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Environmental Pollution
Prevention Project

Mid-Term Review of EP3 Tunisia Program

Prepared for:

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CONTENTS

Acknowledgments

Preface

Chapter 1: Introduction

1.1 Overview of EP3	1-1
1.2 Purpose of the Mid-Term Review	1-3
1.3 Methodology of the Mid-Term Review	1-3

Chapter 2: Review of EP3 Tunisia Achievements

2.1 Overview of EP3 Tunisia	2-1
2.2 Outreach and Training	2-2
2.3 Industrial Pollution Prevention Assessments	2-6
2.4 Technical and Policy Support to Government	2-9
2.5 Information Dissemination	2-14

Chapter 3: Recommendations to Increase Program Effectiveness

3.1 Market Technical Assistance Services to Select Industries	3-1
3.2 Work with Government to Promote Industrial Pollution Prevention	3-6
3.3 Complete and Market Pollution Prevention Clearinghouse	3-7

Chapter 4: Summary and Conclusions

4.1 To what extent has the program succeeded in increasing awareness of environmental problems and the role pollution prevention can play in addressing these problems?	4-1
4.2 Has the Government taken any steps to include incentives for pollution prevention in its environmental policies and regulations?	4-3
4.3 Has a demand for P2 been created? How? How much? What additional steps could EP3 Tunisia take to increase demand in remaining months?	4-4
4.4 Has the program succeeded in charging fees for pollution prevention services (technical assistance, training, and information)?	4-5
4.5 Conclusions	4-5

Appendices

Appendix A: List of Individuals Met	A-1
Appendix B: Overview of Environmental Programs and Policies	B-1

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The overall EP3 program in the countries in which EP3 has activities includes a wide range of activities including audits/assessments, information dissemination, training and small scale demonstrations. These country programs are all designed to create the conditions in the country which will assure the continuation of urban and industrial pollution prevention and establish locally sustainable pollution prevention programs.

This mid-term review of the EP3 Tunisia program was conducted for EP3 by Joseph Karam, President of ECODIT, Inc., an environmental consulting firm. The purpose of this mid-term review is to document the progress of EP3 Tunisia toward creating a sustainable pollution prevention program in Tunisia and recommend ways to increase the program effectiveness during the last six months of the project.

The consultant wishes to thank Ms. Betsy Marcotte, EP3 Project Manager, as well as Mr. Rachid Nafti, Ms. Halima M'rad, and Mr. Maher Harmel of EP3 Tunisia for their support and cooperation with the evaluation mission. The consultant also wishes to thank all parties and individuals who provided input and guidance, including representatives from USAID/Tunisia, the Ministère de l'Environnement et de l'Aménagement du Territoire (MEAT), the Agence Nationale de Protection de l'Environnement (ANPE), companies NOUR, J.F. Fonderies and FINO, and others (see Appendix A for a listing).

This report was prepared for Hagler Bailly Consulting, Inc. by Joseph Karam, ECODIT, 9269 Bailey Lane, Fairfax, Virginia, 22031-1929.

LIST OF ACRONYMS

AME	Agence de Maîtrise de l'Energie
ANPE	Agence Nationale de Protection de l'Environnement
API	Agence de Promotion de l'Industrie
APNES	Association de Protection de la Nature et de l'Environnement de Sfax
DT	Dinars Tunisiens (1 DT ~ US\$ 1)
ENIM	Ecole Nationale des Ingénieurs de Monastir
ENIT	Ecole Nationale des Ingénieurs de Tunis
EP3	Environmental Pollution Prevention Project
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
IRSIT	Institut Régional des Sciences Informatiques et des Télécommunications
MEAT	Ministère de l'Environnement et de l'Aménagement du Territoire
NGO	Non-Government Organization
OECD	Organization for Economic Cooperation and Development
ONAS	Office National de l'Assainissement
PRIDE	Project in Development and Environment
RHUDO	Regional Housing and Urban Development Office (USAID)
SDN	Sustainable Development Network
TEIS	Tunisian Environmental Information System
TSS	Tunisian Scientific Society
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development
USEPA	United States Agency for Environmental Protection
UTICA	Union Tunisienne de l'Industrie, du Commerce et de l'Artisanat
WEC	World Environment Center
WEF	Water Environment Federation

CHAPTER 1

INTRODUCTION

This report presents a mid-term review of the Environmental Pollution Prevention Project (EP3) Tunisia program. It is organized in four chapters and four appendices as outlined in Box 1.

This introductory chapter presents an overview of EP3 and summarizes the purpose and methodology of this mid-term review.

1.1 OVERVIEW OF EP3

The Environmental Pollution Prevention Project (EP3) is a five-year program sponsored by the United States Agency for International Development (USAID) to address urban and industrial pollution and environmental quality in developing countries. The objectives of the program are to:

- ▶ establish sustainable pollution prevention programs in developing countries;
- ▶ transfer urban and industrial pollution prevention expertise and information; and
- ▶ support efforts to improve environmental quality.

EP3 was launched in the spring of 1993 and utilizes three principal resources:

- (1) contract with Hagler Bailly Consulting, Inc. and 16 subcontractors;
- (2) cooperative agreement with the Water Environment Federation; and
- (3) interagency agreement with the U.S. Environmental Protection Agency.

Activities in developing countries are initiated through buy-in agreements with USAID country missions. The first countries to host EP3 activities were Chile and Tunisia, where EP3 offices were established in the fall of 1993. Since then, EP3 operations have begun in Egypt, Ecuador, and Indonesia. EP3 offices in each country develop partnerships with environmental non-government organizations (NGOs), government agencies, and industry associations.

BOX 1

ORGANIZATION OF THE REPORT

This report presents a mid-term review of the EP3 Tunisia program. It is organized in four chapters and four appendices as follows:

- Chapter 1: Introduction presents an overview of EP3 and summarizes the purpose and methodology of the mid-term review
- Chapter 2: Review of EP3 Tunisia Achievements examines past achievements of EP3 Tunisia in outreach and training, industrial pollution prevention assessments, support to government, and information dissemination
- Chapter 3: Recommendations to Increase Program Effectiveness suggests specific actions to increase the effectiveness of the EP3 Tunisia program during the last six months of the project
- Chapter 4: Summary and Conclusions summarizes the key findings of this assessment and presents conclusions
- Appendix A: List of Individuals Met identifies the various individuals interviewed by the consultant, including representatives from EP3 Tunisia, USAID/Tunisia, government ministries and agencies, and industrial facilities
- Appendix B: Overview of Select Environmental Policies and Programs reviews select environmental policies and programs of the Government of Tunisia
- Appendix C: Training Program Announcement for Textile Industries contains a copy of a newspaper announcement for a training program organized by the Textile Technology Center for the textile industry
- Appendix D: List of Tanneries provides a list of tanneries invited to a meeting with the ANPE to discuss eligibility to FODEP and application procedures

1.2 PURPOSE OF THE MID-TERM REVIEW

The purpose of this mid-term review is to (1) document the progress of EP3 Tunisia towards creating a sustainable pollution prevention program in Tunisia and (2) recommend ways to improve program effectiveness during the last six months of the project (USAID support to EP3 Tunisia is due to end in September 1995).

In particular, the review evaluates progress toward:

- (1) increasing awareness of environmental problems and the role pollution prevention can play in addressing these problems;
- (2) convincing government to include incentives for pollution prevention in its environmental policies and regulations;
- (3) creating demand for pollution prevention by industry; and
- (4) charging fees for pollution prevention services (technical assistance, training, and information).

1.3 METHODOLOGY OF THE MID-TERM REVIEW

This mid-term review was conducted for EP3 by an independent environmental consultant, Joseph Karam. Mr. Karam is the President of ECODIT, Inc., an international environmental consulting firm with experience in the Middle East and North Africa. ECODIT is based in Fairfax near Washington, D.C.

Before leaving Washington, Mr. Karam met with Ms. Betsy Marcotte, the EP3 Project Director and reviewed preliminary documentation on EP3 Tunisia. He worked in Tunisia from February 20 through February 28, 1994. During his mission, he worked out of the EP3 Tunisia office, which facilitated daily contact with the EP3 Tunisia staff. He also met with staff, managers, and representatives from:

- ▶ USAID/Tunisia;
- ▶ government ministries and agencies, including MEAT, ANPE, and ONAS;

INTRODUCTION ▶ 1-4

- ▶ three industrial facilities that have received and continue to receive technical assistance support from EP3 Tunisia; and
- ▶ other participating organizations, such as IRSIT and UTICA.

Mr. Karam also interviewed a sample of participants in the outreach seminars and training activities organized by EP3 Tunisia. Appendix A presents a list of individuals met or interviewed.

CHAPTER 2

REVIEW OF EP3/TUNISIA ACHIEVEMENTS

This chapter provides a brief description of the EP3 Tunisia program. It then reviews the achievements of EP3 Tunisia in:

- ▶ outreach and training;
- ▶ industrial pollution prevention assessments;
- ▶ technical and policy support to government; and
- ▶ information dissemination.

2.1 OVERVIEW OF EP3 TUNISIA

The EP3 Tunisia office was established by USAID/Tunisia and the PRIDE project of USAID's Near East Bureau. The office became fully functional in October 1993 and houses a staff of three professionals and a secretary:

- ▶ Rachid Nafti, Office Director and Private Sector Specialist
- ▶ Halima Bali M'rad, Information Specialist
- ▶ Maher Harmel, Pollution Prevention Engineer
- ▶ Leila Abassi, Secretary.

Immediately after it became operational, the EP3 Tunisia office signed two memoranda of understanding (MOUs): one with the Ministère de l'Environnement et de l'Aménagement du Territoire (MEAT) and one with the Institut Régional des Sciences Informatiques et des Télécommunications (IRSIT). The MOU with MEAT outlines a framework for cooperation and support to the Government of Tunisia in promoting urban and industrial pollution prevention. The MOU with IRSIT establishes procedures for joint development of the Tunisia Environmental Information System (see Section 2.4).

2.2 OUTREACH AND TRAINING

Since its creation in October 1993, EP3 Tunisia has undertaken an impressive number of outreach seminars (five) and training activities (seven). More than 500 participants took part in these outreach and training activities, including more than 200 from industry, 80 from government, and 200 consultants and engineering students. In addition, EP3 Tunisia staff have participated in more than 15 national and international conferences and seminars and have met individually with more than 100 representatives of government and industry to promote pollution prevention.

Participants in these outreach and training activities form a solid network of industrial managers, government officials, and professionals who appreciate the economic and environmental benefits of pollution prevention. Recognizing the unique added-value of pollution prevention services that EP3 Tunisia has to offer, many of these participants have requested either additional information on pollution prevention or a pollution prevention assessment of their plant.

2.2.1 OUTREACH SEMINARS

EP3 Tunisia conducted five outreach seminars in different parts of the country: Tunis (kick-off seminar), Sfax in the center and Gabès in the south (in association with the Chamber of Commerce and Industry of the South), and Jendouba in the northwest and Bizerte in the north (in association with UTICA). The purpose of these one-day seminars was to introduce the EP3 Tunisia program and promote pollution prevention among industry, government, and NGOs. A total of 332 participants attended these seminars, including more than 200 from industry and about 60 participants from government (see Exhibit 1). The overwhelming majority of participants found these seminars unique, very useful, and well organized.

2.2.2 TRAINING WORKSHOPS

In addition, EP3 Tunisia organized seven technical training workshops focusing on the concept and practice of industrial pollution prevention. A total of 174 participants took part in these workshops, including 23 from industry, 30 from government, 30 consulting engineers, and 91 engineering students (see Exhibit 1).

Two workshops were targeted exclusively at engineering students from the Ecole Nationale des Ingénieurs de Tunis (ENIT) and the Ecole Nationale des Ingénieurs de Monastir (ENIM). One workshop was organized at MEAT with the employees of MEAT and ANPE. All other

REVIEW OF EP3 TUNISIA ACHIEVEMENTS ► 2-3

Training Activity	Number of Participants				
	Industry	Consultants a/	Government	Other	Total
Outreach Seminars					
1. Tunis 12/3/93	48	34	18	12	112
2. Sfax 1/12/94	54	8	14	4	80
3. Gabès 1/13/94	36	4	6	4	50
4. Jendouba 4/19/94	38	6	5	1	50
5. Bizerte 6/30/94	27	7	6		40
Subtotal	203	59	49	21	332
Training Workshops					
6. Tunis 4/28/94	8	6	4	2	20
7. Bordj Louzir 6/28/94	6	5	5	6	22
8. ENIM b/ 9/94				30	30
9. EP3 Office 11/30/94	5	6	3		14
10. ENIT b/ 12/15/94		4		46	50
11. Tunis 1/24-26/95	4	9	6	7	26
12. MEAT ADD DATE			12		12
Subtotal	23	30	30	91	174
Grand Total	226	89	79	112	506

a/ Includes university professors

b/ Engineering students form the "other" participants category workshops were attended by a mix of industry managers, government officials, and professionals. One workshop was organized jointly with the Chambre Syndicale Nationale de la Gestion Industrielle de l'Environnement et du Recyclage (Centre de Formation Continue, Bordj Louzir).

The last workshop (January 24-26, 1995) was a train-the-trainers workshop which transferred pedagogic and technical tools necessary to train industry managers and engineers as well as government officials in pollution prevention. Participants in the train-the-trainer workshop paid a \$50 registration fee. Many said they would be willing to pay double or even triple that amount to participate in additional training programs for specific pollution prevention themes.

2.2.3 PARTICIPATION IN CONFERENCES

EP3 Tunisia staff have also participated in more than 15 conferences and seminars organized by other groups in Tunisia and abroad and attended by more than 1,000 participants from Tunisian and international government agencies and NGOs. Exhibit 2 presents a selection of conferences and seminars in which EP3 Tunisia staff participated and spread the pollution prevention message.

2.2.4 MEETINGS

In addition, EP3 Tunisia staff met with more than 100 government and industry representatives (one-on-one or in groups) to promote the concept and practice of pollution prevention. For example, the EP3 Tunisia Office Director made presentations on pollution prevention and the mission of EP3 Tunisia to Board meetings of the following organizations:

- ▶ Fédération Nationale de Chimie;
- ▶ Tunisian American Chamber of Commerce;
- ▶ Fédération Nationale de Tourisme; and
- ▶ Chambre de Commerce du Sud.

REVIEW OF EP3 TUNISIA ACHIEVEMENTS ▶ 2-5

EXHIBIT 2

LIST OF CONFERENCES AND SEMINARS ATTENDED BY EP3 TUNISIA

Organizer/Sponsor	Title of Conference/Seminar	Place	Date
	Salon des technologies de protection de l'environnement et de l'aménagement du territoire	Tunis, Tunisia	Dec. 1-4, 1993
PRIDE		Rabat, Morocco	Dec. 6-11, 1993
APNES	Sensibilisation des animateurs des clubs de l'environnement	Sfax, Tunisia	April 6-7, 1994
IACT	Third IACT International Conference		April 6-8, 1994
	Salon International de la Protection et du Recyclage		April 27-30, 1994
USAID	Train-the-trainer course on pollution prevention	Washington, D.C.	May 8-20, 1994
USAID	Pollution prevention assessment training	Washington and Minneapolis, USA	Aug. 15-29, 1994
UNEP		Warsaw, Poland	Oct. 12-14, 1994
TSS	Les nouvelles technologies de protection de l'environnement		Oct. 28, 1994
UNEP/UNIDO	NCPC Training	Netherlands & France	Oct. 30-Nov. 10, 94
MEAT, CICS, USAID, PRIDE, EP3, WEC	Séminaire international sur la prospérité de la communauté par la prévention de la pollution: Opportunités pour les femmes et les ONG	Sfax, Tunisia	Sept. 19-21, 1994
OECD	Development assistance and technology cooperation for cleaner industrial production in developing countries	Hanover, Germany	Sept. 28-30, 1994
APNES		Sfax, Tunisia	Jan. 13-14, 1995
ONAS	L'assainissement dans une perspective de développement durable		

2.3 INDUSTRIAL POLLUTION PREVENTION ASSESSMENTS

As of January 1995, EP3 Tunisia has conducted pollution prevention assessments at 10 industrial plants (battery manufacturing, oil extraction and soap manufacturing, electroplating, textile dyeing, leather tanning, and printing) and two hotels. Working with engineers and managers at each facility, these audits have identified a total of 185 pollution prevention measures, including 59 process modification, 45 general good housekeeping, 27 energy conservation, 22 water conservation, 19 in-process recycling and 13 materials substitution measures (see Exhibit 3).

Implementation of these pollution prevention measures by the audited facilities is well under way thanks to the commitment of audited facilities and the follow-up assistance services provided by EP3 Tunisia. As indicated in Exhibit 4, these measures will:

- ▶ cost the audited industries about one million DT to implement; and
- ▶ reduce operating costs by about 3 million DT annually.

Operation and maintenance cost savings are due largely to water and energy savings. Indeed, implementation of the recommended pollution prevention measures will conserve, each year, at least:¹

- ▶ 230,000 m³ of water;
- ▶ 600,000 kwh of electricity;
- ▶ 500,000 m³ of gas; and
- ▶ 120,000 liters of fuel oil.

Moreover, the recommended pollution prevention measures will reduce raw materials consumption, waste generation and environmental pollution, decrease wastewater discharge fees and penalties, reduce workers' exposure to hazardous substances, and improve product quality and reduce the frequency of defects.

¹Because the audit reports did not always estimate water and energy savings, the above figures may underestimate total water and energy savings from the recommended pollution prevention measures. Future audit reports should provide separate estimates of water and energy savings resulting from the recommended pollution prevention measures.

EXHIBIT 3
SUMMARY OF POLLUTION PREVENTION ASSESSMENTS

Industry	# of Facilities Audited	Pollution Prevention Technique						Total
		Water Conservation	Energy Conservation	Materials Substitution	Process Modification	General Housekeeping	In-Process Recycling	
Battery Manufacturing	1	3	6	0	15	7	4	35
Oil Extraction & Refining b/	2	6	5	3	20	3	3	40
Leather Tanning	2	4	2	1	4	5	5	21
Electroplating	2	4	3	4	11	6	5	33
Textile Dyeing	2	5	11	2	8	13		39
Printing	1			3	1	11	2	17
Total	10	22	27	13	59	45	19	185

a/ Excludes audit results for two hotels, which were not available at the time of this review

b/ Including soap manufacturing

Source: EP3 Tunisia based on individual pollution prevention assessment reports

**EXHIBIT 4
WATER, ENERGY AND COST SAVINGS FROM
IMPLEMENTING RECOMMENDED POLLUTION PREVENTION MEASURES A/**

Industry	# of Facilities Audited	Cost to Implement PP measure (DT)	Annual Cost Savings from PP Measure (DT/yr)	Water Savings (m ³ /yr)	Energy Savings (electricity, gas, or fuel oil)
Battery Manufacturing	1	410,000	2,300,000	32,000	600,000 kwh/yr 260,000 m ³ gas/yr
Oil Extraction-Refining b/	2	410,000	450,000	150,000	NA
Leather Tanning	2	50,000	100,000	7,000	NA
Electroplating	2	40,000	80,000	17,000	NA
Textile Dyeing	2	160,000	130,000	23,000	260,000 m ³ gas/yr 120,000 l fuel/yr
Printing	1	NA	NA	NA	NA
Total	10	1,070,000	3,060,000	228,997	600,000

a/ Excludes audit results for two hotels, which were not available at the time of this review

b/ Including soap manufacturing

Source: EP3 Tunisia based on individual pollution prevention assessment reports

EP3 Tunisia is providing technical assistance to the audited facilities as they implement the recommended pollution prevention measures. Post-audit support includes identifying equipment vendors, testing and verification, and measuring economic and environmental performance of implemented measures.

Audited facilities are extremely pleased to participate in EP3 Tunisia's pollution prevention assessment program. Plant managers and directors deeply regret that AID funding to EP3 Tunisia will stop in six months. Box 2 provides a sample of citations from interviewed plant managers and directors.

EP3 Tunisia plans to conduct at least one pollution prevention assessment of a food processing plant, given the large number (more than 4,000) of such plants in Tunisia and their high pollution potential.

EP3 Tunisia has focused primarily on industrial pollution prevention. Urban pollution prevention issues were not addressed (e.g., municipal environmental management, pollution due to urban transport) although they are part of the overall EP3 agenda.

2.4 TECHNICAL AND POLICY SUPPORT TO GOVERNMENT

EP3 Tunisia has worked with the Government to promote the pollution prevention concept and practice in Tunisia. To work toward this objective, EP3 Tunisia and MEAT signed a Memorandum of Understanding in December 1993.

EP3 Tunisia is working with MEAT and ANPE to:

- ▶ formulate a *pollution prevention policy statement* that would be approved at the ministerial level; and
- ▶ develop a *pollution prevention strategy* (objectives) to be followed by a pollution prevention work plan (activities and milestones) to implement the strategy.

Interviewed MEAT and ANPE staff deeply regret that AID funding to EP3 Tunisia will stop in September 1995. All consider EP3 Tunisia an important and, in certain respects, unique resource for future pollution prevention activities. They recognize the unique qualifications of EP3 Tunisia to provide professional services in industrial pollution prevention: policy development, training and information dissemination, and technical assistance to industry (audits and follow-up support).

BOX 2

SAMPLE OF CITATIONS FROM INTERVIEWED PLANT MANAGERS

Audited facilities are extremely pleased to participate in EP3 Tunisia's pollution prevention assessment program. The following is a sample of citations from interviewed plant managers.

- "EP3 Tunisia made concrete recommendations to reduce waste and cost and increase product quality. We've already implemented these recommendations and were able to reduce waste and costs... EP3 Tunisia's pollution prevention Team included a veteran expert in battery manufacturing who was able to look inside the process and convince the plant engineer and floor manager," Mr. Mondher Cheikhrouhou, PDG, Société NOUR (battery manufacturing).
- "The EP3 Tunisia P2 team was able to quantify pollution and make pollution prevention recommendations for every step in the manufacturing process. We're glad to have benefited from their service and would be happy to pay for it next time," Mr. Choukri Ben Mabrouk, Technical Director, Société NOUR.
- "Although we've had industrial audits in the past, the EP3 Tunisia pollution prevention team was able to identify additional improvements to our process that will reduce water consumption and defective products. We've already invested 15,000 DT and plan to spend an additional 35,000 DT to implement the pollution prevention recommendations, and expect this investment to pay for itself within two to three years," Mr. Imed Jamoussi, Technical Director, Société SFJF (electroplating).
- "We were very much impressed with the professionalism of the EP3 Tunisia staff. They've always kept their engagements and proved they could deliver. EP3 Tunisia opened our eyes to the economic costs of pollution. We knew we had leaks and spills but never realized how much those were really costing us. We've now fixed all leaks and plan to implement their recommendations for heat recovery and water recycling as well," Mr. Khaled Mahouachi, General Director, Société FINO (textile dyeing).

The Government of Tunisia is following a proactive approach to environmental protection and sustainable development (see Box 3). This approach provides opportunities for EP3 Tunisia to continue to provide pollution prevention and other environmental consulting services. The following subsections examine EP3 Tunisia links to pertinent government programs and activities.

2.4.1 POLLUTION PREVENTION STRATEGY

With technical assistance from the USEPA, EP3 Tunisia has already drafted a white paper with recommendations for a cleaner production strategy in Tunisia.² EP3 Tunisia hasn't received feedback and comments from MEAT on this white paper. However, other funding agencies, such as GTZ (German Aid), have expressed interest in financing technical assistance to MEAT in formulating a pollution prevention strategy.

2.4.2 TRAINING OF GOVERNMENT STAFF

As discussed in Section 2.1, *more than 90 government staff* participated in EP3 Tunisia outreach seminars and training activities. Judging from the evaluations and feedback received, most participants found these outreach seminars and training activities unique, informative, and useful. In particular, EP3 Tunisia organized a half-day workshop at MEAT with 12 participants from MEAT and ANPE.

Working with the Water Environment Federation (WEF), a U.S. NGO, EP3 Tunisia is providing support to ONAS in preventing pollution from wastewater treatment facilities. EP3 Tunisia and WEF have already organized a P2 workshop at the international seminar on "Wastewater Treatment and Sustainable Development" organized by ONAS. Future support will include a training seminar for ONAS staff on pollution prevention in wastewater treatment facilities and a pollution prevention assessment of one facility.

²"Recommendations for a Cleaner Production Strategy in Tunisia," Prepared by EP3 Tunisia, Prepared for the Ministère de l'Environnement et l'Aménagement du Territoire, November 3, 1994.

Box 3

OVERVIEW OF ENVIRONMENTAL POLICIES AND PROGRAMS

The Government of Tunisia is following a pro-active approach to environmental protection and sustainable development. MEAT's environmental policies and programs are articulated around three main components:

- (1) *preventive*, aimed at ensuring that any new facilities are environmentally-sound. The requirements for environmental impact studies (EIS), which became effective March 13, 1991, are the primary tool to implement this component;
- (2) *curative*, aimed at eliminating or reducing pollution from existing facilities (prior to March 13, 1991). The Government established a clean-up fund ("Fonds de DEPollution" or FODEP) to promote the curative aspect of its environmental program; and
- (3) *monitoring and enforcement* by the ANPE, which controls all sources of nuisance, pollution, and environmental degradation.

The Government's commitment to environmental protection and sustainable development is illustrated by the following sample of activities (see Appendix B for more detail):

- Requirements for Environmental Impact Studies (EIS)
- Clean-up fund (FODEP)
- Interministerial Sustainable Development Commission
- Ecotechnology Center
- Pro-active Wastewater Treatment Program
- Polluter-Pays Principle
- Solid waste management program.

2.4.3 FONDS DE DÉPOLLUTION (FODEP)

The activities of MEAT and ANPE, while not inconsistent with the basic message of pollution prevention, do not explicitly promote the pollution prevention concept. For example, process changes and other pollution prevention measures are not explicitly identified as potential FODEP candidates (e.g., in promotional brochure). FODEP should cover pollution prevention assessments (see Box 4), but this assertion remains to be tested. In contrast, energy conservation and quality control programs are targeted for subsidies by the Agence de Maîtrise de l'Energie (AME) and the Agence de Promotion de l'Industrie (API).

BOX 4

DOES FODEP COVER POLLUTION PREVENTION INVESTMENTS?

After repeated inquiries from EP3 Tunisia, the ANPE representative took up the issue at a meeting of the FODEP Commission. The Commission's response: pollution prevention investments (process changes, etc.), including the costs of technical assistance, are covered by FODEP, provided the applicant can demonstrate that the investment will reduce environmental pollution (and is not a disguise for replacing obsolete equipment). Moreover, the Minister of Environment reportedly has directed FODEP managers to encourage applications to subsidize investments in clean technologies. However, no written statements supporting these assertions have been issued yet.

Moreover, according to the Director of Studies and Projects, pollution prevention investments in existing facilities should not be subject to the EIS requirements because such investments do not cause pollution or environmental degradation risks (see Article 14 of the EIS decree).

2.4.4 THE ECOTECHNOLOGY CENTER

While it would be preposterous to view the Ecotechnology Center as a direct result of the EP3 Tunisia initiative, it is clear that the Government of Tunisia as well as the concerned donor agencies (GTZ, UNIDO, etc.) view EP3 Tunisia as a major and in certain ways unique resource for the nascent Ecotechnology Center. EP3 Tunisia is expected to play a key role in helping the Ecotechnology Center implement its agenda. Support areas include pollution prevention training, information dissemination and assessments. EP3 Tunisia possesses excellent and unique qualifications in Tunisia in these areas and can expect to win request for proposals to support the Ecotechnology Center in the near future (end 1995 at the earliest).

2.4.5 ENVIRONMENTAL IMPACT STATEMENTS

Although the ANPE's Director of Studies and Projects (Mr. Ferchichi) is encouraging industries and consultants to consider clean technologies in EIS's, his department has no guidelines to offer on which clean technologies may apply in different industries. As a result, clean technologies and pollution prevention measures may not be adequately incorporated by industries and consultants in new facilities. Mr. Ferchichi believes EP3 Tunisia can help identify clean technologies and pollution prevention measures for different industries, but hasn't asked EP3 Tunisia to provide assistance to the ANPE in this area.

2.5 INFORMATION DISSEMINATION

EP3 Tunisia has become a major source of pollution prevention information in Tunisia. EP3 Tunisia's information clearinghouse is built around:

- ▶ a library of pollution prevention documentation (hard copies); plus
- ▶ the Tunisian Environmental Information System (TEIS), a computer-based data management system accessible via Internet.

2.5.1 LIBRARY OF POLLUTION PREVENTION DOCUMENTATION

EP3 Tunisia's library contains *more than 200 publications and reports* on pollution prevention. With support from EP3 Washington, EP3 Tunisia has responded to more than *20 individual requests* for information on pollution prevention (documents, reports, case studies). A sample of requested documentation includes:

- ▶ technologies to recycle:
 - plastics
 - marble and limestone powder

- ▶ pollution prevention for:
 - oil and gas pipeline projects
 - electroplating industry

- ▶ cement kiln dust control

- ▶ ISO 9000 quality standards

- ▶ catalytic converters

- ▶ environmental education materials

- ▶ pre-treatment of textile dyeing wastewaters.

EP3 Tunisia obtained requested documents from EP3 Washington and forwarded them as quickly as possible. In the process, EP3 Tunisia was able to augment its pollution prevention library.

Beneficiaries of these information requests have included ministries and government agencies (e.g., MEAT and ANPE), educational institutions (e.g., Ecole Nationale d'Ingénieurs de Gabès), and industries.

2.5.2 TUNISIAN ENVIRONMENTAL INFORMATION SYSTEM (TEIS)

In addition, EP3 Tunisia, working with IRSIT, has designed the Tunisian Environmental Information System (TEIS). IRSIT has built the computer shell of the system, which is now operational. The TEIS is the first and so far only pollution prevention information network to be developed by any of the EP3 offices worldwide. TEIS has three main components:

REVIEW OF EP3 TUNISIA ACHIEVEMENTS ▶ 2-16

- (1) InMagic, which provides document cataloguing of documents available at the EP3 Tunisia PP library;
- (2) local information system, which provides information on local PP databases developed by EP3 Tunisia (e.g., people, industries, requests for PP information, and environmental legislation and regulations);
- (3) international information system, which provides information on international P2 databases using the Gopher system.

Although EP3 Tunisia has input some of the data into the system (most of components (1) and (2) above), certain international data still await input from EP3 Washington (component (3) above).

CHAPTER 3

RECOMMENDATIONS TO INCREASE PROGRAM EFFECTIVENESS

In view of EP3 Tunisia's significant past achievements and to increase its effectiveness during the last six months of the program, the consultant recommends the following:

- (1) Market EP3 Tunisia's technical assistance services to two or three select industries;
- (2) Work more closely with Government to promote industrial pollution prevention; and
- (3) "Complete" and market the P2 Clearinghouse.

3.1 MARKET TECHNICAL ASSISTANCE SERVICES TO SELECT INDUSTRIES

EP3 Tunisia should market intensely two or three select industries for technical assistance services. Specifically, EP3 Tunisia should:

- (1) complete past pollution prevention assessments, and perhaps conduct one additional, free-of-charge assessment of a food processing plant;
- (2) develop a promotional brochure for industry;
- (3) select industries to be marketed;
- (4) organize industry-specific one-day seminars and follow-up with site visits; and
- (5) visit interested facilities and prepare proposals for technical assistance services.

In order to devote its resources to this intense marketing strategy, EP3 Tunisia should conduct no new free-of-charge pollution prevention assessments, except perhaps of one food processing facility. This is because several food processing industries have requested technical assistance from EP3 Tunisia in the past and no pollution prevention assessment of a food processing plant was conducted so far.

3.1.1 COMPLETE PAST POLLUTION PREVENTION ASSESSMENTS

EP3 Tunisia should continue to work closely with the facilities that were previously assessed to help them implement assessment recommendations. EP3 Tunisia should insist that these facilities document the economic and environmental performance of implemented measures. Also, future assessments by EP3 Tunisia should provide estimates of water and energy savings resulting from the recommended pollution prevention measures.

3.1.2 PRODUCE PROMOTIONAL BROCHURE AND CASE STUDIES

EP3 Tunisia should produce a promotional brochure for technical assistance services to industry. EP3 Tunisia also should complete the case studies of past assessments. Case studies must be short (two pages plus one table maximum), easy to read, and non technical. They should emphasize the economic and raw materials savings as well as the environmental benefits of the pollution prevention measures implemented. In addition, the case studies should explain how easy the pollution prevention assessment process is and how quick its results can be.

3.1.3 SELECT INDUSTRIES TO BE TARGETED FOR INTENSE MARKETING

EP3 Tunisia should select two or three industries to be marketed intensely. Criteria for selection of these industries include:

- ▶ industry previously assessed by EP3 Tunisia;
- ▶ degree of pollution by industry;
- ▶ number of facilities in the industry;
- ▶ proportion of older facilities (i.e., using old technologies);
- ▶ economic conditions of the industry; and

22

RECOMMENDATIONS TO INCREASE PROGRAM EFFECTIVENESS ▶ 3-3

- ▶ strength and commitment of industry trade association and technology center. For example, EP3 Tunisia should evaluate technical assistance services provided by the industry technology center: contents and prices of training seminars, link to pollution prevention, follow-up measures (if any), etc. If possible, EP3 Tunisia should attend one of these seminars.

Candidate target industries include leather tanning, metal finishing, textile dyeing, and food processing.

3.1.4 ORGANIZE INDUSTRY-SPECIFIC ONE-DAY SEMINARS

Next, EP3 Tunisia should develop and implement a marketing strategy to sell technical assistance services to the select industries. For example, for each select industry, EP3 Tunisia could organize a one-day seminar, preferably for a fee, in collaboration with the industry trade association and perhaps the industry technology center. EP3 Tunisia's pollution prevention industry expert and the technical director of the previously-assessed facility should participate in the seminar. For each select industry, EP3 Tunisia should:

- ▶ Send invitation letters in advance and attach promotional materials for the seminar, which should include the industry-specific case study and EP3 Tunisia's promotional brochure
- ▶ Follow-up invitation letters with phone calls
- ▶ Design seminar evaluation form to obtain as much information as possible on each participating facility (processes used, potential for pollution prevention, potential interest in pollution prevention assessment)
- ▶ Offer to visit interested facilities immediately after the seminar (this will allow EP3 Tunisia to take advantage of the presence in Tunisia of the pollution prevention industry expert)
- ▶ For facilities not visited immediately after the seminar, follow-up seminar with phone calls based on responses to evaluation form

3.1.5 VISIT INTERESTED FACILITIES AND SUBMIT PROPOSALS FOR TECHNICAL ASSISTANCE

EP3 Tunisia should visit interested facilities, either immediately after the seminar (see Subsection 3.1.4) or later. The objectives of this visit are to walk through the plant and pre-identify the potential for pollution prevention before preparing a proposal to conduct a pollution prevention assessment of the facility

If significant opportunities for pollution prevention exist at a visited facility, prepare and submit proposal to conduct a pollution prevention assessment of that facility. Box 5 suggests an outline for such a proposal.

EP3 Tunisia should design pollution prevention assessment services as an *integrated package* to include:

- ▶ pre-assessment data collection;
- ▶ facility assessment;
- ▶ pollution prevention assessment report (draft and final), to include pre-treatment recommendations;
- ▶ assistance in applying to FODEP (filling out FODEP application forms, preparing technical reports in appropriate format, etc.); and
- ▶ assistance in implementing pollution prevention recommendations, including pre-treatment, and meeting FODEP milestones

EP3 Tunisia should design payment schedule for EP3 Tunisia services in two phases:

- (1) pre-approval by FODEP: charges should be minimal and represent a fraction of the costs incurred (pre-assessment, assessment, and assessment report)
- (2) post-approval by FODEP: lump sum payment upon approval to pay remaining pre-approval costs plus fee, plus schedule of payments tied to FODEP milestones.

Such a schedule links payment to performance using an objective criterion (FODEP decisions). It provides an incentive to the prospective client (industrial facility) to buy EP3 Tunisia services to

BOX 5

SUGGESTED OUTLINE OF INDUSTRY PROPOSALS

1. BACKGROUND AND CURRENT SITUATION

Provide background information on pollution prevention in general. Discuss briefly the current situation at the targeted facility. Show the need for a pollution prevention assessment

2. PURPOSE

Summarize the key objectives of the proposed pollution prevention technical assistance services

3. SCOPE OF WORK

Describe in general terms the proposed scope of work and present in detail each proposed task

4. PROPOSED PERSONNEL

Introduce staff proposed for each task and summarize their qualifications. Provide CVs in Appendix A

6. COMPANY QUALIFICATIONS

Describe pertinent qualifications of EP3 Tunisia (or CP3). Emphasize results obtained at previous pollution prevention assessments. Provide more detail on company qualifications in Appendix B, plus promotional brochure and case studies separately

7. PROPOSED LEVEL OF EFFORT AND SCHEDULE

Propose level of effort (number of person-months or days) by task and proposed personnel. Present proposed schedule of tasks, showing key milestones (e.g., FODEP applications and approvals, etc.)

APPENDIX A CVs OF PROPOSED PERSONNEL

APPENDIX B PROJECT DESCRIPTIONS

25

RECOMMENDATIONS TO INCREASE PROGRAM EFFECTIVENESS ▶ 3-6

the extent (1) substantive payments are linked to obtaining subsidy and/or loan from FODEP; and (2) FODEP subsidies and loans cover the costs of technical assistance to the facility.

3.2 WORK WITH GOVERNMENT TO PROMOTE INDUSTRIAL POLLUTION PREVENTION

EP3 Tunisia should:

- (1) work with Government to draft a pollution prevention policy statement;
- (2) secure funding for developing a pollution prevention strategy; and
- (3) market technical and policy support services to MEAT and ANPE.

3.2.1 DRAFT A POLLUTION PREVENTION POLICY STATEMENT

EP3 Tunisia should work with MEAT and ANPE officials to draft a pollution prevention policy statement to be issued by the Minister's cabinet before the end of September 1995. Without such

a written statement from a top-level official, pollution prevention will not receive the universal attention it deserves and will not be perceived as a real priority.

3.2.2 SECURE FUNDING FOR DEVELOPING A POLLUTION PREVENTION STRATEGY

In parallel, EP3 Tunisia should impress upon MEAT and donor agencies the need to formulate a pollution prevention strategy. This strategy should provide a unifying framework for other ongoing MEAT activities, such as plans for the Ecotechnology Center.

EP3 Tunisia should identify and contact sources of funding (e.g., GTZ, UNEP, UNIDO) to develop the pollution prevention strategy. EP3 Tunisia should secure funding to conduct such a project after September 1995, either directly from the donor agency or indirectly through MEAT and the Ecotechnology Center. In the latter case, EP3 Tunisia should be prepared to submit a competitive bid for the project.

RECOMMENDATIONS TO INCREASE PROGRAM EFFECTIVENESS ▶ 3-7

EP3 Tunisia should invite the ANPE to make a presentation on FODEP at the industry-specific seminars organized by EP3 Tunisia as part of its marketing strategy for targeted industries. EP3 Tunisia also should offer to participate in meetings with industries organized by the ANPE to promote the use of FODEP.

3.2.3 MARKET SPECIFIC SERVICES TO MEAT AND ANPE

EP3 Tunisia should market specific support services (for a fee) to MEAT, ANPE, ONAS, and the nascent Ecotechnology Center. These technical and policy support services may include:

- ▶ training employees and enforcement agents in pollution prevention rather than end-of-pipe treatment;
- ▶ training EIS consultants and ANPE reviewers in identifying and evaluating pollution prevention alternatives;
- ▶ developing industry-specific pollution prevention fact sheets and guides on clean technologies; and
- ▶ developing promotional brochures to encourage existing facilities to take advantage of FODEP by investing in clean technologies.

3.3 COMPLETE AND MARKET POLLUTION PREVENTION CLEARINGHOUSE

EP3 Tunisia should:

- (1) "complete" missing parts of the Tunisian Environmental Information System (TEIS);
- (2) assess the market for pollution prevention clearinghouse services; and
- (3) develop its clearinghouse capabilities based on the results of the market assessment.

3.3.1 "COMPLETE" MISSING PARTS OF TEIS

EP3 Tunisia should work with EP3 Washington and IRSIT to complete the missing parts of TEIS so that all of its components become operational.

3.3.2 ASSESS THE MARKET FOR POLLUTION PREVENTION CLEARINGHOUSE SERVICES

EP3 Tunisia should assess the market for pollution prevention clearinghouse services: potential buyers, prices and payment mechanisms, maintenance and updating, interest in pollution prevention library versus TEIS, etc. In particular, EP3 Tunisia should meet with UNDP staff in charge of developing Tunisia's Sustainable Development Network (SDN) under the Agenda 21 program. EP3 Tunisia should discuss the potential role of TEIS in SDN and promote TEIS as the pollution prevention component (or node) of SDN.

3.3.3 DEVELOP CLEARINGHOUSE CAPABILITIES BASED ON MARKET ASSESSMENT

EP3 Tunisia could decide on the scope of development of the pollution prevention library and TEIS based on the results of the market assessment. Then EP3 Tunisia could develop the pollution prevention library and TEIS accordingly.

EP3 Tunisia could also provide support to other EP3 offices (e.g., Egypt) as they design their own environmental information system.

RECOMMENDATIONS TO INCREASE PROGRAM EFFECTIVENESS ▶ 3-9

**EXHIBIT 5
TENTATIVE SCHEDULE OF ACTIVITIES**

Activity	March	April	May	June	July	August	Sept.
Market technical assistance services to select industries							
• Complete past P2 assessments a/		●					
• Develop promotional brochure and prepare case studies							
• Select industries to be targeted for intense marketing							
• Organize one-day seminars and follow-up with site visits			▼				
• Visit interested facilities and submit proposals for T.A.							
Work with Government to promote industrial PP							
• Draft a pollution prevention policy statement							
• Secure funding for developing a pollution prevention strategy							
• Market technical and policy support services to MEAT and ANPE							
"Complete" and promote the P2 Clearinghouse							
• "Complete" missing parts of TEIS							
• Assess market for P2 clearinghouse services, incl. link to SDN							
• Develop clearinghouse capabilities based on market assessment							

a/ Including one additional, free-of-charge P2 assessment of a food processing plant

● Leadership Conference

▼ Invitation Letters

25

CHAPTER 4

SUMMARY AND CONCLUSIONS

This chapter summarizes this mid-term review by answering the four basic questions presented in Section 1.2. Conclusions are then presented in the last section.

4.1 TO WHAT EXTENT HAS THE PROGRAM SUCCEEDED IN INCREASING AWARENESS OF ENVIRONMENTAL PROBLEMS AND THE ROLE POLLUTION PREVENTION CAN PLAY IN ADDRESSING THESE PROBLEMS?

Using a combination of outreach and training, industrial pollution prevention assessment, technical and policy support to government, and information dissemination, EP3 Tunisia has made significant contributions to increasing awareness of environmental problems and the role pollution prevention can play in addressing these problems.

4.1.1 OUTREACH AND TRAINING

Since its creation in October 1993, EP3 Tunisia has undertaken an impressive number of outreach seminars (five) and training activities (seven). More than 500 participants took part in these outreach and training activities, including more than 200 from industry, 80 from government, and 200 consultants and engineering students. In addition, EP3 Tunisia staff have participated in more than 15 national and international conferences and seminars and have met individually with more than 100 representatives of government and industry to promote pollution prevention.

4.1.2 INDUSTRIAL POLLUTION PREVENTION ASSESSMENTS

As of January 1995, EP3 Tunisia has conducted pollution prevention assessments at 10 industrial plants (battery manufacturing, oil extraction and soap manufacturing, electroplating, textile dyeing, leather tanning, and printing) and two hotels. Working with engineers and managers at each facility, these audits have identified a total of 185 pollution prevention measures, including 59 process modification, 45 general good housekeeping, 27 energy conservation, 22 water conservation, 19 in-process recycling and 13 materials substitution measures.

Implementation of these pollution prevention measures by the audited facilities is well under way. Once completed, these measures will have cost the audited industries about one million DT to implement and will reduce operating costs by about 3 million DT annually. Operation and maintenance cost savings are due largely to water and energy savings. Indeed, implementation of the recommended pollution prevention measures will conserve annually at least 230,000 m³ of water, 600,000 kwh of electricity, 500,000 m³ of gas, and 120,000 liters of fuel oil.

4.1.3 TECHNICAL AND POLICY SUPPORT TO GOVERNMENT

EP3 Tunisia has worked with the Government to promote the pollution prevention concept and practice in Tunisia. To work toward this objective, EP3 Tunisia and MEAT signed a MOU in December 1993. EP3 Tunisia is working with MEAT and ANPE to:

- ▶ formulate a *pollution prevention policy statement* that would be approved at the ministerial level; and
- ▶ develop a *pollution prevention strategy* (objectives) to be followed by a pollution prevention work plan (activities and milestones) to implement the strategy.

Interviewed MEAT and ANPE staff deeply regret that AID funding to EP3 Tunisia will stop in September 1995. All consider EP3 Tunisia an important and in certain respects unique resource for future pollution prevention activities. They recognize the unique qualifications of EP3 Tunisia to provide professional services in industrial pollution prevention: policy development, training and information dissemination, and technical assistance to industry (assessments and follow-up support).

4.1.4 INFORMATION DISSEMINATION

EP3 Tunisia has become a major source of pollution prevention information in Tunisia. EP3 Tunisia's information clearinghouse is built around a library of pollution prevention documentation (hard copies) and the Tunisian Environmental Information System (TEIS), a computer-based data management system accessible via Internet.

EP3 Tunisia's library contains *more than 200 publications and reports* on pollution prevention. With support from EP3 Washington, EP3 Tunisia has responded to more than *20 individual requests* for information on pollution prevention (documents, reports, case studies). EP3 Tunisia obtained requested documents from EP3 Washington and forwarded them as quickly as possible.

In the process, EP3 Tunisia was able to augment its pollution prevention library. Beneficiaries of these information requests have included ministries and government agencies (e.g., MEAT and ANPE), educational institutions (e.g., Ecole Nationale d'Ingénieurs de Gabès), and industries.

In addition, EP3 Tunisia, working with IRSIT, has designed the Tunisian Environmental Information System (TEIS). IRSIT has built the computer shell of the system, which is now operational. The TEIS is the first and so far only pollution prevention information network to be developed by any of the EP3 offices worldwide. Although EP3 Tunisia has input some of the data into the system (most of components (1) and (2) above), certain international data still await input from EP3 Washington (component (3) above).

4.2 HAS THE GOVERNMENT TAKEN ANY STEPS TO INCLUDE INCENTIVES FOR POLLUTION PREVENTION IN IT ENVIRONMENTAL POLICIES AND REGULATIONS?

The Government has a proactive approach to environmental protection and sustainable development, as illustrated by the following sample of policies and programs:

- ▶ Requirements for Environmental Impact Studies (EIS)
- ▶ Clean-up fund (FODEP)
- ▶ Interministerial Sustainable Development Commission
- ▶ Ecotechnology Center
- ▶ Pro-active Wastewater Treatment Program
- ▶ Polluter-Pays Principle
- ▶ Solid waste management program.

Plans for the Ecotechnology Center, which should start operating before the end of the year, indicate a clear government commitment to pollution prevention and clean technologies. Such plans also indicate a strong commitment of international donor agencies such as UNIDO and GTZ. Other indicators provide mixed signals about government commitment. For example, there is some confusion --among both government and industry-- about whether the recently-

established cleanup fund (FODEP) covers pollution prevention investments or not. EP3 Tunisia has pressed the government on this issue and has obtained verbal assurances that FODEP covers pollution prevention assessments; but this has not been tested yet. Also, EIS consultants and reviewers at the ANPE may not be aware of the full range of opportunities offered by pollution prevention.

4.3 HAS A DEMAND FOR POLLUTION PREVENTION BEEN CREATED? HOW? HOW MUCH? WHAT ADDITIONAL STEPS COULD EP3 TUNISIA TAKE TO INCREASE DEMAND IN REMAINING MONTHS?

There is an increasing demand for pollution prevention in Tunisia today. Thanks in part to EP3 Tunisia's efforts, many government and industry representatives seem convinced of the need for and benefits of pollution prevention. EP3 Tunisia has contributed significantly to creating this demand by spreading the pollution prevention message through its outreach seminars and training activities and by demonstrating pollution prevention through targeted pollution prevention assessments and follow-up activities.

Demand for pollution prevention in Tunisia is enhanced by the Governments' proactive environmental policies and programs (see Section 4.2 above). Government policies and programs have created a favorable environment for pollution prevention that is not currently available in many developing and neighboring countries, such as Morocco. However, the Government hasn't yet clearly spelled out its preference for pollution prevention. As a result, although many government and industry representatives have become more aware of the need for and benefits of pollution prevention, many may continue to conduct business according to the old "end-of-the-pipe-treatment" paradigm. Demand for pollution prevention will increase once government commitment is more clearly articulated.

To increase demand in the remaining six months of the project, EP3 Tunisia should:

- (1) market technical assistance services intensively to two or three select industries, such as leather tanning, metal finishing, and textile dyeing ; and
- (2) work more closely with the Government to promote industrial pollution prevention.

In addition, EP3 Tunisia should "complete" and market the pollution prevention clearinghouse.

4.4 HAS THE PROGRAM SUCCEEDED IN CHARGING FEES FOR POLLUTION PREVENTION SERVICES (TECHNICAL ASSISTANCE, TRAINING, AND INFORMATION)?

Since its inception, EP3 Tunisia has charged fees on a few occasions. EP3 Tunisia charged participants a 50 DT registration fee (about \$50) for the three-day train-the-trainer program held last November in Tunis. While this fee was below the true program cost, many participants said they would be willing to pay twice and even three times this amount to participate in future similar workshops on specific pollution prevention topics. According to EP3 Tunisia, a registration fee of 150 DT would be sufficient to recover program costs.

In addition, some industrial facilities have paid a symbolic 500 DT to participate in EP3 Tunisia's pollution prevention assessment program. Interviewed plant directors and managers said that industries would be willing to pay a fee for the service provided by EP3 Tunisia. They stressed, however, the importance of linking payments to performance and the need to keep service fees moderate (e.g., not exceeding 5,000 DT). With these considerations in mind, EP3 Tunisia may need to link payment schedules for services rendered to objective performance criteria such as subsidy approval by FODEP. EP3 Tunisia could assist facilities in applying for FODEP and implementing pollution prevention recommendations. In this case, EP3 Tunisia could design the payment schedule for EP3 Tunisia services in two phases:

- (1) pre-approval by FODEP: charges should be minimal and represent a fraction of the costs incurred (pre-assessment, assessment, and assessment report)
- (2) post-approval by FODEP: lump sum payment upon approval to pay remaining pre-approval costs plus fee, plus schedule of payments tied to FODEP milestones.

Such a schedule links payment to performance using an objective criterion (FODEP decisions). It provides an incentive to the prospective client to buy EP3 Tunisia services to the extent (1) substantive payments are linked to obtaining subsidy and/or loan from FODEP; and (2) FODEP subsidies and loans cover the costs of technical assistance to the facility.

4.5 CONCLUSIONS

Since its creation in October 1993, EP3 Tunisia has built a solid reputation for professional, reliable, and quality services in the area of pollution prevention. No other Tunisian NGO or consulting firm offers similar or comparable pollution prevention services in Tunisia.

SUMMARY AND CONCLUSION ▶ 4-6

EP3 Tunisia is playing and should continue to play a key role in promoting the pollution prevention concept by: (1) encouraging the ANPE to include clean technologies in the EIS process; and (2) pressing the Government to clarify the extent of FODEP coverage (i.e., are pollution prevention investments covered?).

EP3 Tunisia's earned goodwill among industry and government representatives should allow it to win competitive bids for pollution prevention projects in the future. During the remaining six months of the program, EP3 Tunisia should try to secure at least (1) one contract with a private industry to provide technical assistance services in pollution prevention; and (2) funding to provide technical and policy support to the government in formulating a pollution prevention strategy. In addition, EP3 Tunisia should diversify into other environmental fields such as solid waste management and municipal environmental management.

APPENDIX A

LIST OF INDIVIDUALS MET

While in Tunisia, the consultant met with staff, managers, or representatives from:

- ▶ EP3 Tunisia;
- ▶ US AID/Tunisia;
- ▶ government ministries and agencies, including MEAT, ANPE, and ONAS;
- ▶ three industrial facilities that have received and continue to receive technical assistance support from EP3 Tunisia; and
- ▶ other participating organizations, such as IRSIT and UTICA.

Mr. Karam also interviewed participants in the outreach seminars and training activities organized by EP3 Tunisia. This appendix presents a list of individuals met.

A.1 EP3 TUNISIA

Mr. Rachid NAFTI
Office Director and Private Sector Specialist

Ms. Halima M'RAD
Institutional Specialist

Mr. Maher HARMEL
Pollution Prevention Engineer

A.2 US AID

Mr. Barry HILL
US AID Project Officer

LIST OF INDIVIDUALS MET ▶ A-2

Mr. Mohamed ALI
Environment Officer

Mr. David PANDER
AID Director and
RHUDO Project Officer

A.3 GOVERNMENT MINISTRIES AND AGENCIES

MEAT

Ms. Amel BENZARTI
Chargée de Mission

Mr. FRIAA
Directeur
Département de l'Environnement Industriel

ANPE

Mr. Mounir Ferchichi
Directeur
Département des Etudes et Projets

Mr. Samir MEDDAB
Département des Etudes et Projets

Mr. GASPAR
Service FODEP
Département des Etudes et Projets

ONAS

Ms. Amel JRAD FANTAR
Hydrobiologiste
Laboratoire Central

Mr. Aniba BELHASSEN
Budget et Tarification

A.4 MANAGERS OF PARTICIPATING INDUSTRIES

NOUR

Mr. Mondher CHEIKHROUHOU
President

Mr. Chokri Ben MABROUK
Technical Director

SOCIÉTÉ FONDERIES J.F.

Mr. Imed JAMOUSSE
Manager
Information System - Production Control - Quality Control

FINO

Mr. Khaled MAHOUACHI
President

A.5 OTHER EP3 TUNISIA PARTNERS

UTICA

Mr. Fethi M'BAREK
Président
Chambre Syndicale Nationale pour la Gestion Industrielle de l'Environnement et dy Recyclage

IRSIT

Mr. Mondher MAKNI
Directeur de Laboratoire

**A.6 SELECT PARTICIPANTS IN OUTREACH SEMINARS AND TRAINING
ACTIVITIES**

Ms. Amel JRAD FANTAR
Hydrobiologiste
Laboratoire Central, ONAS

Mr. Hadi HASSOUNAH
Ingénieur-Conseil
Etudes, Conseils, Formation - Energie et Environnement

APPENDIX B

OVERVIEW OF ENVIRONMENTAL PROGRAMS AND POLICIES

The Government of Tunisia is following a pro-active approach to environmental protection and sustainable development as illustrated by the following examples:

- ▶ Requirements for Environmental Impact Studies (EIS). The EIS process is managed by the ANPE, which has reviewed hundreds of EIS since the EIS requirement became law in March 13, 1991 (Décret N° 91-362). The EIS process is the implementation tool for the *preventive* component of MEAT's environmental policies and programs.
- ▶ Cleanup fund (FODEP). The "Fonds de Dépollution" was established by law (Loi N° 92-122) in December 29, 1992. The terms of eligibility and application conditions to FODEP were elaborated in a decree (Décret N° 93-2120) promulgated in October 25, 1993. FODEP reinforces the *curative* component of MEAT's environmental policies and programs. According to the promotional brochure of FODEP, FODEP subsidizes up to 20 percent of the investment costs for the following projects:¹
 - installations aimed at reducing or eliminating industrial pollution (e.g., pretreatment units, filters, etc.);
 - common treatment facilities for several industrial plants grouped by type of activity, whether built by public or private entities; and
 - solid waste collection and recycling units.
- ▶ Interministerial Sustainable Development Commission. Created at the direction of the President of the Republic, this Commission regroups the various ministries involved in economic and social development. The MEAT assumes secretariat responsibilities.
- ▶ Ecotechnology Center. With funding from donor agencies (UNIDO) and the Government of Tunisia, the Ecotechnology Center is under planning and construction and should begin

¹MEAT et ANPE, "Pour vos projets de dépollution, pour vos projets de collecte et de recyclage des déchets, pour améliorer et préserver l'environnement, adressez-vous au FODEP"

OVERVIEW OF ENVIRONMENTAL PROGRAMS AND POLICIES ► B-2

operation before the end of 1995. The Ecotechnology Center responds to a recommendation of the United Nations Conference on Environment and Development Agenda 21 (the Rio Conference). It will serve as a national --and perhaps regional-- focal

point for promoting and developing environmentally-sound technologies and sustainable development programs. The Ecotechnology Center will conduct the following main activities:²

- (1) develop a data base on environmental technologies in industrialized and developing countries;
 - (2) establish a training center to provide universities and educational institutions with expertise in using environmental technologies, taking into account the specific needs of Tunisia and the region;
 - (3) conduct applied research, in collaboration with research institutes and universities, in the areas of engineering, technology, marketing, and management, both in the public and private sectors; and
 - (4) Provide adequate infrastructure for promoting industrial development of environmental technologies adapted to Tunisia and its environmental legislative program.
- Pro-active Wastewater Treatment Program. Tunisia is a leader in the area of municipal wastewater treatment, thanks to the efforts of the Office National de l'Assainissement (ONAS) in the last 20 years. Tunisia has one of the highest collection and treatment coverage rates in urban areas. It has stringent industrial wastewater effluent standards. The wastewater discharge fees levied by the ONAS are a function of pollutant concentrations and wastewater volume.
- Polluter-Pays Principle. The polluter-pays principle is actively implemented in Tunisia. ANPE's enforcement agents ("experts contrôleurs", established by Décret N° 90-2273, December 25, 1990) have access to industrial and other facilities and can assess fines and penalties ranging from 100 DT to 50,000 DT in case of non-compliance.³ The ANPE

²Ministère de l'Environnement et de l'Aménagement du Territoire, "Centre d'Ecotechnologie Tunisie"

³Non-compliance applies to all environmental media, but remains vague and ill-defined since emission standards exist only for wastewater discharges.

OVERVIEW OF ENVIRONMENTAL PROGRAMS AND POLICIES ► B-3

assesses an average of about 2,500 fines/penalties each year; the average fine/penalty is between 1,000 DT and 5,000 DT.

- ▶ Solid waste management program. MEAT has embarked on an ambitious program to build 23 sanitary landfills in the capitals ("chef-lieu") of the 23 provinces of Tunisia. Detailed engineering designs are ready for some of these landfills and MEAT is expected to call for construction and operation bids in the near future. In addition, the Government has drafted a solid waste management bill that will be discussed in Parliament. Finally, investments in solid waste collection and recycling equipment are targeted for government subsidies under FODEP, as discussed next.

LIST OF INDIVIDUALS MET ▶ A-3

ONAS

Ms. Amel JRAD FANTAR
Hydrobiologiste
Laboratoire Central

Mr. Aniba BELHASSEN
Budget et Tarification

A.4 MANAGERS OF PARTICIPATING INDUSTRIES

NOUR

Mr. Mondher CHEIKHROUHOU
President

Mr. Chokri Ben MABROUK
Technical Director

SOCIÉTÉ FONDERIES J.F.

Mr. Imed JAMOUSI
Manager
Information System - Production Control - Quality Control

FINO

Mr. Khaled MAHOUACHI
President

A.5 OTHER EP3 TUNISIA PARTNERS

UTICA

Mr. Fethi M'BAREK

Président

Chambre Syndicale Nationale pour la Gestion Industrielle de l'Environnement et dy Recyclage

IRSIT

Mr. Mondher MAKNI

Directeur de Laboratoire

**A.6 SELECT PARTICIPANTS IN OUTREACH SEMINARS AND TRAINING
ACTIVITIES**

Ms. Amel JRAD FANTAR

Hydrobiologiste

Laboratoire Central, ONAS

Mr. Hadi HASSOUNAH

Ingénieur-Conseil

Etudes, Conseils, Formation - Energie et Environnement

APPENDIX B

OVERVIEW OF ENVIRONMENTAL PROGRAMS AND POLICIES

The Government of Tunisia is following a pro-active approach to environmental protection and sustainable development as illustrated by the following examples:

- ▶ Requirements for Environmental Impact Studies (EIS). The EIS process is managed by the ANPE, which has reviewed hundreds of EIS since the EIS requirement became law in March 13, 1991 (Décret N° 91-362). The EIS process is the implementation tool for the *preventive* component of MEAT's environmental policies and programs.

- ▶ Cleanup fund (FODEP). The "Fonds de Dépollution" was established by law (Loi N° 92-122) in December 29, 1992. The terms of eligibility and application conditions to FODEP were elaborated in a decree (Décret N° 93-2120) promulgated in October 25, 1993. FODEP reinforces the *curative* component of MEAT's environmental policies and programs. According to the promotional brochure of FODEP, FODEP subsidizes up to 20 percent of the investment costs for the following projects:¹
 - installations aimed at reducing or eliminating industrial pollution (e.g., pretreatment units, filters, etc.);

 - common treatment facilities for several industrial plants grouped by type of activity, whether built by public or private entities; and

 - solid waste collection and recycling units.

- ▶ Interministerial Sustainable Development Commission. Created at the direction of the President of the Republic, this Commission regroups the various ministries involved in economic and social development. The MEAT assumes secretariat responsibilities.

- ▶ Ecotechnology Center. With funding from donor agencies (UNIDO) and the Government of Tunisia, the Ecotechnology Center is under planning and construction and should begin

¹MEAT et ANPE, "Pour vos projets de dépollution, pour vos projets de collecte et de recyclage des déchets, pour améliorer et préserver l'environnement, adressez-vous au FODEP"

OVERVIEW OF ENVIRONMENTAL PROGRAMS AND POLICIES ► B-2

operation before the end of 1995. The Ecotechnology Center responds to a recommendation of the United Nations Conference on Environment and Development Agenda 21 (the Rio Conference). It will serve as a national --and perhaps regional-- focal point for promoting and developing environmentally-sound technologies and sustainable development programs. The Ecotechnology Center will conduct the following main activities:²

- (1) develop a data base on environmental technologies in industrialized and developing countries;
 - (2) establish a training center to provide universities and educational institutions with expertise in using environmental technologies, taking into account the specific needs of Tunisia and the region;
 - (3) conduct applied research, in collaboration with research institutes and universities, in the areas of engineering, technology, marketing, and management, both in the public and private sectors; and
 - (4) Provide adequate infrastructure for promoting industrial development of environmental technologies adapted to Tunisia and its environmental legislative program.
- Pro-active Wastewater Treatment Program. Tunisia is a leader in the area of municipal wastewater treatment, thanks to the efforts of the Office National de l'Assainissement (ONAS) in the last 20 years. Tunisia has one of the highest collection and treatment coverage rates in urban areas. It has stringent industrial wastewater effluent standards. The wastewater discharge fees levied by the ONAS are a function of pollutant concentrations and wastewater volume.
- Polluter-Pays Principle. The polluter-pays principle is actively implemented in Tunisia. ANPE's enforcement agents ("experts contrôleurs", established by Décret N° 90-2273, December 25, 1990) have access to industrial and other facilities and can assess fines and penalties ranging from 100 DT to 50,000 DT in case of non-compliance.³ The ANPE

²Ministère de l'Environnement et de l'Aménagement du Territoire, "Centre d'Ecotechnologie Tunisie"

³Non-compliance applies to all environmental media, but remains vague and ill-defined since emission standards exist only for wastewater discharges.

OVERVIEW OF ENVIRONMENTAL PROGRAMS AND POLICIES ► B-3

assesses an average of about 2,500 fines/penalties each year; the average fine/penalty is between 1,000 DT and 5,000 DT.

- Solid waste management program. MEAT has embarked on an ambitious program to build 23 sanitary landfills in the capitals ("chef-lieu") of the 23 provinces of Tunisia. Detailed engineering designs are ready for some of these landfills and MEAT is expected to call for construction and operation bids in the near future. In addition, the Government has drafted a solid waste management bill that will be discussed in Parliament. Finally, investments in solid waste collection and recycling equipment are targeted for government subsidies under FODEP, as discussed next.