

Ministry of Public Works and Water Resources  
US Agency for International Development  
Agricultural Policy Reform Program  
Environmental Policy and Institutional Strengthening Indefinite Quantity Contract

---

**APRP - Water Policy Activity  
Contract PCE-I-00-96-00002-00  
Task Order 807**

***REVISION OF LAW 48 OF 1982  
FOR THE PROTECTION OF THE NILE RIVER  
AND ITS WATERWAYS FROM POLLUTION  
Tranche III Water Benchmark C8 Report***

***Report No. 21  
Main Document***

**June 1999**

---

**Water Policy Program  
International Resources Group Winrock International Nile Consultants**

Task Order No. 807  
Contract No. PCE-I-OO-96-00002-00

**REVISION OF LAW 48 OF 1982 FOR THE  
PROTECTION OF THE NILE RIVER AND ITS  
WATERWAYS FROM POLLUTION**  
*Tranche III Water Benchmark C8 Report*

Prepared By  
Eng. Nasser Ezzat  
Dr. Ibrahim Elassiouty  
Dr. Fatma El-Gohary  
Mr. Victor Kimm  
Dr. Mohamed Sameh

June 1999

For  
United States Agency for International Development//Egypt

*Environmental Policy and Institutional Strengthening Indefinite Quantity Contract (EPIQ)*  
*Partners: International Resources Group, Winrock International,*  
*and Harvard Institute for International Development*

*Subcontractors: PADCO; Management Systems International; and Development Alternatives, Inc.*

*Collaborating Institutes: Center for Naval Analysis Corporation; Conservation International; KNB Engineering and Applied Science, Inc.; Keller-Bliesner Engineering; Resource Management International, Inc.;*  
*Tellus Institute; Urban Institute; and World Resources Institute.*

## ACKNOWLEDGEMENTS

This report was prepared by WPAU / EPIQ Revision of Law 48/1982 Working Group. Members of the group include Eng. Nasser Ezzat, Dr. Ibrahim Elassiouti, Dr. Fatma El-Gohary, Mr. Victor Kimm and Dr. Mohamed Sameh.

Important comments and suggestions were made by Eng. Yehia Abdel-Aziz Head of the Irrigation Department and Chairman of Inter-ministerial Committee for Reviewing Law 48/1982. This report could not have been prepared without the interest and cooperation of the many ministries participating in this committee.

The EPIQ Water Policy Reform Program (WPRP) is a joint activity of the Ministry of the Public Works and Water Resources (MPWWR) and the US Agency for International Development (USAID). It is carried out under the auspices of the Agricultural Policy Reform Program (APRP). Program Implementation is the responsibility of Winrock International, International Resources Group, and the Nile Consultants.

Special thanks to Eng. Gamil Mahmoud, Chairman of the MPWWR Project Steering Committee and the MPWWR Water Policy Advisory Unit, Dr. Craig Anderson, USAID project Technical Officer, and Dr. Jeffrey Fredericks, EPIQ WPRP Team Leader, for their leadership and support.

# TABLE OF CONTENTS

<b>Acknowledgements .....</b>	<b>i</b>
<b>list of Acronyms.....</b>	<b>iv</b>
<b>Executive Summary .....</b>	<b>E-1</b>
<b>1 Introduction.....</b>	<b>1-1</b>
1.1 Overview.....	1-1
1.2 Purpose of the Report.....	1-1
1.3 Organization of the Report.....	1-2
1.4 The Need for Reviewing Law 48/1982.....	1-1
<b>2. Background .....</b>	<b>2-1</b>
2.1 Water Availability and Demand .....	2-1
2.2 Water Quality.....	2-1
2.3 Pollution Sources .....	2-1
2.3.1 Industrial Wastewater .....	2-1
2.3.2 Domestic Wastewater .....	2-2
2.3.3 Pollution from Agriculture.....	2-2
2.4 Health and Environmental Impact of Pollution .....	2-3
<b>3. Institutional and Legal Framework of Water Quality Management in Egypt .....</b>	<b>3-1</b>
3.1 Present Institutions for Water Quality Management .....	3-1
3.2 Present Administrative Framework .....	3-4
3.3 Laws and Decrees Regulating Water Quality .....	3-5
3.4 Incentive and Disincentives for Water Quality Control .....	3-8
3.5 Evaluation of Current Institutional Framework .....	3-10
<b>4. Guidelines for Future Water Quality Management.....</b>	<b>4-1</b>
4.1 Present Institutions for Water Quality Management .....	4-1
4.1.1 History of Regulatory Programs in Industrialized Nations.....	4-1
4.1.2 The Development of Water Pollution Activities in Industrialized Nations .....	4-2
4.1.3 Institutional Development in Developing Nations .....	4-3
4.1.4 Non-Compliance: a World-wide Problem .....	4-3
4.1.5 International Network for Environmental Compliance and Enforcement .....	4-4

4.2 Decision Principles .....	4-5
4.3 Strategic Approach.....	4-6
<b>5. Summary of the Major Findings of the Workshop.....</b>	<b>5-1</b>
5.1 Purpose of the Workshop.....	5-1
5.2 Workshop Issues and Discussion.....	5-1
5.3 Stakeholders Proposals for Amendment of Law 48 and its Executive Regulations .....	5-2
5.4 Conclusions Drawn from the Stakeholder Comments.....	5-4
<b>6. Proposed Changes to Law 48and its Executive Regulations Issued by Ministerial Decree No. 8/1983.....</b>	<b>6-1</b>
6.1 Introduction.....	6-1
6.2 Proposed Amendments to Law 48 .....	6-1
6.3 Proposed Amendments to the Executive Regulations .....	6-4
<b>7. Conclusions and Recommendations.....</b>	<b>7-1</b>
7.1 Conclusions.....	7-1
7.1.1 Compliance Action Plans for Industrial Discharges.....	7-1
7.1.2 Compliance Action Plans for Municipal Discharges.....	7-2
7.1.3 CAP Priorities .....	7-2
7.1.4 Revising Law 48/1982 .....	7-3
7.1.5 Implementation Activities.....	7-3
7.2 Recommendations.....	7-3
7.2.1 Institutionalize CAP Program.....	7-4
7.2.2 Mobilization to Implement the CAP Program .....	7-4
7.2.3 Long Term Reforms.....	7-5
<b>8. References .....</b>	<b>8-1</b>
<b>APPENDIX A Proposed Provisions to Law 48/1982.....</b>	<b>A-1</b>
<b>APPENDIX B Proposed Provisions to Executive Regulations of Law 48/1982 .....</b>	<b>B-1</b>
<b>APPENDIX C Workshop Report .....</b>	<b>C-1</b>
<b>APPENDIX D Memorandum ( In Arabic ) on Revision of Law 48 /1982 .....</b>	<b>D-1</b>

## LIST OF TABLES

**Table 3.1: Principal Environmental Laws, Decrees and Regulations .....3.7**  
.....

## LIST OF ACRONYMS

AGOSD	Alexandria General Organization for Sanitary Drainage
APHA	American Public Health Association
APRP	Agricultural Policy Reform Program
bcm / yr	Billion cubic meters per year
BOD	Biochemical Oxygen Demand
BPJ	Best Professional Judgement
CAP	Compliance Action Plan
COD	Chemical Oxygen Demand
DO	Dissolved Oxygen
DRI	Drainage Research Institute
EEAA	Egyptian Environmental Affairs Agency
EPA	Environmental Protection Agency
EPIQ	Environmental Policy and Institutional Strengthening Indefinite Quantity
GOE	Government of Egypt
GOFI	The General Organization for Industrialization
GOSD	The General Organization for Sanitary Drainage
GWRI	Groundwater Research Institute
INECE	International Network on Environmental Compliance and Enforcement
LE	Egyptian Pound (Currency)
MALR	Ministry of Agriculture and Land Reclamation
MEA	Ministry of Environmental Affairs
mg/l	Milligrams per liter
MHP	Ministry of Health and Population
MHUUC	Ministry of Housing, Utilities and Urban Communities

MIMW	Ministry of Industry and Mineral Wealth
MOI	Ministry of Interior
MPN	Most Probable Number
MPWWR	Ministry of Public Works and Water Resources
NOPWASD	National Organization for Potable Water and Sanitary Drainage
NRI	Nile Research Institute
NWRC	National Water Research Center
ppm	Parts per million
PRIDE	Project in Development and Environment
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UNEP	United Nation Environment Program
USAID	U.S. Agency for International Development
USEPA	U.S. Environment Protection Agency
WHO	World Health Organization
WPAU	Water Policy Advisory Unit
WPRP	Water Policy Reform Program
WQS	Water Quality Standards

## EXECUTIVE SUMMARY

### 1. Assignment

One of the most serious problems facing the Ministry of Public Works and Water Resources (MPWWR) is the protection of the water quality in the Nile River system. This study has focused on ways to improve compliance with water pollution requirements and standards through: (1) changes to Law 48/1982 and its Executive Regulations; (2) revisions to Water Quality Standards (WQS); and (3) activities to promote cooperation among ministries with related responsibilities. This report has been prepared under the auspices of the Water Policy Advisory Unit/EPIQ program to assist MPWWR in the fulfillment of Benchmark C8 of Tranche III of the Water Policy Reform Program, an agreement between the Government of Egypt (GOE) and the USAID.

These activities are also in support of the work of the Inter-Ministerial Committee on Revising Law 48 created under Ministerial Decree No. 88 of 1998 and chaired by Eng. Yehia Abdel-Aziz, Chairman of the Irrigation Department, MPWWR.

### 2. Study Methodology

The study group began its activities with a review of previous studies of water pollution problems in Egypt. During the last week of February and the first week of March, 1999, we conducted a round of informal interviews with representatives of the ministries participating on the Inter-Ministerial Committee. We also reviewed almost 100 specific proposals that had been generated by the committee. Drawing on published literature and our own experiences, we investigated how other developing nations are dealing with similar compliance problems.

On May 3, 1999 the study group conducted a one-day workshop for about 50 participants primarily from the ministries which share responsibilities for activities impacting water quality. Based on the very favorable reaction to our proposals, we identified some suggestions for initial implementation activities and prepared this report for further consideration by MPWWR.

### **3. Initial Comments of the Inter-Ministerial Committee Members**

The study group conducted a round of informal interviews with representatives from the participating ministries at the end of February, 1999. Almost all of the committee members interviewed shared the perception that, despite the progress begun in the last few years, compliance rates with existing water pollution regulations are low, and waste treatment is neither sufficient nor effective. They also shared the perception that there is little oversight of conditions in the field or formal enforcement against non-compliant facilities. When asked their personal opinions about how compliance might be improved, almost all of the respondents indicated that progress could be made if implementation was phased in over time. There was also near universal agreement that coordination among the ministries with related responsibilities needs to be improved.

### **4. Historical Context**

Water pollution control programs in the industrialized nations typically began with one or more rounds of technology-based treatment requirements, based on what each facility could afford to install and operate. These requirements were included in site-specific permits or licenses, usually of five years duration. The responsible regulatory agencies then launched vigorous oversight programs and used enforcement tools to impose sanctions in instances of serious or persistent non-compliance. Over time, these actions produced what the World Bank calls a "culture of industrial compliance" in which compliance rates greatly exceeded 50%.

Among the factors the World Bank cites as contributing to this "culture of industrial compliance" is increased interest among manufacturing firms looking to participate in international trade markets. Such firms are finding increasing value in being able to demonstrate compliance with local pollution abatement requirements.

By beginning with similar requirements for various classes of facilities, the initial economic burden among potential competitors in the market place was equalized and the business community gradually came to see these requirements as just "one more cost of doing business." Additional requirements were added in subsequent permits where the application of technology-based requirements failed to attain ambient water quality standards in nearby receiving waters.

This resulted in phased implementation which spread the economic burden of compliance over a decade or more, during which government agencies and the regulated community developed the institutional capacities to find cost-effective solutions for facilities to address most problems.

More recently, there has been a significant debate about regulatory reform in the US and other industrialized nations, focusing largely on the inherent inefficiencies of uniform technology standards that do not consider site-specific impacts on local environments. Proponents for change recommend that all future requirements be tailored to local environmental needs. Where industries have clearly demonstrated the ability to meet existing requirements, the reformers propose that the facilities be given greater flexibility in how new requirements are attained. In return, the facilities must provide enhanced monitoring information.

In Egypt, water pollution controls were initiated under Law 48, enacted in 1982. Under this law, allowable discharge limits are tied directly to stringent WQS, making full compliance very expensive. The existing low compliance rates are generally believed to relate to: (1) high compliance costs to meet stringent standards; (2) constrained public and private resources for treatment; and (3) limited institutional infrastructure devoted to compliance oversight. It is also generally recognized that plant closures for non compliance, in the absence of some immediate and substantial risk to neighbors, are not an appropriate solution.

## **5. How Other Countries Are Dealing with Compliance Problems**

Many developing countries that have adopted stringent water pollution regulations without fully understanding the cost and administrative burdens required to effectively implement these programs, are now facing significant non-compliance problems. Given the value of employment creation and other national development goals, and in the absence of a clear, immediate, and substantial threat to neighbors, it is very difficult to shut down facilities that do not install required treatment equipment. Faced with these realities, many nations are beginning to use site-specific compliance agreements to establish schedules for feasible improvements for facilities causing the most significant water quality problems.

Under the initial auspices of the Dutch and US governments, an International Network on Environmental Compliance and Enforcement (INECE) was established to promote a dialogue on ways of promoting compliance with environmental regulations. With growing support from many international organizations including the World Bank, UNEP and the Canadian and US foreign assistance programs, INECE has held five biannual meetings generating almost 500 technical papers dealing with national approaches to assessing problems, setting priorities, and dealing with serious non-compliance problems. Of particular interest is the use of compliance agreements, which are discussed below.

## **6. Compliance Agreements**

Many environmental programs around the world are finding Compliance Agreements useful tools with which to set priorities and deal with serious non-compliance problems. Typically, these documents are site-specific agreements which include feasible schedules for installing and operating pollution treatment units as steps toward full compliance. They also include requirements for periodic reporting of progress. These agreements vary from formal, court-supervised, enforceable contracts to informal agreements between governments and the owners of the impacted facilities.

This report recommends that MPWWR adopt a Compliance Action Plan (CAP) system that is midway along the continuum between enforceable contracts and loose, informal agreements. The most essential elements of such agreements are that compliance is defined as meeting all scheduled improvements and that public sanctions are imposed for serious instances of bad faith performance.

## **7. Framing Proposals**

In considering proposed initiatives and assessing suggestions from members of the Inter-Ministerial Committee, the following principles were applied:

- Promote opportunities to initiate pollution abatement activities as quickly as possible;
- Protect the world-class water quality standards adopted in Egypt as goals;
- Promote the efficient use of energy, water, and other natural resources by promoting pollution prevention audits as part of compliance efforts;

- Give priority attention to facilities having the largest adverse impact on water quality;
- Allow incremental improvements, given the significant resource constraints;
- The polluter should pay for the damages created;
- Promote stakeholder participation and public-private sector partnerships in defining regulatory requirements; and
- Foster cooperation among ministries with related missions.

The above principles led the study team to adopt a two-tiered strategy including both short-term actions to initiate compliance activities as quickly as possible, and long-term proposals for more fundamental reforms of Law 48, its Executive Regulations, and the existing WQS. The initial activities should be implemented over a sufficient time period to provide a better understanding of the problem and feasible abatement actions for classes of facilities, before the more fundamental reforms are developed in detail. Proposing major reforms in the law or the standards on the basis of the information available at this time would inhibit progress in the short-run and probably create long delays as the new proposals were subjected to intense debate. Nonetheless, in view of the enormity of the non-compliance problem, this is not a situation that can be resolved in a few years.

## **8. Stakeholder Workshop**

On May 3, 1999, the study group held a workshop with about 50 stakeholders, primarily from the ministries with related pollution control responsibilities. The purpose of the workshop was to solicit comments on the group's findings and recommendations. There was strong agreement about:

- the need to strengthen environmental protection of the Nile River system;
- the principles outlined above, especially the need to maintain Egypt's existing stringent water quality standards;
- the desirability of moving towards phased implementation and the use of negotiated, site-specific compliance agreements; and
- the need to improve coordination among ministries with related missions.

A more comprehensive summary of this workshop can be found in Chapter 5.

## 9. Conclusions and Recommendations

### Conclusions

It is the conclusion of the study group that MPWWR should initiate an active pollution control program to deal with the serious non-compliance problems facing the Ministry. The essential element of these recommendations is that MPWWR launch a system of negotiated, site-specific Compliance Action Plans (CAPs) to move major facilities into compliance with existing stringent water quality standards. These agreements would include schedules for improvements to reduce water pollution based on what is feasible and appropriate for local conditions. Applicants would be required to conduct pollution prevention audits and implement appropriate improvements in facility management as part of the CAP process. Under some circumstances, full compliance may not be immediately feasible, and incremental steps toward full compliance may be in order.

This proposal envisions that the CAP system would become the essence of future operating licenses and would include a description of planned improvements, a schedule for the installation of such treatment or upgrades as may be needed, and specific requirements for monitoring, record keeping, and periodic reporting to MPWWR. The Ministry would use this information to track progress, determine compliance, and initiate follow-up actions when appropriate. This process would be precluded where current operations pose an immediate danger to neighbors, since current law requires that such facilities be closed until the imminent and substantial hazards can be identified and removed. Once approved, these CAPs will provide clarity about what facilities need to remain in compliance during the life of the license.

The owner of the facility should also be required to have an environmental audit of the premises conducted by a competent institution, if one has not been done recently. The purpose of this audit is to identify opportunities for interventions that will improve housekeeping practices and alter production processes in order to reduce the volume and toxicity of waste streams and promote the efficient use of energy, water, and other raw materials. In addition, the applicant

would be required to propose a schedule for feasible treatment improvements. The application would then be discussed with the licensing authority, modified as appropriate, and approved by the Ministry.

As a point of departure for these negotiations, the licensing authority might look to emerging Egyptian practice or publications of the World Bank or other international authorities to determine feasible levels of treatment for classes of facilities. Over time, these transactions will lead to a better understanding of compliance problems and of feasible levels of treatment for classes of facilities in Egypt. In addition, since the process would be initiated by MPWWR, the Ministry can set priorities based on the facilities thought to be creating the greatest water quality problems, and control the pace for these transactions, to be commensurate with available resources and their developing capabilities to manage these new procedures.

The CAP program also offers MPWWR a vehicle through which to consider the use of alternative levels of treatment for municipal waste facilities emanating from small communities. In these circumstances, the applicant would be given an opportunity to show why the proposed application of "appropriate technology" can be maintained in the impacted communities without adversely impacting the health of neighbors. This more flexible approach could enable the government, which currently constructs these facilities, to provide initial treatment to more communities lacking such services, within any fixed level of resources.

Compliance agreements are being used by many developing countries concerned with improving environmental protection in the face of significant compliance problems, as well as in Eastern Europe, where nations are shifting from centrally-planned to market-based economic systems. It is also worth noting that a similar proposal for the use of compliance agreements by the Egyptian Environmental Affairs Agency, related to the implementation of Law 4/1994, received more than 500 positive responses from the business community. This demonstrates an increased interest in improving compliance with environmental regulations.

Since some revisions in Law 48 are needed now to provide clear and unambiguous authority for the CAP program, a few other high priority modifications to improve the effectiveness of

pollution control activities are proposed. Several changes in the Executive Regulations are also proposed, but at this time no significant modifications in existing WQS are made. While the study group thinks this is a reasonable approach, the reader should view these proposals as a menu. Only the specific changes related to the CAP process are vital at this time.

Since these proposals constitute a significant departure from current practices, we offer some specific proposals for implementation activities, should the CAP program be adopted. These proposals include the formation of an internal task force to plan for initial activities and the formation of a technical advisory committee to address a number of issues raised within the existing Inter-Ministerial Committee.

## Recommendations

The report recommends that MPWWR:

1. Adopt the CAP procedures to deal with non-compliance problems among significant industrial and municipal polluters, through an appropriate Ministerial Decree or written policy pronouncements. The essential elements of the CAP program include:

- The MPWWR initiates the process by notifying the facility of their apparent non-compliance with existing WQS;
- The facility has a fixed time to demonstrate full compliance or prepare a CAP application including, where appropriate, the results of a pollution prevention audit and a feasible schedule for the installation and operation of treatment improvements; and
- After dialogue with the applicant and whatever modifications may be appropriate, MPWWR approves the CAP, which is then included in the facilities pollution discharge license.

2. Initiate Very Narrow Modifications of Law 48 to:

- Authorize the CAP process and create a deposit system as an incentive for the attainment of scheduled improvements and so that the new procedures will be clear to all stakeholders;
- Authorize MHP to subcontract with other qualified government laboratories to conduct compliance monitoring for MPWWR, in order to significantly expand the capacity to oversee compliance;
- Clarify that the licensee is responsible for selecting technologies and attaining all standards; and
- Clarify some minor ambiguities in the existing legislation.

A more detailed explanation of these proposals is contained in Chapter 6 and Appendix A of this report.

### 3. Amend the Executive Regulations related to Law 48 to:

- Establish procedures to implement the CAP process (see new article 28 in chapter 6 and Appendix B);
- Give MHP the authority to subcontract with other competent governmental laboratories to provide expanded capacity to perform compliance monitoring;
- Raise fees to reflect some of the inflation that has occurred since enactment in 1983, in order to offset some of the costs of the new activities;
- Clarify that provisions of Law 4/1994 for environmental impact assessments (EIA's) and monitoring, record keeping, and periodic reporting will be included in future licenses issued by MPWWR;
- Modify definitions to provide the bases for added protection for the Aswan High Dam Reservoir and groundwater resources; and
- Include other technical corrections to remove ambiguities in the regulations and to make a few very minor changes in the existing WQS.

A more complete description of these changes can be found in Chapter 6 and Appendix B of this report.

### 4. Long-term Reforms

Over the long-term, there is a need for fundamental reform of Law 48, its Executive Regulations, and the existing WQS. These fundamental reforms should consider:

- A new system of technology-based discharge limits, according to what is feasible for various classes of facilities to install and operate.
- A new set of ambient WQS for in-stream conditions necessary to support designated uses of the receiving bodies.
- Amending Law 48 to allow initial discharge limits for various classes of facilities. These limits should be set on the bases of affordable technologies and more stringent requirements established to attain water quality standards in nearby receiving bodies.
- Developing a national pollution plan to guide future governmental investments in municipal wastewater treatment facilities.
- Creating a new range of sanctions for serious and persistent violations of discharge requirements such that penalties are related to the seriousness of the violations.
- Investigating the creation of a separate division within the State Council to be devoted to environmental compliance activities. This division would expedite the resolution of

disputes and assist the judiciary in building a cadre of judges with expertise in these areas.

## **10. Implementation**

If the major elements of these recommendations are accepted, the following actions are recommended as MPWWR launches enhanced water pollution control activities.

Creation of an Internal Task Force.

The purpose of this group is to plan for initial implementation of the new CAP program including:

- Drafting whatever Ministerial Decrees or policy pronouncements may be needed for the orderly initiating of these new activities;
- Preparing an initial budget for staffing, support services and a training program for personnel;
- Establishing a priority list of facilities to be included in the CAP process, based on a survey of Governors regarding the facilities causing the greatest water quality problems;
- Developing procedures for the review of proposals for alternative treatment systems in small communities, based on their operational feasibility and potential impacts on the health of nearby populations; and
- Initiating procedures to promote cooperation with related activities under Law 4/1994, which impacts other waste discharges emanating from the same facilities.

This proposal envisions a robust training initiative for MPWWR personnel to facilitate undertaking new water pollution control responsibilities related to negotiating agreements, assessing the economic feasibility of alternative treatment technologies, evaluating schedules for improvements, and interpreting the results of pollution prevention audits. The large potential impacts of such activities on environmental protection are widely recognized among development professionals and, the study group recommends seeking funding for training and technical assistance from donor institutions in the near term.

Establishment of a Broad-Based Technical Advisory Committee.

The purpose of this committee is to recommend to MPWWR:

- Feasible discharge levels for BOD, COD and other significant contaminants, based on treatment performance data, in order to facilitate negotiating CAP requirements and to provide a basis for long-term reform in WQS;
- Procedures to promote the use of loading versus concentration limits in future WQS and CAP agreements;
- Appropriate standards to protect the Aswan High-Dam Reservoir and groundwater resources from significant pollution; and
- Longer-term studies of such questions as: impact of pesticides and fertilizers on water quality; improved monitoring methods to help detect and control pathogenic biological agents like parasites; and appropriate controls for cooling water discharges and for sludge and backwash water from water treatment facilities.

These activities are described more fully in Chapter Six of this report.

In conclusion, the adoption of a CAP program would offer MPWWR an opportunity to initiate pollution control activities at facilities believed to be creating the most serious water quality problems. For the regulated community, it provides a clear definition of what needs to be done to remain in compliance with water pollution requirements, which may be particularly valuable to manufacturing facilities interested in entering international markets

Since MPWWR initiates each individual CAP negotiation, it should be possible to manage the process so that the activities remain commensurate with available resources. While there are real costs in undertaking this initiative, the potential benefits appear large. Over time, the related transactions will provide MPWWR with valuable information about the nature of non-compliance problems and feasible abatement improvements with which to formulate more fundamental reforms in the future.

# INTRODUCTION

## 1.1 Overview

One of the most serious and complicated problems facing MPWWR is the protection of water quality from degradation. The fresh waters of the main stem of the River Nile and many of the irrigation canals and agricultural drains are subject to municipal and industrial wastewater with no, or inadequate, treatment.

Law 48 of 1982 governs the discharge of wastes and wastewater into the Nile and its waterways and sets standards for the quality of these discharge effluents. The law outlines the responsibilities of the MPWWR and of other concerned ministries.

Although the law is comprehensive, some of the details need additional review. Some articles are inadequate, while others are inconsistent. Law 4 of 1994 concerning environmental protection gives the Ministry of Environment increased powers and duties. The implementation of Law 48 and Law 4 should be coordinated, as both laws have the same objective of water quality control and protection. Existing Water Quality Standards are very strict, resulting in the failure of many users to comply with the regulations.

A high-level, Inter-Ministerial Committee chaired by the chairman of the MPWWR Irrigation Department with members from the Ministries of Agriculture and Land Reclamation, Health and Population, Environment, Housing and New Communities, Industry, and Public Works and Water Resources has been formed. The main task of the committee is to review Law 48 to improve water quality control and protection on the Nile and its associated waterways.

## 1.2 Purpose of the Report

Benchmark C8 of APRP Tranche III (1/7/1998 – 30/6/1999) states that “GOE (MPWWR) will revise Law 48 of 1982 governing water quality management to more effectively control discharge of wastes and wastewater into the Nile and its waterways”. In support of this benchmark, the following tasks have been completed:

WPAU, with assistance of the EPIQ Team, worked closely with the Inter-Ministerial Committee in the review of Law 48 and its by-laws.

WPAU provided coordination assistance between all the involved ministries (Health, Environment, Housing and New Communities, Agriculture and Land Reclamation, Industry, and Public Works and Water Resources) in the review of the law and by-laws.

WPAU conducted a one-day workshop with representatives of the ministries participating in the Inter-Ministerial Committee and other interested stakeholders in the proposal recommended in this report.

Law 48 of 1982 was issued to protect watercourses from sources of pollution. In view of the difficulties of enforcement, the law and its by-laws have been reviewed to accomplish the following objectives:

Clearly define the roles of the relevant Ministries with respect to licensing procedures.

Amend effluent discharge standards to be more realistic and to achieve better compliance.

Amend articles in the law and the related Executive Regulations to remove gaps, inadequate aspects, and contradictions between articles, to ensure effective water quality control on irrigation and drainage watercourses.

### **1.3 Organization of the Report**

Following the introduction (Chapter 1) of this report, there is an assessment of the current water quality in Egypt (Chapter 2), referring to pollution sources and its health and environmental impact. A general overview of the institutional and legal framework of water quality management in Egypt is presented in Chapter 3. A review of the potential benefits of the Compliance Action Plan approach provides the basis for Chapter 4. A summary of the major findings of the workshop that was held to discuss proposed changes in law 48 and its executive regulations is presented in Chapter 5. Proposed changes in law 48 and its executive regulations issued by the ministerial decree no. 8/1983 are presented in Chapter 6. Conclusions and recommendations are given in Chapter 7. Literature referenced in this report can be found in Chapter 8.

### **1.4 The Need for Reviewing Law 48/1982**

Although Law 48 and its implementing Decree (8/1983) was issued over 15 years ago, their enforcement is facing serious difficulties. There are several reasons for these problems. The most significant ones are:

The law contains many very strict requirements, which were issued with little consideration of economic and administrative implications.

There has been limited cooperation among ministries with related implementation responsibilities.

The government owns many of the big polluting industries, and has not been able to prevent violating environmental requirements. However, this attitude is changing.

Egypt's limited success with the enforcement of this statute signals the need for revising existing laws and decrees to develop a new regulatory framework with flexible performance approaches. Accordingly, a water quality committee was established by Ministerial Decree No. 88 of 1998. It is chaired by the Chairman of the MPWWR Irrigation Department with members from the ministries of Public Works and Water Resources, Agriculture and Land Reclamation, Health and Population, Environment, Housing and New Communities and Ministry of Industry. The committee has identified more than 100 proposed changes, which were considered in preparing this report.

Eng. Yehia Abdel Aziz, Head of the Irrigation Department and Chairman of the committee, suggested the assistance of an expert to help the committee define and follow a methodology to ensure that all interests, benefits and investments are taken into consideration in the discussion on water quality standards.

Eng. Dick Luijendijk, a Dutch Water Quality Management expert with the Ministry of Transport, Public Works and Water Management and the Institute for Inland Water Management and Wastewater Treatment (RIZA) was selected for this assignment. Based on the information he gathered from the available documents and from meetings, he gave the following recommendations:

Management of domestic wastewater (urban and rural) should be given priority.

Taking into consideration the complexity of the problem and the large investment required, a national water pollution control plan should be prepared. This plan would set priorities as well as the financial structure for its implementation. A time span of 15 years was proposed, with a renewal of the program every 5 years.

A two track approach was suggested:

Track 1. The production of a national water pollution control plan, in order to begin reducing the emissions to surface water from municipal sources in the short run.

Track 2. The review of law 48 in order to provide water quality standards and effluent standards for the long term.

This was followed by a visit of Mr. V.J. Kimm, a water quality expert from the USA, from February 23 to March 4, 1999. The first part of his mission was to help the EPIQ team prepare a draft for the proposed changes to Law 48. He returned to Egypt between April 17 and May 7, 1999 during which period a workshop was held on May 3 to review proposed initiatives and conclude this report.

## **BACKGROUND**

### **Water Availability and Demand**

Like many other countries in the Middle East and North Africa, Egypt faces a future of increasing water shortage. The availability of renewable water resources has dropped from 2,189 m<sup>3</sup>/capita/year in 1966 to 1,035 m<sup>3</sup>/capita/year in 1990. At the present population growth rate, availability will drop even further to 536 m<sup>3</sup>/capita/year by the year 2025. Agriculture is the largest user of water (87%), while industry and domestic supplies consume 8% and 4.5%, respectively. Key factors underlying the enormous growth in the demand for water are population growth, rapid urbanization and expanding irrigation.

### **Water Quality**

Water quality degradation is quickly joining water shortage as a major issue in Egypt. In many places, the capacity of the Nile and other water bodies has seriously declined, affecting the economy, public health and the sustainability of the fragile ecosystem. As more fresh water is utilized and water reuse increases and intensifies, water quality degradation is becoming increasingly important, especially with regard to salinity, heavy metals and toxic organic compounds which can only be removed at very high cost. The severity of water quality issues in Egypt varies among different water bodies depending on: flow, use patterns, population density, extent of industrialization, availability of sanitation systems and the socio-economic situation.

### **Pollution Sources**

#### **Industrial Wastewater**

Industry is a major contributor to the Egyptian economy. The value added of industry was about \$12 billion in 1993, representing about 26% of GDP.

There are some 22,000 industrial enterprises, about 650 of which are major industrial facilities. The spatial distribution of industry in Egypt typically depends on the size of the employment pool, availability of services, access to utilities and transport networks, and closeness to principal markets. The manufacturing facilities are therefore often located within the boundaries of major cities, in areas with readily available utilities and supporting services. The majority of heavy industry is concentrated in Greater Cairo and Alexandria. Most of the textile industry is located in the Delta between Cairo and Alexandria -- in Shoubra El-Kheima and Mehalla El-Kubra, where most of the cotton is raised. The industrial sector is an important user of natural resources and a major contributor to pollution of water resources.

At the present time, industrial use of water in Egypt is estimated at 5.89 billion m<sup>3</sup>/year. By the year 2025, the industrial use of water is expected to increase to 7.9 billion m<sup>3</sup>/year. Consequently, an increase in the volume of effluents and of toxic wastes is expected. A recent study (El-Gohary, 1996) estimated the sum of annual industrial waste water discharged into the Nile, the two branches, and the irrigation canals as 169.32 mcm/year. Around 40% is generated in Greater Cairo (Cairo, Giza and part of Qaluibia). The second contributor is Qena, where most of the sugarcane factories are located. It is worth mentioning however, that most of the industries discharging their wastewater into the Nile already prepared

Compliance Action Plans that have been derived by the Egyptian Environmental Affairs Agency (EEAA), and some implementation action has begun.

### Domestic Wastewater

According to a report prepared by the World Bank (World Bank,1993), approximately 85 percent of Egypt's population is connected to the drinking water supply and only 24 percent to sewerage services. The latter percentage is expected to grow rapidly, due to works under construction. The population not connected to sewerage systems relies on individual means of treatment and disposal, mainly on-site treatment.

These methods, if not properly designed and constructed, can contribute serious pollution problems to ground as well as surface water. This is a problem about which very little information is available.

### Pollution from Agriculture

Wastewater seeping from agriculture fields is considered a non-point source of pollution. These non-point sources are, however, concentrated throughout the collecting agricultural drains to form point sources of pollution for the Nile, the Northern Lakes, or irrigation canals, which are increasingly mixed with fresh water for reuse. Moreover, these non-point sources of pollution may also influence the groundwater quality. Major pollutants in agricultural drains are salts, nutrients (phosphorus and nitrogen) and pesticide residues.

## **2.4 Health and Environmental Impact of Pollution**

Although Water Quality Assessment Studies (Pride 1992, 1993, 1994 and 1995) and the monitoring activities carried out since 1975 have provided considerable information about the water quality in Egypt, a lot of data is still unavailable (e.g water quality of irrigation canals, magnitude of the pollution problem from human sources,etc.). In general, there an agreement that the major water quality problems in Egypt are:

- Pathogenic bacteria / Parasites
- Heavy metals
- Pesticides

### **Pathogens / Parasites**

The indiscriminate discharge of untreated human waste into water bodies has created significant pollution problems with serious health implications. The incidence of water borne diseases is greatest in rural areas where there are no appropriate sanitation systems. The situation is especially critical in the Delta area, where high population densities, impervious soils and a high groundwater table make the application of low-cost, on-site sanitation options difficult. The major areas of concern are groundwater, internal or external contamination of crops and translocation to grazing animals.

Groundwater contamination by pathogens involves movement of bacteria or viruses to aquifers that are then used for drinking purposes, without further treatment. Concerns with respect to crop-contamination focus mainly on pathogens entering the food chain for humans and animals as well as adverse impacts on plant life (Larkin, 1976).

## **Heavy Metals**

Heavy metals are often used in industrial processes, primarily electroplating and other metal finishing processes, and in tanneries (chromium) and chemical manufacturing. High concentrations of metals in waste streams lead to a daily discharge of several kilograms of metals into receiving water bodies. Once they have been discharged to waterways, heavy metals attach readily to sediment particles on the bottoms of canals, drains and lakes. Once in the sediments, they are taken up by bottom-dwelling organisms which are in turn eaten by fish. At each stage they are concentrated, and fish can concentrate metals to extremely high levels that can cause illness in people who eat them.

Metals are indestructible and have the potential to accumulate in the body, thus leading to chronic health effects. Pathways within man and other targets are, therefore, crucially important. The rates and mechanisms of absorption and excretion, and the extent to which metals are deposited in such tissues as bone or the kidney cortex, need to be studied if risks are to be assessed. For example, the biological half-life of methyl mercury in man is about 70 days, that of cadmium around 20 years, and that of lead only a few weeks in blood and soft tissue, but at least 10 years in bone. Water contaminated with trace metals could also have an adverse effect on crop production due to the phytotoxicity effects of some heavy metals.

## **Pesticides**

Pesticides are chemical compounds manufactured to kill or prevent the growth of pests. Some pesticides have been carefully tested and are harmful only to target species, with little or no effects on humans in case of accidental contact. Others, which have been less thoroughly screened or were licensed before current testing requirements were in place, may have long-term toxic effects on humans.

Pesticides enter the hydrosphere via many pathways including: direct application, discharge of wastewater, runoff from non-point sources, leaching through the soil, and rainfall (Tisseau et al, 1996). Removal of pesticides from the hydrosphere may occur by volatilization, uptake by aquatic life, settling of particles loaded with pesticides, and biological degradation.

The most persistent group of pesticides are the organo-chlorine insecticides (DDT, Lindane, Endrine, Chlordan, Heptachlor). Organophosphorus and carbamate insecticides are more susceptible to chemical and biological degradation. However, the rate of their degradation is correlated with the chemical structure of each specific compound (Connel and Miller, 1984).

Herbicides also include variable groups of compounds such as phenylcarbamates, phenylureas, phenoxyacid derivatives, and triazines. The persistence of each specific herbicide in soil and water is subject to great variation, extending from a few days up to several months.

# **INSTITUTIONAL AND LEGAL FRAMEWORK OF WATER QUALITY MANAGEMENT IN EGYPT**

The purpose of this section is to provide a brief overview of three components of the current institutional framework for water quality management in Egypt: (i) organizational structure, (ii) regulatory and legislative framework, and (iii) incentives and disincentives for pollution abatement.

## **3.1 Present Institutions for Water Quality Management**

In Egypt, as in many developing countries, the organizational structure for water quality management is extremely complex, mainly because of the large number of government agencies with related responsibilities for water quality management activities. The subsequent paragraphs describe the functional responsibilities of the most important agencies in Egypt.

### **Ministry of Public Works and Water Resources**

The Ministry of Public Works and Water Resources (MPWWR) has sole legal responsibility for the planning and management of water resources in Egypt. In its Charter, the MPWWR is responsible for providing water of suitable quality to all users. To accomplish this goal, the Ministry has to ensure that appropriate measures are undertaken to protect both the quantity and the quality of Egypt's water resources. In practice, very little attention has been given to water quality management, which represents a relatively small portion of the overall activities, although priorities are now being reassessed.

Law 48, for the protection of the Nile and its waterways, assigns to MPWWR legal responsibility over the following functions:

- Issue and cancellation of discharge permits into Egyptian waterways, which include the Nile, canal and drainage networks, lakes, and groundwater reservoirs.
- Inspection of wastewater treatment facilities.
- Monitoring of intake sites for potable water treatment plants as well as municipal and industrial discharges.
- Ensuring that proper samples and analyses of discharges are carried out by the Ministry of Health.
- Levying of fines for non-compliance.
- Setting of regulations and specifications for discharges into water bodies.
- Issue and oversee of licenses for new waste treatment units in floating vessels.
- Issue of licenses for the construction of any establishment that directly discharges into waterways.

The MPWWR has delegated the water quality monitoring tasks of both surface and groundwater to the National Water Research Center (NWRC). NWRC, in turn, consists of the following institutes:

The Drainage Research Institute (DRI). DRI is responsible for monitoring the quality and quantity of drainage water in the Nile system. At present, DRI has installed water quality monitoring stations all along the Nile drainage system. One of DRI's functions is to provide MPWWR with information on the availability of drainage water to be reused for agricultural purposes, predominantly for land reclamation projects. DRI has prepared guidelines for the reuse of drainage water for irrigation purposes.

Nile Research Institute (NRI). NRI is responsible for protecting and developing the Nile River in a sustainable and scientific manner by means of: (i) monitoring water quality in the river channels; (ii) assisting in the enforcement of pollution control laws related to the Nile system; (iii) evaluating and assessing the impact of new developments and interventions in water quality; and (iv) operating and maintaining a database related to water quality. NRI's total network includes 34 water quality monitoring stations along the Nile and 60 observation stations on strategic discharge sites.

Research Institute for Groundwater (RIGW). This institute is in charge of field investigations for the proper understanding of Egypt's groundwater system. Initially, RIGW's main responsibility was to provide advice to MPWWR on the development of groundwater sources for agricultural purposes. Now, RIGW is responsible for the efficient monitoring of groundwater sources in order to ensure availability for irrigation, domestic, and industrial uses. At present, RIGW has set up about 500 observation irrigation wells, and hopes to install about 150 observation drinking wells in the near future.

#### Ministry of Health and Population (MHP)

The MHP has been given a central role in water quality management, especially in setting standards for the quality of the following:

- Potable water sources (River Nile and canals)
- Drain waters that can be mixed with other waters for drinking water
- Industrial and sewage treatment plant discharges
- Wastes discharged from river vessels

Besides developing standards, the ministry must sample and analyze all industrial and municipal effluents and all drinking water treatment plant influents and effluents as well, which is considered a significant load of work.

#### Ministry of Environmental Affairs (MEA)

At the national level, the recently established MEA has the portfolio for environment in the Egyptian Cabinet of Ministers. Within the ministry, the Egyptian Environmental Affairs Agency (EEAA) has the responsibility for setting national policy for the environment and coordinating environmental management activities within the government. The EEAA's functions, as established by law 4/1994, include, among other things, preparing legislation, decrees, and regulations as needed to protect the environment; conducting studies; formulating the national plan for environmental protection; setting requirements for EIAs of projects; monitoring compliance with standards and norms; coordinating enforcement actions; managing natural protectorates; and promoting environmental education.

The EEAA has significant new authorities over industry under Law 4/1994, including the authority to require industries to keep records of the environmental impact of their activities, to collect and analyze samples to ensure that standards are being met, and in the case of a violation, to shut down a facility within 60 days if the violation has not been corrected.

#### Ministry of Housing ,Utilities and Urban Communities (MHUUC)

The General Organization for Sanitary Drainage in Cairo (GOSD), The Alexandria General Organization for Sanitary Drainage (AGOSD) and the National Organization for Potable Water and Sanitary Drainage (NOPWASD) are major organizations within the MHUUC that have the responsibility for planning, design, and construction of collection systems and municipal wastewater treatment plants.

#### Ministry of Industry and Mineral Wealth (MIMW)

The General Organization for Industrialization (GOFI) supervises pollution control, safety and health issues in industry through its General Department for Environmental Protection. It also ensures that new plants include industrial waste treatment units. MIMW decree No. 380 of 1982 requires compliance with all applicable environmental laws, regulations, and standards as a condition for granting industrial licenses. A clause to this effect is written into all industrial licenses granted by the MIMW, committing the industry to taking the necessary preventive measures, such as installing necessary control equipment. However, GOFI does not perform any inspections at industries and, therefore, does not monitor whether industries are actually in compliance with these license requirements

#### Ministry of the Interior (MOI)

The MOI, Egypt's national police force, has for some time maintained the Inland Water Police, a special police force for enforcement of Law 48 and protection of the environment in general. The Inland Water Police provide guidance to citizens and take enforcement actions for violations of environmental laws. Law 4/1994 provides additional authority for this environmental police force, specifying that the MOI shall form a police force specialized in environmental protection within the ministry and in its Security Departments in the governorates (Article 65 of the Executive Regulations).

#### Scientific Institutions and Universities

In terms of supporting institutions, Egypt benefits from having a number of scientific institutes (e.g. the Academy for Scientific Research and Technology, the National Research Center, the National Water Research center, the National Institute for Oceanography and Fisheries Research) with research capabilities and universities (e.g., Ain Shams University, Cairo University, the American University in Cairo, Alexandria University) with good environmental science and engineering programs at both the undergraduate and graduate levels. These institutions carry out basic and applied research on water quality management issues.

### **3.2 Present Administrative Framework**

Over the last four decades, Egypt has adopted a substantial body of environmental laws, decrees and regulations addressing various aspects of environmental protection and natural

resources management (Table 3-1). Law 4/1994, the most recent and comprehensive law gives the EEAA the authority to regulate air pollution, management of hazardous wastes, and discharges to the marine environment. Furthermore, the law gives the EEAA an array of tools for implementing and enforcing these provisions, including traditional regulatory controls (e.g., emission standards for air pollutants), economic instruments, compliance monitoring (e.g., record keeping requirements), inspection, and enforcement (e.g., penalties, closures, and imprisonment).

The EEAA has promulgated regulations (Executive Regulations, 1995) implementing the air pollution, marine discharge, and EIA provisions of the law and is in the process of completing regulations for the management of hazardous substances and wastes. The law granted industry a three-year grace period (until March 1998) to comply with the new standards. An additional two-year extension was available to those industries that submitted an application by August 1997 and prepared a Compliance Action Plan by the end of 1997, demonstrating their progress in meeting the standards. However, this additional extension was rejected by the Prime Minister and the CAP activity was halted.

### **3.3 Laws and Decrees Regulating Water Quality**

Water Quality is addressed separately by two laws and three decrees. The most significant is law 48/1982.

#### **Law 48/1982**

Law 48 prohibits discharges to the Nile, canals, drains, and groundwaters without a license issued by the Ministry of Public Works and Water Resources (MPWWR). Licenses are issued to factories, sanitary sewage treatment plants, and river boats, upon application, as long as the effluents meet certain standards and other conditions. Discharging without a license or discharging in amounts or concentrations that exceed license limits is punishable by fine, jail sentence, or both. The fines range between LE 500 and LE 2,000, and the jail sentence is limited to one year. For a second violation, the penalties are doubled. However, imposing such penalties through the judicial system takes many years and is of limited effectiveness.

Other provisions of the law state that licenses may be withdrawn under several conditions, including failure to immediately reduce a discharge presenting an immediate danger of pollution or failure to install treatment yielding appropriate effluent quality within three months. The law gives MPWWR administrative and police authority over implementation; the Ministry of Interior's Water Police also have police powers, and the Ministry of Health has a standard-setting and discharge-monitoring role.

Water quality standards are specified in the implementing decree for Law 48 (Decree 8/1983) for the following categories:

#### **The Nile River**

Treated industrial discharges to the Nile and canals

Discharges greater than 1,000 m<sup>3</sup>/day above and below the Delta barrages

Discharges less than 1,000 m<sup>3</sup>/day above and below the Delta barrages

Treated industrial and sanitary waste discharges to drains, lakes, and ponds

Treated discharges from river vessels to the Nile and canals

Drain waters to be mixed with the Nile or canals

## Law 93/1962

Law 93/1962 concerns the construction of sewers and sewage treatment facilities and the allowed discharges of residential, commercial, and manufacturing facilities to sewers. Ministerial Decree 9/1989 revised the standards set out in this law. Although originally intended to control discharges to surface waters, Law 48/1982 removed this function from Law 93/1962. The revised standards cover discharges of industrial waste to sewers and the land application of treated sewage on clay and sandy soils. This law is implemented by the Ministry of Housing, Utilities and Urban Communities (MHUUC).

The significance of this decree is that it specifies less stringent standards for industrial facilities that discharge to sewers because of the additional treatment that would occur prior to discharge.

**Table (3-1) Principal Environmental Laws, Decrees and Regulations**

<b>Environmental Law</b>	<b>Date</b>	<b>Authority</b>	<b>Decrees Regulations</b>	<b>Implementing Agency</b>
Law No. 4 on Environment	1994	Establishment of EEAA and Environmental Trust Fund; requirement of EIA; regulation of air pollution, hazardous waste management, and marine pollution	Decree No. 338 of 1995 (Executive Regulations)	Ministry of State for Environmental Affairs; EEAA
Law No. 117 on Cultural Heritage	1983	Preservation and management of cultural heritage	Presidential Decree No. 2828 Of 1971 (cultural heritage)	Ministry of Culture
Law No. 102 on Natural Protectorates	1983	Designation and management of natural protectorates	Decrees designating sites	MOEA; EEAA
Law No. 124 on Fisheries	1983	Management and protection of fisheries and marine animals		Ministry of Agriculture and Land Reclamation
Law No. 48 on Protection of Nile and its Waterways	1982	Control of pollution of surface waters	Decree No. 8 of 1983 (standards for wastewater discharges to surface waters)	Ministry of Public Works and Water Resources
Law No. 137 on Labor	1981	Control of work place safety and environment		Ministry of Manpower and Immigration

Law No. 27 on Public Water Sources	1978	Protection of public water sources for drinking and domestic purposes	Decree No. 27 of 1966 (Supreme Committee for Water) Appendix IV of 1975 (Standards for potable water)	Ministry of Health and Population; Supreme Committee for Water
Law No. 31 on Public Cleanliness	1976	Control of solid waste management (amends Law No. 38 of 1967)		Ministry of Housing, Utilities, and Urban Communities
Law No. 66 on Transport Air Pollution	1973	Control of air pollution from transportation sources	Decree No. 864 of 1969 (Supreme Committee); Decree No. 470 of 1971 (ambient air standards)	Ministry of Health and Population; Supreme Committee for Protection of Air
Law No. 38 on Public Cleanliness	1967	Control of solid waste management (including hazardous waste)	Decree No. 134 of 1968 (waste from domestic and industrial Sources)	Ministry of Housing, Utilities, and Urban Communities
Law No. 53 on Agriculture	1966	Regulation of purchase, importation and handling of pesticides	Decree No. 50 of 1966 (registration and licensing requirements)	Ministry of Agriculture and Land Reclamation
Law No. 93 on Wastewater and Drainage	1962	Control of wastewater discharges and drainage to public sewers	Decree No. 643 of 1962 (Standards for wastewater discharges to public sewers)	Ministry of Housing, Utilities, and Urban Communities

### 3.4 Incentives and Disincentives for Water Quality Control

There are two sets of instruments for water quality control: (i) command and control instruments; and (ii) market-based incentives. Although in the past the GOE has relied mainly on the former, attention is now being given to the latter approach. The following paragraphs describe the set of instruments already in use under each approach.

#### Command and Control Instruments

These include any regulation that imposes requirements regarding water use, treatment technologies, or limitations on effluent discharges. Among the instruments presently being used in Egypt are the following:

**Regulations.** Law 48 has formulated concentration-based water quality standards for effluents and fresh and saline water bodies. The standards established in the Executive Regulations are for the following categories:

Fresh water bodies receiving treated industrial effluents.

Treated industrial effluents being discharged into fresh water bodies and groundwater reservoirs. There are different standards for the Nile, its canal system, and groundwater sources.

Treated industrial effluents for volumes less than 100 cubic meters per day.

Drainage water to be mixed with fresh water for irrigation purposes.

Municipal and industrial effluents discharged into brackish or saline water bodies.

Brackish or saline surface water bodies receiving treated municipal or industrial effluents.

Since the standards are concentration-based and not pollution load-based, many industrial firms have resorted to dilution as a means to comply with the law -- a solution which has no beneficial impact on pollution levels. Shifting the basis for controls is a priority for the future, as discussed later in the report.

Although water resources are used for different purposes (drinking, irrigation, and fishing), quality standards for receiving water bodies do not generally reflect the different uses of the receiving bodies. As a result, some water courses are subjected to standards that are too loose, while others are subjected to standards that are too strict. As discussed below, changes are also needed regarding strictness of standards.

**Environmental Impact Assessment.** The Environmental Protection Law (EPL) proposes the implementation of a new command and control instrument for pollution abatement: requiring Environmental Impact Assessments (EIAs). EIAs are a pre-requisite for all new establishments applying for licenses or for existing establishments looking for expansion. According to the EPL, Line Ministries are responsible for the preparation of the EIAs, and upon completion they should be forwarded to EEAA for approval.

### **Market-Based Incentives**

These include any measures that act as incentives for water users and polluters, allowing them to determine the most efficient and effective ways of controlling water uses and abatement practices. The EPL provides a number of financial incentives for controlling pollution of water sources.

**Environmental Fund.** With the establishment of this fund, money from different sources is made available for environmental protection projects. Regarding the water sector, the fund provides soft loans to industrial firms for pollution abatement projects such as recycling and reuse of treated effluents, as well as for setting up small-scale pilot demonstration projects.

**Effluent and Sewer Charges.** The EEAA has studied other economic instruments, namely effluent and sewer charges, which may be suitable for the Egyptian context. This area is likely to receive increasing attention in the future.

### 3.5 Evaluation of Current Institutional Framework

The analysis of the specific features of water quality management indicates the following problems:

**Unclear Responsibilities:** Law 4 stipulates that EEAA supervise and operate the national monitoring network, for which an environmental information center is established within EEAA. Law 48 assigns the same responsibility to the MPWWR. This calls for the reliance on different institutions for basic data sampling, analysis, processing, and storing.

**Lack of Enforcement:** At present there is limited capacity within the MPWWR to enforce the regulations dealing with water quality. Government-owned enterprises, considered the main polluters, get special treatment since the government cannot easily fine or force closings, for fear of significant unemployment.

**Improve Water Quality Management:** The Government of Egypt has already established some initiatives to improve the current water quality management. This includes the establishment of the following:

- The High Committee for the Nile, chaired by the Minister of MPWWR and comprised of representatives of MOI, MALR, MHP, MIMW, MHUUC, and MEA, is responsible for the protection of the Nile system in terms of its quality and quantity.
- The National Water Quality Conservation Unit (NWCU), which responds to the need of better information on water quality, is the focal point on water quality information in Egypt and aims to serve as a bridge between generators of data and users of information.
- The National Water Quality Conservation Program Advisory Committee, instituted to guide the program of NWCU, includes representatives of several government bodies dealing with water quality matters, e.g. EEAA, DRI, RIGW, NRC .
- An Environmental Impact Assessment is now required for the operation of industrial and wastewater treatment plants.
- The Central Directorate for Waterways Maintenance, under the Irrigation Sector of MPWWR, has the responsibility for issuing permits or licenses for municipal and industrial wastewater discharges, according to Law 48. This Directorate supervises irrigation and drainage use to prevent unnecessary aggression from other parties and to carry out necessary legal follow-up actions.
- The Water Communication Unit, connected to the Minister of Public Works and Water Resources, has responsibilities for raising public awareness about water scarcity and risks generated by polluting water resources.

Despite these important initiatives, there are few natural incentives for cooperation among institutions which must compete for scarce resources.

## **GUIDELINES FOR FUTURE WATER QUALITY MANAGEMENT**

This Section will review the history of water quality management programs in industrialized and developing nations over the last thirty years, discuss a set of principles that the study team developed to help formulate potential directions for MPWWR's future, and present specific strategic choices available to the Ministry over the next few years.

### **Background**

#### **4.1.1. History of Regulatory Programs in Industrialized Nations**

Environmental Regulatory Programs in the US and other industrialized nations have had similar development patterns over the last thirty years. Dating back to the 70's, the enactment of strict, media-specific pollution control laws led to the establishment of discharge limits for classes of facilities which were included in facility-specific discharge licenses or permits. Based on strong popular support for the new legislation, regulatory agencies rigorously oversaw compliance and used an array of civil and criminal penalties to promote high levels of compliance. These systems are generally referred to as "command-and-control regulatory programs," although market-mechanisms, like tradable emission permits, were occasionally employed.

As the scope of such programs began to reach mid-sized and smaller facilities, the value of outreach and compliance assistance programs began to be widely recognized. In the mid 80's, the scope of regulatory agencies expanded to include "pollution prevention" or "clean technologies" programs, to shift the focus from end-of-the-pipe treatment to facility management and process changes to reduce the volume and toxicity of waste streams and improve the efficient use of energy, water, and raw materials. These changes were attractive since they offered potential cost savings for the impacted facilities while reducing pollution impacts. The pursuit of inexpensive ways of improving environmental performance also promoted many collaborative efforts with trade associations, which proved to be especially helpful in dealing with smaller firms generating particularly toxic wastes, such as metal finishing and small pharmaceutical establishments.

In the mid 90's, regulatory programs were again expanded to encourage leading industries to pursue "superior performance objectives" as a way of promoting public commitments to emission reductions that greatly exceeded the facility limits included in current permits. Such actions are needed if the ambitious goal of "Sustainable Development", to leave undiminished resource opportunities to future generations, is to be achieved.

Today, mature regulatory programs enjoying high compliance rates divide their activities among all three activities. These institutions recognize that the newer programs are not replacements for core regulatory activities, although fewer resources need to be devoted to compliance oversight once a "climate of compliance" is achieved.

#### **4.1.2. The Development of Water Pollution Activities in Industrialized Nations**

Abatement programs typically began with one or two rounds of technology-based standards, based on what each sector of the economy or class of facilities could afford to build and operate. Typically these discharge limitations were incorporated in facility-specific permits.

Due to the complexity of relating discharge levels to changes in down-stream water quality, technology-based standards did not lead to the attainment of ambient water quality standards in many crowded waterways.

Where water quality problems persisted, additional requirements were added in future rounds of permits, taking 10 to 15 years or more to generally attain in-stream ambient standards. In practice, implementation was phased over extended periods, and additional increments of technology were generally justified by a failure to attain WQS in nearby water bodies. While not necessarily efficient, these actions tended to equalize costs among potential competitors in the market place, greatly reducing potential economic disturbances. After initial resistance, most industries adopted the attitude that abatement was "just another cost of doing business". This extended implementation period also allowed the major institutions to develop requisite capabilities, as the regulatory agencies, the business community, and a wide array of consultants developed the capacity to identify cost-effective ways of attaining compliance with most requirements.

The recent public debate about "regulatory reform" in the US and other industrialized nations has largely focused on the inherent inefficiency of uniform technology standards that do not consider the site-specific impacts on the local environment. Most proponents for reform argue that future requirements should be justified on the bases of improved local environmental impacts. They also recommend that where compliance rates are high, facilities should be given greater flexibility in how new requirements are met, in return for providing enhanced public availability of performance information.

#### 4.1.3. Institutional Development in Developing Nations

Many developing nations have enacted stringent environmental laws and standards, without considering the costs and economic impacts of such requirements or the administrative burdens necessary to manage such regulatory programs. When faced with high rates of non-compliance, they are often unable to enforce these requirements in the face of: (1) huge compliance costs; (2) local political realities; and (3) conflicting national economic development goals. Direct enforcement by revoking licenses and closing plants is only feasible in the face of "imminent and substantial hazards", and then only as an interim measure until the problems can be identified and fixed.

Some useful insights about the need for a range of sanctions for serious or persistent non-compliance are contained in an article by Bell and Bromm, entitled "Lessons Learned in the Transfer of U.S.-Generated Compliance Tools: Compliance Schedules in Poland", published in the *Environmental Law Review* in June, 1997. This article looks at the practical limits of enforcement in civil law countries and at efforts to use compliance agreements to promote environmental protection in nations shifting from centrally-planned to market-based economies. The authors make a strong case for the need of an array of sanctions, beyond closing plants in order to promote compliance. They recognize that empowering regulatory agencies with such broad discretionary powers is problematic, and suggest potential reforms within the judicial system as a way of creating a range of sanctions for non-compliance problems.

#### 4.1.4. Non-Compliance a World-Wide Problem

High levels of non-compliance is a world-wide phenomenon, receiving increasing attention in the literature of institutions like the World Bank. Many interventions are being tried, but there appear to be no simple solutions to these persistent problems. This is particularly difficult in nations that lack the institutional capacity and legal frameworks with which to manage effective regulatory programs. In a 1997 World Bank publication entitled "Pollution Prevention and Abatement Handbook", there is an interesting section entitled Developing a Culture of Industrial Compliance. This article offers a number of potential prescriptions, which must be tailored to local realities, for promoting compliance in developing countries. Among the remedies noted are:

- pollution inventories-to provide stakeholders with basic information about environmental challenges;
- information on facility compliance - making compliance data publicly available;
- cleaner production techniques-to promote pollution prevention audits and improved facility management beyond end-of-the-pipe treatment;
- voluntary industry standards - like ISO 14,000;
- supplier chain impacts - environmental awareness imposed by enlightened multi-national purchasers; and
- negotiated agreements and government-industry partnerships

The document concludes by noting that the challenge is in picking the tool or combination of tools that can be most effective in a given situation.

In another 1997 World Bank study entitled " Environmental Management and Institutions in OECD Countries: Lessons Learned from Experience" by Lovei and Weiss, the authors conclude that managers in developing nations could benefit from:

the dissemination of environmental quality information to build public interest and political support;

feasible environmental priorities;

- mechanisms for consensus building among major stakeholders;
- a mix of direct regulation and incentive-based policies; and  
an incremental approach to building environmental institutions.

#### 4.1.5. International Network for Environmental Compliance and Enforcement

There are a growing number of international forums concerned with compliance problems in developing countries. One such initiative is the International Network for Environmental Compliance and Enforcement, originally launched by the Dutch Government and the U.S. Environmental Protection Agency and currently receiving support from a number of international bodies like the World Bank, UNEP and the Canadian and the US foreign assistance programs. Over the years, this forum has held five biannual meetings and developed a literature of about 1000 technical papers on how various nations are dealing with compliance problems. Their publications can be reached through their web site [hpt://www.inece.org](http://www.inece.org)

Of growing importance is the attention being given to the use of Compliance Agreements to respond to significant non-compliance problems among large industrial and municipal facilities. Such agreements are typically site-specific, negotiated schedules for actions to be taken toward compliance with existing requirements. These are flexible instruments that can

be used to tailor solutions to local realities, motivate feasible incremental improvements, and sanction phased implementation strategies where appropriate. Once approved by the regulatory agency, compliance is defined as adherence to the approved schedule, which can easily be tracked and reported. These agreements can range from formal court-sanctioned enforcement documents to informal agreements between regulators and facility owners.

While there are significant administrative costs in taking on problems on a site-specific basis, these procedures offer developing countries opportunities to promote visible compliance activities, focus on facilities causing the largest water quality problems, and control the pace of implementation to be commensurate with their developing capacities to negotiate agreements and oversee compliance. Over time, the process of compliance agreements will generate a much better understanding of national non-compliance problems and technically feasible solutions. Eventually, the administrative burden could be dramatically reduced by issuing general permits for classes of related facilities, a technique that has been employed by many industrialized countries.

### **Decision Principles**

In considering proposed initiatives for MPWWR to improve compliance with water pollution requirements, and in assessing suggestions from members of the Inter-Ministerial Committee, the study group worked from the following principles:

- Promote opportunities to initiate pollution abatement activities as quickly as possible and not delay action pending the resolution of major reform proposals;
- Protect the world-class water quality standards adopted in Egypt as goals rather than make major adjustments with the limited information currently available;
- Encourage applications of pollution prevention to reduce pollution impacts and promote the efficient use of energy, water, and other natural resources by promoting pollution prevention audits as part of compliance efforts;
- Give priority attention to facilities having the largest adverse impacts on water quality, to get the maximum return on the use of limited resources;
- Allow incremental improvements, given the significant resource constraints, and promote collaborative interactions with the regulated community;
- Apply the rule that the polluter should pay for the damages created, a principle that underlies most environmental protection programs around the world;
- Promote stakeholder participation and public-private sector partnerships in defining regulatory requirements, so as to move toward a culture of industrial compliance; and
- Foster cooperation among ministries with related missions as a way to maximize the impact of extremely limited governmental resources.

### **Strategic Approach**

In view of these principles, the study team adopted a two tiered strategy. Short-term actions are proposed to initiate compliance activities among facilities believed to be causing the greatest water quality problems, and long-term proposals are for more fundamental reforms of Law 48, its Executive Regulations, and the existing WQS. The interim activities should be implemented over a sufficient period of time to provide a better understanding of the problem and feasible abatement actions, for various classes of facilities, before the details of the more fundamental reforms are established. To do otherwise-- to propose major reforms in the law or the standards at this time, with the limited information currently available-- would

inhibit progress in the short-run and probably create long delays as the new proposals are subjected to intense debate.

In view of the magnitude and complexity of the water pollution problems and the huge cost of attaining full compliance in Egypt, this is not a problem that can be resolved in a few years. Yet, there is a great sense of urgency about the need to increase the priority given to addressing these compliance issues in order to avoid even greater problems in the future.

## **SUMMARY OF THE MAJOR FINDINGS OF THE WORKSHOP**

### **Purpose of the Workshop**

The main objectives of the workshop were to:

Review and discuss the major proposals being developed to improve compliance with the water pollution regulations in law 48 and its executive regulations.

Glean opinion and perspective from a broad range of stakeholders regarding the revision of law 48.

Establish a basis for improving the cooperation among the concerned institutions and organizations.

Identify other initiatives which might contribute to improving water pollution control.

A total of 50 stakeholders participated in the workshop, including representatives of concerned ministries, the private sector, and NGOs. Following presentation of the principles and strategy of proposed improvements, there ensued a full day of discussion and information sharing. The information derived from this discussion was supplemented by interviews with the members of the Inter-Ministerial Committee.

### **5.2 Workshop Issues of Discussion**

In his keynote address, the chairman of the Inter-Ministerial Committee made the following Points:

Egypt's water needs are increasing because of the growing population, industrial development and cultivation of desert areas. Yet the supply is limited.

Irrigated agriculture is by far the largest water consumer. Although advances in irrigation and agriculture technologies stimulate water conservation, further intensification of crop schedules puts increasing demands on the scarce water resources. This calls for more difficult and costly irrigation management to save and reuse agricultural drainage water. The present reuse schemes are environmentally unsound, as they tend to pollute and increase the salinity of freshwater bodies. As a result, the water quality of the Nile System is now of great concern for MPWWR.

Pollution abatement from domestic and industrial wastewater is very complex and demands large investments for the collection, transport and construction of municipal treatment plants.

There was general consensus among workshop attendees and the Inter-Ministerial Committee that legislative reform and removal of current technical and administrative barriers to enforcement of water quality standards are required. The present legislation is mainly based on law 48 and its executive regulation, which have been given the following criticism:

The law is based primarily on one emission standard for the disposal of wastes from all industrial sectors;

Water quality management should take into consideration the functions of the receiving water bodies (drinking water supply, irrigation, fisheries, etc.), as well as the standards for the disposal of wastewater in order to be able to reach these objectives;

The standards are related to concentrations of pollutants and not related to the total load

of a wastewater discharge. This may invoke the dilution of wastewater with scarce water of good quality before the actual discharge into surface water;  
The discharge of domestic wastewater into freshwater bodies is prohibited independent of possible treatment;  
The standards for industrial discharges are rather restrictive and do not permit a flexible step-by-step approach to improvement of water quality, as for example advocated by GOFI; and  
Penalties are generally too low to have effect on decisions of industries to install treatment facilities or to change to clean technology production processes.

It was also agreed to implement Law 48 and its Executive Regulations through the preparation of practical rules and a negotiated time-schedule for the implementation of waste-reducing measures. Standards must be related to both the concentration and total waste load, and need to be related to the actual waste load rather than to the average waste load, in order to enforce the regulations through checks and controlling of effluents.

Some remarks and suggestions on the proposed changes to Law 48 and its Executive Regulations are given in the following:

The Compliance Action Plan is a tool for the government to tackle the pollution problem and should be implemented through law 48.

The idea that the polluter pays principle is not incorporated in the law at present. Only cost recovery for sampling and analysis and some penalties are possible now. The law should state that the polluter pays an amount per discharged load, even if there is a permit.

### **5.3 Stakeholders Proposals for Amendment of Law 48/1982 and its Executive Regulations**

#### Law 48

In addition to WPAU/EPIQ proposed changes, the following amendments are suggested:

Article 1: Add Lake Nasser

Article 2: First part: proposed text is fine but with the added justification that this also gives room to sampling and analysis of untreated waste water and surface and ground water.

Article 3: Last part: proposed text should be clear as to what has to be the situation after three months. Just submission of a CAP is not enough.

Article 5: Given that it is the wish to allow floating vessels to discharge treated waste while moving (as is elaborated on in art.5 of the Ministerial Decree), this article should be made less strict.

#### Executive Regulations

In addition to WPAU / EPIQ proposed changes, the following modifications are suggested:

Add an article stipulating that the polluter pays principle, where the charge is based on the actual discharged load (not the permitted).

Identify who should monitor surface waters for compliance.

Often there is mention of MPN/ml. This is a unit for the bacterial count. It must be specified what is being counted, Total Coliform Bacteria or Fecal Coliform Bacteria (as the WHO uses in its guidelines). This also explains why the original standard was 5,000 in most (Total Coli) and is now changed to 1,000 (Faecal Coli); it involves a different parameter. It may be good to use consistent units and not specify Ammonia as N and Nitrates NO<sub>3</sub>. Either use NH<sub>4</sub> – N and NO<sub>3</sub> – N, and PO<sub>4</sub> –P etc. or use complete Nh<sub>4</sub>, NO<sub>3</sub> and PO<sub>4</sub>. The terms “total solids”, “total suspended solids” and “suspended solids” are sometimes confusing. They are not the same, so the decree should be very precise. The terms as used in article 61 in heavy metals. It should be clear if metals are determined dissolved (after filtration) or total (including adsorbed to suspended solids), as this can make a large difference.

It is suggested that, in addition to modifications to the law, recommendations be developed to assist by MPWWR in phased implementation. This could include delegation to or establishing protocols between, MPWWR and other implementing agencies, to obtain the greatest impact at the most reasonable cost and to help reduce duplication of effort.

For example, a protocol between the MPWRR and the Ministry of Housing and Local Communities could enable the Ministry of Housing to have a more rationale approach to sanitary drainage planning that would allow primary treatment to be a viable option for increasing these services throughout the country. Then when resources are available, systems could be upgraded to enhance the treatment, especially where the degree of treatment has a significant downstream impact. Whenever possible, the selection of the treatment option should factor in the ease of operation and the running cost.

Another protocol could be between the MPWWR and the Ministry of Environment. to allow the Ministry of Environment to be the primary receiver of Compliance Action Plans for industries and other categories, as negotiated.

#### **5.4 Conclusions Drawn from the Stakeholder Comments**

The workshop was designed to provide an opportunity for members of the Inter-Ministerial committee and other interested parties to comment on the adequacy of the proposed changes in Law 48 and its Executive Regulations.

The results of this brainstorming process point out a number of major concerns that need to be addressed in the revision of Law 48. Some conclusions drawn from workshop participants follow:

There was overwhelming support among stakeholders for the establishment of Compliance Action Plans.

The law should stipulate that the polluter pays principle.

- The implementing agency that will monitor surface waters for compliance must be identified.

A two-track approach was suggested:

The production of a National Water Pollution Control Plan in order to begin to reduce emission to surface water from municipal and industrial sources.

Establish a Compliance Action Plan with each corporation that discharges wastewater into the Nile, the two branches and its waterways.

A National Water Pollution Control Plan should address the need and prioritization of

- treatment installations, as well as a financial structure for the implementation of the plan.
- It is recommended to follow a step-by-step approach based on a simplified policy objective: “collection and treatment of wastewater as much as possible on a low budget base”.

## **6. PROPOSED CHANGES TO LAW 48 AND ITS EXECUTIVE REGULATIONS ISSUED BY MINISTERIAL DECREE NO. 8/1983**

### **6.1 Introduction**

The study group proposes minor changes to Law 48 and its Executive Regulations, in order to begin the Compliance Action Program by adopting a new law reflecting the changes which have occurred since the issuance of the Law .

Below, is a list of the original provisions of Law 48 and its Executive Regulations together with our proposed amendments. Only those articles and provisions which the group finds necessary to amend are listed. Justifications for each of the proposals are provided.

### **6.2 Proposed Amendments to Law 48**

#### **Article (1):**

##### **Original Provision:**

Shall be considered as Waterways in the context of this law, the following :

- (a) Fresh water sources, including:
  - 1. The River Nile, its two branches, and streams.
  - 2. Feeders and canals of all levels and ducts.
- (b) Non-fresh water areas, including:
  - 1. Drains of all levels.
  - 2. Lakes.
  - 3. Ponds, closed waterways and oozes.
- (c) Groundwater reservoirs.

##### **Proposed Provision:**

Waterways are:

- High Aswan Dam Reservoir
- River Nile and its two branches

Canals

Groundwater aquifers

- Drains

Lakes

Ponds and closed waterways

##### **Justification:**

We propose to remove the distinction made by Article (1) for the waterways for the following reasons:

- 1. The definition of fresh water is given under Article (1) of the Executive Regulation (see our proposal below).
- 2. This change is consistent with Executive Regulations Article 1.

3. The High Aswan Dam Reservoir cannot be classified as non-fresh water.

### Article (3)

#### Original Provision:

Organs of the Ministry of Health shall carry out in their laboratories periodic analysis of samples from treated liquid wastes from establishments permitted to drain into Waterways as scheduled in addition to non periodic analysis as may be required by the Ministry of Irrigation.

Organs of the Ministry of Health shall be responsible to take samples and make analysis for the account of the licensee, who has to deposit an amount with the Ministry to be determined according to the type of the waste discharged on account of sampling costs, transfer and analysis.

The Ministry of Irrigation and the person interested shall be notified of the analysis results. Should it be established that the liquid wastes drained into the Waterways do not conform with measures and specifications stipulated in the license granted and do not represent immediate danger, the interested person shall, during a period of 3 months from the date of advice, take suitable action to treat the wastes to conform to the specifications and measures specified. Treatment and analysis should be actually effected during this period. If treatment shall not take place by the end of the 3 month period, or proves to be ineffective, the Ministry of Irrigation shall withdraw the license granted to the concerned person and will take administrative measures to stop drainage into waterways.

If the results of the analysis of the samples show that the samples do not conform to the specifications and measures specified by this law, and in a way representing immediate danger to Waterways, the person interested shall be notified to eliminate the reasons of harm immediately otherwise the Ministry of Irrigation shall do so at his expense or withdraw the license granted and stop drainage into the waterway through administrative channels.

#### Proposed Provision:

Organs of the Ministry of Health shall *carry out in their laboratories or other authorized governmental laboratories* periodic analysis of samples from treated liquid wastes from establishments permitted to drain into waterways as scheduled, in addition to non-periodic analysis as required by the **MPWWR**.

Organs of the Ministry of Health *or other authorized governmental laboratories* shall be responsible .....

The **MPWWR** and the *licensee* shall be notified of the analysis results. Should it be established that the liquid wastes drained into the waterways do not conform with measures and specifications stipulated in the license granted, and do not represent immediate danger, the interested person shall, during a period of three months from the date of advice,...*submit a compliance plan as provided for in the Executive Regulations* .

**Justification:**

- (1) The original provision restricts taking samples and conducting analysis to the laboratories of the MHP. We propose to extend this authority to any authorized or certified governmental laboratories, to achieve this task under the supervision of MHP, for the following reasons:
  - (1.1) To expand the number of governmental laboratories conducting samples for analysis under the direction of the Ministry of Health.
  - (1.2) The amendment to the third paragraph will enable both the MPWWR and licensees to find a reasonable method to implement the Law and Executives Regulations under a Compliance Action Program.
- (2) If the results of the analysis is not in conformity with the measures and specifications stipulated in the license and does not constitute immediate danger, the study group proposes a new mechanism under which the establishment should submit a compliance plan in order to mitigate the defects. This should be in accordance with the rules and provisions stipulated in the Executive Regulations (see proposed amendment to Article (28) of the Executive Regulations herein below).

However, no change is proposed with regard to the immediate danger, as it seems very important to maintain a legal mandate for immediate action if the discharge causes a potential health hazard.

**Article (8)**

**Original Provision:**

The General Organization for sanitary Drainage shall prepare one or more models for units processing viscid and liquid wastes from factories, houses and other constructions, from floating units and Nile vessels ensuring their conformability with the specifications and measures specified in this law.

**Proposed Provision:**

To be deleted

**Justification:**

The aim of this proposal is to shift burden to owners to select proper technology and be responsible for compliance with standards.

**6.3 Proposed Amendments to the Executive Regulations issued by the Ministerial Decree No. 8/1983**

**Article (1)**

## Original Provision

In order to implement Law No. (48) for 1982, the Waterways shall mean the following:

1. The River Nile, and its two branches: the main course of the Nile starting from the international borders with Sudan till the mouth of Damietta and Rasheed in the Mediterranean Sea.
  2. Bays: the side branches of the Nile course inside the islands.
- Feeders & Main Canals: the large canals conveying water from the forepart of Delta Barrage, and feeding canals networks in Northern Egypt.
4. Canals: large, and small canals with all their branches up to field irrigation-canal.
  5. Side Channels: parallel or adjacent distribution canals fed by main connecting canals carrying irrigation water.
  6. Drains: large, and small drainage canals with all their branches up to field drainage, and covered drainage canals.
  7. Lakes: the lakes connected with seas or closed once
- Ponds: The greater closed water surfaces in which Waterways pour.  
Closed Water Surfaces: depressions filled with water, and connected with Waterways.
10. Swamps: the low grounds around the lakes in which drainage channels pour.  
The source of all the last three Waterways is drainage water.
  11. Ground Water Reservoirs: the ground water reservoirs inside the Egyptian borders.
- Solid wastes: all solid materials, whether they are resulting from refuses, garbage, sweeping materials, dry rubbish, stones fractures, buildings, workshop-scrap; or any solid materials leftover by persons, housing buildings, and non housing buildings - governmental or private; whether they were commercial, industrial, touristic or public, as well as means of transportation.

Wastewater:

1. Wastes resulting from the industrial shops, and on which the standard measures regarding the industrial liquid wastes are applicable.
2. Human or animal wastes resulting from sewage treatment facilities or sewer network (sanitary drainage), or other establishments, such as public, trading, industrial and tourist shops, whether immovable, movable or floating.
3. Animal wastewater, resulting from slaughtering operations, abattoirs, slaughterhouses, poultry farms, animal yards, and the like.

Establishment means all real estates, shops, commercial, industrial, or touristic, whether governmental or non-governmental.

## Proposed Provision:

In order to implement Law No. (48) for 1982, the Waterways shall mean the following:

1. High Aswan Dam Reservoir, the River Nile, and its two branches: the main course of the Nile starting from the international borders with Sudan till the mouth of Damietta and Rasheed in the Mediterranean Sea.
15. Fresh water: High Aswan Dam Reservoir, The River Nile and its two branches, bays, feeders, canals, and groundwater reservoir.

## Justification:

**Sub-Article(1) is amended by adding High Aswan Dam Reservoir to reflect the same amendment proposed to Article (1) of the Law.**

**The proposed sub–article 15 is to define fresh water, since the regulation refers to it under some of its articles.**

#### **Article (5) [First Paragraph]**

##### **Original Provision:**

It is not permitted to discharge any human, or animal wastes, or municipal waste water into fresh waterways mentioned in Article (1) of the referred to Law No. (48) for 1982, or into groundwater reservoirs. Nevertheless, the Minister of Irrigation may authorize the discharging of wastes of movable boats, and river units into fresh Waterways, and groundwater reservoirs, after treating it according to the standard measures, and pursuant to the conditions and controls stated hereunder, provided the owner of the houseboat or the river unit shall pay the charge stated in Article (82) of the present Regulation:

##### **Proposed Provision:**

It is not permitted to discharge any human, animal, or municipal waste water into the River Nile and its two branches, canals and groundwater aquifers. Nevertheless, the Minister of MPWWR may authorize the discharging of liquid wastes of movable boats, and river units into fresh Waterways, after treating it according to the standard measures, and pursuant to the conditions and controls stated hereunder, provided the owner of the boats or the river units shall pay the charge stated in Article (82) of the present Regulation.

##### **Justification:**

Groundwater is omitted in sentence (2) in order to protect groundwater from pollution.

#### **Article (6)**

##### **Original Provision:**

It is prohibited to discharge all industrial liquid wastes, or domestic wastewater, into fresh waterways, and groundwater reservoirs. The Ministry of Irrigation may authorize discharging industrial liquid wastes, which were treated, into groundwater reservoirs, pursuant to the conditions and specifications, and criteria determined in the present Regulation.

##### **Proposed Provision:**

It is prohibited to discharge all industrial liquid wastes, or domestic wastewater, into fresh waterways, and groundwater reservoirs. The MPWWR may authorize discharging industrial liquid wastes, which are treated into the River Nile and its two branches, the canals and groundwater reservoirs, pursuant to the conditions, specifications, and criteria determined in the present Regulation.

**Justification:**

The proposed amendment to this Article aims to add the possibility to discharge industrial liquid wastes which were treated into surface waterways, upon authorization of MPWWR.

The new draft also reflects the wording of Articles 61-64 which allow discharge of treated industrial liquid wastes into the River Nile and its two branches and stipulates the standards and conditions as specified under the above mentioned articles.

**Article (12)**

**Original Provision:**

(1) The application for obtaining a license to discharge treated industrial liquid wastes into Waterways, shall be submitted to the Irrigation Inspector of the concerned region subject to the Ministry of Irrigation, in whose district the establishment is situated. The application should be submitted with stamp duty prepaid, and attached with the following information:

1. Name of establishment, its location and address.
2. The license issued for the existing establishment, or the number and date of license application, and the approvals issued.
3. Name of the owner of the establishment.
4. The activity practiced by the establishment.
5. Type of liquid wastes to be discharged into Waterways for which the license is requested.
6. For existing establishments, result of analysis carried out within a period not exceeding three months, of a sample of such wastes.
7. Name of the waterway adjacent to the establishment, into which the discharge will take place.
8. Engineering drawings, which indicate the locations for the discharge of wastes into the Waterways, or the underground reservoir, the proposed method of discharge, and the necessary specifications.
9. Payment of a review-charge in the amount of L.E. 20 (twenty pounds).
10. Payment of deposit, for cost of taking the samples, their transportation, and analysis at the following rates:

<b>Serial</b>	<b>Kind of Wastes</b>	<b>Value of Deposit</b>
(1)	Municipal waste water	LE 200 (two hundred pounds)
(2)	<u>Industrial liquid Wastes:</u>	
	(a) Discharge to fresh waterways.	LE 500 (five hundred pounds)

(b) Discharge to non-fresh waterways LE 400 (four hundred pounds)

**Proposed Provision:**

1. ....
2. ....
3. ....
4. ....
5. ....
6. ....
7. ....:
8. ....
9. Payment of a review-charge in the amount of L.E. 300 (*three hundred pounds*).
10. ....:

(2)	Serial	Kind of Wastes	Value of Deposit
	(1)	Municipal waste water	LE 500 ( <i>five hundred pounds</i> )
	(2)	<u>Industrial liquid Wastes:</u>	
	(a)	Discharge to River Nile, its two branches, canals & groundwater aquifers	LE 1000 ( <i>one thousand pounds</i> )
	(b)	Discharge to Drains and Lakes	LE 750 ( <i>seven hundred fifty pounds</i> )

**Justification:**

The fees for review charge's under Sub-article 9 should be increased to meet with the inflation rate, as it was increased fifteen times since 1982.

Fees increased under items (1) and (2) are also intended to meet the rate of inflation.

The above increase shall also increase the amount of fund established under the Executive Regulations.

**Article (17)**

**Original Provision:**

- (1) The license issued in this regard shall include the following:
- (2) - The license number;
- Name of the establishment, and its location;
- Name of the owner of the establishment;
- The standard measures, and special specifications which the quality of the liquid wastes should not exceed;
- Name and location of the waterway into which the liquid wastes are licensed to the discharged;
- Quantity of liquid wastes licensed to be discharged into the waterway (M3/day);
- The licensed number and discharge locations;

- The duration of license;
- The annual due charges on the account of practical inspection and sample analysis.

**Proposed Provision:** We propose to add the following to the above provisions:

- (1) All newly issued licenses shall include appropriate provisions for self monitoring and record keeping by the facility.

**Justification:**

This proposal aims to oblige the owner of the establishment to keep books and records to indicate all development concerning the monitoring of the quality of wastewater discharges. This monitoring, reporting and record keeping activity is specified in the license to promote compliance.

**Article (19)**

**Original Provision:**

The following bodies shall be provided with a copy of the license granted:

- 1) The concerned General Irrigation Department;
- 2) The applicant for license;
- 3) The General Department for Environmental Health in the Ministry of Health; and,
- 4) Water Surface Police in the Ministry of Interior.

**Proposed Provision:**

We propose to add to the above authorities EEAA as it has related responsibilities.

- 1) .....
- 2) .....
- 3) .....
- 4) .....; and,
- 5) **The EEAA.**

**Justification:**

To promote coordination among ministries with common responsibilities in the field of environment protection.

## **Article (23)**

### **Original Provision:**

In case of the loss or damage to the license, the General Irrigation Department, which issued the license, should be promptly notified, to obtain a replacement of the lost or damaged license, after payment of a fee of ten pounds.

### **Proposed Provision:**

In case of the loss or damage to the license, the General Irrigation Department, which issued the license, should be promptly notified, to obtain a replacement of the lost or damaged license, after payment of a fee of *LE 100 (one hundred pounds)*.

### **Justification:**

The increase of the fees reflects the inflation rate and will increase the funds of the MPWWR in order to be able to fulfill the objectives of these funds.

## **Article (24)**

### **Original Provision:**

The Ministry of Health shall carry out in its laboratories and by itself at least.....

### **Proposed Provision:**

The Ministry of Health shall carry out in its laboratories or through other authorized governmental laboratories at least .....

### **Justification:**

To reflect the proposed amendment of article 3 of the Law .

## **Article (28)**

### **Original Provision:**

If it is established from the results of analysis of the samples taken from the treated liquid wastes, that they violate the standard measures and specifications stipulated in the granted license, in a manner which does not constitute an immediate danger; the Ministry of Irrigation shall notify the concerned person, by registered letter, to eliminate the reasons of violation, within three months from the date of the notification.

### **Proposed Provision:**

If samples taken from the treated liquid wastes violate the standard measures and specifications stipulated in the granted license, in a manner which does not constitute an immediate danger<sup>[1]</sup>,

- 1) The Ministry may issue a “notice of violation” to facilities that may be in violation of existing requirements and standards.
- 2) The licensee, within ninety (90) days of notification, shall prepare and submit to MPWWR a draft Compliance Action Plan and a schedule of steps to be taken towards compliance.
- 3) The Compliance Action Plan will be subject to provisions of and approval by the MPWWR.
- 4) After approval of the Compliance Action Plan by the MPWWR, an amount of LE 25,000 is required from the licensee to be deposited with the MPWWR as a guarantee and, once the works have been completed in a satisfactory manner, the LE 25,000 will be refunded to the licensee.
- 5) If the licensee fails to submit a satisfactory plan within three (3) months, or fails to complete scheduled compliance actions in the approved Compliance Action Plan, the Minister shall be entitled to withdraw the license.
- 6) If the licensee fails to complete the schedule, wholly or partially, the Ministry shall be entitled to withdraw the license and the LE 25,000 deposited by licensee will revert to the MPWWR.

**Justification:**

The aim behind this proposal is to find a practical solution to solve the problems which affect the environment of the Nile and water resources, yet which do not constitute immediate danger, and to enable the MPWWR to supervise those Compliance Action Plans. However, the adoption of this amendment needs, first of all, an authorization by Article 3 of the Law, since our proposal cannot be adopted in the Executive Regulations without amending Article 3 of the Law, as proposed above (see the proposed comment on Article 3 of the Law above).

**Article (29)**

**Original Provision:**

The Ministry of Irrigation shall notify the Ministry of Health of the measures carried out pursuant to the previous Article, to take a new sample on the day following the expiry of the three (3) month period referred to in the previous Article, to analyze it; and to notify the Ministry of Irrigation with the result of the analysis, and of the final decision of the Ministry of Health with in this respect, on the form referred to in Article (26) of the present Regulation.

---

[<sup>1</sup>] It should be noted that this provision cannot be amended without amending Article (3) of Law No. (48) for 1982.

**Proposed Provision:**

The *MPWWR* shall notify the Ministry of Health of the measures carried out pursuant to the preceding Article, to take a new sample on the day following *the lapse of the CAP period*, to analyze it; and to notify the *MPWWR* with the result of the analysis, *together with* the final decision of the Ministry of Health *in relation therewith*, on the form referred to in Article (26) of the present Regulation.

**Justification:**

This amendment is required, if the proposed amendment of Article 28 above is adopted.

**Article (30)****Original Provision:**

The Ministry of Irrigation must withdraw the license, and prevent discharge into the Waterways through administrative methods, if compliance shall not be completed during the three (3) month period referred to in Article (28), or if the results of reanalyzing the samples have revealed the unsuitability of the corrective treatment methods undertaken by the licensee.

**Proposed Provision:**

To be deleted

**Justification:**

The deletion is required if the proposed amendment to Article 28 is adopted.

**Article (41)****Original Provision:**

The license application for the construction of boats, shall be submitted by its owner to the Head of the Irrigation Sector at the Ministry in Cairo, on an application containing a prepaid stamp fee, attached to which are the following documents:

- 1) Boat ownership document.
- 2) A certificate from the General Authority for River Transportation, of the houseboat's fitness and its conformity with the following conditions laid down by such Authority.
- 3) A certificate from the concerned irrigation engineer of the existence of a unit for treating wastes resulting from the use of the houseboat, his inspection thereof, and confirming the units serviceability.
- 4) Approval of the other concerned authorities.

- 5) Undertaking from the boat owner not to allow leakage of fuel used in its operation into Waterways.
- 6) Name of the waterway used by the houseboat whether sailing or at anchor.
- 7) Payment of review fee in the amount of twenty pounds.

**Proposed Provision:**

- 1) .....6).
- 7) Payment of a review fee in the amount of *two hundred pounds*.

**Justification:**

The increase of the review fee reflects the inflation rate and will increase the funds of the MPWWR.

**Article (44)**

**Original Provision:**

In case the license is lost or damaged, the Irrigation General Department, or the Nile Inspection Department from which the license was issued, must be notified at once, to obtain a replacement for the one lost or damaged, after paying a fee in the amount of ten pounds.

**Proposed Provision:**

In case the license is lost or damaged, the Irrigation General Department, or the Nile Inspection Department from which the license was issued, must be notified at once, to obtain a replacement for the one lost or damaged, after paying a fee in the amount of *one hundred pounds*.

**Justification:**

The increase of the review fee reflects the inflation rate and will increase the funds of the MPWWR.

**Article (56)**

**Original Provision:**

The volume of the sample should not be less than two liters. The samples should be collected in bottles with a tightly closed cover of frosted glass. The container and the cover should also be clean inside before using. In case of collecting liquid wastes treated with chlorine, sterilized containers shall be used.

**Proposed Provision:**

The volume of the sample should be in accordance with recognized International Standards ("Standard Methods", APHA , Last Edition).

**Justification:**

This proposal to act in accordance with recognized international standard is to reflect current practice.

#### **Article (58)**

##### **Original Provision:**

The sample should represent the nature of the liquid wastes as far as possible, and should be taken from an appropriate place at the end of the treatment process; or at the final contact place for the wastes of the establishment, or the treatment process, and at the place into which the waste shall be discharged into the Waterways. If there are more than one outlet for the waste of one establishment, a separate sample should be taken from each such outlets individually.

##### **Proposed Provision:**

The sample should be collected in accordance with recognized International Standards. If there is more than one outlet for the waste of one establishment, a separate sample should be taken from each outlet individually.

##### **Justification:**

The proposal is to act in accordance with recognized international standards and is to reflect current practice.

#### **Article (59)**

##### **Original Provision:**

The person in charge of taking the sample must accurately fill in legible handwriting, the form designated for this purpose, and must be signed by the concerned person or his representative ; he shall send it immediately with the sample, to the General Department of the Central Laboratories in the Ministry of Health in Cairo, or its regional laboratories in the governorates.

##### **Proposed Provision:**

The volume of the sample should be in accordance with recognized International Standards ("Standard Methods", APHA, Last edition).

##### **Justification:**

This proposal to act in accordance with recognized international standard is to reflect current practice.

#### **Article (60)**

**Original Provision:**

<b>Parameter</b>	<b>Standard Measures (ppm unless otherwise mentioned)</b>
Ammonia	Not more than 0.5
Sulfate	Not more than 200
Nitrate	Not more than 45

**Proposed Provision:**

<b>Ammonia - N</b>	<b>Not more than 0.5</b>
Sulphate - SO <sub>4</sub>	Not more than 200
Nitrate - NO <sub>3</sub>	Not more than 45
Faecal Coliform MPN/100 ml	1000 (to be added)

**Justification:**

The proposed amendments to the standard measures are in accordance with the WHO Guidelines.

**Article (61)**

**Original Provision:**

COD (Permanganate)	15	10
Phenol	0.005	0.002

**Proposed Provision:**

COD (Permanganate)	Should be excluded	
Phenol	0.02	0.01

**Justification:**

COD (Permanganate)	No longer used	
Phenol	BPJ	

**Article (62)**

**Original Provision:**

COD (Permanganate)	20	15
Phenol	0.005	0.002

**Proposed Provision:**

COD (Permanganate)	Should be excluded	
Phenol	0.05	0.02

**Justification:**

COD (Permanganate)	No longer used
Phenol	BPJ

**Article (66)****Original Provision:**

Municipal wastewater, and industrial liquid wastes which are licensed to be discharged into drains and lakes, must fulfill the following standard measures and specifications:

COD (Permanganate)	40	50
Phenol	-	0.005
Faecal Coliform MNP/100ml	5000	5000

**Proposed Provision:**

Municipal waste water and industrial liquid wastes that are licensed to be discharged into drains and lakes, must fulfill the following standard measures and specifications, if the definition of the law change replaces non-fresh water by agricultural drains and saline lakes:

COD (Permanganate)	Should be excluded	
Phenol	-	0.05
Faecal Coliform MNP/100ml	1000	1000

**Justification:**

COD (Permanganate)	No longer used		
Phenol	-	0.05	BPJ
Faecal Coliform MNP/100ml	1000	1000	WHO Guideline

**Article (81)****Original Provision:**

The owners of the establishments which were licensed to discharge their treated liquid wastes into Waterways shall be bound to deposit an insurance in the special Fund of the Irrigation Department, as a guarantee for executing the provisions of Article (16) of the referred Law No. (48) for 1982, pursuant to the following:

- (a) One thousand pounds, with respect to each establishment which uses a pipe with a diameter not exceeding twenty centimeters or several pipes having the same discharge quantity for discharging its treated liquid wastes into Waterways.
- (b) Two thousand pounds, with respect to each establishment which uses a pipe with a diameter of twenty centimeters or more, for discharging its treated liquid wastes into Waterways.

**Proposed Provision:**

- (a) .....
- (b) **Ten thousand pounds**, with respect to each establishment which uses a pipe with a diameter of twenty centimeters or more, for discharging its treated fluid wastes into Waterways.

**Justification:**

The study group has no proposal to amend Sub-Article (a), in order not to affect the interest of small establishments. This proposal is directed only to Sub-Article (b) to increase the amount to LE 10,000, which shall not affect the big establishments, as they can afford such proposed amount. This increase also accounts for inflation.

**Article (82)**

**Original Provision:**

On the usufruct of exploiting waterways, an annual fee shall be payable in the amount of one piaster per one cubic meter of treated liquid wastes which are licensed to be discharged into the waterways. The amount of such collected fee shall be deposited in the Fund of the Irrigation Department in the Ministry of Irrigation.

**Proposed Provision:**

On the usufruct of exploiting waterways, an annual fee shall be payable in the amount of **fifteen piasters** per one cubic meter of treated liquid wastes which are licensed to be discharged into the waterways.

**Justification:**

The proposed increment of the annual fee is to account for inflation.

## 7. CONCLUSIONS AND RECOMMENDATIONS

This section includes a summary of the conclusions reached by the study team and a comprehensive list of recommendations to MPWWR for improving compliance with water quality requirements and standards.

### 7.1. Conclusions

The study group concluded that the best way for MPWWR to deal with serious non-compliance problems is to initiate a system of negotiated, site-specific Compliance Action Plans (CAPs). These agreements would identify schedules for improvements to reduce water pollution based on what is feasible and appropriate in view of local conditions.

The process envisions that, where appropriate, applicants would be required to conduct pollution prevention audits and implement appropriate improvements in facility management, as part of the CAP process. Under some circumstances, full compliance may not be immediately feasible, and such plans may include incremental improvements toward eventual full compliance.

#### 1.0.0 Compliance Action Plans for Industrial Discharges

This proposal envisions that the approved CAPs would become the essence of future operating licenses for the facilities and would include a description of planned improvements, a schedule for the installation of such treatment or upgrades as may be needed, and specific requirements for monitoring, record keeping, and periodic reporting on compliance. Access to this process would be precluded where current operations pose an immediate danger to neighbors, since current law requires that such facilities be closed until the imminent and substantial hazards are identified and removed. Once approved, these CAPs will provide clarity about what facilities need do to remain in compliance during the life of the license.

The owner of the facility would be responsible for preparing a CAP application and having an environmental audit of the premises, conducted by a competent institution, if one has not been done recently. The purpose of this audit is to identify opportunities for pollution prevention to improve housekeeping practices and alter production processes to reduce the volume and toxicity of the resulting waste streams and improve the facility's efficiency in the use of energy, water and other materials. In addition, the applicant would be required to propose a schedule for feasible treatment improvements. The application would then be discussed with the licensing authority, modified as appropriate, and approved by the Ministry.

As a point of departure for these negotiations, the licensing authority might look at feasible levels of treatment for classes of facilities from emerging Egyptian practice or from publications of the World Bank or other international authorities. Over time, these transactions will lead to a much better understanding of compliance problems and of feasible levels of treatment for classes of facilities in Egypt. In addition, since the process would be initiated by MPWWR, it would be possible for the ministry to set the pace for these transactions to be commensurate with available resources and their developing capabilities to manage these new procedures.

## 2.0.0 Compliance Action Plans for Municipal Discharges

The CAP program also offers MPWWR opportunities to consider the use of alternative levels of treatment for municipal wastes facilities in small communities. In these circumstances, the applicant would be given an opportunity to show why the proposed application of "appropriate technology" can be maintained in the impacted communities without adversely impacting the health of neighbors. This is particularly important since a more flexible approach could enable government, which currently constructs these facilities, to provide initial treatment to more communities within any fixed level of resources.

## 3.0.0 CAP Priorities

The proposed CAP program would have MPWWR setting priorities based on anticipated adverse water quality impacts and negotiating with facilities to tailor requirements to local conditions and the financial realities of the impacted facilities. It would maintain existing, stringent WQS as national goals, which is consistent with the comments of the vast majority of the participants at the workshop.

Compliance agreements are being used by many developing countries concerned with improving environmental protection in the face of significant compliance problems, and in Eastern Europe, where nations are shifting from centrally-planned to market-based economic systems. It is worth noting that a somewhat similar proposal for the use of compliance agreements by the Egyptian Environmental Affairs Agency related to the implementation of Law 4/1994 received more than 500 positive responses from businesses, demonstrating an apparent increased sensitivity to the need for improving compliance with environmental regulations.

## 4.0.0 Revising Law 48

Since some revisions in Law 48 are needed to provide clear and unambiguous authority for the CAP program, a few other high priority modifications are proposed to improve the effectiveness of pollution control activities. As noted below, several changes are being proposed in the Executive Regulations but not any significant modifications in existing WQS are proposed at this time. While we think this is a reasonable approach, the reader should view these proposals as a menu. Only the specific changes related to the CAP process are vital at this time.

## 5.0.0 Implementation Activities

Since these proposals constitute a significant departure from current practices, specific proposals for implementation activities are offered, should the Ministry adopt the recommendation for the creation of a CAP program. These proposals include the creation of an internal task force to plan for initial activities and the formation of a technical advisory committee to address a number of issues raised within the existing Inter-Ministerial Committee. Since the beneficial impacts of enhancing the regulatory capacities of licensing institutions are well understood among development officials, high priority should be given to seeking specific donor institution support for training and technical assistance to support these activities.

## 2.0 Recommendations

The following is a consolidated list of the recommendations which the study team proposes to MPWWR.

### 1.0.0. Institutionalize CAP Program

As described fully in Section 6 and the charts in Appendix A and B, the following activities are proposed to provide a solid legal basis for the Compliance Action Plan Program

Very narrow changes to law 48 including:

- Authorization to establish a CAP program to be administered in accordance with Executive Regulations Article 28;
- Incentives to promote on-time compliance with the schedules contained within future CAPs;
- Authority for MHP to subcontract with other government laboratories conducting compliance monitoring, in order to expand the universe of approved government laboratories that can undertake this work;
- Amendments to clarify that the licensee is responsible for selecting appropriate technologies and meeting standards; and
- Changes in the definitions recognizing the unique characteristics of the High Aswan Dm Reservoir and of groundwater resources.

Limited changes to the Executive Regulations to:

- Adopt a standard terminology to describe the water quality standards which are contained in Articles 61 through 64;
- Increase fees to reflect some of the inflation since enactment in 1982, in order to offset some of the costs of the new activities;
- Note requirements for Environmental Impact Assessments (EIAs) and monitoring, reporting, and record keeping by licensees, as required currently under Law 4/1994;
- Establish the process through which CAPs will be generated, reviewed, and approved;
- Create incentives to ensure the on-time installation of planned abatement improvements in CAPs;
- Reference contemporary international standards for sampling and analyses of wastewater discharges; and
- Make very minimal changes in existing WQS.

### Mobilization to Implement the CAP Program

Create an internal implementation task force to:

- Draft whatever Executive Decrees or policies may be needed to initiate an orderly implementation of the new program;
- Develop an implementation plan for a new special unit to implement the CAP program, including staffing, budget, and support needs;
- Prepare a robust training program to prepare MPWWR personnel to assess CAP applications related to the adequacy of the related pollution prevention audits and proposed follow-up actions, as well as the feasibility and appropriateness of the schedules for treatment improvements included in the applications;

Establish implementation priorities based on identification by Governors of facilities believed to be causing the greatest water quality problems;  
Develop procedures with which to evaluate applications for alternative waste treatment for small communities;  
Establish procedures to oversee the implementation of approved CAPs;  
Develop liaison relations with other strategic planning activities within MPWWR;  
Develop plans for coordination with related pollution control activities conducted to implement Law 4/1994, which covers many of the same facilities.

Establish a Broad-Based Technical Advisory Committee to Recommend to MPWWR:

Feasible discharge levels for BOD, COD and other significant contaminants, based on treatment performance data, in order to facilitate negotiating CAP requirements and to provide a basis for long-term reform in WQS;  
Procedures to promote the use of loading versus concentration limits in future WQS and CAP agreements;  
Appropriate standards to protect the High Aswan Dam Reservoir from significant pollution;  
Undertake longer-term studies of such questions as:

- impact of pesticides and fertilizer use on water quality;
- improved monitoring methods to help detect and control pathogenic biological agents like parasites; and
- appropriate controls for cooling water discharges and for sludge and backwash water from water treatment facilities.

### 7.2.3. Long-Term Reforms

Over the long-term, there is a need for a fundamental reform of Law 48, its Executive Regulations, and the existing WQS, building on improved information about compliance problems and feasible treatment opportunities. These deliberations should consider:

A new system of technology-based discharged limits based on what is feasible for various classes of facilities;  
A new set of ambient WQS for in-stream conditions necessary to support designated uses of the receiving bodies;  
Amending Law 48 to allow initial discharge limits for classes of facilities to be set on the bases of affordable technologies and more stringent requirements established when needed to attain water quality standards in nearby receiving bodies;  
Creating a new range of potential sanctions for serious and persistent violations of discharge requirements, so that the penalties can be related to the seriousness of the violations;  
Creating a separate division within the State Council to be devoted to environmental compliance activities to expedite the resolution of disputes and assist the judiciary build a cadre of judges with expertise in these areas; and  
Developing a national pollution plan to guide future governmental investments in municipal wastewater facilities.

In conclusion, the adoption of a CAP program offers MPWWR an opportunity to initiate pollution control activities at facilities believed to be creating the most serious water quality problems. For the regulated community, it provides a clear definition of what needs to be done to remain in compliance with water pollution requirements. This may be particularly valuable to manufacturing facilities interested in entering international markets. Since MPWWR initiates each individual CAP negotiation, it should be possible to manage the

process so that the activities remain commensurate with available resources. While there are real costs in undertaking this initiative, the potential benefits appear large. Over time, the related transactions will provide MPWWR with valuable information about the nature of non-compliance problems and feasible abatement improvements with which to formulate more fundamental reforms in the future.

## 8. REFERENCES

El-Gohary, F.A. et. al. (1996). "Needs Assessment Study for the Industrial Sector", Unpublished Report, NRC .

Harris J and Abdel Nasser, G. (1995). Assessment of Water Quality Hazards in Egypt. National Water Quality Conservation Unit, PRIDE .

PRIDE, (1994). Comparing Environmental Health Risks in Cairo, Egypt, Submitted to USAID/Egypt, contract number ANE-0178-Q-00-1047,00. September, USAID Project No. : 398-0365.

PRIDE, (1992). Egypt Water Quality Impact Assessment: Phase I, submitted to USAID Egypt under contract ANE-0178-Q-00-1047-00 Project Number :398-0365.

PRIDE, (1992). Egypt Water Quality Management Action Plan: Phase II, submitted to USAID Egypt under contract No. ANE-0178-Q-00-1047-00 AID Project No. 398-0365.

UNEP-CAMRE (1996). The state of Industrial Pollution in the Arab Region, League of Arab states-I.S.B.N. 977-5024-14-5.

Tisseau, M.A., Fauchon, N., Cavard, J., and Vandavelde, T., (1996). Pesticide contamination of Water Resources : A case study. The rivers in the Paris Region. Wat. Sci. Techn., 34, 147.

Water Resources Management (1991). Friedrich Ebert Stiftung-EEAA

World bank, 1997. Pollution Prevention and Abatement Hand book.

World bank (Lovei and Weiss) , 1997. Environmental Management and Institutions in OECD Countries: Lessons Learned from Experience.

World Bank, (1993). Arab Republic of Egypt, Water and Wastewater Sector Study, Infrastructure Division Report, Report No.10350-EGT, 68p.