

ENVIRONMENTAL INFORMATION SERVICE
FOR LATIN AMERICA AND THE CARIBBEAN

USAID Grant No. LAC-0605-G-SS-8050-00

FOURTH SEMI-ANNUAL PROGRESS REPORT
April 1, 1989 through September 30, 1990

October 8 , 1990

Submitted by:

World Wildlife Fund and
The Conservation Foundation
1250 24th Street, NW
Washington, DC 20037

TABLE OF CONTENTS

- Overview
- Information Responses
- Preliminary Results of Evaluation
- Clippings
- Consultations
- Other Activities

- ANNEX A: User Network Distribution per Country and Region
- ANNEX B: Number and Distribution of Users per Type of Organization
- ANNEX C: List of Subject Titles in EIS Information Base
- ANNEX D: Report on Responses: from April 1 through September 30, 1990
- ANNEX E: List of EIS Responses per Subject Matter Category
- ANNEX F: Distribution of EIS Responses per Category
- ANNEX G: Report on Second Mission on Environmental Quality Management in Quito

Overview

The past six months mark a period of unprecedented growth in all areas of activity of the Environmental Information Service.

o Inquiries and Responses

The volume of activity of the EIS has grown from responding to an average of four inquiries per month (Third Semi-Annual Progress Report: Activities from October '89 to March '90), to an average of 15 inquiries per month. This is close to a fourfold increase in the volume of activity of the EIS in this past six months.

o User Network

In the month of March '90, the EIS' user network consisted of 248 individuals and institutions. At the end of September '90, the EIS network has grown up to 295 members (See Annex A). The EIS user network consists of 116 governmental and 113 non-governmental organizations, and 15 universities in 18 countries in Latin America & the Caribbean. Our mailing list also includes 35 USAID officers and 16 staff members of other international organizations (See Annex B).

o Document Files

During the past six months, EIS document files have been reviewed and updated, obsolete documents have been deleted from the files and new ones have been added. In the month of March '90, EIS document files contained 36 subject titles. At the end of September '90, EIS files contain a total of 74 subject titles. In the past six months alone, 38 new subject titles have been added to the information base of the EIS. (See Annex C). All these correspond to field requests for new topics. The EIS files contain over 500 individual documents.

Information Responses

From April 1 to September 30 of this year, the Environmental Information Service responded to a total of 91 individual inquiries on a broad range of environmental issues. The nature of these requests varied from the status of studies related to health hazards posed by high tension electrical transmission lines, and hospital waste management, to offering suggestions for the clarification of the air pollution situation in Manzanillo, Mexico.

From this total of 91 inquiries, 64 contained requests for two or more subjects; the remaining inquiries were for one subject only. The total number of subjects on which information was requested amounts to 242 subjects (this includes repeated requests for the same subject from different inquirers).

Of the 242 subjects requested in the past six months, 38 requests (16%) required the search for, and preparation of, new information not previously requested. The remaining 84 percent were requests for subjects that required copies of previous responses (See Annex D).

In order to conduct the following analysis, responses to inquiries were grouped into eleven categories (See Annex E). According to this categorization, the majority of the requests received by the EIS during the past six months were for Environmental Economics and Natural Resources (39 requests, 16 percent of the total). One piece of information in high demand included in this category is "Debt for Nature Swaps".

Information on Institutional Support and Development issues ranks second place with 35 requests and 14 percent of the total, this category includes, among other subject titles, information on "Planning an Environmental Education Program".

Third place is shared by inquiries on Pesticides and Water Quality (31 requests and 13 percent of the total, respectively). Information on these categories includes "Possible Toxic and Environmental Effects Caused by the Use of Hexazinone & Spike-Tebuthiuron in Coca Eradication Programs", and "Limiting Phosphates in Detergents and Management of Phosphorous in Water Bodies".

Twenty six inquiries were received on the subject of Solid Waste Management and eighteen on Toxic Waste Management. If added together (44), these would account for 18 percent of the total, giving "waste management" the number one place in terms of volume of inquiries and responses. Information on these categories includes "Site Selection for Disposal of Toxic Waste", and "Solid Waste Landfill Design & Operation Practice".

The table in Annex F contains the number and distribution of EIS responses per subject matter category.

Quarterly Reports on Responses Number 7 and Number 8, prepared and delivered during this six month period contained, in addition to the report itself, included: a) open letters to the user network; b) a list of new information available through the service; c) a list of changes in subject titles; d) an evaluation form/questionnaire; and e) lists of inquiries in process/backlog.

Preliminary Results of Evaluation

A performance evaluation questionnaire was prepared and delivered to the user network along with Report on Responses Number 7, in the month of June. The questionnaire was resubmitted with Report on Responses Number 8, to give new inquirers a chance to respond to the evaluation and remind others who have not sent the questionnaire. However, preliminary figures indicate a high degree of satisfaction with the information delivered by the EIS, for example:

- o 63 percent of the respondents stated that the information provided was "very relevant" to their specific needs, 25 percent stated it was "relevant", and the remainder 13 percent said it was "too early to tell"
- o 94 percent declared that the level of detail of the information provided was "just right", and the remainder 6 percent declared the information was "too detailed"
- o 32 percent responded that the information provided had been used for background or reference material, 23 percent used the information for problem analysis or evaluation, 19 percent used the information for policy formulation, and the remainder 26 percent show a split (13-13 percent) who used the information for problem definition and environmental literacy respectively.

Clippings

During this period, two clippings packages were delivered with selected articles on Environmental Pollution and Natural Resource issues that were published in major U.S. newspapers during the months of March and April 1990; and May and June, 1990. These packages were sent to 23 USAID Mission Staff (REMS and Environmental Officers) and 32 selected private and public institutions in Latin America and the Caribbean.

Consultations

The Environmental Information Service was also asked by the USAID mission in Quito and the Environmental Health Department of the Municipality of Quito to provide additional support to the formulation and implementation of their Urban Environmental Quality Management Program with specific emphasis on air and water quality Management.

From the 27 of August to the 8th of September, Blair Bower conducted a short-term consultancy in Quito, Ecuador, to support the development of an environmental quality management program for the Municipality. Among his key recommendations for the city is the establishment of a "Pollution Prevention Pays Program" (See Annex G).

Other Activities

The Service has carried out several other activities in the past three months, these include meeting and providing logistic and information support to several visitors from abroad, as follows:

- o German Sarmiento, FUNDEPUBLICO, Colombia;
- o Livia Benavides, CEPIS, Peru;
- o Tirso Maldonado, Fundación Neotrópica, Costa Rica;
- o Rodrigo Paz, Mayor of Quito and four members of his staff;
- o Gonzalo Oviedo, Fundación Natura, Ecuador;
- o Mr. & Mrs. José Serrulle, Science and Arts Foundation, Dominican Republic;
- o Fernando Aguero, Municipality of Tegucigalpa, Honduras.

During this period, Carlos Linares participated in a UNEP-sponsored "World Congress of Local Governments for a Sustainable Future", held at the United Nations in New York City from the 5th to the 8th of September.

ANNEX A

User Network Distribution per Country and Region

EIS MAILING LIST
 Number and Distribution of Users
 per country and region
 1990

	February	March	June	September
SOUTH AMERICA	105	122	129	137
1 Brazil	40	42	44	44
2 Colombia	13	19	19	20
3 Peru	12	15	17	19
4 Ecuador	27	31	34	36
5 Bolivia	8	10	10	12
6 Chile	5	5	5	5
7 Venezuela				1
CENTRAL AMERICA	39	54	61	74
1 Mexico	6	9	9	12
2 Belize	5	5	5	5
3 Honduras	5	7	7	8
4 El Salvador	12	12	13	16
5 Costa Rica	10	14	19	21
6 Guatemala	1	5	6	7
7 Panama		2	2	4
8 Nicaragua				1
CARIBBEAN	27	30	31	33
1 Dominican Republic	14	14	14	15
2 Jamaica	6	8	9	9
3 Haiti	7	8	8	8
4 St. Lucia				1
USAID (Missions & DC staff)	32	32	32	35
OTHER AGENCIES	6	10	12	16
1 USEPA	3	3	3	4
2 PAHO/WHO	1	1	1	1
3 IEB/Switzerland	1	1	1	1
5 UNEP	1	1	1	1
6 Peace Corps		2	2	2
7 Inter American Dvmt. Bank		1	2	2
8 World Bank		1	1	1
9 EDI/World Bank			1	1
10 WRI				2
11 WEC				1
TOTAL USER NETWORK	209	248	265	295

ANNEX B

Number and Distribution of Users
per Type of Organization

EIS MAILING LIST
 Number and Distribution of Users
 per type of Organization
 September 1990

TYPE OF ORGANIZATION	NUMBER	PERCENTAGE
Governmental	116	39%
Non-Governmental	113	38%
AID and Other International Org.	51	17%
Universities	15	5%
TOTAL	----- 295	----- 100%

ANNEX C

List of Subject Titles in EIS Information Base

LIST OF SUBJECT TITLES PRE 1990
Corresponds to Responses Prepared and Delivered
by the EIS During 1988 and 1989

1. Planning Methodologies for Transportation Control
2. Limiting Phosphates in Detergents and Management of Phosphorous in Water Bodies
3. Possible Toxic and Environmental Effects Caused by the Use of Hexazinone & Spike-Tebuthiuron in Coca Erradication Programs;
4. Environmental Impacts of Open-Pit Coal Mining and Coal Powered Generation of Electricity
5. Toxicological and Fate Information on Insecticide Chlorpyrifos;
6. Health Impacts of Sulfur Dioxide
7. Health Effects and Regulation of Aldrin
8. Toxic and Environmental Effects of Chlordimeform
9. Debt for Nature Swaps
10. Protecting the Environment During Petroleum Exploration and Development
11. An Introduction to Environmental Economics
12. The Regulation of Pesticide Exports from the United States
13. The Production and Use of CFC's in Aerosols
14. The Impacts of Plastic Waste on Marine Life
15. Wetlands Protection
16. Wind Energy
17. Solar Box Cookers
18. Impacts of Mercury on Aquatic Life and Environmental Impacts of Gold Mining
19. Marine Oil Spill Cleanup
20. Economic and Ecological Impacts of Grazing on Amazonian Rainforests;

21. Environmental Impacts and Control Options for Geothermal Electric Power
22. Health and Environmental Impacts of Air Emissions from Portland Cement Plants and Control Technologies
23. The Use of Effluent Fees for Pollution Control
24. Regulatory Changes to Control Asbestos Pollution;
25. Potential Health Effects of Using Asbestos Cement Pipes for Drinking Water Supplies
26. A Summary of Physical, Chemical and Toxicological Characteristics of Paraquat, Glysophate, Diquat and Triclopir
27. Some Information on Food Fats and Oils
28. Soil Erosion

LIST OF SUBJECT TITLES POST 1989
Corresponds to Responses Prepared and Delivered
by the EIS During the first 9 months of 1990

1. Safe Disposal and Handling of Outdated Pesticides
2. Norms for the Safe Storage and Handling of Pesticides
3. Pesticide Usage in Central America
4. Pesticide Use in Nicaragua
5. Water Quality Criteria
6. Industrial Water Use and Wastewater Treatment
7. Information on The Sacramento Watershed Model: A Generalized Streamflow Simulation Model
8. Technologies for the Minimization of Adverse Impacts of Liquid & Solid Residues from the Tanning Industry
9. Industrial Effluent Guideliness in Several Industries
10. Oil Spill Cleanup
11. Bibliographical Search on The Effects of Aquatic Plants on Municipal Wastewater Stabilization Ponds
12. Some Basic Principles on Air Quality Monitoring
13. Atmospheric Emission Standards for Air Pollutants from Industrial and Automobile Sources;
14. Status of Studies Related to Health Hazards Posed by High Tension Electrical Transmission Lines
15. Health Impacts of Pesticides Used in Agriculture
16. Information on Dioxins
17. Environmental Impacts of Hydroelectric Projects
18. Design and Operation of Landfills for the Treatment of Municipal Solid Waste
19. Solid Waste Landfill Design & Operation Practice
20. Recycling Domestic and Industrial Waste

21. Double Liner Systems for Landfills
22. Site Selection for Disposal of Toxic Waste
23. The Safe Disposal of Toxic Waste
24. Serious Reduction of Hazardous Waste
25. Hospital Waste Management
26. Natural Resources & Economic Development
27. Ecotourism
28. Suggestions for clarification of "Air Pollution Situation in Manzanillo"
29. Suggestions for clarification of inquiry on "Air Quality Standards of USEPA"
30. Suggestions for clarification of inquiry on "Water Quality Monitoring and Management, and Environmental Information Management"
31. Suggestions for clarification of request on environmental topics
32. Suggestions for clarification of Information on "the Environmental Impacts of Hydroelectric Projects"
33. Clarification requested on inquiry about "Mathematical Models for Air Pollution"
34. Clarification requested on "Oil Spill Cleanup"
35. Clarification requested on inquiry about: "Rainfall Characteristics"
36. Identification of specialist on mitigation and prevention of environmental impacts of oil exploration and exploitation activities
37. Advisory Support to Non-Governmental Organizations in Project Preparation
38. Assistance for Planning an Information Center in Guatemala

39. Suggestions for the Preparation of Project Proposals;
40. Wecology: a pamphlet for a public environmental awarness campaign for children;
41. Suggestions for clarification of information about the metropolitan issues of U.S. cities, and their experiences in urban development
42. Environmental Policy
43. Planning an Environmental Education Program;
44. APELL, Awareness and Preparedness for Emergencies at Local Level
45. Setting Environmental Standards;
46. Standards of Performance for 23 Industrial Operations

ANNEX D

Report on Responses:

From April 1 through September 30, 1990



The Conservation Foundation

OPEN LETTER TO THE USER NETWORK OF THE ENVIRONMENTAL INFORMATION SERVICE

June 29, 1990

Dear Friends

We wish to take this opportunity to thank you for your continued interest in the Environmental Information Service (EIS), and to inform you of several new developments in the service. Enclosed you will find the following:

1. Report on Responses Number 7

As you can see in the enclosed Report on Responses Number 7, the number of inquiries received, and the number of responses sent, by the EIS in the past three months (April, May and June) has increased threefold compared to the last quarter of 1989 (Report on Responses No.5) and the first quarter of 1990 (Report on Responses No.6).

We sincerely hope that the information provided has and will continue to be a contributing factor to the success of your efforts to deal with the critical environmental issues in your respective cities, regions and nations.

Due to the increased number of inquiries, the EIS, in an attempt to make the best possible use of its limited resources, is setting a limit to the number of responses sent with each inquiry. The limit has been set to four responses per inquiry. Thank you for your cooperation.

2. New Information/Documentation Available

Enclosed you will find a list of new information available from the Environmental Information Service. The information is presented per subject title, including bibliographical references and contents of each particular document available.

Again, please limit your inquiries to no more than four subjects per inquiry.

With respect to inquiries in general, and the kinds of information the EIS would like to provide, we wish to point out that we believe that:

a) the transfer of information to developing countries cannot be made without sensitivity to local conditions, institutional and financial capability and level of technological development; and

b) the services provided under this program should be viewed not as an event, e.g., delivering an information packet, but as a process, whereby the EIS provides sustained support to ongoing programs.

Therefore, we can serve you better if your inquiries include: a) a brief description of your institution's work and the work being planned or implemented on this particular subject; and b) a brief statement describing the purpose of the information requested. Our contribution can be more effective if you can provide us with this kind of information.

3. Performance Evaluation Form

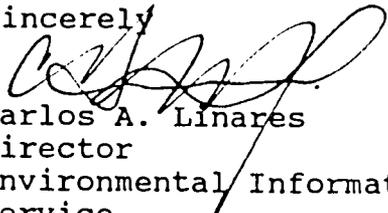
In September of 1988, the Bureau for Latin America and The Caribbean of the U.S. Agency for International Development provided The Conservation Foundation with a grant in support of activities to fund and carry out this service. The estimated completion date of this grant is September 30, of this year. Therefore, in order to comply with the final evaluation report required under this agreement, the EIS is kindly requesting that you take a minute to answer the questions contained in the enclosed performance evaluation form.

Your answers will also help us assess the effectiveness of the service and introduce improvements in the preparation and delivery of responses to your inquiries.

4. Inquiries in Process

Enclosed you will find a list of inquiries that are being processed at this time. They include the name, title, agency and country of the inquirer. This backlog is due to the unprecedented number of requests for information received in the last three months. Responses to these requests will be sent on the first and second week of July '90. Thank you for your cooperation.

Sincerely


Carlos A. Linares
Director
Environmental Information
Service.



The Conservation Foundation

ENVIRONMENTAL INFORMATION SERVICE

REPORT ON RESPONSES

Number 7
June 1990

The following is a list of the information responses prepared by the Environmental Information Service during the past three months (April, May and June). Each entry consists of a descriptive title of the response or subject matter, and the name, title, organization and country of the recipient. If you would like to receive a copy of one of these responses, please contact:

Carlos A. Linares, Director
Environmental Information Service
The Conservation Foundation
1250 24th Street, NW
Washington, DC 20037
USA
Telephone: (202) 293-4800
Telefax: (202) 293-9211
Telex: 64505 PANDA

RESPONSES PREPARED

1. Impacts of Mercury on Aquatic Life and Environmental Impacts of Gold Mining

Carlos Cardoso Aveline
President
Uniao Protetora do Ambiente Natural (UPAN)
Sao Leopoldo, Brasil

2. a) Possible Toxic and Environmental Effects Caused by the Use of Hexazinone & Spike-Tebuthiuron in Coca Eradication Programs;
b) Debt for Nature Swaps

Raul Gutiérrez
Director
ONERN
Lima, Peru

3. a) Possible Toxic and Environmental Effects Caused by the Use of Hexazinone in Coca Eradication Programs;
- b) Technologies for the Minimization of Adverse Impacts of Liquid & Solid Residues from the Tanning Industry

Centro Panamericano de Ingeniería Sanitaria y
Ciencias del Ambiente
Repidisca - Biblioteca
Lima, Peru

4. Environmental Impacts of Hydroelectric Projects

Nelson Medina
Superintendente General Manejo de Cuencas
Instituto Ecuatoriano de Electrificación
Quito, Ecuador

5. a) Methodologies for Controlling Automobile Use and Improving Air Quality in Urban Areas;
- b) Detergent and Phosphate Ban for the Control of Phosphorous Pollution in Water Bodies;
- c) Toxicological and Fate Information on the Insecticide Chlorpyrifos;
- d) Possible Toxic and Environmental Effects Caused by the Use of Hexazinone in Coca Eradication Programs

Anthony De Christo
Communication and Press Adviser
State Secretariat of the Environment
Sao Paulo, Brazil

6. a) The Safe Disposal and Handling of Outdated Pesticides;
- b) Air Quality Monitoring;
- c) Methodologies for Controlling Automobile Use and Improving Air Quality in Urban Areas;
- d) Detergent and Phosphate Ban for the Control of Phosphorous Pollution in Water Bodies

Jim Galoup
USAID
ANE/PD/ENV
New State Department
Washington, D.C.

7. a) Environmental Impacts of Open-Pit Coal Mining and Coal Powered Generation of Electricity;
- b) Debt for Nature Swaps

Carlos Hayem
Director Ejecutivo
CEL
San Salvador, El Salvador

8. a) Possible Toxic and Environmental Effects Caused by the Use of Hexazinone in Coca Eradication Programs;
- b) Environmental Impacts of Open-Pit Coal Mining and Coal Powered Generation of Electricity;
- c) Toxicological and Fate Information on Insecticide Chlorpyrifos;
- d) Regulatory Changes to Control Asbestos Pollution

Deepal Gunawardena
Ministry of Health
Kingston, Jamaica

9. The Safe Disposal of Hazardous Wastes

Peter Lamm
Underground Water Authority
Kingston, Jamaica

10. Pesticide Use in Nicaragua

Angel Chiri
Pest/Pesticide Management Advisor
Bureau for Latin America & The Caribbean
AID/LAC/DR/E
Washington, D.C.

11. Industrial Water Treatment Practices and Effluent Guidelines and Standards in the Following Industries: Iron and Steel, Pharmaceutical, Textiles and Pulp and Paper

Centro Panamericano de Ingenieria Sanitaria y
Ciencias del Ambiente
Repidisca - Biblioteca
Lima, Peru

12. a) Debt for Nature Swaps;
- b) Regulatory Changes to Control Asbestos Pollution

Luis Fernando Parra Paris
Director General
Direccion General de Saneamiento Ambiental
Ministerio de Salud
Bogota, Colombia

13. The Safe Disposal of Hazardous Wastes

Juan Francisco Ayala Valenzuela
Director
Centro de Estudios para el Tratamiento y
Reiclaje de Desechos Domésticos e
Industriales
Tamulipas, Mexico

14. a) Possible Toxic and Environmental Effects Caused by the Use of Hexazinone & Spike-Tebuthiuron in Coca Eradication Programs;
b) Debt for Nature Swaps

Eduardo Jorge Caparo Soto
Jefe de la Unidad de Documentación
INADE/APODESA
Lima, Peru

15. a) Toxicological and Fate Information on Insecticide Chlorpyrifos;
b) Regulatory Changes to Control Asbestos Pollution;
c) Information on Dioxins

Germán Sarmiento Palacio
Presidente
FUNDEPUBLICO
Bogotá, Colombia

16. a) Pesticide Usage in Central America;
b) Health Impacts of Pesticides Used in Agriculture

Jose Orive
Commercial Counselor
Embassy of Guatemala
Washington, D.C.

17. a) Recycling Domestic & Industrial Waste;
b) Oil Spill Cleanup;
c) Health Effects of Palm Oil Consumption;
d) The Safe Disposal and Handling of Outdated Pesticides;
e) The Safe Disposal of Hazardous Wastes

Mario Espinosa
Asesor de Saneamiento
Dirección de Higiene
Municipalidad de Quito
Quito, Ecuador

18. a) Methodologies for Controlling Automobile Use and Improving Air Quality in Congested Urban Areas;
b) Possible Toxic and Environmental Effects Caused by the Use of Hexazinone in Coca Eradication Programs;
c) Detergent and Phosphate Ban for the Control of Phosphorous Pollution in Water Bodies;
d) Environmental Impacts of Open-Pit Coal Mining and Coal Powered Generation of Electricity

Marcel Anderson
Principal Director
Natural Resource Conservation Division
Ministry of Development, Planning and Production
Kingston, Jamaica

19. a) Air Quality Monitoring;
b) The Safe Disposal and Handling of Outdated Pesticides;
c) Methodologies for Controlling Automobile Use and Improving Air Quality in Congested Urban Areas;
d) Detergent and Phosphate Ban for the Control of Phosphorous Pollution in Water Bodies

Jacqueline Aloisi de Larderel
Director
Industry and Environment Office, UNEP
Paris, France

20. a) Air Quality Monitoring;
b) Recycling Domestic and Industrial Waste;
c) The Safe Disposal and Handling of Outdated Pesticides;
d) Debt for Nature Swaps;
e) Advisory Support to NGO's in Project Preparation

Albert E. Fry
Director
International Environmental Bureau
Geneva, Switzerland

21. a) Recycling Domestic & Industrial Waste;
b) Assistance for the Creation of an Information Center in Guatemala

Arq. Jorge García
Centro de Investigaciones CUIDAD
Quito, Ecuador

22. a) Debt for Nature Swaps;
b) Advisory Support to NGO's in Project Preparation

Jaime Ayala Ramirez
Director Ejecutivo
Fundación Segunda Expedición Botánica
Bogotá, Colombia

23. a) Possible Toxic and Environmental Effects Caused by the Use of Hexazinone & Spike-Tebuthiuron in Coca Eradication Programs;
b) Environmental Impacts of Open-Pit Coal Mining and Coal Powered Generation of Electricity;
c) Debt for Nature Swaps;
d) Regulatory Changes to Control Asbestos Pollution

Jorge Caillaux Z.
Presidente
Sociedad Peruana de Derecho Ambiental
Lima, Peru

24. a) Economic and Ecological Impacts of Grazing on Amazonian Rain Forests;
b) The Safe Disposal and Handling of Outdated Pesticides;
c) Potential Health Effects of Using Asbestos Pipes for Drinking Water Supplies;
d) Debt for Nature Swaps

C.E. Brockmann
Secretario Ejecutivo
Lic. Luis Jordán
Gerente Técnico
PL 480 Secretaría Ejecutiva
La Paz, Bolivia

25. Water Quality Criteria

Edson Cardoso
Secretariat for the Environment
Campo Grande, MS, Brasil

26. Clarification requested on inquiry about: "Rainfall Characteristics"

Milciades Mejía
Encargado Dpto. Control Ambiental
Rosario Dominicana, S.A.
República Dominicana

27. Bibliographical Search on The Effects of Aquatic Plants on Municipal Wastewater Stabilization Ponds

Diane Wood (WWF/CF),
for Francisco Soto
Santa Cruz, Bolivia

28. a) Site Selection for Disposal of Toxic Waste and Guidelines for Construction of Landfills;
b) Design and Operation of Sanitary Landfills for Treatment of Municipal Solid Waste

Charles A. Scheibal
Environmental Officer
USAID/Kingston
Jamaica

29. Economic and Ecological Impacts of Grazing on Amazonian Rain Forests

Arturo Elejalde
Coordinador Programa Bosques Tropicales
Fundación Peruana para la Conservación de la Naturaleza
Lima, Peru

30. a) Methodologies for Controlling Automobile Use and Improving Air Quality in Congested Urban Areas;
b) Detergent and Phosphate Ban for the Control of Phosphorous Pollution in Water Bodies;
c) Health Impacts of Sulfur Dioxide;
d) Possible Toxic and Environmental Effects Caused by the Use of Hexazinone in Coca Eradication Programs

Lucy Castillo
Librarian
Belize Center for Environmental Studies
Belize

31. a) Air Quality Monitoring;
b) Ambient Atmospheric Emission Standards for Air Pollutants in Several Industries and for Automobile Exhausts

Peter Lamm
Senior Hydrogeologist
Underground Water Authority
Kingston, Jamaica

32. a) Air Quality Monitoring;
b) Site Selection for Disposal of Toxic Wastes;
c) Methodologies for Controlling Automobile Use and Improving Air Quality in Congested Urban Areas;
d) Detergent and Phosphate Ban for the Control of Phosphorous Pollution in Water Bodies

Andres Incer Arias
Director
Departamento de Control Ambiental
Ministerio de Salud
San José, Costa Rica

33. a) Economic and Ecological Impacts of Grazing on Amazonian Rain Forests;
b) Debt for Nature Swaps;
c) Advisory Support to NGO's in Project Preparation

Ismael Ponciano
Director
Centro de Estudios Conservacionistas
Universidad de San Carlos de Guatemala
Guatemala

34. a) Debt for Nature Swaps;
b) Advisory Support to NGO's in Project Preparation
- Martha Segura
Jefe del CEDOIN
INSOTEC
Quito, Ecuador
35. a) The Safe Disposal and Handling of Outdated Pesticides;
b) Site Selection for Disposal of Toxic Wastes;
c) Health Effects and Regulation of Aldrin;
d) Debt for Nature Swaps
- Dr. Roberto Castro Córdova
Director
Departamento de Sustancias Tóxicas
Ministerio de Salud
San José, Costa Rica
36. a) Wetlands Protection;
b) Debt for Nature Swaps;
c) Economic and Ecological Impacts of Grazing on Amazonian Rain Forests
- Rosa Sandoval Meléndez
Asociación de Estudiantes de Biología
Universidad de Costa Rica
San José, Costa Rica
37. a) Recycling Domestic and Industrial Waste;
b) Oil Spill Clean-Up;
c) Health Effects of Palm Oil Consumption;
d) Safe Disposal and Handling of Outdated Pesticides
- Celia G. Castello
CETESB
Sao Paulo, Brazil
38. a) Recycling Domestic and Industrial Waste;
b) Design and Operation of Sanitary Landfills for the Treatment of Municipal Solid Waste
- Fernando Cabezas Pravia
Presidente
Comité Pro Recursos Naturales
Asociación de Estudiantes de Biología
Universidad de Costa Rica
San José, Costa Rica



The Conservation Foundation

NEW INFORMATION AVAILABLE FROM THE ENVIRONMENTAL INFORMATION SERVICE

TEMA: Educación Ambiental

1. Wood, David, and Diane Walton Wood, Como Planificar un Programa de Educación Ambiental, El Centro para el Desarrollo Internacional y Medio Ambiente del Instituto de Recursos Mundiales, y El Servicio de Pesca y Vida Silvestre de los Estados Unidos, Washington, D.C., 1989.

Contenido

La Evaluación de la Realidad Ambiental; La Identificación del Público, La Identificación del Mensaje; La Selección de una Estrategia Educativa; La Evaluación. 45 páginas.

TEMA: Política Ambiental

1. Eichbaum, M. William, E. Rehbinder, G. Persson, P. Menke, Diálogos 1989 con Líderes Mundiales de la Política Ambiental, Fundación Ambiente y Recursos Naturales, Buenos Aires, Argentina 1989.

Contenido

Administración Pública y Control de Sustancias Tóxicas; Desarrollo de una Política Ambiental; Principios para una Política Educativa Ambiental; Desarrollo y Aplicación de Estrategias Ambientales Provinciales. 148 páginas.

SUBJECT: Ecotourism

1. Boo, Elizabeth, Ecotourism: The Potentials and Pitfalls, World Wildlife Fund, Washington, D.C., 1990.

Contents

Volume 1: The Link Between Tourism and Protected Natural Areas; The Impacts of Nature Tourism; A Comparison of The Status of Nature Tourism in Belize, Costa Rica, Dominica, Ecuador, and Mexico; Conclusions, Recommendations and Nature Tourism Development Strategy. 72 pages.

Volume II: Country Case Studies, Belize, Costa Rica, Dominica, Ecuador, Mexico. 165 pages.

TEMA: Recursos Naturales y Desarrollo Económico

1. Leonard, H. Jeffrey, Recursos Naturales y Desarrollo Económico en América Central: Un Perfil Ambiental Regional, Instituto Internacional para el Ambiente y el Desarrollo. Traducción del Inglés por Gerardo Budowski y Tirso Maldonado, CATIE, San José, Costa Rica, Octubre de 1986.

Contenido

América Central: La Tierra y Sus Recursos; Tendencias Socio-Económicas en América Central; Explotación de Recursos Naturales y Patrones de Uso de la Tierra; Consecuencias Ambientales de las Tendencias Actuales en América Central; Manejo de los Recursos Naturales de América Central; Conclusiones y Recomendaciones Sobre Políticas. 249 páginas.

TEMA: Preparación para Responder a Emergencias

1. APELL, Concientización y Preparación para Emergencias a Nivel Local: Un Proceso para Responder a los Accidentes Tecnológicos, Programa de las Naciones Unidas para el Medio Ambiente PNUMA, Primera Edición en Español 1989.

Contenido

El Proceso APELL y sus Participantes; Cómo Iniciar el Proceso Apell?; La Preparación para Casos de Emergencia; Anexos (entre otros): Elementos para un Estudio sobre la Seguridad de una Instalación Industrial; Criterios para Evaluar el Estado de Preparación a Nivel Local; Elementos para la Planificación de Respuesta a una Emergencia. 71 páginas.

SUBJECT: Setting Environmental Standards

1. Setting Environmental Standards: Guidelines for Decision-Making, World Health Organization, United Nations Environment Programme, and International Union for Conservation of Nature and Natural Resources, Geneva. 1987.

Contents

Identification of Priority Pollution Issues; Information on Health Effects; Assessment of Exposure; Strategies for Prevention and Control; Legal Framework; Consequences of Different Approaches to Environmental Health Protection; Decision-making Process. 71 pages.

TEMA: Pesticidas

1. Normas para la Manipulación Segura de Pesticidas Durante su Formulación, Envasado, Almacenamiento y Transporte, International Group of National Associations of Manufacturers of Agrochemical Products, Bruselas, Bélgica. Edición en Español.

Contenido

Riesgos; Responsabilidades; Propiedades de los Productos; Ubicación, Sitio y Edificios; Higiene, Salud, Seguridad y Procedimientos de Emergencia; Derrames y Eliminación de Desechos; Formulación y Envasado; Almacenamiento y Transporte. 63 páginas.

SUBJECT: Landfills

1. Solid Waste Landfill Design and Operation Practices, U.S. Environmental Protection Agency, Office of Solid Waste, Washington, D.C., April 1981.

Contents

Public Participation Program; Site Selection; Design; Equipment and Personnel; Operation; Special Considerations; Monitoring; Completed Site; Management and Costs. 362 pages.

2. Minimum Technology Guidance on Double Liner Systems for Landfills and Surface Impoundments - Design, Construction and Operation. (Second Version). U.S. Environmental Protection Agency, Washington, D.C., May 1985.

Contents

Primary Leachate Collection and Removal Systems for Landfills; Double Liner Specifications; Secondary Leachate Collection System Between the Liners; Construction Quality Assurance; Suggested Reading List. 71 pages.

SUBJECT: Hazardous Waste Reduction

1. Serious Reduction of Hazardous Waste: For Pollution Prevention and Industrial Efficiency, U.S. Congress, Office of Technology Assessment, Washington, D.C., September 1986.

Contents

Policy Options; Technology and Waste Reduction Decisions; Data and Information for Waste Reduction; Waste Reduction in the Federal Government; State Activities in Waste Reduction; Industry Survey; An International Perspective. 253 pages.



The Conservation Foundation

ENVIRONMENTAL INFORMATION SERVICE
PERFORMANCE EVALUATION FORM

Please take a minute to answer the following questions so that we may improve our service. We appreciate your contribution.

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More than three _____

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Not relevant _____

7. Was the level of detail of the information provided?

Too detailed _____
Just Right _____
Insufficiently detailed _____

8. How many other people in your office have had the chance to read the information provided?

Myself _____
One or two _____
Three or more _____

9. How was the information used?

Problem definition or identification _____
Problem analysis or evaluation _____
Policy formulation or development _____
Background or reference material _____
Environmental education _____

10. Suggestions for the improvement of the Environmental Information Service or other comments:

Thank you. Please send the completed form to:

Carlos A. Linares, Director
Environmental Information Service
The Conservation Foundation
1250 24th Street, NW
Washington, D.C. 20037, USA
Telefax: (202) 293-9211



The Conservation Foundation

INQUIRIES IN PROCESS

1. **Lic. Carmen Miranda**
Sub-Directora
Academia Nacional de Ciencias de Bolivia
Bolivia
2. **Ing. Daniel Polo Yopez**
Director Nacional del
Medio Ambiente
Instituto Ecuatoriano de Obras Sanitarias
Ecuador
3. **Jaime E. Garcia G.**
Programa De Educación Ambiental
Universidad Estatal a Distancia
Costa Rica
4. **Naresh C. Singh Ph.D**
Executive Director
Caribbean Environmental Health Institute
St. Lucia
5. **Lucy Castillo**
Librarian
Belize Center for Environmental Studies
Belize
6. **William E. Kurtz**
Committee For a Smog Free Manzanillo
Mexico
7. **Deepal Gunawardena**
for Director
Environmental Control Division
Ministry of Health
Jamaica
8. **Prof. Miguel Angel Mejia**
Laboratorio de Ecologia
Universidad Nacional de Colombia
Colombia



The Conservation Foundation

**SECOND OPEN LETTER TO THE USER NETWORK
OF THE ENVIRONMENTAL INFORMATION SERVICE
September 29, 1990**

Dear Friends

The Environmental Information Service (EIS), wishes to thank all of you who responded to the evaluation questionnaire sent in our last open mailing in June; and to remind and encourage those of you who have not yet responded, to do so. Many thanks for the positive and encouraging comments we have received. There are several items enclosed, for your information:

1. Changes in Subject Titles

Our first enclosure is a list of changes in the subject titles of responses. These new titles substitute the previous titles used. Please take note of it.

These new titles are the result of an ongoing review and evaluation of the responses which have been prepared. The objective is to have titles which accurately characterize the nature of the material prepared and delivered. We are sure that the new titles will be helpful to you in determining if the materials are relevant to your information needs.

2. Report on Responses Number 8

As you can see in the enclosed Report on Responses Number 8, the number of responses sent by the EIS in the past three months (July, August and September) has increased to 53 responses. This represents a 40 percent increase in the number of responses sent compared to the previous quarter (38 responses listed in our report on responses number 7).

We sincerely hope that the information provided has and will continue to be a contributing factor to the success of your efforts to deal with the critical environmental issues in your respective cities, regions and nations.

We continue to have a maximum limit of four responses per inquiry. Thank you for your support and cooperation.

3. Performance Evaluation Form

The Bureau for Latin America and The Caribbean of the U.S. Agency for International Development has agreed in principle to provide The Conservation Foundation with a three month extension of the grant in support of activities to carry out this service.

Therefore, there is still another opportunity for those of you who, for one reason or another, did not get a chance to respond to the evaluation questionnaire to do so now. Please take a minute to answer the questions contained in the enclosed performance evaluation form. Disregard this request if you have already returned the questionnaire to us.

Your answers will help us assess the effectiveness of the service and introduce improvements in the preparation and delivery of responses to your inquiries.

4. Inquiries in Process

Enclosed you will find a list of inquiries that are being processed at this time. They include the name, title, agency and country of the inquirer. This backlog is due to the unprecedented number of requests for information received in the last three months. Responses to these requests will be sent on the first and second week of October '90. Thank you for your cooperation.

Sincerely



Carlos A. Linares
Director
Environmental Information
Service



The Conservation Foundation

CHANGES IN SUBJECT TITLES

New Subject Title: Some Information on Food Fats and Oils

**Previous Subject Title: Health Effects of Palm Oil
Consumption**

New Subject Title: Wind Energy

**Previous Subject Title: Use of Windmills for the Generation
of Electricity**

**New Subject Title: Limiting Phosphates in Detergents and
Management of Phosphorous in Water Bodies**

**Previous Subject Title: Detergent and Phosphate Ban for the
Control of Phosphorous Pollution in
Water Bodies**

**New Subject Title: Planning Methodologies for Transportation
Control**

**Previous Subject Title: Methodologies for Controlling
Automobile Use and Improving Air
Quality in Congested Urban Areas.**

**New Subject Title: Some Basic Principles on Air Quality
Monitoring**

**Previous Subject Title: Air Quality Monitoring Systems and
Equipment**

**New Subject Title: Assistance for Planning an Information Center
in Guatemala**

**Previous Subject Title: Assistance for the Creation of an
Environmental Information Center in
Guatemala**



The Conservation Foundation

ENVIRONMENTAL INFORMATION SERVICE

REPORT ON RESPONSES

Number 8
September 1990

The following is a list of the information responses prepared by the Environmental Information Service during the past three months (July, August and September). Each entry consists of a descriptive title of the response or subject matter, and the name, title, organization and country of the recipient. If you would like to receive a copy of one of these responses, please contact:

Carlos A. Linares, Director
Environmental Information Service
The Conservation Foundation
1250 24th Street, NW
Washington, DC 20037
USA
Telephone: (202) 293-4800
Telefax: (202) 293-9211
Telex: 64505 PANDA

RESPONSES PREPARED

1. a) Clarification requested on inquiry about "Mathematical Models for Air Pollution"; and
b) Design and Operation of Landfills for the Treatment of Municipal Solid Waste

Daniel Polo Yépez
Director Nacional del Medio Ambiente
Instituto Ecuatoriano de Obras Sanitarias
Ecuador

2. Suggestions for clarification of "Air Pollution Situation in Manzanillo"

William E. Kurtz
Committee for a Smog Free Manzanillo
Mexico

3. a) Some Basic Principles on Air Quality Monitoring;
b) Recycling Domestic and Industrial Waste;
c) Safe Disposal and Handling of Outdated Pesticides; and
d) Site Selection for Disposal of Toxic Waste

Naresh C. Singh
Executive Director
Caribbean Environmental Health Institute
St. Lucia

4. a) Grazing on Amazonian Rainforests;
b) Clarification Requested on Oil Spill Cleanup;
c) Some Information on Food Fats and Oils; and
d) Safe Disposal and Handling of Outdated Pesticides

Lucy Castillo
Librarian
Belize Center for Environmental Studies
Belize

5. a) The Impacts of Plastic Waste on Marine Life;
b) Wetlands Protection; and
c) Wind Energy

Deepal Gunawardena
for Director
Environmental Control Division
Ministry of Health
Jamaica

6. a) Economic and Ecological Impacts of Grazing on Amazonian Rainforests;
b) Debt for Nature Swaps; and
c) Advisory Support to Non-Governmental Organizations in Project Preparation

Carmen Miranda
Sub-Directora
Estación Biológica Beni
Academia Nacional de Ciencias de Bolivia
Bolivia

7. Assistance for Planning an Information Center in Guatemala

Miguel Angel Mejía
Jefe, Laboratorio de Ecología
Universidad Nacional de Colombia
Colombia

8. a) Recycling Domestic & Industrial Waste;
b) Safe Disposal & Handling of Outdated Pesticides;
c) Site Selection for Disposal of Toxic Waste; and
d) Limiting Phosphates in Detergents and Management of Phosphorous in Water Bodies

Jaime García
Programa de Educación Ambiental
Universidad Estatal a Distancia
Costa Rica

9. a) Some Basic Principles on Air Quality Monitoring;
b) Recycling Domestic and Industrial Waste;
c) Site Selection for Disposal of Toxic Waste; and
d) Planning Methodologies for Transportation Control

Marco Encalada
Director EDUNAT III
Fundación Natura
Ecuador

10. a) Some Basic Principles on Air Quality Monitoring;
b) Recycling Domestic and Industrial Waste;
c) Assistance for Planning an Information Center in Guatemala; and
d) Suggestions for clarification of inquiry on "Air Quality Standards of USEPA"

Guido Larrave Arce
Asesor
Comisión Ejecutiva Hidroeléctrica
del Río Lempa
El Salvador

11. Suggestions for clarification of inquiry on "Water Quality Monitoring and Management, and Environmental Information Management"

Carlos Vargas Bejarano
Jefe División Saneamiento Ambiental
Corporación Autónoma Regional
Colombia

12. a) Some Basic Principles on Air Quality Monitoring
b) Economic and Ecological Impacts of Grazing on Amazonian Rain Forests;
c) Clarification requested on "Oil Spill Cleanup"; and
d) Some Information on Food Fats and Oils

Juan Carlos Riveros Salcedo
Coordinador de Difusión
Asociación Peruana para la Conservación
de la Naturaleza
Peru

13. a) Water Quality Criteria; and
b) Industrial Water Use and Wastewater Treatment

Nelson Jose Martins Rocha
Secretaria Do Meio Ambiente
Brasil

14. Information on The Sacramento Watershed Model: A Generalized Streamflow Simulation Model

Heriberto Rodriguez
Environmental Officer
USAID/Costa Rica

15. Identification of specialist on mitigation and prevention of environmental impacts of oil exploration and exploitation activities

Yolanda Kakabadse
National Executive Director
Fundación Natura
Ecuador

16. a) Industrial Water Use and Wastewater Treatment;
b) Health Impacts of Pesticides Used in Agriculture; and
c) Norms for the Safe Storage and Handling of Pesticides

Franklin Arboleda
Director
Centro de Desarrollo del Ecuador
Ecuador

17. Suggestions for clarification of information about the metropolitan issues of U.S. cities, and their experiences in urban development

Elsa Avilés
Science Section, USAID/Mexico
for Dr. Miguel Castillo Costa
Departamento del Distrito Federal
Mexico

18. Response to request for specialist's participation on industrial and automobile emissions seminar.

Elsa Avilés
Science Section, USAID/Mexico,
for Dr. Javier Garfias y Ayala
Secretaría de Desarrollo Urbano y Ecología
Mexico

19. Response to request for consultants for identification, analysis & evaluation of management activities for the establishment and preservation of protected areas

Mario A. Boza
Vice Ministro
Ministerio de Recursos Naturales
Energía y Minas
Costa Rica

20. a) Impacts of Mercury on Aquatic Life and Environmental
Impacts of Gold Mining; and
b) Debt for Nature Swaps

Gertrude M. James
Latin America & Caribbean Program
World Wildlife Fund
Washington, D.C.

21. Status of Studies Related to Health Hazards Posed by High Tension Electrical Transmission Lines

Kerry Wortzel
USAID
ANE/PD/ENV
Washington, D.C.

22. a) Planning Methodologies for Transportation Control;
b) Planning an Environmental Education Program;
c) Ecotourism; and
d) Natural Resources & Economic Development

Gonzalo Bustamante
Subdirector de Estudios
Municipalidad de Quito
Ecuador

23. a) Possible Toxic and Environmental Effects Caused by the Use of Hexazinone & Spike-Tebuthiuron in Coca Eradication Programs;
b) Toxicological and Fate Information on Insecticide Chlorpyrifos;
c) Planning Methodologies for Transportation Control; and
d) The Safe Disposal of Toxic Waste

Roberto Castro Córdova
Director, Departamento de Sustancias Tóxicas
y Medicina del Trabajo
Ministerio del Salud
Costa Rica

24. a) Debt for Nature Swaps;
b) Regulatory Changes to Control Asbestos Pollution;
c) Planning Methodologies for Transportation Control; and
d) Recycling Domestic & Industrial Waste

Carlos Cardoso Aveline
President
Uniao Protetora do Ambiente Natural
Brasil

25. a) Regulatory Changes to Control Asbestos Pollution;
b) Limiting Phosphates in Detergents and Management of
Phosphorous in Water Bodies;
c) Design & Operation of Sanitary Landfills for Treatment
of Municipal Solid Waste; and
d) Solid Waste Landfill Design & Operation Practice

Manuel Fernández
Presidente
Federación Conservacionista Mexicana
Mexico

26. a) Environmental Policy;
b) Economic and Ecological Impacts of Grazing on Amazonian
Rain Forests;
c) Wetlands Protection; and
d) Advisory Support to NGO's in Project Preparation

Hermel Caberera Abarca
Director Nacional Forestal
Ministerio de Agricultura y Ganadería
Ecuador

27. APELL, Awareness and Preparedness for Emergencies at Local
Level

Centro Panamericano de Ingeniería Sanitaria
y Ciencias del Ambiente
Repidisca - Biblioteca
Peru

28. a) Design & Operation of Sanitary Landfills for Treatment
of Municipal Solid Waste; and
b) Solid Waste Landfill Design & Operation Practice

Dr. Fernando Aguero
Municipalidad de Tegucigalpa
Honduras

29. Soil Erosion

Alfredo Arangel Jimenez
Plan Sierra
República Dominicana

30. a) Pesticide Usage in Central America and Health Impacts
of Pesticides Used in Agriculture;
b) Debt for Nature Swaps;
c) Advisory Support to NGO's in Project Preparation;
d) Water Quality Criteria

Lucy Castillo
Belize Center for Environmental Studies
Belize

31. a) Suggestions for Clarification on Information about the
Environmental Impacts of Hydroelectric Projects;
b) The Safe Disposal of Hazardous Waste;
c) Pesticide Usage in Central America and Health Impacts
of Pesticides Used in Agriculture;

Dr. Victor Gonzales
Chief Environmental Officer
Ministry of Tourism and the Environment
Belize

32. a) Ecotourism;
b) Setting Environmental Standards;
c) Solid Waste Landfill Design & Operation Practice;
d) Serious Reduction of Hazardous Waste

Marcel Anderson
Principal Director
Natural Resource Conservation Division
Ministry of Development, Planning &
Production
Jamaica

33. Natural Resources and Economic Development

Fernando Cabezas Pravia
Presidente
Comité Pro Recursos Naturales
Asociación de Estudiantes de Biología
Universidad de Costa Rica
Costa Rica

34. a) Advisory Support to Non-Governmental Organizations in Project Preparation;
b) Planning and Environmental Education Program;
c) Ecotourism; and
d) Setting Environmental Standards

Luis Jordán
Gerente Técnico
CF Brockman
Secretario Ejecutivo
Secretaría Ejecutiva PL 480
Bolivia

35. a) Impacts of Mercury on Aquatic Life and Environmental Impacts of Gold Mining;
b) Possible Toxic and Environmental Effects Caused by the Use of Hexazinone in Coca Eradication Programs;
c) Technologies for the Minimization of Adverse Impacts of Liquid & Solid Residues from the Tanning Industry

Jacqueline Aloisi de Larderel
Director
United Nations Environment Programme
Industry and Environment Office
France

36. a) Environmental Policy;
b) Solid Waste Landfill Design and Operation Practices;
c) Double Liner Systems for Landfills; and
d) Serious Reduction of Hazardous Waste.

Pablo Martínez Chiriboga
Director Municipal de Higiene
Municipalidad de Quito
Ecuador

37. a) Hospital Waste Management;
b) Advisory Support to Non-Governmental Organizations in Project Preparation;
c) Air Quality Monitoring; and
d) Recycling Domestic and Industrial Waste

Ricardo Oliveira Neves
Executive Director
Instituto de Tecnologia para o Cidadao
Brasil

38. a) Impacts of Mercury on Aquatic Life and Environmental Impacts of Gold Mining;
b) Planning Methodologies for Transportation Control;
c) Some Basic Principles on Air Quality Monitoring; and
d) Potential Health Effects of Using Asbestos Cement Pipes for Drinking Water Supplies

Eduardo Espín
División Impacto Ambiental
Instituto Ecuatoriano de Obras Sanitarias
Ecuador

39. a) Recycling Industrial and Domestic Waste;
b) Site Selection for Disposal of Toxic Waste;
c) Design and Operation of Sanitary Landfills; and
d) Planning an Environmental Education Program

Jorge E. Orejuela
Jefe, Area Medio Ambiente y Recursos Naturales
Fundación para la Educación Superior
Colombia

40. a) Recycling Industrial and Domestic Waste;
b) The Safe Disposal and Handling of Outdated Pesticides;
c) Site Selection for Disposal of Toxic Waste; and
d) Design and Operation of Sanitary Landfills

Director, Environmental Control Division
Ministry of Health
Jamaica

41. Natural Resources and Economic Development

David Jessee
Private Sector Officer
USAID/Managua
Nicaragua

42. Standards of Performance for 23 Industrial Operations

Peter Lamm
Underground Water Authority
Jamaica

43. a) Planning an Environmental Education Program;
b) Environmental Policy;
c) Natural Resources and Economic Development; and
d) Norms for the Safe Storage and Handling of Pesticides

Marlene Avalos
Presidenta del Consejo Regional
de Educación Ambiental
Bolivia

44. a) Some Basic Principles on Air Quality Monitoring;
b) Recycling Industrial and Domestic Wastes; and
c) Impacts of Mercury on Aquatic Life and Environmental Impacts of Gold Mining

Rom Michalek
Director, Technical Programs
World Environment Center
New York

45. a) Industrial Water Use and Treatment Practices and Effluent Guideliness in Several Industries;
b) Atmospheric Emission Standards for Air Pollutants from Industrial and Automobile Sources;
c) Setting Environmental Standards; and
d) Serious Reduction of Hazardous Waste

Marco Encalada
Director EDUNAT III
Fundación Natura
Ecuador

46. a) Debt for Nature Swaps;
b) Advisory Support to Non-Governmental Organizations in Project Preparation; and
c) Planning an Environmental Education Program

Peter Hearne
Natural Resources Liason Officer
USAID c/o American Embassy
Honduras

47. a) Planning an Environmental Information Program;
b) Ecotourism;
c) Setting Environmental Standards; and
d) Limiting Phosphates in Detergents and Management of Phosphorous in Water Bodies

Graciela Palacios
Coordinadora a.i. División de Ciencias
Asociación Nacional para la Conservación de la Naturaleza
Panamá

48. a) Suggestions for the Preparation of Project Proposals;
b) Wecology: a pamphlet for a public environmental awarness campaign for children;
c) Planning and Environmental Education Program

Andrés Caballero
Instituto Nacional de Recursos Naturales Renovables
Panamá

49. Suggestions for clarification of request on environmental topics

Frank Gutiérrez Elías
Asesor Técnico
Comisión Especial del Ambiente
Asamblea Legislativa
Costa Rica

50. The Safe Disposal of Hazardous Waste

Kathleen List
Science Officer
Consulate General of the United States
San Diego

51. a) Planning an Environmental Education Program;
b) Ecotourism;
c) Natural Resources and Economic Development; and
d) Debt for Nature Swaps

Néstor Herrera
Director Comunicaciones
Asociación Salvadoreña de Conservación del
Medio Ambiente
El Salvador

52. Industrial Water Use and Treatment Practices

Francisco de la Torre
Director de Saneamiento
Municipalidad de Quito
Ecuador

53. a) Assistance for Planning an Environmental Information Center in Guatemala;
b) Planning and Environmental Education Program;
c) Natural Resources and Economic Development; and
d) Impacts of Mercury on Aquatic Life and Environmental Impacts of Gold Mining

Juan Carlos Villagrán
Sección de Investigación
Consejo Nacional de Areas Protegidas
Guatemala



The Conservation Foundation

**ENVIRONMENTAL INFORMATION SERVICE
PERFORMANCE EVALUATION FORM**

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Policy formulation or development _____
Background or reference material _____
Environmental education _____

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Carlos A. Linares, Director
Environmental Information Service
The Conservation Foundation
1250 24th Street, NW
Washington, D.C. 20037, USA
Telefax: (202) 293-9211



The Conservation Foundation

INQUIRIES IN PROCESS

1. Tirso Maldonado
Director, Centro de Estudios
Ambientales y de Políticas
Fundación Neotrópica
Costa Rica
2. Carlos Cardoso Aveline
President
Uniao Protetora do Ambiente Natural
UPAN, Brasil
3. Marisol Ferrer de Toledo
Asistente Ejecutiva
Ministerio de Agricultura y Ganadería
El Salvador
4. Sergio Midence
Dirección General de Recursos
Naturales Renovables
Secretaría de Recursos Naturales
Honduras
5. Efraín Pérez
Director Ejecutivo
Estudios de Estructura y
Administración del Estado
Ecuador

ANNEX E

List of EIS Responses per Subject Matter Category

SUBJECT TITLES

Categories:

Pesticides

Safe Disposal and Handling of Outdated Pesticides

Norms for the Safe Storage and Handling of Pesticides

Possible Toxic and Environmental Effects Caused by the Use of Hexazinone & Spike-Tebuthiuron in Coca Erradication Programs;

Toxicological and Fate Information on Insecticide Chlorpyrifos;

Pesticide Usage in Central America

Health Impacts of Pesticides Used in Agriculture;

Pesticide Use in Nicaragua

Water Quality

The Impacts of Plastic Waste on Marine Life

Limiting Phosphates in Detergents and Management of Phosphorous in Water Bodies

Water Quality Criteria

Industrial Water Use and Wastewater Treatment

Information on The Sacramento Watershed Model: A Generalized Streamflow Simulation Model

Impacts of Mercury on Aquatic Life and Environmental Impacts of Gold Mining

Technologies for the Minimization of Adverse Impacts of Liquid & Solid Residues from the Tanning Industry

Industrial Effluent Guideliness in Several Industries;

Oil Spill Cleanup

Bibliographical Search on The Effects of Aquatic Plants on Municipal Wastewater Stabilization Ponds

Air Pollution

Some Basic Principles on Air Quality Monitoring;
Planning Methodologies for Transportation Control
Atmospheric Emission Standards for Air Pollutants from
Industrial and Automobile Sources;

Health Impacts

Some Information on Food Fats and Oils
Status of Studies Related to Health Hazards Posed by High
Tension Electrical Transmission Lines
Health Impacts of Pesticides Used in Agriculture
Regulatory Changes to Control Asbestos Pollution;
Potential Health Effects of Using Asbestos Cement Pipes for
Drinking Water Supplies
Information on Dioxins
Health Impacts of Sulfur Dioxide
Health Effects and Regulation of Aldrin

Energy

Wind Energy
Environmental Impacts of Hydroelectric Projects
Environmental Impacts of Open-Pit Coal Mining and Coal
Powered Generation of Electricity

Solid Waste Management

Design and Operation of Landfills for the Treatment of
Municipal Solid Waste
Solid Waste Landfill Design & Operation Practice
Recycling Domestic and Industrial Waste;
Double Liner Systems for Landfills;

Toxic Waste Management

Site Selection for Disposal of Toxic Waste

The Safe Disposal of Toxic Waste

Serious Reduction of Hazardous Waste

Hospital Waste Management

Environmental Economics and Natural Resources

Economic and Ecological Impacts of Grazing on Amazonian Rainforests;

Debt for Nature Swaps;

Natural Resources & Economic Development

Wetlands Protection

Ecotourism

Soil Erosion

Suggestions for Clarification

Suggestions for clarification of "Air Pollution Situation in Manzanillo"

Suggestions for clarification of inquiry on "Air Quality Standards of USEPA"

Suggestions for clarification of inquiry on "Water Quality Monitoring and Management, and Environmental Information Management"

Suggestions for clarification of request on environmental topics

Suggestions for clarification of Information on "the Environmental Impacts of Hydroelectric Projects"

Suggestions for clarification of information about the metropolitan issues of U.S. cities, and their experiences in urban development

Suggestions for Clarification (cont...)

Clarification requested on inquiry about "Mathematical Models for Air Pollution"

Clarification requested on "Oil Spill Cleanup"

Clarification requested on inquiry about: "Rainfall Characteristics"

Referrals and Requests for Consultants/Experts

Identification of specialist on mitigation and prevention of environmental impacts of oil exploration and exploitation activities

Response to request for specialist's participation on industrial and automobile emissions seminar.

Response to request for consultants for identification, analysis & evaluation of management activities for the establishment and preservation of protected areas

Institutional Support

Advisory Support to Non-Governmental Organizations in Project Preparation

Assistance for Planning an Information Center in Guatemala

Suggestions for the Preparation of Project Proposals;

Wecology: a pamphlet for a public environmental awareness campaign for children;

Environmental Policy

Planning an Environmental Education Program;

APELL, Awareness and Preparedness for Emergencies at Local Level

Setting Environmental Standards;

Standards of Performance for 23 Industrial Operations

ANNEX F

Distribution of EIS Responses per Category

EIS RESPONSES

(Responses per subject matter category)
From April 1 through September 30, 1990

CATEGORIES	NUMBER	PERCENTAGE
Pesticides	31	13%
Water Quality	31	13%
Air Quality	25	10%
Health Impacts	20	8%
Energy	6	2%
Solid Waste Management	26	11%
Toxic Waste Management	18	7%
Environmental Economics and Natural Resources	39	16%
Suggestions for Clarification	8	3%
Referrals and Requests for Consultants/Experts	3	1%
Institutional Support and Development	35	14%
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TOTAL	242	100%

ANNEX G

Report on Second Mission on
Environmental Quality Management in Quito, Ecuador



MEMORANDUM

TO: Alcalde Rodrigo Paz
FROM: Blair T. Bower
SUBJECT: Second Mission on Environmental Quality Management in Quito

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Since the first visit one year ago, some progress has been made in establishing the capacity to manage Quito's water and air quality. Nevertheless, certain "facts of life" must be recognized.

(1) Air quality and water quality in Quito will continue to decrease before they may be improved. Even if it were possible to initiate an environmental quality management program today, which would begin to reduce discharges, increasing population and economic activities would more than compensate for those reductions in the short-run.

(2) However, it is just as clear that, unless a management program is begun, the time at which the state of the quality will begin to improve will recede farther and farther into the distance.

(3) Economic development and improved ambient environmental quality do not have to be conflicting and antagonistic goals. Much evidence exists to show that reductions in discharges can be made at relatively small costs in many cases, particularly with respect to industrial activities, and in some cases with increase in profits. This is the basis for the Pollution Prevention Pays program recommended below and described in Annex A.

(4) Neither monitoring of ambient water quality and air quality nor modeling water quality and air quality will result in any improvement in environmental quality. It is clear that environmental quality will continue to degrade unless discharges to the water and air environments are decreased. Neither monitoring nor modeling will indicate how discharges can be reduced and how much such reduction will cost. Therefore, the focus of the efforts of your Department of Environmental Quality should be on generating information on methods for, and costs of, reducing discharges by various types of activities in the urban area.

(5) The paper produced last year, 11 August 1989, entitled, "Goal and Basic Concepts for a Program of Environmental Quality Management" is just as relevant at this point in time as it was last year.

RECOMMENDATIONS

- (1) Because (a) problems relating to discharges from industrial activities in the El Inca area are critical; and (b) what is developed for that area to reduce discharges can be applied throughout the urban area, major efforts of the DEQ should be directed to that area.
- (2) A POLLUTION PREVENTION PAYS (PPP) team should be established for the EI Inca area. The team should be comprised of experienced individuals from: industrial activities in the area; the federation of industries; and the municipalidad. Details of the proposal are contained in Annex A. The municipalidad should quickly respond to the clearly expressed interest and support of the Federation of Industries of Pichincha and some industrial activities and their willingness to cooperate in developing efficient procedures for reducing discharges.
- (3) The position of director of the DEQ must be a full-time position. The director must: advise and work with staff, making detailed suggestions with respect to data sources and analytical methods; review task outputs; develop work plan with work staff; decide with staff when consultants are needed and develop TORs with staff; monitor work of consultants as well as of staff; crunch numbers; and write. The director must provide the framework which links all of the various activities and outputs, and which makes clear the objective of generating information for the city's investment decisions in relation to environmental quality management. In addition, there are external demands on the director's time, from both the private sector and from other public agencies. These external demands will increase even more when the activities of the solid wastes management section shift from analysis and planning to operations, so that the Subdirector of Environmental Quality will have much less time to devote to DEQ activities. All these required activities represent more than a full-time job.
- (4) Even with a full-time director, with the limited staff, efforts should be concentrated on a few problems, rather than be dispersed among many, thus precluding providing a critical mass of inputs for any task

Management of environmental quality in the El Inca area is one problem with high priority; the other is air quality in the urban area.

- (5) A coordinating committee should be established with representatives from Planificacion, DEQ, EMAP, and EMA. The need for coordination is greater even than perceived last year. Coordination is critical both with respect to efficiency of data collection and management, and with respect to development and adoption of management strategies. There are many common problems among these four agencies relating to important decisions which the municipalidad must make. Under the present situation, it seems quite likely that different agencies can proceed in widely different directions. This makes the task of environmental quality management even more difficult than it already is.

- (6) A full-time technical advisor should be obtained, preferably for at least one year, as described in Annex B. The tasks of the adviser would be to: provide technical and economic inputs to the various tasks; help formulate and format outputs; act as a "sounding board"; make specific suggestions with respect to sources of data and methods of analysis; and work with consultants. The adviser should also be available to meet with individuals and groups from other agencies and the private sector.

Having a full-time adviser is the most efficient procedure for training staff, far more effective than short courses.

- (7) Only external advisers should come who can make specific inputs to specific tasks in the Work Plan. Just because an adviser's fee does not have to be paid by DEQ does not mean that the adviser imposes no costs. Every visitor requires staff time and resources which are subtracted from ongoing tasks.

Similarly, demands on staff for tasks which are not related to the Work Plan should be carefully limited.,

- (8) A permanent water quality monitoring station should be established on the Rio Machangara to use as a base for determining trends in ambient water quality. The station should be located downstream from the last major point of discharge of liquid wastes to the river and upstream from the major diversion and irrigation. Advice should be obtained from an expert experienced in locating water quality monitoring stations, such as an individual from the U.S. Geological Survey. The optimal location in the river reach indicated should be selected, even though this

location may not be the location where water quality was measured in the past. The distance between the former station and the one to be established would not be so large as to preclude integrating data from both stations. The critical criterion is to locate the station downstream from the last major discharge point and upstream from the diversion to the irrigated area.

ACKNOWLEDGEMENTS

To the extent that the mission has been useful, it is because of the essential help provided by Ing. Francisco de la Torre, Asesoria Mario Espinosa, Ing. Luis Antonio Gomez, Dipl.-Ing. Jorge Jurado, and the rest of the DEQ staff.

PROPOSAL FOR ESTABLISHMENT OF POLLUTION PREVENTION PAYS (PPP) PROGRAM

The rationale for the establishment of a PPP program is that often the most effective way for reducing discharges to the environment is to reduce GENERATION of wastes, that is, prevent wastes from forming in the first place in production. Waste treatment, e.g., wastewater treatment plants, wet scrubbers on stacks, represent nonproductive uses of materials and energy. Removing an undesired material from a waste stream, to prevent its discharge into the environment, requires inputs of materials and energy. These in turn become residuals requiring disposal. Thus, "waste treatment", i.e., at the end-of-the-pipe, adds to the total quantity of materials discharged to the environment. The reason for adopting waste treatment is because it is assumed that modification of the original materials by the treatment results in a pattern of discharges to the environment which is less adverse than the pattern without treatment.

The foregoing suggests the logic in establishing a PPP program in Quito (applicable to the rest of Ecuador as well). The objective of the program is to analyze individual industrial plants with respect to generation of liquid, gaseous, and solid wastes and use of energy, to determine what changes might be made in raw materials and production processes which would result not only in reductions in discharges but savings of materials and energy, so that the net cost of production would be negative, i.e., a savings.

The proposal would be implemented in three stages: (1) establishment of the group; (2) organization of the group; and (3) operations.

Stage I: Establishment of the PPP Group (Team)

The PPP group would be comprised of professionals from individual industrial operations, the federation of industries, and the municipalidad, for example, 2 or 3 from individual industrial operations, 1 from the federation, and 1 from the municipalidad. The individuals from the industrial operations and from the federation should be individuals who have had experience in, and responsibility for, running a plant, i.e., for production to achieve profits. They must know how to analyze unit processes and unit operations, and relate technological options to costs. They should have had experience in materials recovery and/or energy recovery in some type of production. Being a professional trained engineer is not necessarily a prerequisite. More important is actual work experience in a plant, and a pragmatic

approach--not a theoretical approach--to analyzing production options.

The problems of choosing and assigning personnel to the group should not be underestimated. If the group is to be successful in achieving the objective, it must be comprised of experienced individuals. Individual industrial operations will not likely be happy to assign a top employee to the group, despite the fact that what the individual will learn as a member of the group will help his/her company. At the same time, the individual must be confident that he/she will not "lose out" in his/her company by participation in the group. Therefore, there probably will have to be some incremental reward for participation.

Stage II: Organization of the PPP Group

After the members of the group have been selected, the next step is organizing the operation. There must be some space assigned for the office for the group, with the appropriate sign over the door, OFFICINA: POLLUTION PREVENTION PAYS PROGRAM. A small amount of space should be allocated for a laboratory, which would begin with simple mobile equipment for measuring a few parameters.

This stage also involves development of the "operating procedures", including: developing interview and data tabulation forms; developing a simple brochure to inform individual industrial operations of the background and purpose; deciding on how to approach individual industrial operations; allocating tasks among the group members; choosing the leader of the group, which probably should be done by the group itself, for best results. Finally, this stage involves the selection of the first plant to be visited and analyzed. The plant should have significant problems, but should not be too complicated, e.g., a chemical plant producing 50 different chemicals.

For this step it would be helpful to have assistance from an individual who has actually developed, organized, and run a PPP program, such as the program in North Carolina in the U.S. A visit of at least one month to work with the group would be highly desirable.

Notes: 1. The PPP team is to be a full-time team. This means that 85-90% of the time of team members would be on PPP work, 10-15% for maintaining contact with their agencies.

2. The work of the PPP team, in terms of approach, would be integrated with the approach of the National Institute in analyzing individual plants to increase efficiency of energy use.

Step III: Operations

After the analysis of the first plant has been completed and the group has worked with plant personnel to implement the results of the analysis, the group moves on to another plant. The process of analysis is repeated.

For particular types of plants, especially where several plants in a category exist, external technical assistance could be sought. This might be done through various programs in the U.S., FRG, Switzerland, the Netherlands, in which technical assistance is provided by retired individuals with the only cost to the host country being the provision of living expenses.

TERMS OF REFERENCE: TECHNICAL ADVISOR FOR DEQ

Position: Technical advisor to Department of Environmental Quality, Direccion Municipal de Higiene, Quito, Ecuador

Responsibilities: The general responsibility of the advisor is to provide advice to the staff of the DEQ and to the Subdirector de Saneamiento Ambiental of the Direccion with respect to the analysis and planning function of the DEQ.

Specifically, the advisor would be expected to:

- o provide suggestions with respect to methods of analysis to use;
- o provide suggestions with respect to how to obtain data needed for the analyses;
- o help in preparing TORs for consultants to the department;
- o review individual work tasks in process, including work of consultants and suggest revisions where necessary;
- o review drafts of outputs from work tasks;
- o help in deciding upon formats to be used in producing outputs for various audiences; and
- o make presentations upon request to various individuals and groups, including the mayor.

Desirable Knowledge and Experience

The advisor should have understanding of and experience with:

- o public investment decisions and associated resource allocation decisions;
- o engineering economics and cost-effectiveness analysis;
- o various types of economic and noneconomic incentives which can be imposed on activities to induce desired

responses, particularly with respect to pricing of water intake, wastes discharges, energy;

- o detailed analysis of industrial activities, in relation to materials and energy balances under different sets of factor prices and constraints, in order to estimate discharges and to estimate costs of reducing discharges;
- o combining economics, technology, ecology, and institutions in urban and regional analysis for environmental quality management;
- o monitoring discharges, quality control of analyses;
- o general hydrology; and
- o analysis of natural systems, e.g., with respect to water quality and air quality.

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- Notes: 1. With respect to the foregoing, the last two are the least important. However, it would be extremely helpful if the individual also had some experience with, and understanding of, these areas.
2. Fluency in Spanish is highly desirable, and would expedite the utility of the advisor. However, the substantive requirements take precedence.

M E M O R A N D U M

TO: Alcalde Rodrigo Paz
FROM: Blair T. Bower and Mario Espinosa
DATE: 8 September 1990
SUBJECT: Supplement to Memorandum of 7 September

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The purposes of this memorandum are: (1) to inform you about progress, since you departed for New York, with respect to the proposed Pollution Prevention Pays program; and (2) to emphasize our concern about two other issues which require action by you as soon as you return.

The proposed PPP program, to be initiated in the El Inca area --

Tuesday morning, 4 September, we met with Sr. Luis Luna Osorio, Vice President for technology of the Camara de Industrials de Pichincha, to discuss the proposal. He responded positively, and took the proposal to his board meeting that evening. The board approved the idea and agreed to provide 2 engineers for the team. The Camara has tentatively agreed to provide one engineer. We have suggested that the municipalidad provide two, to make a 5-person team the logical individuals from the Department of Environmental Quality have been identified.

Mario is to meet again with the Camara on Wednesday, 12 September, to discuss various organizational details necessary to make the team effective.

- o It is very important to create an image of some independence for the PPP team. Therefore, we are suggesting that a non-profit entity be formed, for example, PPP of Quito or El Inca, Inc., with a board consisting of three, one representative from the Camara, one representative from the municipalidad, and one representative from the industrial establishments in the El Inca rea. The PPP team would report to this board.
- o There should be a 2-year commitment by all parties to the effort. The PPP team must be given time to prove itself. The 2-year period does NOT mean that there will be no

results long before that time. A 2-year commitment means that the parties involved are serious. This in turn will increase the likelihood of attracting good people for the effort.

- o The team would have its own office in the El Inca area, with a sign over the door: PREVENIR LA POLUCION PAGA, its own telephone, its own stationery. This means a small operating budget, reviewed and adopted by the board, and allocated among the participating entities.

As soon as an agreement is signed by all parties, an individual should be brought in for at least a month to help initiate the program, develop operating procedures, assist with at least the first plant visit. That individual should be one who has developed and managed a PPP program somewhere.

- o In order to achieve some integration of the activities of Planificacion and the activities of DEQ in the Direccion de Higiene, we suggest that one DEQ staff member be assigned to work full-time in Planificacion. You have given DEQ responsibility for assessing the environmental implications of urban plans. Without the information DEQ cannot carry out that responsibility. The suggested procedure seem to be one which would make operational your directive.
- o The present TOR for work to be financed by GTZ, the aid agency of the FRG, go beyond what would be immediately useful to the Quito area, namely: (a) identification of the quality of water used to irrigate areas downstream from Quito; and (b) estimate the capital and operating costs of facilitates to improve the quality of the water used for irrigation, based on investigation of alternative designs. Work items in the TOR relating to discharges throughout the area and investigation of treatment facilities for the entire area, are not relevant until DEQ has done further work. Prompt action on your part is required to ensure that the effort financed by GTZ is focused on the irrigated area.

M E M O R A N D U M

TO: Ing. Francisco de la Torre
Dipl.-Ing. Jorge Jurado

COPIES: Dr. Pablo Martinez Chiriboga
Asesoría Mario Espinosa
DEQ Staff

FROM: Blair T. Bower, P.E.-Economist

DATE: 7 September 1990

SUBJECT: Second Mission on Environmental Quality Management in
Quito

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RECOMMENDATIONS

1. Staffing

- o The staff of the DEQ should be increased by at least two individuals, preferably one experienced in air quality management and one experienced in applied resource/environmental economics. An alternative to the applied resource economist would be an individual experienced in application of engineering economics.
- o A full-time adviser to the DEQ should be obtained. The role of the adviser is delineated in Annex B of the memorandum of the Alcalde, which annex was prepared at his request.
- o No consultants in addition to the current contracts with Salinas and Castro should be hired until the questions to be answered are refined and priorities established among those questions, and the work plan is elaborated.

2. Immediate Tasks

- a. Specify "analysis conditions", as recommended last year, specifically:

- o base year or base period, which might logically be 1988, given that data on vehicles are available for that year;
 - o price level to be used in estimating costs;
 - o capital recovery factor to be used, or factors to be used, or discount rate to be used if present value of costs is the method to be used in analyzing costs (where capital recovery factor (CRF) reflects some interest rate for some time period, e.g., 10%, 15 years);
 - o target years for analysis, e.g., 1995, 2000;
 - o criteria to be used in selecting an environmental quality;
 - o the specific residuals (wastes) to be considered in the analyses, given that not all residuals can be analyzed.
 - o specification of any constraints on factor inputs to technological options for reducing discharges, such as restrictions on imports, which must be considered in estimating costs.
- b. Develop or obtain projections of population, economic activities, and vehicle-kilometers traveled in Quito, for the target years for at least one Scenario. The scenario should logically be the one used in Plan Quito.
- c. In preparation for the activities of the PPP team in the El Inca area, the individual industrial establishments should be located on a map of the area, with an accompanying table indicating the CIU for each establishment, and any other information available, such as nature of product, level of output, raw materials processed. The area should be subdivided in relation to the various concentrations of activities, with existing qualitative information concerning the subareas compiled in a table, e.g., Subarea 4 contains numbers of garages for repair and maintenance of facilities, Subarea 1 contains highly concentrated in space activities which are

relatively large textile operations, plus the soap-detergent operation.

- d. In preparation for the activities of the PPP team, carry out door-to-door survey of the establishments in EL Inca area, to obtain information on products, level of output, raw materials used.
- e. Estimate discharges from the establishments in the EL Inca area, based on CIIU category and coefficients from the literature, modified by judgment of local conditions.
- f. Obtain from EMAP the data on water intake by the industrial establishments in the EL Inca area.
- g. On the basis of (f.), estimate discharges from the establishments in the EL Inca area, using concentrations in effluent developed elsewhere, e.g., by NOAA.
- h. Delineate drainage areas and interceptor sewer areas in relation to their locations of discharges into the Rio Machangara and Rio Monjas. This would be done in cooperation with consultant.
- i. Estimate discharges in each area from storm runoff using $Q = CiA$, where c can be assumed to be 0.9, and concentrations from the literature can be used with modifications for local conditions.
- j. Superimpose population distribution on interceptor sewer areas, and estimate discharges based on logical coefficients per inhabitant for Quito conditions.
- k. on the basis of (h.), (i.), and (j.), develop a skeleton diagram (schematic) of the two rivers, showing locations and amounts of above estimated discharges. This can be done jointly with Castro. Subsequently, the additional estimated discharges from industrial activities can be added.
- l. Based on (b.), repeat the estimates of discharges of liquid wastes for the target years, taking into consideration possible changes in technology and other factors which

- would change the discharge coefficients of various activities.
- m. Based on (b.), or on the projections of kilometers traveled by various types of CO, HC, Nox, TSP, and SO₂ from vehicles in the target years.
 - n. Given (m.), estimate the reduction in discharges which theoretically could be achieved in the target years by various measures such as: replacement of buses; requiring high level of emission controls on all imported vehicles; installing and carrying out an intensive "inspection and maintenance" system on all vehicles; implementation of a por puesto system; extending the one-way street system to major arteries. Estimate the costs of each of the proposed measures.
 - o. Estimate the quantities of different types of fuel oil used for combustion by various activities in the target years, based on data for the base year.
 - p. Based on (o.), estimate the discharges of TSP, SO₂, and Nox from combustion of fuel, assuming the same distribution of fuel types as in the base year.
 - q. Estimate the reduction in discharges of TSP, SO₂, and Nox which could be achieved by a shift to higher quality fuel oil by various
 - r. Development of an ordinance relating to discharges from industrial establishments and other activities, e.g., commercial, institutional, should not be undertaken until more data are obtained on the types of activities and nature of discharges in the El Inca area, except for consideration of implementing the proposed system detailed in Annex I, Proposed Incentive System.
 - s. In connection with the work on industrial activities in the El Inca area, the criteria for the removal of industrial activities from that area, developed by Planificacion, should be reviewed.

- t. WITH RESPECT TO THE RIO MACHANGARA AND RIO MONJAS, THE EFFORTS OF DEQ SHOULD BE DIRECTED TOWARD ESTIMATING HOW DISCHARGES TO THE TWO RIVERS COULD BE REDUCED, AND WHAT THE COSTS OF DIFFERENT AMOUNTS OF REDUCTION WOULD BE.

3. Work Plan

Limited staff resources require **EXPLICIT** allocation of those resources over time. such explicit allocation is required for all contractors as well, remembering that staff time is necessary to work with and to monitor the work of the contractors. This is necessary to ensure that the outputs from contracts are what is needed, at the times needed, and that the staff knows how the numbers were obtained. Thus, using contractors requires staff time.

This allocation of resources should be reflected in a specific Work Plan which shows: personnel assigned to tasks; contractors assigned to tasks and the staff assigned to work with them; utilization of adviser(s); interim and final outputs to be produced by each task, when; and how the various tasks fit together, as in a CPM (critical path method) diagram. The work plan must be consistent with the resources available, and should have some allowance for contingencies.

A detailed Work Plan should be developed, starting with the "immediate tasks" listed above. It would be useful to detail the Work Plan for: the 9/10 - 12/31/90 period; 1/1/91/ - 4/30/91 period (end of budget period; and 5/1/91 - 12/31/91 period.

This work plan should integrate the requested technical assistance outlined in Annex II, prepared at the request of the Alcalde for his trip to the U.S.

Contracts for consultants should be a function of the questions to be answered and outputs needed, and how the work of the consultants would be integrated with staff work to produce the desired outputs.

Every TOR for a contractor should have the following requirements: (a) that the contractor report weekly to the relevant DEQ staff member, with respect to results, problems; and (b) that the final report of the contractor should include -- explicit description of how the data were obtained; estimates of the accuracy of the data; what method(s) of analysis was (were) used, where this is relevant; date(s) data were gathered and date(s) to which the data refer, e.g., interview at Plant Y was done on 17 August 1990, resulted in obtaining data on monthly water use for 1989.

5. Consideration should be given to the TYPES of reports to be produced by DEQ, with a short statement prepared describing the types, so that all interested parties, especially the Alcalde and the Consejo, will understand what the results of the work will be, and that contractors will understand what is expected of them. There should be a standard format for each type of report. Having these standards conveys the image of a coherent and well organized operation.

For example, the following types of reports might be defined:

- a. decision reports, those showing the costs of achieving different levels of environmental quality and/or showing the tradeoffs between levels of air quality and water quality which might be achieved for different total amounts of resources;
 - b. public information reports, written for wide range of audiences and containing the relevant basic information, but without all of the technical explanation; and
 - c. technical reports, which would include the full description of analytical methods and sources of data used.
6. With respect to sampling of ambient water quality, only the following sampling should be undertaken:
- a. at the location of the permanent water quality monitoring station recommended to be established on the Rio Machangara somewhere between the location of the last major discharge to the river from the Quito metropolitan area and the intake to the irrigated area;
 - b. at the heads of the diversion canals to the irrigated areas; and
 - c. in the Rio Monjas just upstream from the diversion to the irrigated area.

In the beginning, only parameters to be sampled are those which are easily analyzed, for which the analyses are accurate and reliable (reproducible), and therefore require simple equipment. Suggested parameters in relation to the two objectives of developing a base station and determining the quality of the irrigation water are: TOC, TDS, SS, fecal coliforms, and parasites.

7. Assuming that the Salinas contract produces the desired information about the irrigated areas, no additional staff time needs to be allocated to that problem. This also assumes that the work to be done by GTZ will include, with respect to the irrigated area: (a) sampling of water quality at the beginning of the diversion canals, if this has not already been done; and (b) designing ? and estimating the costs of treating the water to be used for irrigation at the head of the canals, in relation to different levels of quality which would be produced.
8. In addition to the work indicated in No. 7, the GTZ group could be helpful in estimating the types and amounts of toxic materials likely to be generated and discharged by the various types of industrial activities in the area. This assumes that the GTZ group has, in fact, had substantial experience with respect to toxics.
9. Efforts to educate the general public in the region should be the responsibility of Fundacion Natura. The Fundacion has both the experience and the resources for the task. DEQ should provide the Fundacion with data and results produced by the work of the DEQ.
10. If a comparison of efficiency of carrying out the tasks of solid wastes management (other than planning) between the public sector and the private sector is desired, a specific area of the city should be selected, one which includes a combination of types of activities, i.e., residential, commercial, even industrial. It is not necessary to divide the city in half in order to obtain a valid comparison. Bidding for the contract to undertake the task should be open. The requirements should be that the private contractor must carry out the identical tasks as the public agency, which include street cleaning, disposal of dead animals, corner pick up, and all transport to the landfill.

The major problem will be to establish a system of costs by type of task, and obtaining the data in relation to that system, in order to obtain data for a valid comparison.
11. Weekly or bi-weekly staff meetings should include both Francisco and Mario, and of course the long-term technical adviser, and any short-term advisers. This enables them to keep up-to-date on progress and problems, and to make suggestions. The meetings should focus on specific tasks underway, with discussion of progress and problems, and how problems might be solved, on progress in producing

outputs, and how the linkages among activities are being achieved. These meetings also provide the forum for reallocating resources for whatever reason, e.g., new questions to be answered with higher priorities, insolvable problems.

DEVELOPING INCENTIVES FOR INDUSTRIAL ACTIVITIES TO REDUCE DISCHARGES TO THE ENVIRONMENT.**BACKGROUND**

At present (1990), industrial (and other) activities are using the common property environmental resources of the area -- water bodies, atmosphere, and land -- essentially without having to pay directly for such use (except for charges for solid wastes disposal). Industrial activities are discharging into the atmosphere and into water courses a variety of materials/substances. This use of the environment for the disposal of wastes represents a necessary input for production, analogous to other factor inputs such as labor, energy, raw materials. The difference between the use of the environment as an input into production and the use of the other factors is that, at present, there is no charge for its use, whereas all the other factors have a price.

Ideally, there would be charges for the use of the environment -- air, water, land--to reflect the damages resulting from excess use. Such charges would then induce entrepreneurs to consider explicitly their use of the environment when making decisions about production methods and products. However, there is at present no set of economic incentives -- fines, subsidies, charges on effluent--to induce/stimulate activities to adopt measures to reduce discharges. [As noted below, economic incentives or regulations are insufficient to induce reduction in discharges. A lack of technical and related economic information is a major constraint.]

In Quite at present (1990), industrial activities are assessed a 10% surcharge on the amounts paid for energy use, i.e., kilowatt hours each month. This revenue accrues to the city, and is characterized as payment for collection and disposal of the solid wastes generated by the activities. However, there is likely to be LITTLE or NO relationship between the amount paid, and the solid wastes generated, by an activity, and therefore between the amount of solid wastes generated by an activity and the solid wastes management (SWM) costs--collection, transport, disposal, administration -- imposed on the city by those generated solid wastes. Typically, the amount paid by an activity is substantially more, probably in some cases many times more, than the costs actually imposed by the activity on the city.

In addition, because of the flat 10% rate and the increasing costs of energy, revenues from this charge are accruing at a rate of about 3% per month, much more rapidly than the rate of increase in costs of SWM. Thus, the present system is becoming increasingly inequitable in that industrial activities are paying increasing amounts for the same level of service. In cases where an activity generates essentially no solid wastes, the activity is paying for, but receiving no, services.

PROPOSED INCENTIVE SYSTEM

Rationale

The rationale for the proposed incentive system consists of two fundamental principles. One, as stated above, all users of the environment, for example for disposal of wastes, should bear the costs of such use. The first step in developing an environmental quality management (EQM) program, is to develop the institutional capability to "manage". This requires personnel to analyze, to develop strategies, to inspect and monitor activities, and the associated material resources to carry out these tasks. These management costs should be borne by the users. In addition, the costs imposed on the users are imposing on society, i.e., the damages. The estimation of damages caused is not an easy task, although it usually is easier to estimate damages than it is to estimate which activities "caused" the damages.

Two, in order to improve environmental quality, the various activities must be induced to modify their activities so as to reduce discharges to the air, water, and land environments. To induce discharge reduction requires incentives for the activities to respond. Typically, neither discharge standards alone -- unless vigorously enforced with significant sanctions, which is very difficult -- nor financial incentives alone, are sufficient to stimulate action. This is because the activities often lack the information they need in order to modify their activities to reduce discharges. Thus, provision of information is an important and necessary (critical) incentive.

Therefore, the proposed system has three components.

The Proposed System

1. The first component (element) of the system is to elaborate to the users what services they are receiving for the amounts they pay as a result of the 10% surcharge on electricity use. (It should be emphasized that, as the EQM activities of the city increase, additional services will be provided). This elaboration involves the following.

- a. Calculation of the solid wastes management costs imposed on the city as a result of the quantities of solid wastes generated by an activity and handled by the city:----The unit cost of SWM to the city includes collection, transport, disposal, and administrative costs, plus costs of street sweeping and similar activities, for which an individual activity should pay its share. Thus, the portion of the 10% charge to an activity allocated to an activity for SWM = quantity of solid wastes (tons) X SWM costs (suces per ton).
 - b. Imputation of the costs of air quality management (AQM):---At present, the costs to the city for AQM consist primarily of data collection, analysis, planning. In the future, there will be additional costs for air quality monitoring, activity monitoring, permitting, and provision of technical assistance. For the present, until more accurate estimates of gaseous discharges become available, the city's AQM costs could be allocated on the basis of the amount of fuel used by an activity in combustion). Thus, the portion of the 10% charge allocated to an activity in a given time period, e.g., a year, divided by the total number of gallons used by all industrial activities in the same time period, times the AQM costs.
 - c. The sum of (a) and (b) is likely to be substantially less than the total revenues received from the 10% charge. The difference would then be available to finance, or help finance, the second and third components of the system.
2. The second component of the system is to provide an economic incentive to industrial activities to reduce discharges of liquid wastes. (Subsequently, the system might be extended to discharges of gaseous wastes.) This involves a system of bonuses based on performance, i.e., the extent to which (how much) an activity reduces its discharges of specific substances, or reduces its discharge as measured by some proxy variable such as TOC, COD, BOD. (TOC and COD are more easily and reliably measured than BOD.)

The procedure would be as follows. A base level of discharge would be defined for an activity under present conditions, in terms of mean daily discharge of, for example, suspended solids. This level would be established jointly by DEQ and the activity. Each quarter the performance of the activity would be reviewed, to determine the extent to which the mean daily discharge was less than the base level, or

exceeded the base level. A step function would relate the % reduction in discharge to the amount of bonus to be received, as a reduction in the 10% surcharge. If the mean daily discharge exceeded the base level, points would be charged against the activity, which would reduce the amount of bonus for positive performance, if any, achieved in the next quarter.

Each activity would be required to monitor its own performance, by equipment and procedures specified by DEQ. Reports of performance would be submitted each quarter. DEQ would make random checks to determine if sampling and analytical procedures were accurate, i.e., the quality control function of DEQ.

The total amount to be paid out in bonuses probably should not exceed the funds available, as calculated above as the difference between the revenue from the 10% surcharge and the sum of (a) and (b). However, if the bonus system appears to be resulting in significant/substantial decreases in discharge, it may well be a rational economic procedure to provide monies for the "bonus fund" from other sources. The decreases in discharges may well eliminate having to incur additional costs for wastewater and intake water treatment.

Note: It should be made explicit in the accounting of the city that the amounts involved in (a), (b), and (c) should be credited against the city's costs for SWM, AQM, and water quality management, respectively.

To keep a continuing incentive "in front of" the activities, the base level should be reviewed periodically, to determine whether or not it should be changed as a result of change in production processes, products, level of output. The rationale for this review procedure is twofold. One, as population and economic activity continue to grow, at the same time the assimilative capacity of the environment is fixed, the environmental resources become scarcer in relation to demands placed upon them. Therefore, the unit value of the environment as a place for disposal of wastes become higher. This should be reflected in the "price" imposed upon the activity, where price in this procedure is reflected in the base level for measurement of discharge. [The "tightening" of the base level for measurement is analogous to the tightening of discharge standards as more and more activities are trying to use a given environmental resource are. That is, to maintain the desired ambient standards, discharges in the given area must be maintained within some level. This requires reductions from existing activities.]

Two, if an activity is rational, it will respond to the bonus incentive by adopting measures which, with the bonus it

would achieve, would maximize profits. If all factor prices remain the same, e.g., energy, other raw materials, the bonus, there is no incentive for further reduction. To induce the activity to continue searching for measures to reduce use of the environment, the cost of that use must be increased. Under this indirect procedure, this can be done only by tightening the base for the bonus.

3. The third component of the system is a mechanism to provide technical advice to individual activities. The orientation of the proposed system is reduction of discharges, with the motto, "pollution prevention pays". This approach has evolved in the U.S. over the last 25 years or so. What has been learned is that very often an activity is actually not operating at its point of maximum efficiency or maximum profits, and that there are many types of often small changes in raw materials, unit processes, unit operations which result in reduction in discharges and often in reduced costs and increased profits. The problem is that many small and medium-size plants do not have the relevant information to make these changes.

What follows from the above is that a mechanism is needed to provide the technical information to the individual activities, e.g., an industrial extension service performing the same type of information transfer function as the traditional agricultural extension service. It is proposed that this mechanism be a team of component engineers, experienced in both technology and engineering economics. It would be a joint private-public entity, formed by the federation of industries and the ciudad. The team would be comprised of 3-4 engineers from the private sector and 1 engineer from the DEQ.

Industrial activities could apply to the entity for the assistance. The team would spend time in a plant, make its assessment, and prepare a report to management of the activity, of changes which would reduce discharges and their effects on net costs of production and on profits.

After formation of the team, an activity where management was interested and cooperative would be selected for the first analysis. Also, it would be helpful to have an individual from one of the pollution prevention pays programs in the U.S. provide advice to the team, particularly in the beginning.

The team would be available to an activity at which it had made an analysis for subsequent consultation and review with respect to any problems encountered in implementing the recommendations of the team.

WATER QUALITY MODELING: RIOS MACHANGARA AND MONJAS

FACTS OF LIFE

1. Water quality in both rivers will continue to decrease over time, as population and economic activities continue to increase. Having water quality models of the rivers will have absolutely no effect on this trend.
2. Modeling is not feasible at the present time because:
 - a. no estimates of discharges to rivers at various locations are available; and
 - b. no or inadequate ambient water quality data and streamflow data are available to calibrate a model, to say nothing of validating a model.

Both types of data are essential for modeling water quality. Otherwise, one is engaged in a completely hypothetical exercise.

Conclusions

1. Under these circumstances, efforts should be directed toward:
 - a. developing estimates of discharges under current and near future conditions; and
 - b. developing management strategies to reduce discharges.

Only via implementation of management strategies can ambient water quality be improved.
2. The immediate need and logical activity is to identify the locations of discharges into the two rivers from sewer outfalls and from drainage channels. The product of this activity will provide the framework for developing the estimates of the discharges.

The drainage channel areas can be identified by the DEQ staff on the project base map.

The locations of the outfalls can be done under contract, via revising the TOR for the existing proposed contract. The contractor should use the same base map as used by the

project. It would be specified in the contract that DEQ would provide the base map to the contractor.

3. Based on the results of 2, a skeleton diagram of the rivers, to scale, should be produced, using one color for sewer outfall discharges and another color for storm runoff discharges. As estimates of discharges are produced by the team, these can be shown on the diagram.



SHORT-RUN WORK PROGRAM (DEQ) AND REQUESTED TECHNICAL ASSISTANCE

Note: RTA in the following means "requested technical assistance."

EL INCA AREA

- o For base year, identify/characterize/locate industrial plants in area by CIIU and level of activity (employees, product output, raw material processed), via door-to-door survey.
 - o Estimate discharges of at least a few conventional wastes (liquid, gaseous, solid) from these activities, using coefficients for each category of activity (2-digit or 4-digit CIIU).
 - o Rank plants by size of estimated load for each type of waste.
 - o Estimate discharges of so-called "toxic" materials, based on typical behavior for specified industrial categories as compiled in U.S. and elsewhere.##
- ##RTA: Assistance of consultant experienced in toxics generated by various types of industrial activities.
- o Establish industry-federation of industry-municipalidad POLLUTION PREVENTION PAYS group. [See separate memorandum.]##
- ##RTA: Assistant from consultant who developed, organized, operated one of the PPP programs, e.g., state level (North Carolina), private firm (3M).
- o Establish simple laboratory in the El Inca area, for use by the PPP group and industrial activities in the area. Obtain mobile equipment for measuring TDS, TOC, SS.##
- ##RTA: Mobile equipment for measuring indicated parameters. Assistance from consultant experienced in problems of figuring out how to measure discharges from industrial plants. The consultant could be from a private firm or from a public agency, such as the Metropolitan Sewage District of Louisville (or similar agency.)
- o Given results from prior steps, develop alternative sets of physical measures (technological options) to reduce

discharges, both measures at individual industrial establishments and joint facilities (those which would handle effluent from several or many different establishments), and the related capital and operating costs associated therewith.##

##RTA: Assistance of consultant from an entity with system-wide responsibility for handling wastes from multiple activities, e.g., Gulf Coast Waste Disposal Authority in the U.S., Dow Chemical plant in Midland, Michigan, Emschergerossenschaften.

- o Develop system of effluent charges for industrial and large commercial and institutional activities, based on strength discharge, e.g., loads of COD and SS.##

##RTA: Assistance from consultant who has been involved in developing and implementing a sewer charge system, particularly where few data on discharges from individual plants are available in the beginning, as in the French initiation of a charge system.

AIR QUALITY MANAGEMENT

- o Identify for base year, distribution of vehicles by number and type, kilometers driven, fuel type, e.g., buses, light and heavy trucks, old/not so old/new automobiles.
- o Estimate discharges of CO, HC, Nox, TSP, SO2 from vehicle use in each of the categories.##

##RTA: Obtain emission coefficients used in Mexico City.

- o Estimate reduction in discharges in target years, e.g., 1995, 2000, if all buses were replaced with new buses; estimate costs, both capital and operating.##

##RTA: Assistance from consultant experienced in delineating pattern of discharges from new buses over time in relation to different levels of maintenance.

- o Estimate reduction in discharges from different levels of inspection and maintenance systems; estimate related capital and operating costs. Such systems require not only emission measuring equipment with trained operators but trained mechanics working in garages who can make the modification/repairs indicated to be necessary by the inspection procedure.##

##RTA: Assistance of consultant experienced in establishing I and M systems, i.e., training, problems, and knowledgeable about results achieved by sucl. systems.

- o Investigate possibility of establishing por puesto system in Quito; estimate reductions in discharges such a system might achieve by decreasing overall vehicle use; estimate costs of administering such a system and of establishing the system.##

##RTA: Assistance of consultant who has analyzed por puesto systems in various major cities in Latin America.

MONITORING WATER QUALITY

Select location for a base station for monitoring water quality in the Rio Machangara. The location should be downstream from the last major discharge into the river. This base station would be used as the indicator of trends in ambient water quality.##

##RTA: Assistance of individual from U.S. Geological Survey expert in locating water quality sampling stations.

SUPPLEMENTARY COMMENTS

1. Urban storm runoff

Given that no measurement of the quality of storm runoff in Quito have likely been made, one must adapt data on concentrations of wastes in storm runoff from other locations for making first rough estimates of wastes generated by and discharged from storm runoff. In using coefficients from other locations, judgment can be used to modify those coefficients in relation to perceived conditions in Quito. One can also vary the coefficients in order to determine if the relative importance of storm runoff, in relation to other sources of discharges of particular materials, will change.

In the late 1970s and /early 1980s, the U.S. Environmental Protection Agency carried out a data collection and analysis program on urban storm runoff. Runoff and concentrations were measured for many storms of different sizes in sections of 25-30 cities in the U.S., representing various types of land use, e.g., residential, commercial/industrial, open space. The results of the study have been published in various reports. The tables attached hereto represent some of the summary data, and could be used at least as a beginning for the analysis of urban storm runoff contribution to discharges to the rivers in the Quito area.

One of the important findings of the study was that there was no significant correlation between the measured concentrations of pollutants (wastes), termed the "event mean concentration" (EMC), and the runoff volume. That is, considering the various sizes of storms, i.e., runoff volume, in various areas sampled of different sizes, the concentrations did not vary significantly with the volume of runoff, for the pollutants indicated in Table 6-12, and the other tables.

Note: Concentrations can and did, vary during the time period of the event. But the physical interpretation of the finding is that, whenever a precipitation event is large enough to flush the materials available for transport, most of these are transported in the early portion of the event. The mean concentration for a precipitation-runoff event is calculated as the total mass of material discharged during the event divided by the total runoff occurring during the event] .

Table 6-12 shows the median event mean concentrations, combining data from all sites, for the pollutants measured, by

land use category. [The land use categories would only be roughly comparable to those in Quito, except for the commercial category. The characteristics of commercial areas in the U.S., e.g., shopping malls, strip commercial areas, are similar to those in Quito and to those in many other areas of the world.]

Column (A) in Table 6-17 shows the median EMC for urban sites, where an urban site includes all of the land use categories together. Table 6-18 shows measured concentrations of fecal coliforms for the few sites where they were measured; Column (A) for warm weather conditions, Column (B) for cold weather conditions (not applicable to Quito). Table 6-25 combines the data from all sites and all storms to produce estimated mean concentrations of indicated pollutants for urban sites, shown in Column (A).

Table 2 shows the results of a study of 15 drainage basins in the San Francisco Bay region. The objective of the study was to investigate the quantities of hydrocarbons, in particular, which were discharged in urban storm runoff. Note the concentrations of "particulate TEO". (TEO = total extractable organics.) This parameter reflects quantities of oil and particulate emissions from vehicles. The study found a very high correlation between concentration of particulate TEO and extent of commercial/industrial land use.

It is interesting to note the method used for collecting samples to be analyzed. The researchers simply inserted 4 liter glass bottles into the discharge stream, during the different phases of storm events.

2. Tasks for DEQ, in relation to developing a program for environmental quality management.

Reviewing the memorandum on "immediate activities" prepared last year, 11 August 1990, indicates that several of those tasks "to be done" are still relevant. It is recommended that the section, "Analysis for Regional REQM" be "revisited" in connection with developing the work plan based on the list of items, plus modifications, contained in the body of the current memorandum.

3. Quito must be careful in considering the establishment of ambient environmental quality standards. Some factors to be considered are indicated in the attached memorandum.