units. It is hoped that the environmental profile will be able to facilitate the siting of industries and treatment facilities in Metro Cebu.

A proposal to set up a Management Information System (MIS) for DENR-EQD Region 7 using a computer data-base was submitted for comments.

**Table 2 Environmental Profile**

Plus	Minus
Sampling and analysis of industrial wastewater	sampling arrangements with industries
The Groundwater Sensitivity map of Metro Cebu (scale 1:50,000) as basis for regional industrial planning and zoning which would give information on groundwater level, distance of groundwater to surface, groundwater direction and velocity, and sensitivity of groundwater to pollution. Six different types of base maps e.g. topographic, geologic, soil etc. were updated, digitized and overlaid using the Geographic Information System.	<p>Delay in coming up with the final output was caused by the minimal participation of local consultants in the verification of well survey data and development of groundwater related maps, and DENR-EQD in providing secondary input data e.g. pollution sources in Metro Cebu.</p> <p>Mechanism to link this activity with each local government unit.</p>
The Environmental Profile of Metro Cebu	Editing and coming up with the final report

**2.2.3 Lessons Learned.** There is a need to introduce, enhance and update DENR-EQD staff and local planners in the adoption of the Geographic Information System for planning. At the moment only a few can operate the software. The extent of GIS in updating the environmental profile has to be defined in order to plan or improve an information system management in Metro Cebu.

The Environmental Profile of Metro Cebu is a valuable tool in planning that needs to be coordinated with local government units.

**2.3 Environmental Laboratory Services at USC**

The Project deemed it necessary to upgrade the University of San Carlos Water Laboratory to deal with a wide range of toxic and hazardous substances, and environmental analysis. It was found that the lack of laboratory facilities made it difficult to identify and quantify pollutants in Metro Cebu.

**2.3.1 Process.** An inventory and assessment of equipment was made to evaluate which is needed for environmental analysis. Major equipment were provided by the Project to the USC Waterlab such as the Atomic Absorption Spectrophotometer (AAS), Gas Chromatograph (GC) and a BOD incubator; and a range of small necessary equipment. Specialized training were conducted for laboratory personnel regarding the operation of new equipment.

Water samples from rivers, wells and industries were analyzed. These were collected and submitted by Project Engineers, environment/pollution officers of industries and other government and private organizations.

**2.3.2 Milestones.** Aside from the usual environmental parameters, the USC Waterlab was able to analyze heavy metals such as cadmium, chromium, copper, nickel, lead, zinc, mercury, arsenic, potassium, sodium, calcium, barium and strontium with the AAS. The GC facilitated the analysis of volatile hydrocarbons.

**Table 3 Environmental Laboratory**

Plus	Minus
<p>The Atomic Spectrophotometer (AAS), a capillary gaschromatograph (GC) for reliable analysis of heavy metals and volatile hydrocarbons; a series of minor equipment and necessary chemicals, reagents and consumable.</p> <p>Trained laboratory personnel on equipment operation and chemical analysis.</p>	<p>As of June, 1993 the GC was not being used, and analysis of volatile hydrocarbons was suspended. The equipment is delicate and needs a zero electrical ground which the present source cannot provide.</p> <p>Troubleshooting the GC and AAS takes a long time because the Manila-based dealer, Dakila Trading does not have a local representative or technician.</p>

**2.3.3 Lessons Learned.** A training in troubleshooting laboratory equipment is needed.

Assessment of specific analysis needs for THW must be conducted to improve the capability and institutionalize an environmental laboratory.



## **2.4 IPC Advisory Service at CCCI**

As the lack of knowledge and technology is more pronounced in the small- and medium-scale industries (SMI), the Project featured a consulting or advisory service placed under the Cebu Chamber of Commerce and Industry (CCCI). Bigger industries could also avail of the Advisory Service. It was tasked to put the industry particularly the SMI in a position that enables them to comply with environmental regulations, and put emphasis on waste management and waste minimization.

**2.4.1 Process.** The IPC Advisory Service at the Cebu Chamber of Commerce and Industry was formally launched and introduced to the industry and media.

The survey of industries in Metro Cebu was evaluated and problems of THW among industries were prioritized. Particular attention was given to electroplaters, generators of heavy metal waste, and linkage with the Philippine Electroplaters Association (PEA) was strengthened. A Memorandum of Agreement about the Project's assistance and the association's cooperation was forged between the Project and PEA.

Plant visits, personalized training, conduct of seminars, production of brochures and other promotional materials were major activities of the advisory service.

**2.4.2 Milestones.** The Advisory Service has formally defined its relationship with PEA, Cebu Chapter with the acceptance of the association to the CCCI in November 1992. It will properly support and grant its services to PEA-Cebu as a CCCI member.

The Advisory Service has satisfied a total of sixteen clients: 7 clients for one-year retainership, 6 clients for advice and consultancy in the preparation of Environmental Impact Studies or Project Descriptions, and 3 clients for consultancy in waste treatment design.

On the promotional aspect, the IPC Advisory brochure and issues of the quarterly IPC News renamed as IPC Updates were

distributed to prospective clients during special meetings and industry visits.

The IPC Advisory Service staff echoed training and seminars attended here and abroad to its clients particularly the Pollution Control Officers (PCOs)

**Table 4      Advisory Service at CCCI**

<b>Plus</b>	<b>Minus</b>
The promotional campaign which resulted to a significant demand for the IPC services e.g. retainership contracts, treatment facility designs, support of environmental impact assessment reports (EIA)	There is obviously a lack of experts, manpower resources, and time to meet the demands.
Strengthened linkages with industries and NGOs in raising environmental awareness.	Limited funds and staff hindered the IPC Advisory Service from initiating fora, special meetings and production of promotional materials.

**2.4.3      Lessons Learned.** There is a need to hire a Promotions Officer to sustain the services publications, awareness campaign and strengthen external linkages. The IPC Advisory Service still needs GTZ's support for hiring of additional consultants and staff, and funding of promotions, training and researches.

**2.5.      Information Dissemination**

The Project recognized effective information, education and communication (IEC) as a basic foundation to solve our present environmental problems. Acceptance of Project activities on THW management by government, private and industry sectors, and the community was realized with proper information dissemination.

**2.5.1      Process.** Mass media linkage was strengthened. Articles and fact sheets were developed and provided to media. Mass media outlets such as radio, television and newspapers were tapped for information dissemination. Media briefing sessions or

press conferences were conducted in coordination with the Philippine Information Agency (PIA).

An official publication, the bimonthly IPC-C Bulletin, was maintained and distributed to desired recipients.

**2.5.2 Milestones.** As per assessment of the Project Progress Review, this component has greatly increased the awareness of the general public not only in THW management in Metro Cebu but also advocated environmental planning and management.

The IPC-C Bulletin which regularly features THW management articles captured the public's interest and elicited several reactions from them as evidenced by news items/releases monitored, and during dialogues with public officials and the academe. Two thousand copies were printed per issue and distributed to industries, academic institutions, government offices (local and national), and policy decision makers. Copies were also given to participants during symposia, lectures and dialogues conducted or attended by the Project.

A 30-minute radio feature, "*Polusyon Patrol*" is maintained and anchored by the Project's Information Officer. It is aired over dySS-AM, 5:30 to 6:00PM daily except Saturdays and Sundays over the program "*Tingog sa Kinaiyahan*". It provided an avenue for public opinion, reactions, and comments on environmental and pollution issues. The radio program received a special citation from the Catholic Archdiocesan Mass Media Awards (CAMMA) as the Instructional Radio Program of the Year 1993.

Pollution and environmental management messages were packaged for television and radio. Three 30-second television spots and forty two 30-second to one-minute radio plugs both in English and Cebuano were produced. Airtime placement was supported by the German counterpart fund from July to October, 1992. A scheme to tap the local broadcasters association- Kapisanan ng mga Brodkaster sa Pilipinas (KBP) and the Philippine Information Agency (PIA) was envisaged to support the broadcast of television and radio plugs.

Interpersonal communication approaches were used in disseminating technical information and details on THW management such as student lectures, special symposia, public fora, meetings and briefings. Audio-visual aids were used to convey messages e.g videos, slides, charts, posters and transparencies.

Books, scientific literatures, and even video documentaries on THW management were acquired to provide reference materials to Project Engineers and researchers.

Special activities conducted like quiz bowl, photo displays and exhibits, video showings, and invitational lectures were able to reinforce THW messages raised by the Project.

Press, radio and television interviews, and public speaking engagement were also entertained.

Table 5- Information Dissemination

Plus	Minus
<p>Press releases; publication and distribution of a total of seven issues or 14,000 copies of the bimonthly IPC Bulletin.</p>	<p>Impact of the strategy not measured scientifically. <i>state the results of lack of impact quantitatively</i></p>
<p>30 min. daily radio feature <i>Polusyon Patrol</i>; 40 sets of radio plugs and 3 sets of TV spots produced. An average of two (2) radio or TV interview/guesting monthly.</p>	<p>Impact of the strategy not measured scientifically. Lack funds to increase broadcast frequency.</p>
<p>School symposia, lectures, speaking engagements as resource speakers to answer numerous requests by teachers, students, and the communities.</p>	<p>Lack manpower, time and funds to increase frequency and meet local demands.</p>

*recommendations:*  
*need this to be incorporated in the 11*  
*facilities (attached to all schools)*  
*Let the ...*

**2.5.3 Lessons Learned.** Planning and development of IEC strategies can be facilitated if the impacts of IEC programs applied by the projects were measured and documented; and parameters or indicators to measure the success of each activity should be defined.

Publication of micro-media e.g. brochures, posters, handouts, booklets etc., could satisfy specific information needs of clients.

The radio and television media tapped for the project needed the coordination and cooperation of the local broadcasters organization (the KBP) in order to save on airtime cost and assure the continuance of broadcasting messages promoted by the Project. This can be guaranteed through a memorandum of agreement between the project and KBP.

A "speakers forum" can be created to pool resources of experts and communicators on THW from the project and involved agencies, and improve the quality of lectures and symposia.

## **2.6 Project Management**

The work of the Project was guided by supervisory body or a Steering Committee. A Project Manager was designated from the DENR-EQD to direct and coordinate the operations of the Project. GOP counterpart fund was channeled through DENR Region 7.

**2.6.1 Lessons Learned.** The efficiency and the success of the project would have gained if the interactions between the higher management of DENR in Manila and in Cebu had been more frequent and intensive.

The project would benefit greatly from a shift to a higher level of the hierarchy (preferably with direct access to the Regional Executive Director) which would render the exchange of information and coordination more effective.

### **3.0 Decisions and Unresolved Issues**

**3.1 Decisions.** At its fifth Object Oriented Project Planning or ZOPP-5, the following decisions were made to effectively carry out the project purpose during the second phase:

- 1. It will continue to enhance the capabilities not only of DENR-7 EQD personnel but also other concerned government and non-government units in Metro Cebu in toxic and hazardous waste management.**
- 2. An electroplating plant will be selected as a model in TWH management. Enhancement of its processes will be assisted by the project in order to make a demonstration of low-waste technology.**
- 3. The IPC Advisory Service at the Cebu Chamber of Commerce and Industry will be strengthened especially in industrial plant processing.**
- 4. A Centralized Treatment Facility for toxic and hazardous waste from metal finishing industry will be proposed to the local government and if they approve, it will be constructed and made operational by the Project.**
- 5. The creation of an Environmental Quality Council will be supported with the objective of making the THW management in Metro Cebu more effective.**
- 6. The Waterlaboratory of the University of San Carlos will be improved as an environmental laboratory.**
- 7. Environmental awareness raising will be continued as one the main concerns of the project.**

The workload of the technical staff of EQD caused in part by an inefficient internal organization seemed to prevent personnel from getting fully involved with the project activities. Because of this, the Project hired contractual personnel to speed up project activities. Budget for this was

approved through the 1993 GOP Appropriations. The personnel staffing was as follows:

Six	(6)	Project Engineers II	filled up
Three	(3)	Accountants I	only one was hired
One	(1)	Engineering Assistant	filled up
One	(1)	Statistician I	vacant
One	(1)	Information Officer I	filled up
One	(1)	Budget Assistant I	filled up
One	(1)	Accounting Clerk II	filled up
One	(1)	Statistical Aide I	filled up
One	(1)	Clerk II	filled up
One	(1)	Utility	filled up
Two	(2)	Drivers	vacant

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erroneously entered in the last year's budget preparation. A request to reclassify the two (2) Accountant position into two (2) Engineering Assistants was denied by DBM because the position approved was scheduled to terminate in June, 1993 and revision of the Personnel complement can no longer be considered.

**3.2 Unresolved Issues.** Even as the IPC Advisory has been integrated with the CCCI organization, there is still a perceived gap in internal coordination between the IPC Advisory and other units at the CCCI and DENR Region 7.

The IPC Advisory still feels a few inadequacy of available data, scientific approaches and methods, and equipment of the project even if consultants had been hired to fill up these gaps. Identification and hiring of foreign consultants and local advisers not only for the IPC Advisory but also of other Project components was not consulted with GOP proponents. No evaluation of consultant's effectiveness in meeting or responding to the Project needs was made.

The upgraded USC Water Laboratory needs to be accredited by DENR. At the moment, it is difficult to use laboratory results for legal purposes.

The Geographic Information System (GIS) which the project acquired is temporarily installed at the Cebu Provincial GIS. Transfer of the equipment to DENR-7 is yet to be effected. Although DENR-7 has four

GIS staff assisted by the Natural Resources Management and Development Project (NRMDP), which is supporting the Planning and Management Division (PMD), but it cannot accommodate Project demands. A proposal to establish a Management Information System Unit within DENR-7 is still to be consulted.

EMPH

*Handwritten notes:*  
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